UMC1000 SERIES

Digital Weight Indicator

Installation Manual

CONDEC

Genuine Quality, Proven Performance.

16822

UMC1000 SERIES

INSTALLATION/CALIBRATION/OPERATION MANUAL

TABLE OF CONTENTS

SECTION 1

1.1 INTRODUCTION

This manual is written to assist in the installation, calibration, and proper operation of the UMC1000 series Tabletop Digital Weight Indicators. Units included in this manual are:

The UMC1000 AA-AA Unit, with:

* Standard Tabletop or Panel Mount Unit.
* 10,000 Displayed Graduations
* Powers 8-350 Ohm Load Cells at 12VDC.
* Standard Serial Data Output - 20mA Loop or RS232C.
* 20 Updates/second with selectable Digital Averaging
* Thumbwheel Tare Option
* 6-Wire RFI Shielded Load Cell Connector

The UMC1000AABA "Auto-Cal" Unit offers:

* Front-Panel "Auto Calibration" for calibration parameters, and fine zero and span.

The UMC1000 AA-CA Digital Weight Indicators feature, in addition to the "standard" UMC1000 capability:

* 20-Key Keyboard for tare and parameter entry.
* Four (4) Multi-Function programmable keys, which can be configured as:

  - One (1) or two (2) setpoints
  - Tare recall
  - Lb/Kg conversion
  - Display check
  - Three (3) button accumulate function

* 2 Serial outputs, one continuous 20 mA Loop and one selectable 20 mA Loop or RS232C Signal.
* "G-T-N" Printout Capability
* Setpoints can be equipped with Solid State Triac outputs.

These units are also available as "Uncased" units.

UMC1000

PART NUMBERING GUIDE

UMC1000 (____) (____) - (____) (____)

CASE STYLE

A = Cased
B = Cased with Thumbwheel Tare Assy
C = Uncased
D = Uncased with Thumbwheel Tare Assy

INPUT VOLTAGE

A = 117VAC
B = 237VAC

CPU CONFIGURATION

A = Standard
B = Auto Calibration
C = Keyboard Tare with 2 Setpoints

LOAD CELL CONNECTIONS

A = Standard MS Connector
B = Terminal Strip Only - No Connector
C = Shielded 6-wire MS Connector

NOTE If non-standard instrument configuration are supplied, the normal letter coding system will be replaced by the manufacturerer with a two digit number, used to uniquely define the modified unit.

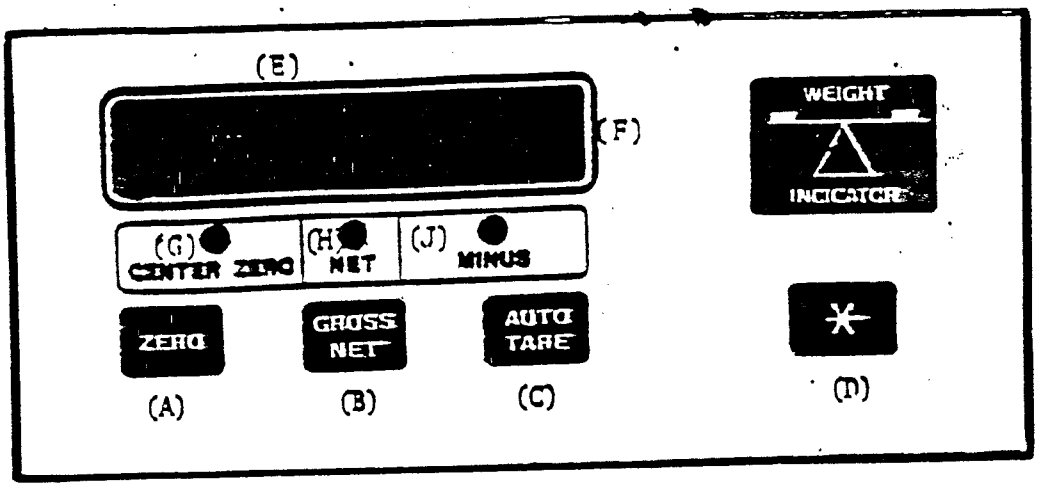


FIGURE 1

UMC1000 without Thumbwheel Tare Option

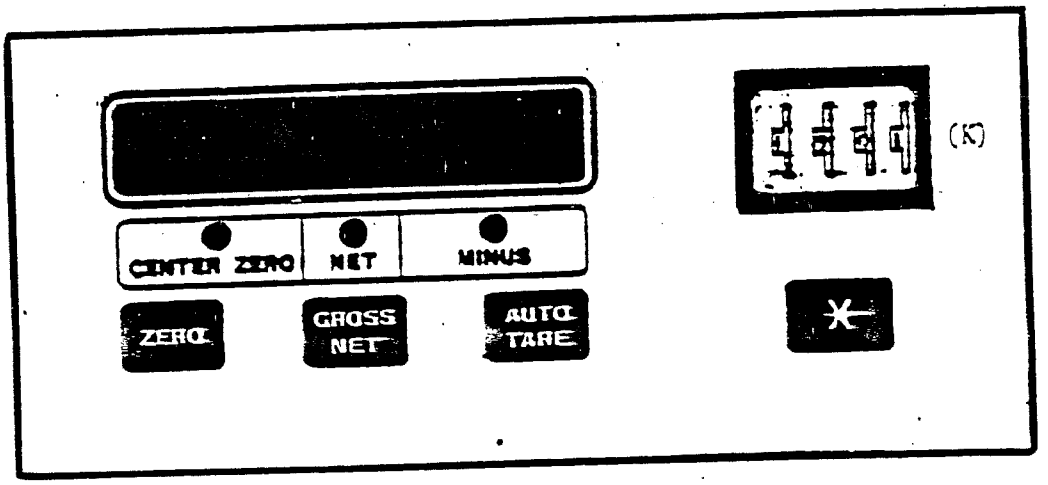


FIGURE 1.2

UMC1000 with Thumbwheel Tare Option

1.2 FRONT PANEL SWITCHES

The UMC1000 AA-AA and AA-BA Front Panel contains the following switches:

A. ZERO - provides PAZ (Pushbutton Auto Zero) function over ±2% or 100% of Full Scale capacity. Operates only in the "GROSS" mode.

B. GROSS/NET - Switches the unit between the "GROSS" and "NET" weighing modes.

C. AUTO TARE - Provides a "Pushbutton Tare" function over 100% of Full Scale Capacity, operating in the "NET" mode only. The "AUTO TARE" switch will also be inoperative if the Thumbwheel Tare option is installed and operative.

D. DATA OUTPUT (*) - This switch provides a manual "PRINT" command if the unit is wired to a serial printer or other data device. Note that printing will not occur if the scale is in motion, overload, or other non-normal display condition. Consult Section 6 for Serial Output specifications.

FRONT PANEL DISPLAY INDICATORS

E. DISPLAY - The display consists of six (6) seven-segment red LED digits. The left-hand digit also serves as a minus (-) sign for negative "Gross" or "Net" weight indications.

F. "LB" OR KG" INDICATORS - "Lb" or "Kg" weighing mode status is indicated by the light-bar indicators immediately to the right of the LSD display digital. Only one of the indicators will be "on", and selection of the "Lb" or "Kg" is made by program switch S2-5 (consult Table 3.7 on Page 3-4).

G. "CENTER ZERO" LED - The LED is on whenever the scale weight is within ±1/4 graduation of "Zero", either in the "GROSS" or "NET" modes.

H. "NET" LED - This LED is on whenever the unit is in the "NET" weighing mode. If the LED is off, the unit is in the "GROSS" mode.

J. "MINUS" LED - On whenever the unit is displaying negative "NET" or "GROSS" weight, and will correspond with the minus (-) sign to the left of the display.

K. THUMBWHEEL TARE - The unit can also be equipped with an optional 4-digit Thumbwheel Tare module. Consult Section 8 for installation and operation specifics.

1.3 UMC1000AACA FRONT PANEL

The UMC1000AACA unit has a 20-Key keyboard containing the following functions:

A. Standard "Zero", "Net/Gross", "Tare", and "Print" switches.

B. A "0" - "9" keyboard, with "ENTER" and "CE" (clear entry) keys, for fixed (manual) tare and Setpoint entry.

C. Four programmable function keys, which can be:

C.1 A single-register accumulator (Figure 1.3, Section 7)
C.2 Two (2) setpoints (Figure 1.4, 1.5, Section 7)
C.3 Lb/Kg Conversion (Figure 1.4, Section 7)
C.4 Tare Recall (Figure 1.4, 1.5, Section 7)
C.5 Display Check (Figure 1.5, Section 7)

The standard unit is sent with inserts as shown in Figure 1.4. If the function keys are reprogrammed (see Sections 7.1 - 7.5) , the additional inserts are found with this manual.

