

QUICK COUNT™ / EASY COUNT™ TECHNICIAN'S GUIDE

setra

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Introduction

This Technician's Guide is designed to give you a better understanding of the capability of your Quick Count/Easy Count[™] scale. Detailed explanations are outlined regarding the RS-232 data communications. Instructions are provided for remote control of the scale via the RS-232 port, how to perform operating procedures and how to program the scale set-ups via serial commands.

The manual is divided into four sections. Section One, Establishing RS-232 Communications; Section Two, Operating Your Scale Remotely via RS-232; Section Three, Set-up Functions via RS-232; Section Four, Calibration.

Section One

Establishing RS-232 Communications

The SETRA Quick Count/Easy Count comes equipped with a bi-directional RS-232 interface. Users who are interfacing a scale to the SETRA Auto Count™ Bar Code System should follow the installation instructions in the Auto Count 200 operator's manual.

The RS-232 software conventions and formats used to communicate with a SETRA Quick Count/Easy Count are discussed in the first part of this section, followed by the interface hardware. For information on connection and data type, consult the latter part of this section entitled, " The RS-232 Interface Hardware" .

INTERFACING A SETRA QUICK COUNT/EASY COUNT SCALE TO A COMPUTER

The bi-directional RS-232 interface not only allows the scale to transmit data to a computer, but also enables a computer to control the scale. Your Setra Quick Count/Easy Count comes from the factory set-up to operate at 2400 baud with no parity. Since the baud rate of this interface is selectable, virtually any computer or terminal with an RS-232 interface can be connected to the scale. (See Section Three to program a new baud rate and parity) Setra scales do not support either hardware or software handshaking.

If you cannot communicate with the scale, you should perform the procedure below to reset the scale to its default set-ups. The default settings are shown following this reset procedure.

To revert to the factory default settings it is necessary to reset the scale's battery backed RAM. This will cause all of the user set-ups to return to the factory defaults and will erase any span calibration that may have been performed. To reset the scale's battery backed RAM use the following procedure:

1. Remove power from the scale by unplugging the DC connector from the AC adaptor.
2. QC: Hold down the sample size and print keys simultaneously.
EZ: Hold down the zero and count keys simultaneously.
3. While holding these two keys down, restore power to the scale. This puts the scale in the diagnostic mode
4. The scale will display "d nOS". Press the clear key (QC) or zero key (EZ). The scale will now perform tests to verify its operation and reset all of the set-ups to the factory defaults. The scale will then display "PASS".
5. Press the clear key (QC) or zero key (EZ). The scale will now perform the normal segment test, capacity and count down displays.

The factory defaults are set as follows:

- Baud Rate equal to 2400; no parity.
- print is assigned to the standard serial tape print format (QC) with only the net weight, APW and pieces being printed; or APW bar code for the CoStar SETRA 250 (EZ).
- Minimum sample size is ten pieces.
- Minimum accuracy is 95%.
- Display hysteresis is enabled.
- INT mode is set to fast update.
- All weighing units enabled.

SENDING COMMANDS TO THE SCALE

In addition to the functions that appear on the scale keyboard, there are several more which can be accessed by a computer or terminal via the RS-232. To perform a scale function simply send the ASCII character which corresponds to that function. These characters are shown below and in the following tables.

QUICK COUNT/EASY COUNT FUNCTIONS

Z	zero	Assigns the pan and whatever is currently being weighed a value of zero. While the scale is determining a stable weight reading, the display will indicate "bUSY".
---	------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------

Note: If a tare value is stored in memory it will be cleared.

0	sample size	Displays preprogrammed sample sizes (QC/EZ6 only).
C	count	Instructs the scale to begin or resume counting (on EZ2 also used to sample size).
F	set-up/ cal	Instructs the scale to enter a set-up or perform a calibration.
A	apw	Instructs the scale to accept an average piece weight entry.
K	clear	Clears the last number entered or operation requested, and displays weight.
T	tare	Instructs the scale to accept a numerical tare weight entry. If a container is placed on the pan, transmitting T for tare assigns its weight as the "tare" (i.e. container weight) and saves it in memory. The display will read net weight (i.e. contents weight).
G	gross	Toggles between the gross weight and the net weight.

(gross weight - tare weight = net weight)

P	print	Scale sends displayed and stored information to a printer (or other peripheral device).
U	units	Converts the weighing units of measure (e.g. changes from grams to ounces).
M	accum	Sums and stores the results of multiple weighing or counting operations.
S	id	Instructs the scale to store an identification number of up to 25 digits (e.g. a part number or account number) to be printed or transmitted to a peripheral device.
•	display	Instructs the scale to recall the value stored in any of the various registers (e.g. tare, accumulate, etc.).
X	reset	Sets all counting and weighing registers to zero. Clears all volatile ID registers. Assigns the pan and whatever is currently being weighed a value of zero. Displays full scale capacity.
•		Instructs scale to enter a decimal point during numeric entry.
—		Instructs scale to change the sign of a number. Interpreted as a hyphen when entered as part of an ID number.
		When preceding any register that stores a value, instructs the scale to clear the stored value from that specific register. (e.g. Transmitting the —, tare will clear the tare value in memory.)
		When preceding units, instructs the scale to convert the weighing units to the factory default.
0-9		Instructs the scale to enter numerical values given, such as number of pieces or average piece weight.

DISPLAY SYMBOLS

ok	Reading shown is stable. Further operations may be performed.
gross	Reading shown is gross weight.
apw	Reading shown is average piece weight.
accum	Reading shown is the amount, in pieces or in weight, stored in the accumulator register.
tare	Reading shown is the weight stored in the tare register.
pc	Reading shown is given in number of pieces.
g	Reading shown is given in grams.

oz Reading shown is given in ounces.

lb Reading shown is given in pounds.

t oz Reading shown is given in troy ounces.

dwt Reading shown is given in pennyweights.

c Reading shown is given in carats.

int Scale is operating in either a very fast or very slow fixed integration mode.

