OPERATING INSTRUCTIONS FOR

MODEL 4100 GRADING OPTION

OPTION TYPE 21

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A. INTRODUCTION

This addendum outlines the features and operation of the Model 4100 with the Option Type 21 Grading software. The Model 4100 is provided with the standard 6 digit weight display and tolerance indicators with an additional 8 grade indicator display.

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

The Grading Option provides :

- Standard or reverse grading operation.
- A 6 digit, 0.43" Red LED weight display.
- A 8 element Red LED grade display.
- Keyboard entry of grade cutoff points.
- Keyboard entry of Tare, Under and Over values.
- LB, Kg, Oz Display units.
- DIP Switch selectable time delays for the Autozero function.
- Support for 4 digit password for keyboard disable/enable to prevent operator tampering of entered information.
- Support for disabling the digital weight display when the grading display is only required.
- Optional External Rotary Time Delay Switch for external setting of the time delays for the Autozero function. (Option Type 2)
- Serial Data Output for printing weight and/or current grade of item on scale.

B. OPERATION

A grade is a set of weight values between which an indicator light illuminates. The 4100 Grading Option has 8 programmable grade points with associated grade lights. The grade points are entered in ascending order with Grade 1 being the lowest and Grade 8 being the highest. The appropriate Grade light will turn on when the weight is in the particular grade range.

See following table:

Grade Cutoff Point	Entered Value	Range of Weight	Grade Indication
		0.00 lb to 0.99 lb	no grade
1	1.00 lb	1.00 lb to 1.99 lb	1
2	2.00 lb	2.00 lb to 2.99 lb	2
3	3.00 lb	3.00 lb to 3.99 lb	3
4	4.00 lb	4.00 lb to 4.99 lb	4
5	5.00 lb	5.00 lb to 5.99 lb	5
6	6.00 lb	6.00 lb to 6.99 lb	6
7	7.00 lb	7.00 lb to 7.99 lb	7
8	8.00 lb	8.00 lb to capacity	8

Reverse Grading Operation

The Reverse Grading feature for the Model 4100 allows placing a container of full product on the scale platform and allowing the scale indicator to indicate the proper grade of the item removed from the container. Once the item has been removed and has been graded, upon stability, the indicator will autozero after the selected time delay has elapsed as selected by the Time Delay DIP Switch (or external rotary switch). After the new zero has been acquired, another item can be removed from the container and process can be repeated until all the items have been removed.

C. GRADE CUTOFF ENTRY

TO ENTER A GRADE CUTOFF POINT :

Enter the 4 digit security code if applicable.

Press GRD to select the grade entry function.

Press the number on the keyboard that represents the desired grade cutoff the modify. The display will show the selected grade 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 grade 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.

The value for the grade cutoff points should be entered in successively higher numbers from grade 1 to grade 8. For example, Grade 1= 1.00 lb, Grade 2=2.00 lb, Grade 3=3.00, etc. Be sure to enter a value for all 8 grade cutoff points to ensure proper operation. Program any unused grade cutoff point with a value equal to the capacity of the indicator (i.e. scale capacity=30lbs, enter 30 lbs).

D. SELECTING AUTOZERO TIME DELAY:

TO SELECT THE AUTOZERO TIME DELAY :

If the External Rotary Time Delay Switch is not installed, remove the back panel of the indicator to gain access to the main processor board for the indicator. Locate SW3 in the upper left hand corner of the board as pictured from the back of the indicator. See the chart below for the desired settings.

E. 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 :

Enter the 4 digit security code if applicable.

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.

F. 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 totally 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.

G. KEYBOARD LOCKOUT FEATURE:

H. Display Control Feature:

1. To enable the display, enter the 4 digit security code and then press ‘1’.
2. To disable the display, enter the 4 digit security code and then press ‘0’ . The display, except for the tolerance indicators will turn off.
3. To turn off the tolerance indicators, Press OVER and then CLR. Press UNDER and then CLR. The tolerance indicators will turn off.
4. To activate the tolerance indicators, enter values into the OVER and UNDER function of the keypad. Press OVER/UNDER then enter value and press ENTER.

Note: Do not use security codes ‘0000’ or ‘1111’ with the display control feature.

I. 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.

K. SERIAL DATA OUTPUT:

1. When the display is enabled, the serial port will send the weight data and the tolerance information when a print is initiated.
2. If the display is disabled, then the current Grade will be sent from the serial port.
3. No data will be sent if both the grading and scale display are turned off.

L. 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.

M. 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 c ontinuous 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 fie ld 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"

N. 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 mode

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.