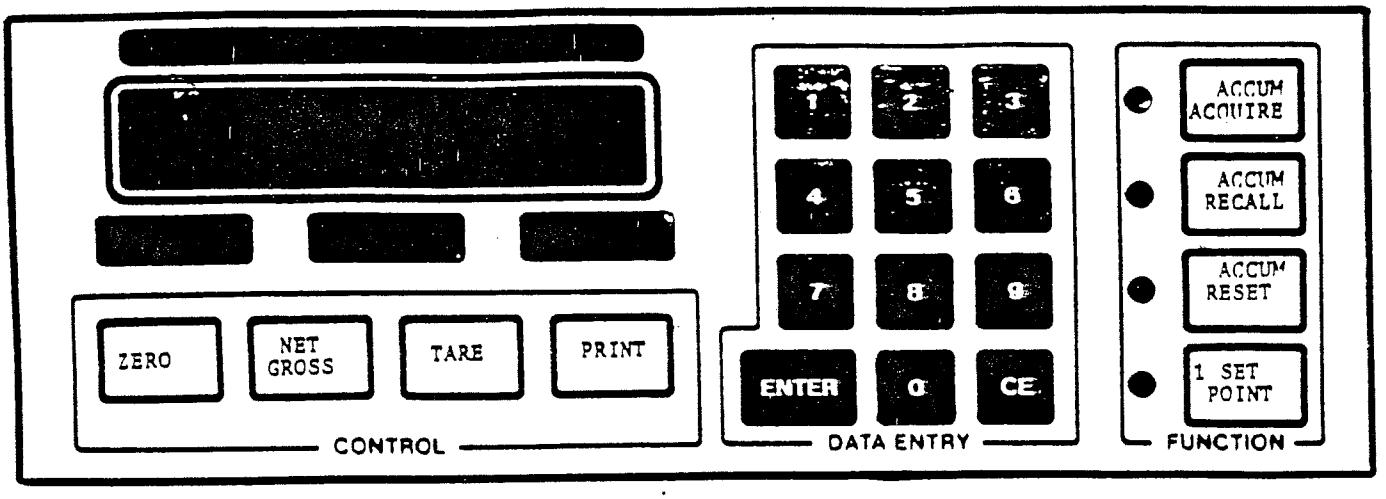


FIGURE 1.3

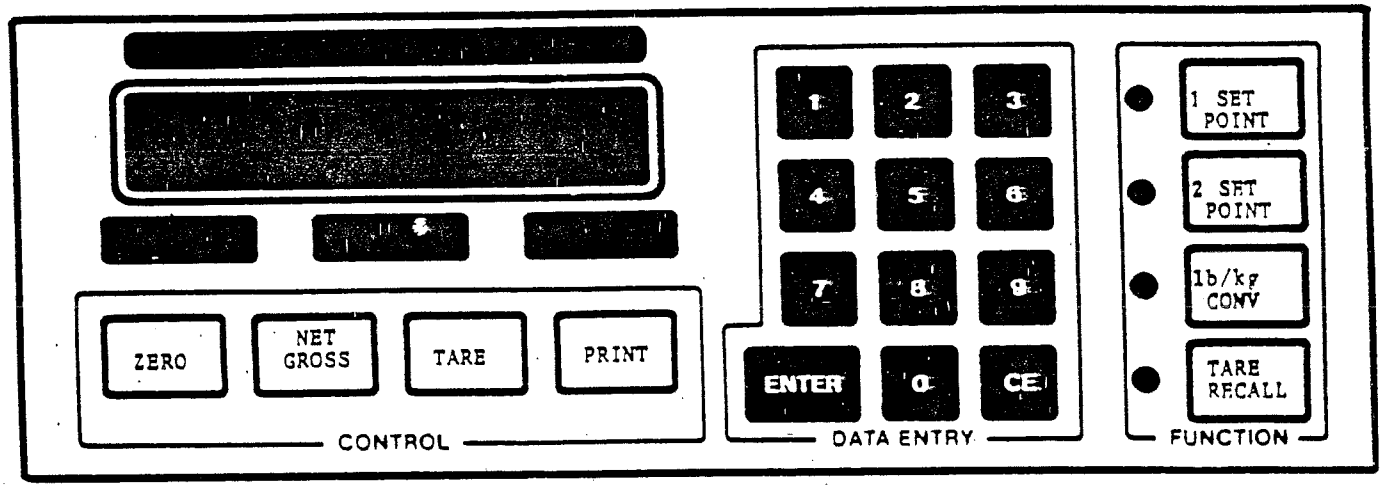


FIGURE 1.4

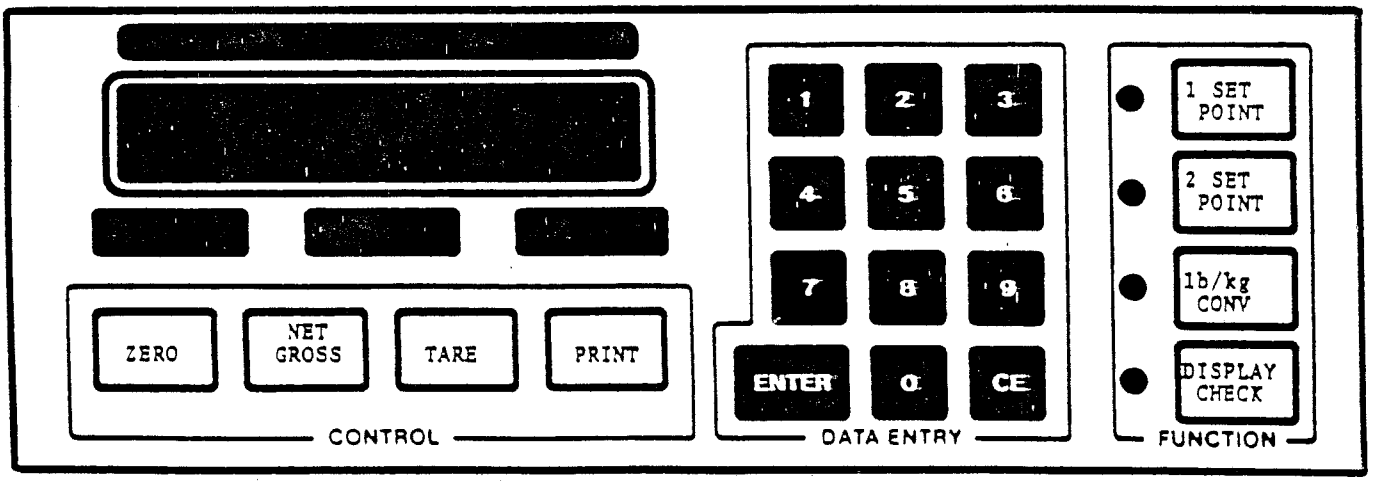


FIGURE 1.5

1.3 MECHANICAL AND PANEL MOUNTING INFORMATION

Figure 1.6 below gives mechanical size information on the UMC1000 series indicators.

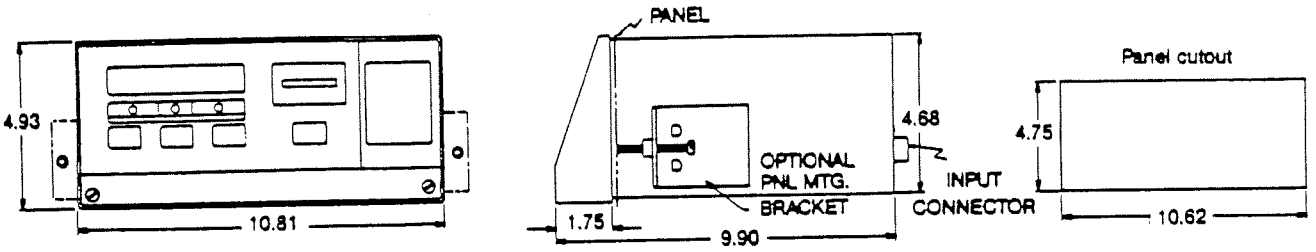


FIGURE 1.6

Panel mounting of the UMC1000 series units requires the use of the optional KW116-8 Panel Mount Kit, using the procedure as follows:

1. Remove the unit from its case.
2. Remove the rubber mounting "feet".
3. Using a hammer and screwdriver, carefully tap out and discard the two knockouts on each side of the outer case.
4. Cut the panel as shown above.
5. Insert the outer case in the panel
6. Attach the mounting bracket, one to each side, to the case and tighten the screws until they are tight.
7. Insert the inner chassis of the Indicator into the outer case.

18. Front Panel Control Switches: (UMC1000AAAA, AABA)	Zero, Gross/Net, Auto Tare Print (*)
20. Front Panel Control Switch: (1000AACA)	"Zero", "Gross/Net", "Auto Tare" "Print", "0-9" Digit Keys with "Enter", "CE" 4 programmable function keys.
21. Front Panel Annunciators: (red LED's)	Center Zero, Net, Minus, or Motion
22. AZM (Zero Track):	Operational in both Gross and Net modes, or Gross mode only.
23. Operational AZM Aperture:	±1.9% of selected full scale capacity or 100%, selectable
24. AZM Capture Range:	Selectable to "off", ±1/2, ±1, or ±3 graduations
25. Motion Band:	Selectable to ±1 or ±3 display graduations
26. Motion Time Sensitivity:	Fixed at (1) second.
27. Power Input:	117/220VAC, 50/60 Hz
28. Power Consumption:	13 watts, typ; 20 watts, Max.
29. Display Check:	All digits segments and LED annunciator illuminated for two (2) seconds upon application of power.
30. Front Panel Indicator: (Light Bar)	Lb, Kg
31. Component Board Module Sizes:	
A. Power Supply/CPU Module:	7.85" wide x 6.75" deep x 3.0"high
B. Display Module:	5.25" wide x 3.150" high

SECTION 3

UMC1000 CALIBRATION

3.1 LOAD CELL CONNECTIONS

Load Cell connections are made to TB1 on the CPU Board or the 5-Pin "MS" Connector. Consult Table 3.1 for connection information.

TABLE 3.1

LOAD CELL CONNECTION

TB1 LOCATION	"MS"* CONNECTOR PIN	FUNCTION
1	A	+ Excitation
2	-	No Connection
3	C	+ Signal
4	D	- Signal
5	B	- Excitation
-	E	Chassis Ground or Shield

* Bulkhead Connector is part number MS3102A14S-5P
Mating Connector is part number MS3106A14S-5S.

Note - Attach Load Cell connections only with power disconnected.

3.2 SIX WIRE RFI - SHIELDED LOAD CELL CONNECTOR

If the UMC1000 series unit is to be used in an application where RFI is a problem, or if the unit is to be used in a multiple - load cell system requiring remote sensing, the KBA7314-2 Load Cell Connector Assembly should be ordered and installed. The table below provides the wiring to the load cell connector and the terminal strip (TB1) on the CPU Assembly.

SIGNAL	J1 CONN PIN NO.	WIRE COLOR	TB1 TERM NO.
(+) Excitation	A	Green	TB1-1
(-) Excitation	B	Black	TB1-6
(+) Signal	C	White	TB1-3
(-) Signal	D	Red	TB1-4
(+) Sense	E	Orange	TB1-2
(-) Sense	F	Blue	TB1-5

Installation of the KBA7314-2 Assembly is as follows:

A. Remove the 5-Pin connector assembly from TB1 and J1.

B. Note, locate the clad jumpers between TB1-1 and TB1-2, and between TB1-5 and TB1-6. They are located on the top of the printed circuit board, under the words "+EXC", "+SEN", "-SEN", and "EXC" on the silk screen. Cut each jumper with a sharp knife.