Note: Not all weighing units are available on Easy Count models.

LIST OF SCALE COMMANDS

Function	ASCII	Hexadecima l	Function	ASCII	Hexadecima l
accum	M	4D	—	—	2D
apw	A	41	0	0	30
setup/cal	F	46	1	1	31
clear	K	4B	2	2	32
units	U	55	3	3	33
count	C	43	4	4	34
gross	G	47	5	5	35
id	S	53	6	6	36
print	P	50	7	7	37
•	•	2E	8	8	38
display	•	2E	9	9	39
tare	T	54	reset	X	58
zero	Z	5A	int	I	49
sample size	O	4F			

Below are additional commands available via RS-232:

Function	ASCII	Hexadecima l	Function	ASCII	Hexadecima l
ID START	/	2F	JUMP	J	4A
ID FINISH	\$	24	VERIFY	V	56
QUANTITY	Q	51	Immediate Transmit	#	23
WAKE UP	W	57			

Never include a carriage return or line feed in any command sequence. The scale uses any command character as a terminator for an input string.

For example, if you wish to enter a tare weight of 1000 (in the units currently being displayed), simply transmit "1000T". This will enter the number 1000 into the TARE register. To enter an average piece weight of 12.35, send "12.35A".

The Jump and Verify Functions are described later in this section.

SENDING ALPHANUMERIC DATA TO THE SCALE

Alphanumeric identification numbers may be entered into the scale through the RS-232 interface. SETRA scales do not have alpha-numeric keyboards, so the RS-232 interface is the only means of entering such data.

Since SETRA scales recognize upper-case ASCII characters as commands, it is necessary to instruct the scale to ignore entries as commands when entering alpha-numeric data. Special control sequences are used to disable interpretation of alpha-numeric characters as commands.

To enter alphanumeric data from a computer, send the following string to the scale:

```
/ [string identifier] $ S
```

The ID START (or introducer), " / " , instructs the scale to ignore subsequent characters as commands. The ID FINISH (or terminator), " \$ " , instructs the scale to interpret subsequent characters as commands. Everything between the start and finish will be stored as alphanumeric data. The entry command, " S " , instructs the scale to enter the string identifier into the 0 ID field. The additional identification fields and their ASCII field identifiers are listed below:

<u>ASCII Field Identifier</u>	<u>Hexadecimal</u>	<u>ID Field</u>
S	53	0
D	44	1
R	52	2
L	4C	3
N	4E	4
Y	59	5
H	48	6
B	42	7

Note: Field #1, 5 and 7, are not cleared when the reset key is pressed or when the unit is powered off.

The command letters indicated can be used in place of "S" in the command:

```
/ [string identifier] $ S
```

The string identifier may consist of any uppercase ASCII character (A-Z), any number (0-9), a space, or a hyphen (-). It may be up to 25 characters in length. Lowercase ASCII character (a-z) are translated into uppercase by the scale. All other characters are ignored by the scale.

DO NOT SEND A CARRIAGE RETURN, CR, OR A LINE FEED, LF, DURING OR AFTER THE STRING IDENTIFIER.

To display alphanumeric data stored in the 0 ID field, transmit .S, which instructs the scale to display the contents of the 0 ID field. To display the other ID fields, transmit . and the ASCII field identifier for the ID field.

RECEIVING DATA FROM THE SCALE USING THE IMMEDIATE TRANSMIT MODE

When a scale is connected to a computer, it is suggested that "immediate transmit" ("I") be used. In response to this command the scale will transmit whatever number or message appears in the scale display. The "string format" output is shown below:

+/- 1 2 3 4 5 6 . c0 c1 c2 c3 CR LF

The first six digits represent the number field. A sign (+ or -) always precedes the first digit and a decimal point is always transmitted. The leading 0's are replaced by a space (SP) before the + or - sign. (Messages, when transmitted, are sent in the number field.)

NOTE: The decimal point will be positioned according to the readability and units the scale is displaying.

"c0" is the INT mode character.

CHARACTER	MEANING
-----------	---------

I	Scale is in the INT mode
---	--------------------------

(space)	Scale is not in the INT mode
---------	------------------------------

"c1" is the "mode" character. It describes what the number being transmitted represents. The following is a list of all possible mode characters:

CHARACTER	MEANING
-----------	---------

(space)	Number field is a message or net weight
---------	-----------------------------------------

G	Number field represents GROSS weight
---	--------------------------------------

T	Number field represents TARE weight
---	-------------------------------------

A	Number field represents APW
---	-----------------------------

M	Number field represents ACCUM contents
---	----------------------------------------

"c2" is the "units" character. It describes the units of the number being transmitted. The following is a list of all possible characters sent in this digit:

CHARACTER	MEANING
-----------	---------

G	Number is expressed in grams
---	------------------------------

O	Number is expressed in ounces
---	-------------------------------

P	Number is expressed in pounds
---	-------------------------------

Y	Number is expressed in troy ounces
---	------------------------------------

D	Number is expressed in pennyweights
---	-------------------------------------

K	Number is expressed in carats
---	-------------------------------

C	Number is expressed in pieces
---	-------------------------------

Note: Not all weighing units are available on Easy Count models.

" c3" is the " stability" character. This character corresponds to the " OK" symbol on the display.

CHARACTER	MEANING
(space)	Reading is not stable
S	Reading is stable

The immediate transmit output is always transmitted with a carriage return and line feed.

To read data that may be stored in a specific memory register, you must first instruct the scale to display the data held in the particular memory register, and then to transmit the displayed data to the computer. For example, to read the contents of the following registers, the following codes must be transmitted.

Register	Transmit	Hexadecimal		
Tare	.T#	2E	54	23
Accumulator	.M#	2E	4D	23
Count	.C#	2E	43	23
APW	.A#	2E	41	23
Gross	.G#	2E	47	23
Net	.GG#	2E	47	23

The following are some examples of transmit now output:

" +12.3_GPS" means that the GROSS weight is 12.3 lbs stable.
" +10000___C_" means 10000 pcs, and the reading is not stable.
" +84.6_TO_" means that the TARE weight is 84.6 ounces.
" +14.2I_P_ " means the NET weight is 14.2 pounds, and the scale is in the INT mode.
" UNABLE " means that no APW has been entered or calculated.

