OPERATING INSTRUCTIONS FOR MODEL 4100 KEYBOARD DATA ENTRY OPTION

OPTION TYPE 15

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A. INTRODUCTION

This addendum outlines the features and operation of the Model 4100 with the Option Type 15 Keyboard Data Entry software. The Model 4100 is provided with the standard 6 digit weight display and tolerance indicators with a waterproof neoprene keypad to program Tare values, Over/Under values, and Setpoint values.

Please refer to the Model 4100 Operating and Service Manual for additional information regarding the operation of the indicator.

The Keyboard Data Entry Option provides :

- A 6 digit, 0.43" Red LED weight display.
- Keyboard entry of 8 setpoint cutoff points.
- Keyboard entry of Tare, Under and Over values.
- LB, Kg, Oz Display units.
- Support for a single accumulator. Option Type 41 OPT 17B.
- Serial Data Output for printing weight and tolerance data of item on scale.

B. SETPOINTS

C. SETPOINT CUTOFF ENTRY

TO ENTER A SETPOINT CUTOFF POINT :

- Press S.P. to select the setpoint entry function.
- Press the number (1 - 8) on the keyboard that represents the desired setpoint to modify. The display will show the selected setpoint on the display.

- Press ENT to simply recall the currently entered value.

  OR

- Press CLR to clear the currently entered value.

  OR

- Enter the new value for the selected setpoint cutoff point and then press ENT. As the new value is entered, the display will scroll the new value across the display from the right.

- Be sure to program all 8 setpoints and program any unused setpoints to 999.99.

D. KEYBOARD TARE

The Tare is a weight value that is subtracted from the current scale weight data. It is used to compensate for weights of boxes, fixtures, etc. When a positive tare value is entered, it causes the weight display to offset in the negative direction. A negative tare cannot be entered.

TO ENTER A TARE :

- Press TARE
- Enter the new value that is to be the Tare value.
- Press ENT and the new value will be saved.

TO RECALL A TARE :

- Press TARE
- Press ENT and the current Tare value will be displayed.
- Press ENT again to return to weight display.

TO CLEAR A TARE :

- Press TARE
- Press CLR and the current Tare value will be erased. The display will no longer be offset by the Tare value.

E. OVER and UNDER TOLERANCES

Over and Under tolerance are weight values that determine the point at which the OVER and UNDER indicators will illuminate. If the displayed weight is less than the Under value, then the UNDER indicator will illuminate. If displayed weight is above the Over value the OVER indicator will illuminate. If the displayed weight is in between the UNDER and OVER values, the ACCEPT indicator will be illuminated.

If only the Over value or Under value is entered and the other is cleared, then the cleared value is assumed to be zero when executing the test for tolerance.

To disable the tolerance indicators, clear both the Over and Under values.

TO ENTER OVER/UNDER TOLERANCE VALUES :

- Press OVER/UNDER.
- Enter the new weight value for the OVER/UNDER value. To enter a negative value, press the UNDR/- key before entering the value. The new value will scroll across the display as it is entered.
- Press ENT and the new value will be saved.

TO CLEAR OVER/UNDER TOLERANCE VALUES :

- Press OVER/UNDER.
- Press CLR and the value(s) will be cleared and saved.

TO RECALL OVER/UNDER TOLERANCE VALUES :

- Press OVER/UNDER.
- Press ENT and the current values of the Over/Under will be displayed.

F. GENERAL

All keyboard entered values are stored in nonvolatile EEPROM (Electrical Erasable Programmable Read Only Prom). These values are stores permanently even during the loss of power.

During keyboard entry and recall operations, once a function has been selected and there is no activity at the keyboard for approximately 30 seconds, the display will return to normal weighing.

This describes the operation of the accumulator option. Note that Option Type 41 OPT 17B is required for proper operation.

The accumulator option accumulates to a single register. The subtotal can be displayed and return to weight display without clearing the accumulator. The total can be displayed, but is cleared when the scale is returned to weight display.

ACCUMULATOR OPERATION:

TO ACCUMULATE:

Press and release the ACCUM button. The scale will accumulate the net weight.

TO DISPLAY SUBTOTAL:

- Press SUBTOTAL.
- To return to weight display, press and release ZERO. The subtotal will remain in memory.
- You can accumulate in the subtotal display mode.

TO DISPLAY TOTAL:

- To display the total of the accumulator, press and release TOTAL.
- To return to weight display, press and release ZERO. This will clear the accumulator memory.

TO CLEAR THE ACCUMULATOR:

- Press and release TOTAL and then press and release ZERO.

Note: Data is retained only as long as the scale is powered up .

I. SERIAL DATA OUTPUT:

- The serial port will send the weight data and the tolerance information when a print is initiated.

J. SERIAL CHARACTER FORMAT

All characters are in ASCII and can consist of the following:

1 Start Bit
7 or 8 Data Bit*
Even, Odd, or no Parity
2 Stop Bits

* With parity enabled there are 7 data bits and 1 parity bit. With parity disabled, there are 8 data bits in which the 8th bit is a "dead zero". Desired character format can be selected via internal DIP switches.