C. Install the 6-pin connector assembly in the J1 position on the rear panel.

D. Wire the 6-pin connector assembly to TB1, using the table above.

E. Wire the load cell cable to the mating connector supplied. Note that the load cell wiring color code may NOT be the same as the bulkhead connector wiring.

SECTION 4

CALIBRATION - UMC1000AAAA UNITS

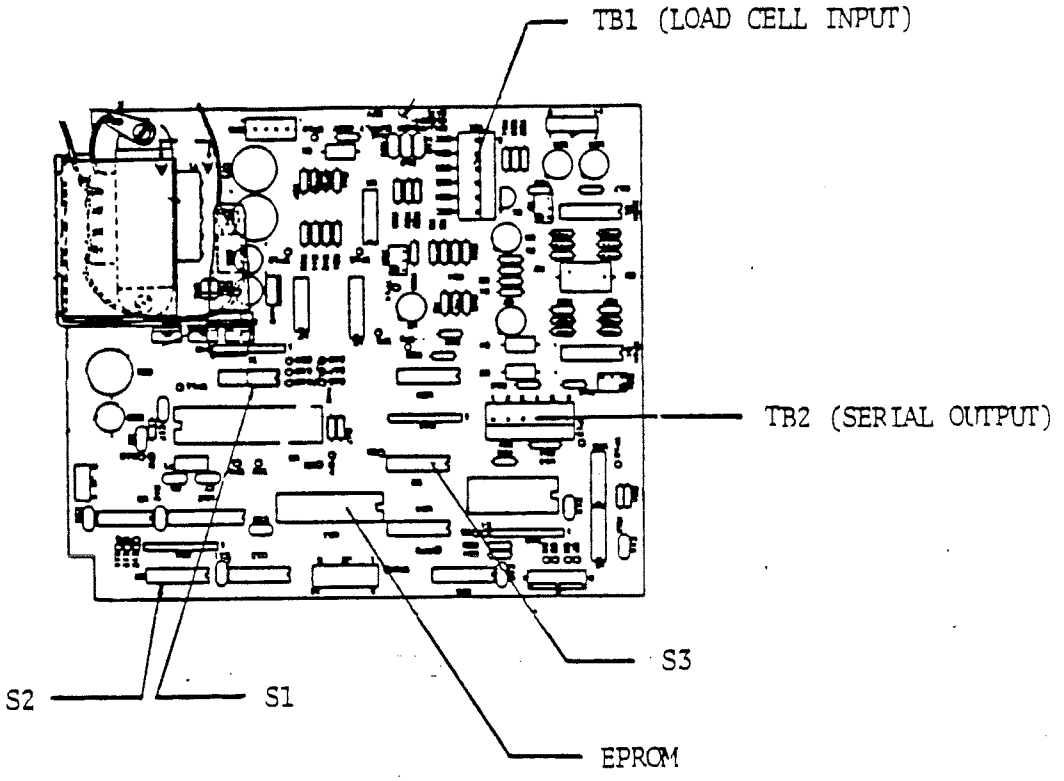


FIGURE 4.1

UMC1000AAAA CPU (KE8924-2)

4.1 DIGITAL CALIBRATION

Using the Program Switch Tables in Section 4, set the following parameters ("0" = "open" setting):

TABLE 4.1

DIGITAL CALIBRATION

PARAMETER	RECOMMENDED SETTING	SWITCH SETTING
Display Resolution	As Required	
AZM Capture Band	±3 Grads	S1-3 = 1 S1-4 = 1
AZM Mode	Gross Mode	S1-5 = 1
Capacity	As Required	
Decimal Point	As Required	
Tare Mode Selection	As Required	
Base Select	As Required	
AZM Aperture	1.9% Capacity	S2-6 = 1
Power Loss Detection	"Dashes" Disabled	S2-8 = 0
Digital Averaging	4 averages, or	S3-1 = 0 S3-2 = 0 S3-3 = 0 S3-4 = 0
Motion Band	±3 Grads	
Serial Baud Rate/ Format	As Required	
Serial Mode	As Required	

TABLE 4.2

PROGRAM SWITCH SETTINGS - UMC1000AAAA (KAU1921-7-1 EPROM)

S1-1	S1-2	DISPLAY RES.
0	0	x1
1	0	x2
0	1	x5
1	1	x10

S1-3	S1-4	AZM CAPTURE BAND NO. OF GRADUATIONS
0	0	Off
1	0	±0.5
0	1	±1
1	1	±3

S1-5	AZM MODE
0	Gross Mode Only
1	Gross & Net Modes

S1-6	S1-7	S1-8	NO. OF GRADUATIONS
0	0	0	1000
1	0	0	2000
0	1	0	2500
1	1	0	3000
0	0	0	4000
1	0	1	5000
0	1	1	6000
1	1	1	10000

S2-1	S2-2	S2-3	DECIMAL POINT/ FIXED ZERO SELECTION
1	1	1	xxxxx
0	1	1	x.xxxx
1	0	1	xx.xxx
0	0	1	xxx.xx
1	1	0	xxxx.x
0	0	0	xxxxx0

S2 - 4	TARE MODE
0	AUTO (STORED) TARE
1	THUMBWHEEL TARE

S2-5	S2-7	BASE SELECT	DISPLAY SELECT
0	0	LB	KB or KG
0	1	LB	LB
1	0	KG	KG
1	1	KG	KG

S2 - 6	AZM APERTURE
1	±1.9% Full Scale
0	±100% Full Scale

S2 - 8	CONDITION OF DISPLAY WHEN POWER APPLIED
0	Normal Operation
1	Dashes (----)

S3-1	S3-2	S3-3	# CONV. AVERAGED	APPROX. UPDATES/ SEC.
0	0	0	1 (off)	20
1	0	0	2	10
0	1	0	4	5
1	1	0	8	2
0	0	1	16	1
1	0	1	32	1/2
0	1	1	64	1/4
1	1	1	128	1/8

S3-5	S3-6	BAUD RATE	FORMAT
0	1	300	Standard
1	0	1200	Standard
0	0	4800	Standard

S3 - 7	MODE
1	Demand Print
0	Continuous Output

Non-Functional Switch: S3-8

4.2 ANALOG CALIBRATION

To utilize the ZERO and SPAN Calibration charts provided with this manual only the scale's microvolt per grad span sensitivity and the zero millivolt per volt "dead-load" offset value need be known. To obtain this data only three relatively simple calculations are required and the information needed for calculating purposes is all normally available. It is as follows:

A. F.S. Load Cell output---------- in mV/V

B. F.S. Load Cell range ---------- in pounds or kilograms

C. Scale "dead-load" weight ---------- in pounds or kilograms

D. Scale "live weight" ---------- in pounds or kilograms

E. Load Cell excitation voltage ---------- in volts

F. Number of display graduations---------- graduations (grads) utilized by the scale

As and example, assume the following typical informtion is known about a scale installation.

A. F.S. Load Cell output = 3 mV/V

B. F.S. Load Cell range = 10 pounds

C. Scale "dead-load" = 2 pounds

D. Scale "line" weight range = 5 pounds

E. Load Cell excitation voltage = 12 VDC

F. Number of F.S. display grads = 5000

To determine the scale's dead-load output signal the formula to be used is as follows:

$$\text{Dead-Load} = (\text{F.S. Load Cell Output}) \times \frac{\text{Weight of "dead-load"}}{\text{F.S. Load Cell range}}$$

and substituting the numerical values form the above examples give:

$$\text{Dead-Load} = \frac{3 \text{ mV}}{\text{V}} \times \frac{2 \text{ pounds}}{10 \text{ pounds}}$$

$$\text{Dead-Load} = \frac{3\text{mV}}{\text{V}} \times 0.2$$

$$\text{Dead-Load} = 0.6\ \text{mV/V}$$

Next, to determine the microvolt per grad span sensitivity the formulas are as follows:

$$\text{uV/Grad} = \frac{(\text{Scale mV output})\ (1000)}{(\text{Full scale grads})}$$

where:

$$\text{Scale mV output} = (\text{mV/V or cell}) \times (\text{Excitation voltage}) \times \frac{\text{weight of "live" load}}{\text{F.S. load Cell Range}}$$

and again substituting numerical values yields:

$$\text{Scale mV} = \frac{3\text{mV}}{\text{V}} \times 12\text{V} \times \frac{5\ \text{pounds}}{10\ \text{pounds}}$$

$$= (36\text{mV}) \times (.5)$$

$$\text{Scale mV output} = 18\text{mV}$$

and with this data, the span sensitivity value is calculated to be:

$$\text{Span Sensitivity} = \frac{(18\text{mV})\ (1000)}{5000\ \text{Grads}}$$

Note: mV x 1000 = u volt

$$\text{Span Sensitivity} = 3.5\ \text{u volts/grad}$$

Once the above information has been determined the COARSE ZERO (S5) and the COARSE SPAN (S4) switches may be preset, prior to actual calibration, by referring to the appropriate set of zero and span adjustment charts presented on the following pages.

To use the charts simple locate in their left hand columns the value or range of values that most closely matches the numerical data determined from the above calculations. After making the selection, read horizontally across on the row of the chart and set the appropriate switches accordingly.

TABLE 4.3

ZERO ADJUSTMENT

This table is to be in conjunction with the 0.70 to 5.0 MICROVOLTS/GRAD SPAN ADJUSTMENT Table on the next page.