NOTE: To achieve the fastest and most consistent response to the immediate transmit command ('#'), use the Quick Count/Easy Count INT mode. See the section entitled, "USE OF THE INT MODE"

THE JUMP FUNCTION

The Jump Function causes the scale to immediately operate in a given weight unit. Using this function ensures that numbers, such as tare weight or average piece weight, entered through the RS-232 interface are interpreted in the correct units. For example, if the average piece weight was stored by a computer in grams, it would be necessary to ensure that the scale was operating in grams prior to sending the APW to the scale. This feature is only available through the RS-232 interface.

To use the Jump Function, send the following to the scale:

nJ

Where " J" is the Jump function command and " n" is the unit code. The unit code ranges from 1 to 6 as shown below: (Not all weighing units are available on Easy Count models.)

Unit Code	Unit
1	grams
2	ounces
3	pounds
4	troy ounces
5	pennyweights

Do not send any number other than 1-6.

For example, to enter an average piece weight of 0.23456 grams from a computer, send "1J0.23456A". The "1J" sets the scale for operation in grams. The "0.23456A" tells the scale to enter that weight into the APW register.

The Jump Function prevents misinterpretation of values entered from a computer.

THE VERIFY FUNCTION

When many scales or other peripherals are connected to a computer, it is sometimes useful for the computer to be able to check on the status of these devices. The verify function can be used to determine the model number of a scale and determine that the scale is functioning correctly. To invoke the verify function, transmit an ASCII "V". If the scale is functioning correctly, it will send one of the following messages followed by carriage return and line feed:

" SETRA QUICK COUNT 1000 grams"	" Easy Count EZ2-500"
" SETRA QUICK COUNT 2500 grams"	" Easy Count EZ2-2000"
" SETRA QUICK COUNT 5000 grams"	" Easy Count EZ2-5000"
" SETRA QUICK COUNT 12500 grams"	" Easy Count EZ6-500"
" SETRA QUICK COUNT 25000 grams"	" Easy Count EZ6-2000"
" SETRA QUICK COUNT 34000 grams"	" Easy Count EZ6-5000"
" SETRA QUICK COUNT 50000 grams"	

STATUS AFTER POWER IS APPLIED

All SETRA scales have an internal nonvolatile memory for storing certain status information. This memory does not erase when power is removed from the unit. All set-up functions (such as print format, minimum pieces, minimum accuracy, and baud rate) are stored in this memory. As a result, the baud rate and print format will not need to be reset each time the scale is turned on.

During the first 30 seconds of operation, the scale will run through a self-diagnostic procedure. When the unit is ready to be used, it will identify itself by transmitting a "wake-up" message. (This message can also be invoked by sending a W to the scale.)

The RS-232 INTERFACE HARDWARE

Although SETRA scales can communicate with almost any RS-232 device, the built-in interface does not include the complete protocol. Only the transmit and receive lines of the standard interface are used. This should not present any interfacing problems in most applications.

The data format is:

- 1 start bit
- 8 data bits including parity
- 1 stop bit
- 10 bits per frame (framing errors ignored)

NOTE: The scale will transmit using the parity selected; however it does not check the parity it receives.

Use an RS-232 cable to connect the external device to the scale, or construct one following the instructions below.

The QC serial port uses an eight pin modular connector and the EZ uses a male DB9 pin connector. The pinout is as follows:

Pin #	QC	EZ
1	shield ground	NC
2	Tx - transmit out	TX
3	Rx - receive in	RX
4	NC - no connection	NC
5	NC - no connection	GND
6	+5V @ 250 ma* optional	+5V @ 250 ma* optional
7	GRD - ground	NC
8	ground	NC
9		NC

* If the fuse is installed, power is provided for the Auto Count 200, bar code scanning wand (Smart Wand), or CCD/laser scanner accessory on pin 6.

NOTE: The "handshake" signals, such as "Clear To Send" (CTS), are not implemented. This requires that the peripheral have a minimal buffer (15 characters).

In addition, some computers which require handshaking will require a connection between two pins on the computer's connector named DTR and DSR (Data Terminal Reading and Data Set Ready) in order to enable it to communicate with the scale. CTS may also need to be jumpered to RTS at your computer interface.

The maximum recommended cable length is 15 meters. The cable may be longer if it has less than 2,500 pF capacitance. The load impedance of the device connected should be between 3,000 and 7,000 ohms with not more than 2,500 pF shunt capacitance.

For more information, consult EIA Standard RS-232: "Interface Between Data Terminal Equipment Employing Serial Data Interchange."