K. SERIAL DATA FORMAT

The data formats are:

1. Standard format in manual demand and Autoprint modes for LB, KG, and OZ weight display modes:

| STX | POL | DATA | SP | LB/KG/OZ | SP | OVER / ACPT / UNDR | CR+LF |

2. Standard format in manual demand and Autoprint modes for LB & OZ weight display mode (not available in units with Keyboard option):

| STX | POL | DATALB | SP | LB | SP | DATAOZ | SP | OZ | OVER / ACPT / UNDR | CR+LF |

3. Standard format in continuous mode for LB, KG, and OZ weight display modes:

| STX | POL | DATA | L/K/O | ST | CR+LF |

4. Standard format in continuous mode for LB & OZ weight display mode (not available with Keyboard option):

| STX | POL | DATALB | L | SP | DATAOZ | O | ST | CR+LF |

Where:

STX: Nonrecording "Start of Text" character (ASCII 02H).

POL: Polarity sign. A space is transmitted for positive data and a minus (-) is transmitted for negative data.

DATA: Six digits of data including decimal points. Leading zero suppression with leading zeroes transmitted as spaces.

ST: One character field used in continuous output mode only to indicate the status of the scale.

Characters listed in order of priority.

Character	Description
"M"	Motion
"O"	Scale in Over
"A"	Scale in Accept
"U"	Scale in Under
"SP"	None of the above

SP: Space Character

CR+LF: Two character field, "Carriage Return" and "Line Feed" characters, used to signal end of message.

OVER/: Four character field for demand mode. Checkweigh status.
ACPT/
UNDR/

OVER = Scale in Over
ACPT = Scale in Accept
UNDR = Scale in Under

DATALB: One to three character field (depending on scale capacity) for integral pound weight data in pounds and ounces. Leading zeros are transmitted as spaces.

DATAOZ: Two to five character field (depending on scale capacity) including decimal point for ounce weight data in pounds and ounces. Leading zeros are transmitted as spaces.

LB/KG/OZ: Two character field for weight units.

LB for pounds
KG for kilograms
OZ for ounces

L/K/O: One character field for data identification in continuous mode.

Weight in LB = "L"
Weight in KG = "K"
Weight in OZ = "O"

L. ACCUMULATOR DATA OUTPUT:

The Serial Data output will output the Subtotal and Total when the scale is in the Subtotal or Total display mode.

Subtotal: STX POL DATA SP UNITS SP “STOT” CR+LF

Total: STX POL DATA SP UNITS SP SP “TOT” CR+LF

STX : Nonrecording a “Start of Text” character (ASCII 02H)

POL: Polarity sign. A space is transmitted for positive data and a negative (-) is transmitted for negative data.

DATA: Six digits of data including decimal points. Leading zeros are transmitted as spaces.

SP: Space Character

“STOT”: Literal text label for sub total.

“TOT”: Literal text label for total.

CR+LF: Carriage return and line feed. (ASCII 13H and 10H)

M. DEMAND, CONTINUOUS, and AUTOPRINT MODE:

Serial data transmission can be initiated in either of four ways as follows:
1. DEMAND:

The demand mode is used to interface to printers and requires a manual "print" command (switch closure), to initiate data output in the format described in Section C. An optional "print" button can be provided with any 4100 scale. The output is inhibited during the following conditions:

a. Scale in motion b. Positive/Negative Overload c. Scale in display test

2. CONTINUOUS:

The continuous mode is used to interface to computers and transmits the data automatically following each update of the display, in the format described in Section C.

3. AUTOPRINT:

a. AUTOPRINT 1: When the data output mode is set to "AUTOPRINT 1", the scale will transmit once and only once for each stable weight. Data transmission occurs any time scale goes into motion and stabilizes again.

   This output mode can be used either with a printer or computer/data-logger when a complete sampling of weights is required and a minimum of operator intervention is desired.

b. AUTOPRINT 2: When the data output mode is set to "AUTOPRINT 2", the scale will transmit stable weights above gross zero (empty platform) once and only once for transition from zero to the weight. This means that when an object is placed on the platform, the scale reading will increase to its weight and stabilize. At this point the data output will transmit the displayed weight data and remain disabled until the scale returns to gross zero (empty platform). Then the data output is enabled to transmit the next stable weight. This differs from the AUTOPRINT 1 mode in that the weight must return to zero before the next weight data can be sent.

   The AUTOPRINT 2 output mode is useful with printers or computers where there is a need for large number of high quality weight samples with a minimum of operator intervention.

TB1 Pin	Function	Serial Cable Color Code
1	Print Switch	Green
2	RS232 txd	Red
3	20ma + txd	Red
4	20ma - txd	Black
5,6,7		Not used
8	Signal Gnd	Black/ White

P. ACCUMULATOR SWITCH CONNECTIONS: MAIN BOARD J3.

Terminal	Function
J3-1	N.A.
J3-2	Total
J3-3	Subtotal
J3-4	Accumulate
J3-5	Ground
J4-1	Zero
J4-2	Ground
J4-3	Units Convert
J4-4	Ground

Q. SETPOINT TERMINAL BLOCK CONNECTIONS, UIB TB2.

TB2	Description	
1	Setpoint 1	Active Low
2	Setpoint 2	"

3	Setpoint 3	"
4	Setpoint 4	"
5	Setpoint 5	"
6	Setpoint 6	"
7	Setpoint 7	"
8	Setpoint 8	"
9	Setpoint 1	Active High
10	Setpoint 2	"
11	Setpoint 3	"
12	Setpoint 4	"
13	Setpoint 5	"
14	Setpoint 6	"
15	Setpoint 7	"
16	Setpoint 8	"
17-25	not used	
26	Ground	