MILLIVOLT SENSITIVITY	COARSE ZERO SWITCH SETTINGS S5 - POSITIONS							
MV/V	1	2	3	4	5	6	7	8
0.08	1	0	0	0	0	0	0	0
0.10	1	0	1	0	0	0	1	0
0.12	1	0	1	1	0	0	1	0
0.16	1	1	0	0	0	1	1	0
0.21	1	1	0	1	0	0	1	0
0.29	1	1	1	0	0	0	0	0
0.34	1	1	1	0	0	1	1	0
0.42	1	1	1	0	1	0	1	0
0.50	1	1	1	0	1	1	1	1
0.60	1	1	1	1	0	0	0	1
0.68	1	1	1	1	0	1	0	0
0.78	1	1	1	1	0	1	1	0
0.83	1	1	1	1	0	1	1	1
1.04	1	1	1	1	1	0	0	0
1.13	1	1	1	1	1	0	0	1
1.25	1	1	1	1	1	0	1	0
1.39	1	1	1	1	1	0	1	1
1.56	1	1	1	1	1	1	0	0

0 = Open Setting

Zero potentiometer, R7, is used to provide intermediate values between range established for each combination of switch settings above.

TABLE 4.4

SPAN ADJUSTMENT

Calibration Range - 0.75 to 5.0 Microvolts/Grad

MICROVOLTS/GRADUATION				COARSE SPAN SWITCH SETTINGS S4 - POSITIONS							
1K to 5K		6K to 10K									
FROM	TO	FROM	TO	1	2	3	4	5	6	7	8
1.40	1.50	0.70	0.75	0	1	0	0	0	0		1
1.50	1.60	0.75	0.80	1	1	1	0	0	0		1
1.60	1.70	0.80	0.85	0	1	0	1	0	0		1
1.70	1.80	0.80	0.90	1	0	1	1	0	0	s	1
1.80	1.90	0.90	0.95	0	0	0	0	1	0	p	1
1.90	2.00	0.95	1.00	0	1	0	0	1	0	a	1
2.00	2.10	1.00	1.05	1	0	1	0	1	0	r	1
2.10	2.20	1.05	1.10	1	1	1	0	1	0	e	1
2.20	2.30	1.10	1.15	0	0	0	1	1	0		1
2.30	2.40	1.15	1.20	0	1	0	1	1	0	n	1
2.40	2.50	1.20	2.25	0	0	1	1	1	0	o	1
2.50	2.60	1.25	1.30	1	0	1	1	1	0	t	1
2.60	2.80	1.30	1.40	1	1	1	1	1	0		1
2.80	3.00	1.40	1.50	0	0	0	0	0	1	u	1
3.00	3.20	1.50	1.60	0	1	0	0	0	1	s	1
3.20	3.50	1.60	1.70	1	0	1	0	0	1	e	1
3.50	4.00	1.70	2.00	1	1	1	0	0	1	d	1
4.00	4.50	2.00	2.25	1	0	0	1	0	1		1
4.50	5.00	2.25	2.25	0	0	1	1	0	1		1

0 = Open Setting

Span potentiometer, R31, is used to obtain intermediate values between limits established for each combination of switch settings above.

TABLE 4.5

ZERO ADJUSTMENT

This Table is to be used in conjunction with the 4.8 to 33.5 MICROVOLTS/GRAD SPAN ADJUSTMENT Table on the next page.

MILLIVOLT SENSITIVITY	COARSE ZERO SWITCH SETTINGS S5 - POSITIONS							
MV/V	1	2	3	4	5	6	7	8
0.10	0	0	0	0	0	0	0	0
0.12	0	0	0	0	1	1	1	1
0.19	0	1	1	0	0	1	0	0
0.30	1	0	1	0	0	0	1	0
0.48	1	1	0	0	0	1	1	0
0.63	1	1	0	1	0	0	1	0
0.87	1	1	1	0	0	0	0	0
1.02	1	1	1	0	0	1	1	0
1.26	1	1	1	0	1	0	1	0
1.50	1	1	1	0	1	1	1	1
1.80	1	1	1	1	0	0	0	1
2.04	1	1	1	1	0	1	0	0
2.49	1	1	1	1	0	1	1	1
3.10	1	1	1	1	1	0	0	0

0 = Open Setting

Zero potentiometer, R7, is used to provide intermediate values between range established for each combination of switch settings above.

TABLE 4.6

SPAN ADJUSTMENT

Calibration Range - 2.30 to 33.50 Microvolts/Grad

MICROVOLTS/GRADUATION				COARSE SPAN SWITCH SETTINGS S4 - POSITIONS							
1K to 5K		6K to 10K									
FROM	TO	FROM	TO	1	2	3	4	5	6	7	8
4.80	5.00	2.40	2.50	1	0	0	0	0	0		0
5.00	5.20	2.50	2.60	0	0	1	0	0	0		0
5.20	5.50	2.60	2.75	1	1	1	0	0	0	s	0
5.50	5.80	2.75	2.90	1	0	0	1	0	0	p	0
5.80	6.00	2.90	3.00	0	0	1	1	0	0	a	0
6.00	6.50	3.00	3.25	0	1	1	1	0	0	r	0
6.50	7.00	3.25	3.50	1	0	0	0	1	0	e	0
7.00	7.30	3.50	3.65	1	0	1	0	1	0		0
7.30	8.00	3.65	4.00	1	1	1	0	1	0	n	0
8.00	8.50	4.00	4.25	1	0	0	1	1	0	o	0
8.50	9.00	4.25	4.50	0	0	1	1	1	0	t	0
9.00	10.00	5.50	5.00	1	1	1	1	1	0	u	0
10.00	11.00	5.00	5.50	1	0	0	0	0	1	s	0
11.00	12.00	5.50	6.00	0	0	1	0	0	1	e	0
12.00	13.50	6.00	6.75	1	1	1	0	0	1	d	0
13.50	15.00	6.75	7.25	0	0	0	1	0	1		0
15.00	16.00	7.25	8.00	0	1	0	1	0	1		0
16.00	17.50	8.00	8.75	0	0	1	1	0	1		0
17.50	18.50	8.75	9.25	0	1	1	1	0	1		0
18.50	21.50	9.25	10.75	1	1	1	1	0	1		0
21.80	23.00	10.75	11.50	0	0	0	0	1	1		0
23.00	24.50	11.50	12.25	1	0	0	0	1	1		0
24.50	26.00	12.25	13.00	0	1	0	0	1	1		0
26.00	28.00	13.00	14.00	1	1	0	0	1	1		0
28.00	30.50	14.00	15.25	0	0	1	0	1	1		0
30.50	33.50	15.25	16.75	1	0	1	0	1	1		0

0 = Open Setting

Span potentiometer, R31, is used to obtain intermediate values between limits established for each combination of switch settings above.

4.4 FINAL CALIBRATION

After performing all operations and set ups described in paragraphs 4.2 and 4.3 above, the final calibration of the scale should be performed. The recommended procedure is as follows:

A. Prior to applying power to the scales, the "Power Loss Detection" switch must be disabled (S2-8 = Open).

B. Apply line power and allow unit to stabilize for approximately 20 minutes. During this period, and prior to performing the initial "zero" calibration, DO NOT actuate any of the front panel switches. Under these conditions the unit will be operating in its "Gross Weight" mode.

C. With the scale empty, the display reading should be within approximately ± 100 counts of zero and should be capable of being "zeroed" with the zero adjustment potentiometer, R7. If not, the "dead load" calculations must be rechecked and the COARSE ZERO switch settings changed if required.

D. Place a known weight on the scale that is as close to full scale capacity as is possible or practical. If the span sensitivity calculations have been correctly determined, the displayed weight value will be within the range of the SPAN adjustment potentiometer, R31, so that the "true" weight value may be set and displayed. If not, recheck the span calculations and readjust the COARSE SPAN switch settings, if required.

E. Repeat the procedure of paragraph "D" above until repeatable zero and span readings are obtained without having to make any adjustments. At this time the scale is ready for normal operation.

F. Review the list of digital calibration switches contained in Section 4.2 and make any final changes that might be desired.

SECTION 5

UMC1000 AA-BA & UMC1000 AA-CA

"AUTO-CAL" UNITS - CALIBRATION SEQUENCE

5.1 GENERAL:

The UMC1000 "Auto - Cal" Digital Weight Indicator units now have a simplified front - panel calibration sequence which permits parameter entry as well as fine zero and span calibration from the unit front panel. All calibration and configuration values, as well as the Auto or Keyboard Fixed Tare and PAZ (Pushbutton Auto Zero) values, are protected by EEPROM memory from accidental erasure or power loss. The "key" to this calibration/configuration sequence is found on CPU program switch S3, as shown in Table 5.1 below:

TABLE 5.1 - CALIBRATION/CONFIGURATION SELECTION

S3 (CPU)		MODE
1	2	
0	0	Normal Operation
1	0	Digital Configuration
1	1	Initial Analog Calibration
0	1	Final Digital Calibration

Program Switches S3 - 3 to - 8 are not used; leave "0" or "open".

Note also that program switches S1 and S2 are not used, and may not be present.

5.2 DIGITAL CONFIGURATION:

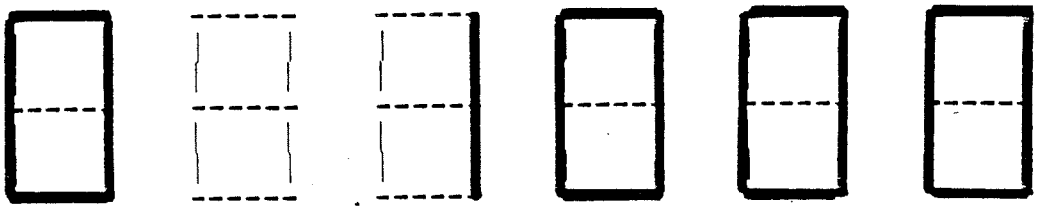
Before the Analog Calibration can be done, the unit must be configured digitally, traditionally done by program switches. The UMC1000 AA-BA and UMC1000 AA - CA units can be digitally configured from the front panel. First, set program switches S3 - 1 and S3 - 2 to the "Digital Configuration" Mode as follows:

S3 - 1 = "1" or "not open" S3 - 2 = "0" or "open"

The unit is now in the "Digital Configuration" Mode, and front panel switch functions are as follows:

DIGITAL CONFIGURATION	UMC1000 AA - BA	UMC1000 AA - CA
PARAMETER KEY	ZERO	ZERO
DATA KEY	GROSS/NET	GROSS/NET
ENTRY KEY	AUTO TARE	ENTER

The display will show:



Pushing the "PARAMETER KEY" will "roll" the unit through its various configuration parameters, as shown in the Tables on the next two pages. If the option shown is not the one currently entered into memory, the display will "flash", and the "PARAMETER KEY" will have no effect. Either push the "ENTRY KEY" to enter the new parameter selection, or continue to "roll" the options by pushing the "DATA KEY".