The following is a short example of a BASIC program which will a) set the PC's "com" port for use with a Setra Quick Count/Easy Count scale, b) obtain a verification message, c) clear and zero the scale, d) set the scale units to grams, e) set the ID to ABC-123, f) read the ID back from the scale and g) wait for a stable reading and obtain a weight. This program will work with an "IBM" PC type computer using BASICA or GW BASIC version 3.0 or higher.

```
100 CLS
120 PRINT " SETRA SCALE COMMUNICATIONS TEST"
140 PRINT " PLEASE INPUT THE SCALE'S BAUD RATE .... USUALLY 2400"
160 INPUT BAUD$
180 PRINT" PLEASE INDICATE WHICH COMPUTER COM PORT YOU ARE USING (1 OR
2)";
200 INPUT I%
220 IF I%=2 THEN PORT$="COM2" ELSE PORT$="COM1"
240 REM: OPEN THE COMMUNICATIONS PORT & DISABLE ALL HANDSHAKES
260 REM: 8 DATA BITS WITH NO PARITY AND 1 STOP BIT IS SELECTED
280 O$=PORT$+":"+BAUD$+", N, 8, 1, RS, CS, DS,CD"
300 OPEN O$ AS #1
320 REM: VERIFY THE SCALE MODEL
340 REM: SCALE COMMANDS DO NOT USE A <CR> OR <LF>...
360 REM: NOTE USE OF (;) AT END OF PRINT #1 STATEMENTS
380 PRINT #1, "V";
400 INPUT #1, A$
420 PRINT "SCALE MODEL IS: ";A$
440 REM: CLEAR EVERYTHING AND ZERO THE SCALE
460 PRINT #1, "-KZ";
480 PRINT "PLEASE WAIT FOR SCALE TO ZERO"
500 REM: READ THE ZERO AS A PSEUDO HANDSHAKE
520 PRINT #1, "#";
540 INPUT #1, A$
560 REM: SET THE SCALE IN GRAMS
580 PRINT #1, "1J";
600 PRINT "THE SCALE ID WILL BE SET TO 'ABC-1234'"
620 REM: THE ID FIELD IS THE SCALE 'S' REGISTER
640 PRINT #1, "/ABC-1234$S";
660 PRINT "PLEASE PLACE AN OBJECT ON THE SCALE AND PRESS <Enter> WHEN
FINISHED";
680 INPUT A$
700 REM: READ SCALE ID NUMBER AND THEN CURRENT WEIGHT ON THE SCALE
720 REM: WAIT FOR A STABLE READING, INDICATED BY AN 'S' IN CHAR.
POSITION 12
740 PRINT #1, ".S";
760 INPUT #1,A$
780 PRINT "THE SCALE ID IS: ";A$
800 PRINT #1, "#";
820 INPUT #1,A$
840 B$=MID$ (A$, 12, 11)
860 PRINT A$
880 IF B$<>"S" THEN GOTO 800
900 PRINT "THE WEIGHT ON THE SCALE IS ";A$
```

Operating The Scale Remotely Via RS-232

BASIC WEIGHING

To weigh a sample on your scale, use the following procedure:

1. Transmit Z for zero.
2. Place the object(s) to be weighed on the pan.
3. Wait for the "OK" symbol, then read the weight from the display or transmit # and the scale will transmit the reading to the computer.

CONVERTING THE WEIGHING UNITS

Your Quick Count/Easy Count scale is capable of weighing in many different units of measure. To convert from one unit to another, simply transmit the units' jump code or transmit U for units. Each time you transmit a U for units the display is converted to the next unit in line. Continue transmitting a U until the units you wish to use are displayed. The order of units is as follows: GRAMS - OUNCES - POUNDS - TROY OUNCES - PENNYWEIGHTS - CARATS - GRAMS. To return to the factory default (grams) transmit - U.

NOTE: The units displayed can be limited to certain selected units of measure, and can be restricted to as few as one if desired. See Section Three, Set-Up Functions.

Not all weighing units are available on the Easy Count models.

WEIGHING WITH A CONTAINER

You can use your scale to weigh objects (or liquids) by placing or pouring them into a container. To weigh objects or liquids in this manner, WITHOUT including the weight of the container, transmit T for tare or Z for zero. If you wish to retain the container weight for later reference the tare (T) should be transmitted. If you do not need to retain the container weight, and do not need to display or print the gross weight, transmit Z for zero only. To tare out or zero out the weight of a container, and then weigh the contents placed or poured into it, use the following procedure:

1. Transmit Z for zero. Place the empty container on the pan.
2. Transmit T for tare or Z for zero. (If the tare weight is known, a full container may be placed on the pan in step #2. In this case, transmit the tare weight, then T for tare.)
3. Wait for the "OK" symbol. Place or pour objects or liquids into the container.
4. Wait for the "OK" symbol, then read the net weight from the display or transmit # and the scale will transmit the reading to the computer.

NOTE: You must transmit T for the tare, not Z for zero, in step #3 to store the container weight in memory. To recall the stored tare value to the scale display, transmit . T or transmit . T # and the scale will transmit the reading to the computer.

DISPLAYING THE GROSS WEIGHT

To display the gross weight, transmit . G. To toggle between the gross weight and the net weight, transmit G for gross repeatedly. The gross weight will equal the net weight unless a container weight has been entered using the tare command (see Weighing with a Container).

COUNTING WITH A CONTAINER

You can use a container when counting pieces without including the container weight in the count. Your scale can do this by "taring out" (subtracting) the weight of the container before it begins counting. If you wish to retain the container weight for later reference, the T for tare should be transmitted in step #3 below. If you do not need to retain the container weight, and do not need to display or print the gross weight, transmit Z for zero only. To tare out or zero out the weight of a container, use the following procedure:

1. Transmit Z for zero.
2. Place the container on the pan.
3. Transmit T for tare or Z for zero. (If the tare weight is known, a full container may be placed on the pan in step #2. In this case, transmit the tare weight then T for tare.)
4. Wait for the "OK" symbol.
5. Place the sample size on the pan and transmit the number of pieces in the sample.
(Note: The EZ2 requires the selection of the sample size before counting.)
6. Transmit C for the count.
7. Wait for the "OK" symbol, then add pieces until you reach the desired count.
8. Wait for the "OK" symbol, then read the display. The scale will display the total number of pieces you have placed in the container or transmit # and the scale will transmit the reading to the computer.

NOTE: You may recall the tare weight to the scale display by transmitting . T (or . T # to recall the tare weight to the computer) but only if it was stored in step #3 by transmitting T for tare and not Z for zero.

The scale may request that more pieces be added after the initial sampling if a minimum accuracy or sample size requirement has been preset.

DISPLAYING THE GROSS WEIGHT DURING COUNTING

To display the gross weight during a counting procedure, use the following procedure:

1. Transmit . G for gross to display the gross weight.
2. Transmit C for count to return to the counting mode. (Not available on the EZ2).

The gross weight will equal the net weight unless a container weight has been entered using the tare (see section, Counting with a Container above).