DIGITAL CONFIGURATION PARAMETERS

PARAMETER "0" - CAPACITY

DISPLAY	DISPLAYED GRADS
0-1000	1 000
0-2000	2 000
0-2500	2 500
0-3000	3 000
0-4000	4 000
0-5000	5 000
0-6000	6 000
010000	10 000

PARAMETER "1" - RESOLUTION

DISPLAY	DISPLAY RESOLUTION
1- 1	x1
1- 2	x2
1- 5	x5
1- 10	x10 (1)
1- 20	x20 (1)
1- 50	x50 (1)
1- 100	x100 (1)

PARAMETER "2" - DECIMAL POINT

DISPLAY	DECIMAL POINT
2- 0	none (2)
2- 0.0	xxxxx.x
2- 0.00	xxxx.xx
2-0.000	xxx.xxx
20.0000	xx.xxxx

PARAMETER "3" - AVERAGING

DISPLAY	DIGITAL AVERAGING
3- 1	1 (20/sec)
3- 2	2 (10/sec)
3- 4	4 (5/sec)
3- 8	8 (2.5/sec)
3- 16	16 (1/sec)
3- 32	32 (2 sec)
3- 64	64 (4 sec)
3- 128	128 (6 sec)

PARAMETER "4" - MOTION BAND

DISPLAY	BAND IN GRADS
4- 1	+/- 1 GRAD
4- 3	+/- 3 GRADS

PARAMETER "5" - AZM BAND

DISPLAY	BAND IN GRADS
5- 0.0	OFF
5- 0.5	+/- 0.5 GRADS
5- 1.0	+/- 1.0 GRADS
5- 3.0	+/- 3.0 GRADS

PARAMETER "6" - PAZ APERTURE

DISPLAY	APERTURE - % FS
6- 1.9	+/- 1.9 % FS
6- 100	100 % FS

PARAMETER "7" - AZM MODE

DISPLAY	MODE
7- 0	GROSS MODE ONLY
7- 1	GROSS AND NET

PARAMETER "8" - DISPLAY/BASE

DISPLAY	BASE	DISPLAY
8- 0	lb	lb
8- 1	kg	kg
8- 2	lb	kg

PARAMETER "9" - TARE MODE

DISPLAY	TARE MODE
9- 0	Auto (Stored) Tare
9- 1	Fixed (Manual) Tare
9- 2	Both

UMC1000 AABA UNITS - PARAMETERS "0" TO "13" ACTIVE. (KAU1921-1-1)
UMC1000 AACA UNITS - PARAMETERS "0" TO "20" ACTIVE. (KAU1921-16-1)

DIGITAL CONFIGURATION PARAMETERS (PAGE 2)

PARAMETER "10" SERIAL PORT # 1 ENABLE	
DISPLAY	SERIAL MODE
10 0	Serial Disable (1)
10 1	Serial Enable
10 2	"G-T-N Format"

PARAMETER "14" SERIAL PORT # 2 ENABLE	
DISPLAY	MODE
14 0	Port # 2 Disabled
14 1	Port # 2 Enabled

PARAMETER "11" SERIAL PORT # 1 BAUD RATE (1)	
DISPLAY	BAUD RATE
11 300	300 Baud
11 1200	1 200 Baud
11 4800	4 800 Baud

PARAMETER "15" SERIAL PORT # 2 BAUD RATE	
DISPLAY	BAUD RATE
151200	1200 Baud
154800	4800 Baud

PARAMETER "12" SERIAL PORT # 1 and # 2 FORMAT (1)	
DISPLAY	SERIAL FORMAT
12 0	Printer Format
12 1	Computer Format

PARAMETER "16" - FUNCTION KEY ENABLE	
DISPLAY	FUNCTION KEY
16 0	Do Not Use
16 1	4 Function Keys
16 2	Accum Mode + 1 Function Key

PARAMETER "13" SERIAL PORT # 1 OUTPUT MODE (1)	
DISPLAY	MODE
13 0	Print on Demand
13 1	Continuous Output

FUNCTION KEY PROGRAMMING

FUNCTION	PARAMETER 17 Function Key #1	PARAMETER 18 Function Key #2	PARAMETER 19 Function Key #3	PARAMETER 20 Function Key # 4
Disable	17 0	18 0	19 0	20 0
Setpoint #1	17 1	18 1	19 1	20 1
Setpoint #2	17 2	18 2	19 2	20 2
Lb/Kg Conversion	17 3	18 3	19 3	20 3
Tare Recall	17 4	18 4	19 4	20 4
Display Check	17 5	18 5	19 5	20 5

5.3 ANALOG CALIBRATION

After all of the Digital Configuration Parameters have been entered, the next step is Initial Analog Calibration. First, place the unit in the "Initial Analog Calibration" mode as follows:

S3-1 = "1" or "Not Open"
S3-2 = "1" or "Not Open"

The front panel switches will not function.

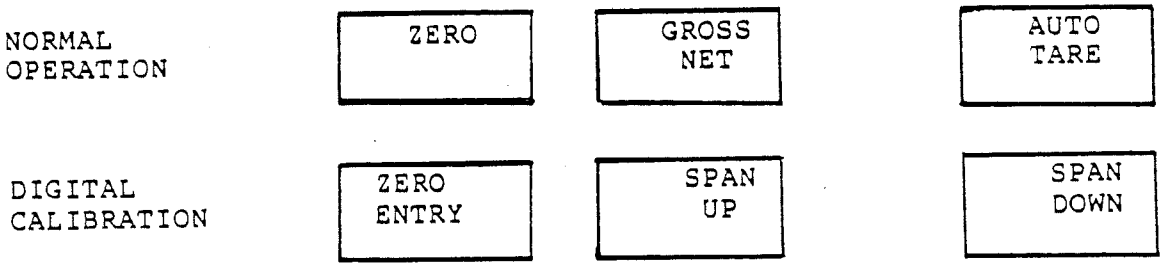
Follow the Coarse Analog Calibration sequence found in Section 4.2. The "Zero" or "Dead Load" value must be within +5% of zero, and the "Span" value must be within 5% of full scale capacity or the desired value. NOTE that, although full scale capacity is desired as a reference span value, it is not mandatory to have full scale capacity. The weight used simply must be greater than 20% of the full scale capacity.

5.4 FINAL DIGITAL CALIBRATION

Once the Initial Analog Calibration is done, the "Auto Calibrate" function then is used to "fine tune" zero and span. First, place the unit in the "Digital Calibration" mode as follows:

S3-1 = "0" or "Open"
S3-2 = "1" or "Not Open"

All three (3) LED's will be illuminated, the front panel switches then have the following functions:



5.4.1 ZERO CALIBRATION

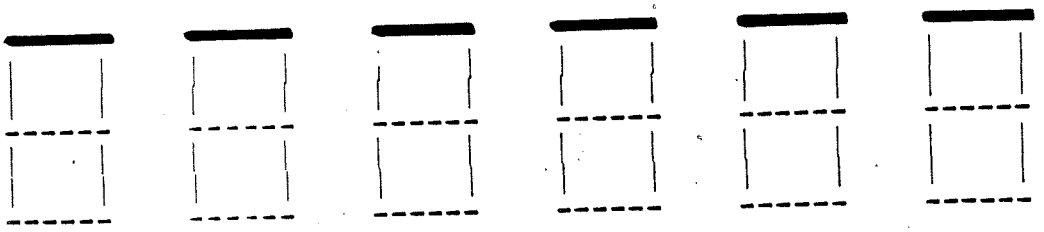
First, all weight is removed from the scale and the "Zero Entry" key is pushed. Note that if the weight is not within +5% of Zero, there will be no response when the key is pushed.

Also note that if the display is between 5% and 20% of full scale capacity, none of the keys will function.

5.4.2 SPAN CALIBRATION

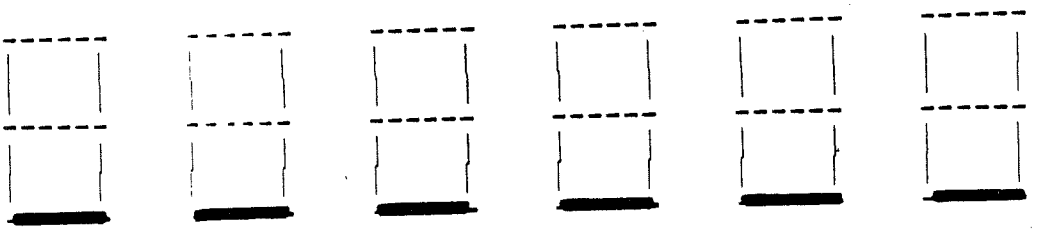
Now that the Zero Calibration value has been entered, place weight on the scale greater than 20% of full scale capacity. It is desirable to have as close as possible to full scale capacity in order to provide the most accurate span. If the displayed weight is less than the desired value, push and hold the "SPAN UP" ("GROSS/NET") key. Note that the displayed weight value will start to increment slowly, and then faster and faster. The best way to "Zero In" on the appropriate value is to hold the key until the weight is within one or two graduations of the desired value, release the key, and then push it again. If you "over shoot" the desired value, reverse the process by pushing the "SPAN DOWN" ("AUTO TARE") key. The span may also be calibrated on the UMC1000AACA by keying in the span weight via the Numeric Key pad and pressing "ENTER".

If the display reads:



It means that the upper 5% limit has been reached, and the span switches must be readjusted to get closer to the desired value.

If the displayed weight is greater than the desired value, using the "Span Down" ("Auto Tare") key will decrement the weight value in the same manner. The following display error symbol indicated that the lower limit has been reached:



Always recheck the Zero after any change in the Span switches. Once the Zero and Span calibration is correct, return the unit to normal operation by:

S3-1 = "0" or "Open"
S3-2 = "0" or "Open"

SECTION 6

SERIAL DATA OUTPUTS

6.1 GENERAL

All UMC1000 series units have a standard simplex serial data output, either 20mA current loop (or TTL output), or an RS232C output.

The data Output is used to transmit weight data to an external printer or computer. The data can be sent in a "Demand" mode, (when the "PRINT" or "*" button is pushed), or in a "Continuous" mode at the end of each display update.

6.2 DATA FORMATS

The data character format is the same for either serial output, namely:

* Each character in ASCII Format
* 1 Start Bit
* 7 Data Bits
* Parity Bit (odd)
* 2 Stop Bits

The message format is:

A. <STX><POL><DATA><SP><LB/KG><SP><GR/NT><CR><LF>

B. <STX><POL><DATA><L/K><G/N><CR><LF>

WHERE

<STX> = Non-recording "Start of Text" character (ASCII 02H)

<POL> = Polarity Character <-> if negative (ASCII 2DH) (SP> if positive (ASCII 20H)

<DATA> = Six Digits of numeric data, includeing decimal point: "Leading Zero Blanking" in demand mode, all zeros transmitted in continuous mode.

<LB/KG> = Two character unit identifier in demand mode - <LB> if graduated in pounds (ASCII 4CH, 42H), <KG> if graduated in kilograms.

<L/K> = Single character unit identifier in continuous mode - <L> if graduated in pounds, <K> if in kilograms.

<GR/NT> = Two character mode identifier in demand output mode - <GR> if in Gross mode (ASCII 47H, 52H), >NT> if in Net mode (ASCII 4EH, 54H).

<G/N> = Carriage return (ASCII 0AH), followed by -

<LF> = Line feed (ASCII 0AH) indicates end of message.

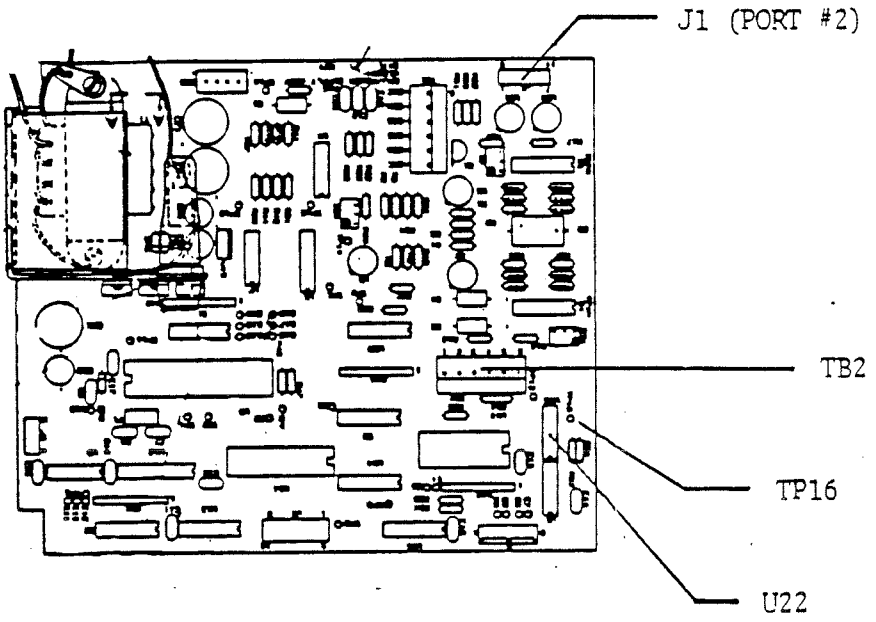


FIGURE 6.1 - UMC1000 SERIES CPU

6.3 DEMAND VS CONTINUOUS MODE

The transmission of serial output data can be initiated in either of two ways as follows:

Demand - The demand mode is used to interface to printers and requires a manual "print" command to initiate the output data in the formats as described in Section 6.2. The output is inhibited during the following conditions:

a. Scale in motion
b. Positive overload
c. Negative overload
d. Negative gross weight displayed
e. Instrument in "Display Check mode"
f. Display in dashed mode
g. Display in "Non-Increment Fixed Tare" mode.

Continuous - The continuous mode is used to interface to computers and transmits the data out automatically followed each update of the display. The format, as described in Section 6.2, includes status information.

Note - The serial Output will extend the conversion period and therefore reduce the number of updates per second and front panel switch response as follows:

TABLE 5.1

CONTINUOUS OUTPUT MODE	APPROX. NUMBER OF UPDATES/SEC (No Averaging)
None	20
300 Baud	2
1200 Baud	6
4800 Baud	12

Therefore, it is not recommended that the continuous serial output be configured in the 300 or 1200 Baud, or that the unit left in the "Continuous output mode" if the serial output is not used.

6.4 20mA CURRENT LOOP WIRING INFORMATION

Figure 6.1 and 6.2 define the signal terminal block (TB 2) connections and typical interface wiring required.

TABLE 6.2

TERMINAL BLOCK NUMBER TB2	SIGNAL MNEMONIC	DEFINITION
1	GRD	Demand print button return
2	TX-	Transmit data output (-) current loop minus
3	TX+	Transmit data output (+) current loop plus
4	PTR	Demand print button Signal
5	N O T U S E D	
6		

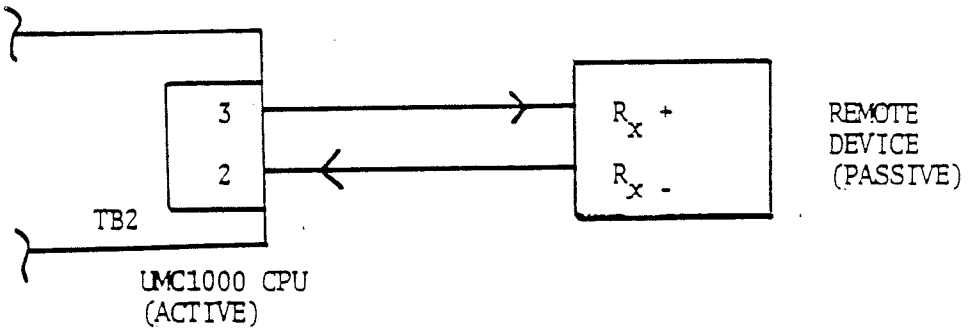


FIGURE 6.2

6.5 RS232C OUTPUT INSTALLATION AND WIRING

In order to use the RS232C Data Output, Integrated Circuit "Chip" U22 must be installed. This I.C. is:

Part Number KFT1918
Commercial Part Number MC1488 or SN 75188N

Using Figure 6.1 as a guide, install U22 into the socket as shown, with the "Notch" toward the front of the unit. Wiring is done as follows, using Figure 6.3:

Signal Output (+/- 12v) to TP16
Signal Common to TB2-1

NOTE that, if the RS232C Data Output is active, the 20mA Loop from TB2-2 and TB2-3 must not be used.

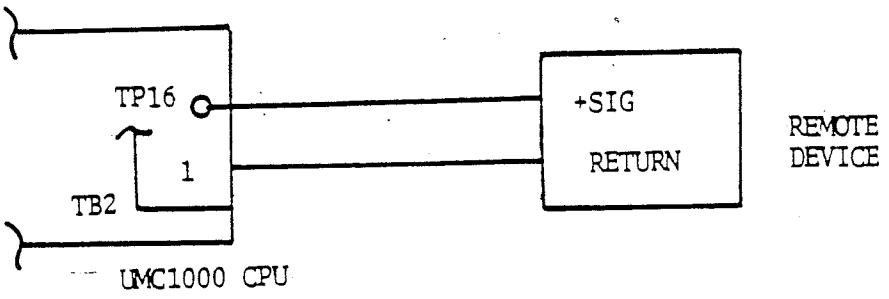


FIGURE 6.3 - RS232 OUTPUT WIRING

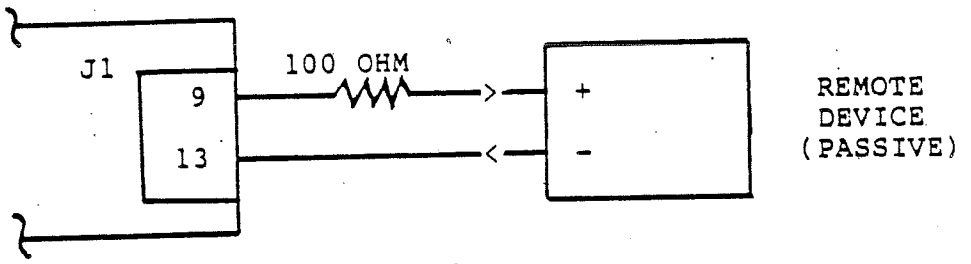
6.6 20mA CONTINUOUS OUTPUT PORT # 2(UMC1000AACA Only)

The UMC1000AACA (Keyboard Auto-Cal) units also have a continuous, active, 20mA current loop output Port #2, which is commonly used to send data to a remote scoreboard or computer. Wiring is done per Figure 6.4. Note that Port #2 is always a 20mA Active Loop, whether Port #1 is configured as a 20mA Loop or and RS232C output. Refer to the Digital Configuration Tables for settings:

PROMPT	FUNCTION
14	Port #2 Enable
15	Port #2 Baud Rate
12	Port # 1 and 2 Format

FIGURE 6.4

Serial Port #2 Wiring (UMCAACA Units only)



6.7 "G-T-N" Output Format (UMC1000AACA Units Only)

The UMC1000AACA units also have three-line "G-T-N" (Gross-Tare-Net) weight output format available from Serial Port #1. Normally required for Truck Scale applications, the output has the following format:

A. "Demand" Print Mode (Three-Line)

<STX><POL><DATA><SP><LB/KG><SP><GR><CR/LF>

* Time Delay

<STX><POL><DATA><SP><LB/KG><SP><TR><CR/LF>

* Time Delay

<STX><POL><DATA><SP><LB/KG><SP><NT><CR/LF>

B. "Continuous" Output (One-Line)

<STX><POL><DATA><L/K><G><SP><POL><DATA><L/K><T><SP><POL><DATA><L/K><N><CR/LF>

Enabling the "G-T-N" Format is done by setting:

Prompt # 10 = "2"

SECTION 7

UMC1000AACA FUNCTION KEY

7.1 GENERAL

This section outlines the options available to the user through the four (4) programmable function keys on the UMC1000AACA unit. These options include:

7.2 Single-Register Accumulator
7.3 Setpoints
7.4 Lb/Kg Conversion
7.5 Tare Recall
7.6 Display check

Programming of the four (4) function Keys is done per the Digital Configuration Tables on Pages 5-3 and 5-4.