COUNTING WITH A KNOWN AVERAGE-PIECE-WEIGHT

The scale can count the number of pieces in a batch by dividing the weight of the batch by the known average piece weight (APW). To calculate the number of pieces in a batch using the average piece weight, use the following procedure:

1. Transmit Z for zero.
2. Transmit nJ where "n" corresponds to the known APW's unit of measure. (Refer to the Jump Function section of this manual.)
3. Place the pieces on the pan.
4. Enter the known average piece weight, then transmit A for APW.
5. Wait for the "OK" symbol, then read the display. The scale now reads the number of pieces on the pan. Transmit # and the scale will transmit the reading to the computer.

NOTE: To determine an unknown average piece weight simply use the procedure for counting, and when you have a known number of pieces displayed, transmit . A to recall the APW to the scale or . A # to recall it to the computer.

COUNTING WITH A KNOWN AVERAGE-PIECE-WEIGHT AND TARE WEIGHT

Items in a filled container can be counted without opening the container if the average piece weight and tare weights are known. Simply enter the weight values using the procedure outlined below:

1. Transmit Z for zero.
2. Place a filled container on the pan.
3. Enter the value of the known tare weight and transmit a T for tare.
4. Enter the value of the known average piece weight and transmit A for the APW.
5. Wait for the "OK" symbol and then read the display. The scale now displays the count of items in the container. Transmit # and the scale will transmit the reading to the computer.

REVERSE COUNTING OR KITTING

Using this feature, you can place a container full of pieces on your scale and count the number of pieces removed. This is especially helpful when kitting (counting out a certain number of pieces to be packed together). To perform reverse counting or kitting, use the following procedure:

1. Place a container full of pieces you wish to count on the pan.
2. Transmit Z for zero.
3. Place the sample size on the pan, then transmit the number of pieces in the sample.

(Note: The EZ2 requires the selection of the sample size before counting.)

4. Transmit C for the count.
5. Remove pieces until the scale displays the number of pieces you wish to count out or kit. Transmit # and the scale will transmit the reading to the computer.
6. Transmit Z for zero.
7. Repeat Steps 5 and 6 as many times as needed.

- NOTE:
- a. If the average piece weight is known, you may transmit the —, enter the average piece weight, and transmit A for APW in place of Steps 3-6.
 - b. If the sample size is not large enough to satisfy the minimum accuracy requirement the display will read "sub nnn". Remove the specified number of pieces (i.e. nnn) from the container, then transmit C for the count.
 - c. It is possible that the required sample size is larger than the quantity needed for each kit. For instance, the required sample size is 100 pieces but only 50 pieces are to be kitted together. In this case follow steps 1 through 6 above, then proceed as follows: place the 100 piece sample back into the container and transmit Z for zero. Continue with steps 5 through 7 above.

ACCUMULATING RESULTS BY WEIGHT OR COUNT

It is sometimes necessary to accumulate WEIGHTS or COUNTS of various batches; e.g., the number of capacitors counted or the total weight of fasteners weighed out during a day. The scale can be used to simultaneously accumulate both weights and counts.

To accumulate a WEIGHT, use the following procedure:

1. Enter the weighing mode by transmitting K for clear.
2. Clear the weight accumulator by transmitting the numeral 0 then M for accum while in the weighing mode.
3. Transmit Z for zero. Place the object to be weighed on the pan.
4. Transmit M for accum. This weight is then added into the accumulator. The total accumulated weight is then displayed.
5. Transmit K for clear. The current weight is displayed.
6. Repeat Steps 2-4 anytime you wish to accumulate the weights of further batches.
7. Transmit a . M for accum. The scale now reads the accumulated weight. or Transmit # and the scale will transmit the reading to the computer.

NOTE: A K for clear must be transmitted after completing each accumulation.

To accumulate a COUNT (or reverse count, if kitting), use the following procedure:

1. Enter the counting mode by transmitting . C for count. Clear the count accumulator by transmitting the numeral 0 and M for accum. (If you are in the weighing mode 0 M will clear the contents of the weight accumulator from memory.)
2. Transmit Z for zero.
3. Place the sample size on the pan, transmit the number of pieces in the sample.
4. Transmit C for count.
5. Wait for the "OK" symbol, add (or subtract if kitting) the desired number of pieces.
6. Transmit M for accum.
7. Transmit . C for count. The current count is displayed. Transmit # and the scale will transmit the reading to the computer. Transmit Z for zero.
8. Repeat Steps 5-7 anytime you wish to add to the accumulated count.
9. Transmit . M for accum. The number of pieces shown is the total number accumulated. Transmit # and the scale will transmit the reading to the computer.

NOTE: The . C commands must be transmitted after completing each accum operation when accumulating the count.

WARNING: Transmitting X for reset or - K for clear will clear the contents of both accumulators.

USE OF THE "INT" MODE

The Setra Quick Count/Easy Count automatically adjusts the display update rate to provide stable performance under environmental conditions such as vibration or draft. However, certain applications may require that a fixed display update rate be set. When weighing in the presence of very severe vibration or draft a slower display update will provide a more stable display. When filling containers to a target weight or count, a very rapid display update can help prevent overshooting the target.

Either a very slow or very rapid display update is available when the scale is in the INT mode. The factory default setting for the INT mode is a very rapid display update. Refer to the Set-Up Functions in Section Three to alter the mode from very fast to very slow. To enter the INT mode, transmit the letter I for int. The INT symbol will appear in the display. Exit this mode by retransmitting I for int. This mode can be used while performing weighing or counting operations.