Guidelines associated with the Function Keys are:

A. If the Accumulator option is energized (see Section 7.2) only function Key #4 (Bottom, Prompt # 20) will be separately active, and any prompts set on prompts # 17 - # 19 will be ignored.

B. Multiple keys may be set for the same function (which is not recommended), but there will be only one set of setpoint registers and outputs. For example, if all four (4) function keys were set to "Setpoint # 1" (prompt = "1"), all four setpoint function keys LED's would operate the same, but only the latest value entered in the setpoint #1 register (by any of the four keys) would be valid.

7.2 SINGLE-REGISTER ACCUMULATOR

The first available option is a single-register accumulator, which is activated by setting:

PROMPT # 16 = "2"

This enables the top three (3) function keys as follows:

FUNCTION KEY #	FUNCTION	DESCRIPTION
1 (Top)	Accumulate Acquire	Adds displayed weight to Accumulator memory
2 (2nd)	Accumulate Recall	Recalls Accumulated total on display
3 (3rd)	Accumulate Reset	Resets Accumulated total to "0" (Zero).

NOTE that, in order to prevent accidental resetting of the Accumulator memory, the "ACCUM RECALL" switch must be pushed and held first, then the "ACCUM RESET" switch must be pushed.

Function Switch #4 (Bottom) may be set to any other function by means of Prompt #20.

The Function Key insert comes equipped with a set of spare labels which include the "ACCUM ACQUIRE", "ACCUM RECALL", and "ACCUM RESET" Labels. The installer should apply these labels to the insert as shown below in figure 7.1 before sliding the function key inset into its associated "Pocket" in the front panel.

Guidelines associated with the Accumulator include:

A. The "Accumulator Recall" LED (2nd) stays on in a "Flashing" mode while the Accumulator total is displayed. The time that the LED "Flashes" and the Accumulated total is displayed is a function of the update rate, but typically is three (3) to ten (10) seconds.

B. Printing of accumulated total weight may be done by pushing the "Print" key while the accumulated total weight is being displayed.

C. If the Six (6) Digital capacity of the Accumulator has been exceeded, the display will also "Flash" while in the "Accumulate Recall" Mode.

D. Either "Gross" or "Net" Weights will be accumulated.

E. Negative weight values will be accumulated as positive weights: in other words, only the absolute value of the weight is accumulated.

F. Weight inputs must be "Valid" weights (not in motion, overload, etc.) or they will be ignored.

FIGURE 7.1

7.3 SETPOINTS

The UMC1000AACA unit can be configured with one or two setpoints, designated Setpoint #1 and (if used) Setpoint #2. Programming for the setpoints is done through the function key prompts, #17-#20. Note the following guidelines:

A. If the Single-Register Accumulator is enabled (P#16 = "2"), only function key #4 (bottom) is available for use as a setpoint.

B. DO NOT set (P#16 = "0"), or the function keys will not operate.

7.3.1 SETPOINT ENTRY

The setpoint entry sequence is as follows:

A. Push the appropriate function key. The associated function LED to the left will "FLASH", and setpoint value will appear on display for three (3) to ten (10) seconds.

B. Enter the setpoint value serially using the "0" - "9" keys, then push "Enter" (or push "CE" if value is incorrect). Note that, if no keys are pushed for Ten (10) seconds, the display will revert to normal operation.

C. Note that setpoint values will always be "rounded" to the correct displayed increment value, and that setpoint values will be converted appropriately if the Lb-Kg conversion key is pushed.

7.3.2 SETPOINT OPERATION

Figure 7.2 on the next page shows the states of the function key LED'S and associated setpoint outputs found on TB1 of the LED Interface Assembly behind the front panel, shown in Figure 7.3. The actual setpoint outputs present at TB1-2 to TB1 - 5 are 5VDC, TTL, Logic Level outputs ("0" = Energized, "1" = De energized) If 120 VAC (Or 240 VAC) Compatble outputs are desired, the KL2900-2 Solid State Triac Output Assembly may be separately purchased and installed as shown in Figure 7.3. Output specifications for the KL2900-2 solid state triac switches are given in Table 7.1.

Note, that both a "normally energized" and "normally deenergized" output are available for each setpoint, as shown in Figure 7.2 . Also note that the outputs are associated with Setpoint #1 or Setpoint #2, regardless of which function key is assigned that specific setpoint function.

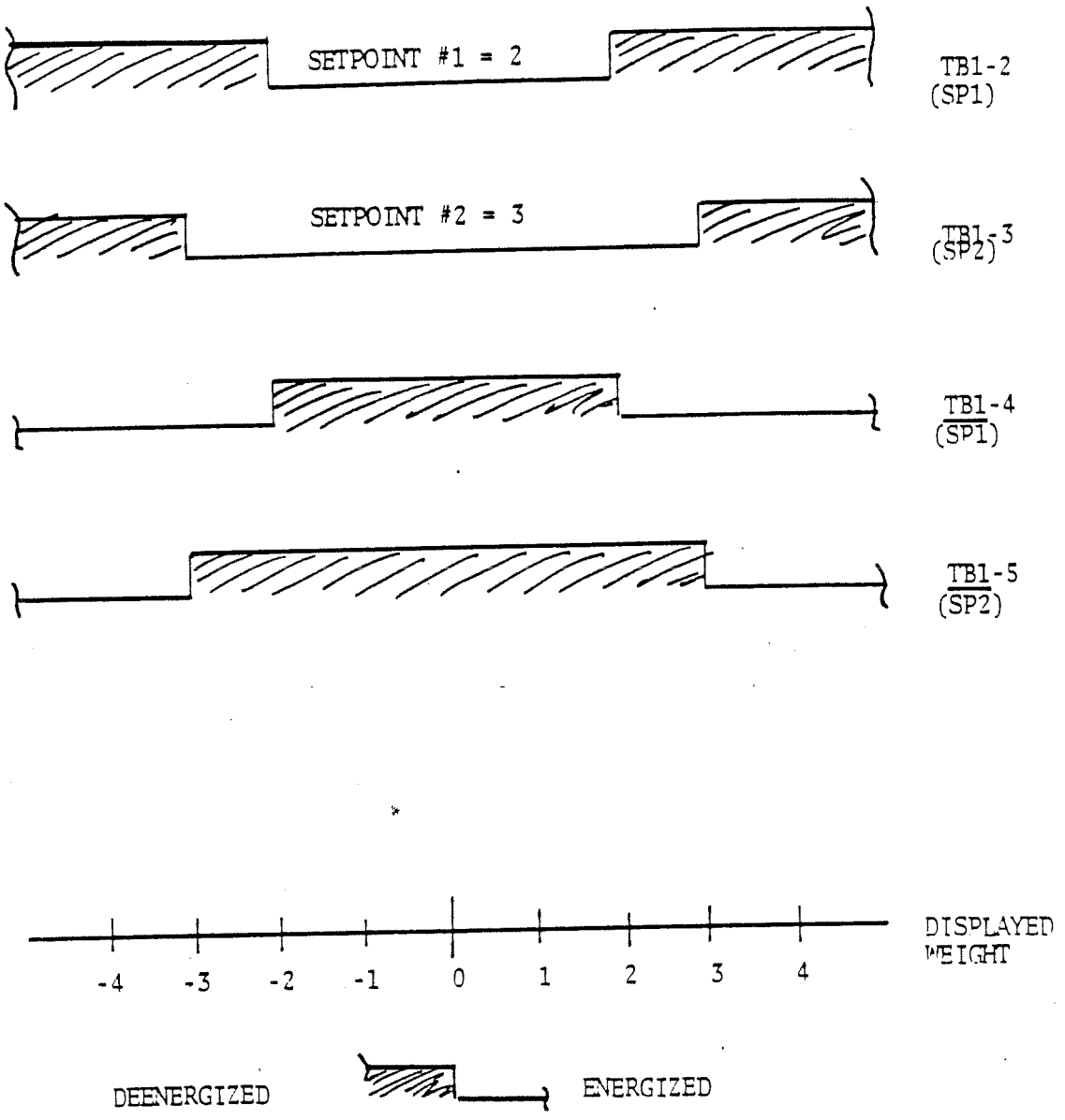

SETPOINT #1 = 2
TB1-2
(SP1)
SETPOINT #2 = 3
TB1-3
(SP2)
TB1-4
(SP1)
TB1-5
(SP2)
DISPLAYED
WEIGHT
-4
-3
-2
-1
0
1
2
3
4
DEENERGIZED
ENERGIZED