ASSIGNING AN I.D. NUMBER TO A BATCH

To assign an ID number (such as a part number or an account number) to a given batch, use the following procedure:

1. Enter the number you wish to assign (up to 25 digits).

2. Transmit S for ID.

3. To recall the ID number, transmit . S for id.

NOTE: a. The ID number you have entered will be assigned to all batches until a new ID number is entered. To clear an ID number, transmit - S.

b. If an ID number of more than six digits is used, the scale will display the last six digits entered, but will store and print the entire number (up to its limit of 25 digits). For example, if 123456789 is entered, the scale will display 456789, but will store and print 123456789.

c. The - may serve as a dash (hyphen) during ID number entry. Simply transmit the - wherever you wish to insert a dash (you may use as many dashes as you need, however, no more than one dash may be used consecutively).

d. See the section entitled "Sending Alphanumeric Data to the Scale" for more information.

Section Three

Set-Up Functions Via RS-232

PRINT FORMAT

The print format set-up controls the printout of various measured and stored numbers. You may set-up the scale for printing bar code labels or for English (human readable) printing. The command sequence - 1111 may be formatted for bar code or English (human readable) labels and determines the printing device and specific data that shall print when the print key is pressed. To format the information to be printed, use the following procedure:

1. Transmit - 1111.
2. Transmit F for setup/cal. The scale will display "SEt Pr."
3. Enter 0 to enter the ScriptCoder menu (QC) or to select the APW bar code label format for the CoStar SETRA 250 (EZ). Transmit F to continue ScriptCoder* (QC) or to end (EZ).

Enter 1 to select a tape print format; transmit F for setup/cal and continue to step #6.

Enter 2 if it is connected to a Setra Auto Count 200 bar code printer option; transmit F for setup/cal. The scale's print format is now set and this procedure is complete.

Enter 3 to select a label print format; transmit F for setup/cal and continue to step #5.

Transmit K for clear if you do NOT wish to proceed.

4. The scale will display "LinES". The scale now asks how long the printout should be, measured in terms of lines (for most printers 6 lines = 1 inch). To determine the number of lines, measure with a ruler the distance from the top of one label to the top of the next label in inches and multiple by six. Enter this value and transmit F for setup/cal. The CoStar SETRA 250 requires a form feed between each label which can be programmed by selecting 0 as the number of lines.

Regardless of the number of lines of information to be printed, the Quick Count/Easy Count will advance the printer the same preset distance each time. CAUTION: The scale will not print more lines of information than the number entered in this step.

5. Read the display. The scale now asks if you wish to print the "TARE" weight.
6. Enter 1 if you wish to print the TARE weight (enter 0 if you do not).
7. Transmit F for setup/cal.

* See ScriptCoder operator's manual for further programming instructions.

8. Read the display. The scale now asks if you wish to print the "GROSS" weight.
 9. Enter 1 if you wish to print the GROSS weight (enter 0 if you do not).
 10. Transmit F for setup/cal.
 11. Read the display. The scale now asks if you wish to print the "APW" , average piece weight.
 12. Enter 1 if you wish to print the APW (enter 0 if you do not).
 13. Transmit F for setup/cal.
 14. Read the display. The scale now asks if you wish to print the "ACCUM", accumulated weight (or count).
 15. Enter 1 if you wish to print the ACCUM (enter 0 if you do not).
 16. Transmit F for setup/cal.
 17. Read the display. The scale now asks if you wish to print the "PC", quantity of pieces (count).
 18. Enter 1 if you wish to print the quantity of pieces counted (enter 0 if you do not).
 19. Transmit F for setup/cal.
- NOTE: a. Your printer is now formatted. To change the print format, simply repeat Steps 1-19.
- b. The Quick Count/Easy Count can be used with serial data printers other than those supplied by Setra, as long as the printer has a minimum buffer of 1K and no RS-232 "handshaking" requirement.
 - c. If the length of the printout is unlimited and there is no need for spacing between each printout, format the Quick Count/Easy Count as if you are using a tape printer format by entering the number 1 in step #3.

If you require a uniform printout length such as when printing on adhesive backed labels, format the Quick Count/Easy Count as if you are a label printer, sprocket feed printer and enter the number 3 in step #3.
 - d. For customized output and formatting to both bar code and text printers refer to the ScriptCoder manual (not available for Easy Count).

PROGRAMMING A MINIMUM SAMPLE SIZE

This feature allows you to preset the minimum number of pieces required in a sample. This number will also be requested when the sample size key is pressed. To enter the minimum sample size you wish to have used when counting, use the following procedure:

1. Transmit - 2222.
2. Transmit F for setup/cal. The scale will display " PC nnn" , where "nnn" is the current minimum sample size setting.

3. Enter the minimum number of pieces you wish to be used.
4. Transmit F for setup/cal.

NOTE: To discontinue use of the Minimum-Sample-Size feature, repeat this procedure and enter the numeral 0 in Step #3.

PROGRAMMING A MINIMUM ACCURACY

To enter a specific minimum accuracy level you wish to have used by your scale when counting, use the following procedure:

1. Transmit - 3333.
2. Transmit F for setup/cal. The display will read "ACnn.nn", where "nn.nn" is the current minimum accuracy setting.
3. Enter the desired accuracy in percent. (A number between 95 and 99.99, e.g., 99.9.)
4. Transmit F for setup/cal.

NOTE: For any given piece, the scale automatically calculates the number of pieces needed to be added to the sample, if any, based upon the sample weight necessary to achieve a desired accuracy. The higher the accuracy selected, the larger the sample the scale will request. To discontinue use of the Minimum Accuracy feature, repeat this procedure and enter the numeral 0 at Step #3.

PROGRAMMING BAUD RATE AND PARITY

The SETRA Quick Count/Easy Count is capable of interfacing with a wide variety of computers. To set the baud rate (the rate at which the scale sends information to a computer) and parity, use the following procedure:

1. Transmit - 5555.
2. Transmit F for setup/cal. The display will read " CAL br" .
3. Enter the baud rate. Choose either 300, 600, 1200, 2400, 4800, or 9600, depending on the baud rate required by your printer or computer.
4. Transmit F for setup/cal. The display will read "P- 012".
5. Enter the desired parity. Choose either no parity (enter 0), odd parity (enter 1), or even parity (enter 2). If you are unsure, try entering 0 for no parity. If the scale cannot communicate with your computer, consult the computer's or printer's manual to determine the required baud rate and parity.
6. Transmit F for setup/cal.
7. Set the baud rate and parity of the computer to match the scale.
8. REPEAT STEPS 1-6 TO ENSURE THIS BAUD RATE & PARITY IS RETAINED EVEN AFTER POWER IS REMOVED FROM THE SCALE.

NOTE: The factory default baud rate setting is 2400 and no parity. The scale will transmit with the parity selected; however, it does not check the parity it receives.

DISPLAY HYSTERESIS

Display Hysteresis can prevent the apparent "jumpiness" of the scale display in the weighing mode from moving one digit to the next. For example: If the weight is nearly equal to 235.65 grams, the display may

toggle between 235.6 and 235.7. By performing the following procedure the scale can be set-up to prevent changes to the display that are less than 1 displayed increment, providing greater stability in the weight reading. The display hysteresis may be enabled or disabled by performing the following procedure:

1. Transmit - 6666.
2. Transmit F for setup/cal. The display will read "H - 01".
3. Enter 1 to enable the display hysteresis or enter 0 to disable the display hysteresis.
4. Transmit F for setup/cal.

NOTE: The display hysteresis does not affect the display in the counting mode.

The factory default display hysteresis setting is "enabled" (i.e. 1).

PIECE WEIGHT PER THOUSAND

When counting extremely small parts accuracy and efficiency can be increased if the APW is representative of 1000 pieces rather than of a single piece. The piece weight per thousand mode allows the scale to count tiny parts using an APW that is 1000 times the weight of one part.

This mode is enabled using the following steps:

1. Transmit - 14443 and F for setup/cal.
2. The scale will display "APW 1".
3. To select an APW representative of a single piece transmit F setup/cal.

To select the piece weight per thousand mode, transmit K for clear.

4. The scale will display "APW 1000".
5. To select an APW representative of 1000 pieces, transmit F setup/cal.

Transmit K to exit this procedure without changing the setting of this mode.

The factory default setting for this mode is an average piece weight for a single piece.

WARNING: Any APWs that were previously stored will be incorrect if this mode is changed. All APW's will become representative of either one piece or 1000 pieces depending on how the mode was set previous to the change.

DISPLAYING SCALE CAPACITY, SOFTWARE VERSION AND SET-UP INFORMATION

SETRA is continually making improvements to its products. As a result the operating software, or firmware, of the scale has a revision number.

The revision number may prove useful in communicating with your dealer or SETRA in case of difficulty.

Information regarding the scale's particular set-up can be obtained at any given time; however, it is necessary to connect the scale to a printer or computer, as this information is transmitted via the serial port. The format of the printed information is as follows:

SETRA QUICK COUNT EXAMPLE

Capacity: nnn g
Software Version: n.n

Print: 240P, 340P or Auto Count
 NET
 TARE only if set-up to print
 GROSS "
 APW "
 ACCUM "
 PIECES "

Label Header: YOUR COMPANY NAME, ETC (if defined)

Baud Rate: nnnn

Parity: none/odd/even

Minimum Sample Size: nnn pieces

Minimum Accuracy: nn.nn%

Display Hysteresis: on/off

Weighing Units Enabled: grams, ounces, pounds, troy ounces,
pennyweights, carats

To view the scale's capacity, display the software version and print current set-up information, follow this procedure:

1. Transmit - 7777.
2. Transmit F for setup/cal. The scale will display "rEF n.n" , where "n.n" is the software version number. At the same time the scale will transmit all current set-ups via RS-232 to a printer, computer or other external device.
3. Transmit K for clear. The scale will display "nnn g", where nnn is the capacity of the scale in grams.
4. Transmit K for clear. to return the scale to normal operation.

SETTING THE DISPLAY UPDATE RATE (INT MODE)

The SETRA Quick Count/Easy Count scale automatically adjusts the update rate of the displayed information to provide optimum performance in various environmental conditions, such as vibration or draft. However, certain applications may require a fixed display update. The INT mode is factory preset to provide a rapid display update (short integration time) for filling pieces to a target count. The use of this mode can be altered to provide a slow display update (long integration time) for weighing in the presence of draft or vibration. Follow the procedure below to change the functionality of the INT mode to either a slow or rapid display update:

1. Transmit - 11110.
2. Transmit F for setup/cal. The scale will display "INT 1 or 0".

3. Transmit 1 for a long integration time (vibration control). Transmit 0 for a short integration time (filling).
4. Transmit F for setup/cal.
5. Transmit I to enter INT mode.

UNITS ENABLE/DISABLE SELECTION

The units enable/disable feature controls which weighing units the scale will toggle between when U for units is transmitted or pressed on the scale keypad, repeatedly. The units of measure can be limited to two, three, four, etc. or it can be entirely disabled so that only one unit of measure can be displayed. For example, if only the grams and pounds units are enabled, transmitting U for units repeatedly will toggle between grams and pounds. To enable or disable units, follow this procedure: (Not all weighing units are available on the Easy Count models.)

1. Transmit - 12221.
2. Transmit F for setup/cal. The display will now read "CAL U". Transmit F for setup/cal again.
3. Read the display. The scale now asks if you wish to enable grams.
4. Enter 1 if you wish to enable grams (enter 0 if you wish to disable grams.)
5. Transmit F for setup/cal. Read the display. The scale now asks if you wish to enable ounces.
6. Enter 1 if you wish to enable ounces (enter 0 if you wish to disable ounces.)
7. Transmit F for setup/cal. Read the display. The scale now asks if you wish to enable pounds.
8. Enter 1 if you wish to enable pounds (enter 0 if you wish to disable pounds.)
9. Transmit F for setup/cal. Read the display. The scale now asks if you wish to enable troy ounces.
10. Enter 1 if you wish to enable troy ounces (enter 0 if you wish to disable troy ounces.)
11. Transmit F for setup/cal. Read the display. The scale now asks if you wish to enable pennyweights.
12. Enter 1 if you wish to enable pennyweights (enter 0 if you wish to disable pennyweights.)
13. Transmit F for setup/cal. Read the display. The scale now asks if you wish to enable carats.
14. Enter 1 if you wish to enable carats (enter 0 if you wish to disable carats.)
15. Transmit F for setup/cal.

Note: If you attempt to disable all units, the scale will respond "UnAbLE". This feature affects the units convert function by displaying only the units that are enabled in the following sequence of units: grams, ounces, pounds, troy ounces, pennyweight and carats. Transmitting – U for units will return the scale to the factory default units, if it is enabled, otherwise it will display the next unit that is enabled.

RESTORING THE FACTORY DEFAULT SET-UPS

The many features described in this section allow the user to customize the Setra Quick Count/Easy Count to suit a particular application. However, in doing this it is also possible to inadvertently set-up the scale in such a way that it will not operate as expected. To reset the scale to the original factory defaults, follow the steps outlined below.

1. Transmit – 8888.
2. Transmit F for setup/cal. The scale will display " DEFAULT" .
3. Transmit F for setup/cal to restore the factory defaults, transmit K for clear if you do not wish to proceed.

If the unit displays any unusual messages during the warm-up period, or does not return to normal operation, contact an Authorized Setra Service Center or Setra Systems, Inc., as service may be required.

The factory defaults are set as follows:

- Baud Rate equal to 2400 and no parity.
- print is assigned to the standard serial tape printer format (QC) with only the net weight, APW and pieces being printed or APW bar code for the CoStar SETRA 250 (EZ).
- minimum sample size is ten pieces.
- The minimum accuracy is 95%.
- The display hysteresis is enabled.
- The int mode is set to fast update.
- All weighing units enabled.

NOTE: To print a copy of the scale's current setup information use the following procedure. Connect the scale to a printer via the RS-232 serial port. Power up the scale and then hold the print key (QC) or count key (EZ) down while the scale completes the countdown and displays the scale capacity, i.e., -2-, -1-, C xxxxg. The scale will display "rEF n.n", the software version while printing the current setup information. Press the clear (QC) or zero (EZ) key twice to return to the normal weighing mode.

WARNING: Restoring the factory default setups will erase any span calibration and will return the scale to the factory calibration.

Section Four

Calibration

The SETRA Quick Count/Easy Count is highly stable, and requires infrequent calibration. While it may be calibrated as often as desired, the factory calibration is adequate for most counting applications. For precise weighing applications, or for APW entry via bar code or computer, periodic calibrations may be desirable. Outlined below is a calibration procedure for use with a computer or terminal.

To calibrate the scale using a computer or terminal (for a calibration weight contact your dealer), use the following procedure:

1. Remove all objects from the pan.
2. Level the scale.
3. Transmit X for reset.
4. Transmit U for units, until the scale reads in the units of the known weight.
5. Place the known weight on the pan.
6. Enter the value of the known weight.
7. Transmit F for setup/cal.

NOTE: To ensure maximum accuracy, a weight should be used which is as close as possible to the capacity of the scale.

For calibration instructions using the scale's keyboard, please refer to the product's operator manual.

Section Five

In Case of Difficulty

SETRA Quick Count/Easy Count scales are designed to be easy to use. If, however, you have reached a state in which the scale will no longer follow your instructions, you may wish to "reset" the scale. It is possible to do so by following this sequence.

1. Remove all weights from the pan.
2. Press the clear key (if available).
3. Press the zero key.

If this procedure does not solve the problem, try briefly unplugging the unit from its power source; then, plug the unit in again.

To print a copy of the scale's current setup information use the following procedure. Connect the scale to a printer via the RS-232 serial port. Power up the scale and then hold the print key down while the scale completes the countdown and displays the scale capacity, i.e., -2-, -1-, C xxxxg. The scale will display "rEF n.n", the software version while printing the current setup information. Press the clear key (QC) or zero key (EZ) twice to return to the normal weighing mode.

If the scale does not return to normal operation, you may want to completely reset the scale's battery backed RAM. This will cause all of the user setups to return to the factory defaults and will erase any span calibration that may have been performed. To reset the scale's battery backed RAM use the following procedure:

1. Remove power from the scale via the scale's power switch (if equipped with one) or by unplugging the AC adaptor.
2. Hold down the sample size and print keys (QC) or zero and count keys (EZ) simultaneously.
3. While holding these two keys down, restore power to the scale. This puts the scale in the diagnostic mode.
4. The scale will display "d nOS". Press the clear key (QC) or zero key (EZ). The scale will now perform tests to verify its operation and reset all of the setups to the factory defaults. The scale will then display "PASS".
5. Press the clear key (QC) or zero key (EZ). The scale will now perform the normal segment test, capacity and count down displays.

If the unit displays any unusual messages during the warm-up period, or does not return to normal operation, contact an Authorized Setra Service Center or Setra Systems, Inc., as service may be required.

If the scale displays the "bUSY" message for an extended period of time, or the displayed reading is unstable, too much vibration or draft may be present. Relocate the scale away from the source of vibration or shield the scale from draft in order to correct this condition. If vibration or draft is not the cause of the instability, service may be required.

If the scale displays "d nOS", it may have been subjected to an extreme discharge of static electricity or power line fluctuations. The scale can be easily restored to operation by following the procedures outlined in steps #4 and #5 above. Note, the user setups will be restored to the original factory defaults.

If the RS-232 interface does not function correctly, first make certain that you are using the correct RS-232 cable, and that it is securely fastened to both the scale and the peripheral device. If data transmission or reception is still not possible, be certain that the cable is the correct type.

When communicating with certain types of devices, especially computers, it may be necessary to "cross" the receive and transmit lines of the interface. That is, the receive line of the scale must connect to the transmit line of the external device. Likewise, the transmit line of the scale must connect to the receive line of the external device. Special cables can be purchased for this purpose from a computer dealer.

If the problem still persists, contact your local Authorized Setra Dealer.

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