FIGURE 7.2

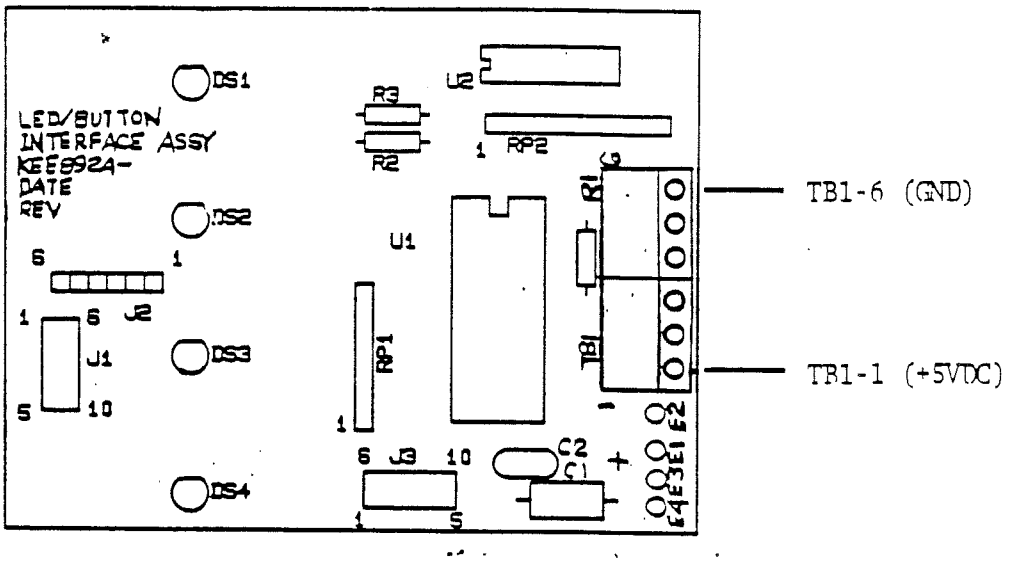
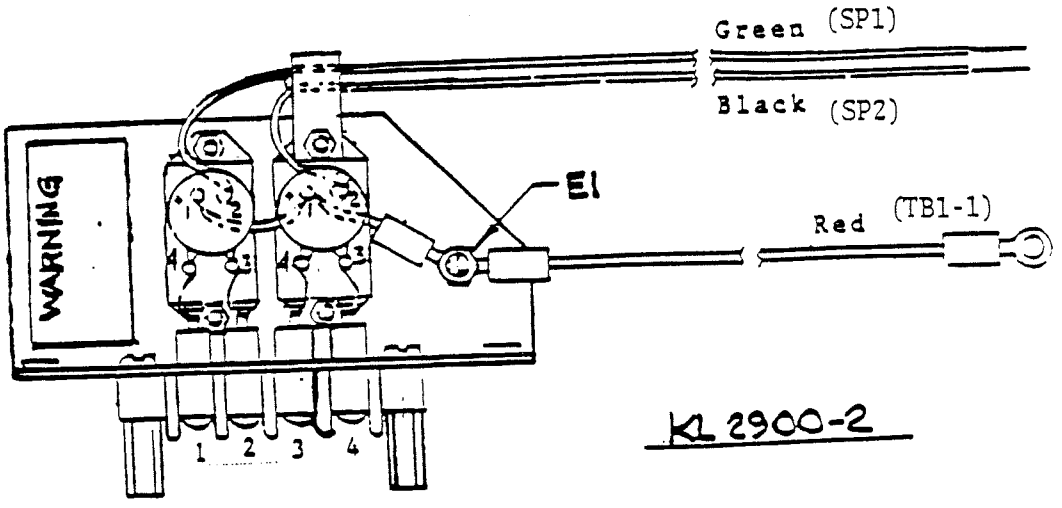

LED/BUTTON
INTERFACE ASSY
KEE8924-
DATE
REV
DS1
DS2
DS3
DS4
R3
R2
J2
RP2
U1
RP1
J1
J3
C2
C1
TB1
TB1-6 (GND)
TB1-1 (+5VDC)

FIGURE 7.3

SOLID STATE SWITCH OPERATIONAL PARAMETERS

Isolation (Input to output and output to case)	2500 V_{rms} minimum
Insulation Resistance	10^{12} ohms @ 500VDC
Turn-on Time	8 mS typ, 16 mS max
Turn-off Time	25 mS typ, 60 mS max
Continuous Load Current, rms	50 mA min, 1.5 A max
Surge Current max, one cycle	50 A, rms
Leakage Current	1 uA typ, 0.1 mA max
Repetitive Peak Block Voltage	+/- 400 V peak
Output Transient Immunity dV/dt Blocking	100 V/uS min
Output Frequency Range	47 to 70 Hz
Transient Clipping	270 V_{rms} varistor suggested



7.4 Lb/Kg CONVERSION

Any one of the four (4) function Keys may be set to provide an Lb (pound) to Kg (Kilogram) conversion at the push of the appropriate function key. Pushing the key causes the display and the associated identifying legend to switch. Also note that the serial outputs and all internal memory functions (tare and setpoint values and accumulated total weight) are automatically converted also.

Enabling of the Lb/Kg Conversion Function is done through Prompts #17 - #20, by setting the associated Prompt to = "3". Note also that Prompt #8 (Display/Base) must be set = "2", or the Lb/Kg conversion cannot be enabled.

The "Lb/Kg conversion label should be attached to the appropriate function key insert prior to insertion of the insert.

7.5 TARE RECALL

Setting any of the function key prompts (#17 - #20) to = "4" enables the "Tare Recall" function from that key. Any tare value, either "Auto (stored) Tare" or "Keyboard Digital (manual) Tare" may be recalled by pushing the function key. The associated function key LED will "Flash" while the Tare value is displayed, for a period of three (3) to Ten (10) seconds. The unit may be either in the "gross" or "net" weighing mode. Printing of the tare value may be done by pushing the "Print" Key, while the tare is being displayed.

The "Tare Recall" label should be attached to the appropriate function key insert prior to insertion of the insert.

7.6 DISPLAY CHECK

A "Display Check" function (all 8's and all associated LED's and display legends illuminated for 2 seconds) may be activated by setting any of the function key prompts (#17 - #20) = "5".

The "Display Check" label should be applied to the appropriate function key insert prior to insertion of the insert.

SECTION 8

THUMBWHEEL TARE OPTION

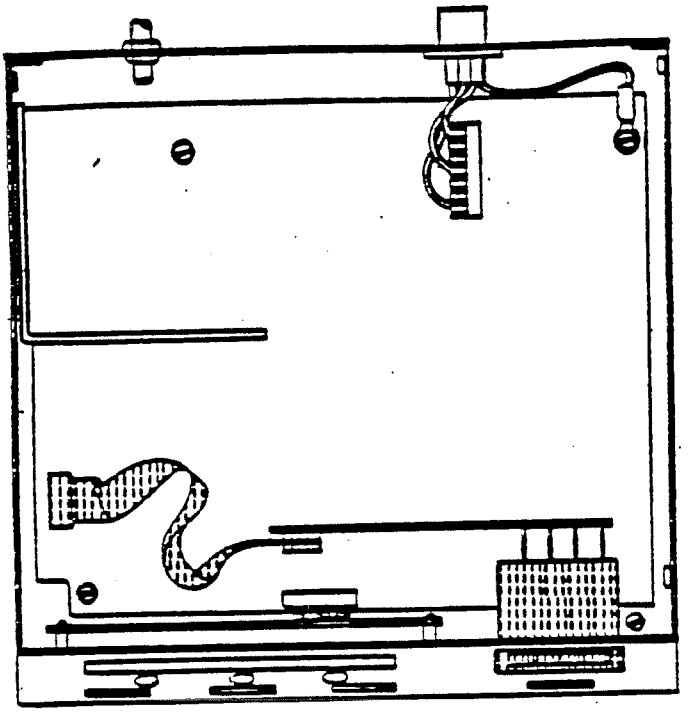
8.1 GENERAL

The UMC1000AAAA or AABA units may be equipped with a 4-digit Thumbwheel Tare Kit, either at the factory or in the field. The kit is part number KL8924-1, and is a one-piece assembly with the Thumbwheel Switch and mating cable attached.

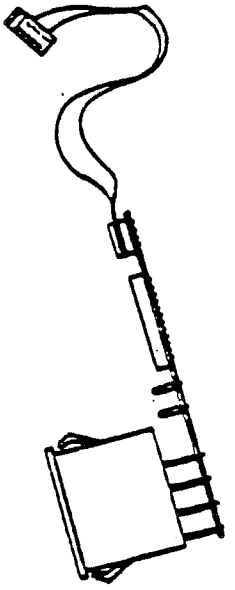
8.2 INSTALLATION

The KL8924-1 Thumbwheel Assembly is installed in a UMC1000 in the following sequence:

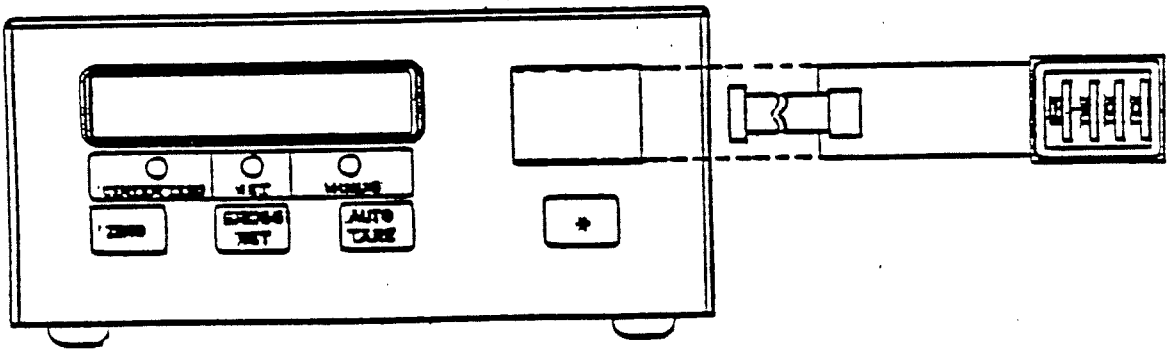
1. Refer to Figure 6.1 for pictoral information.
2. Open the UMC1000 top case, exposing the interior of the unit.
3. There will be a hole in the upper right section of the metal plate supporting the front panel, immediately behind the brown "Digital Weight Indicator" logo.
4. CAREFULLY using an "X-Acto" knife or other similar sharp instrument, pierce a hole in the center of the logo
5. Cut out the section of front panel even with the edges of the hole in the metal plate.
6. Insert the tare assembly, cable end first, into the hole.
7. If the hole has been cut correctly, the Tare Assembly should snap into place with the tare bezel covering the edges of the hole.
8. Plug the mating connector into J4, at the left-hand front edge of the CPU assembly.
9. Program switch S2-4 must be set at the "0", or "open" position, for the Thumbwheel Tare to operate.
10. The Thumbwheel Tare value shown will then be subtracted from the displayed weight, when the unit is switched into the "Net" mode. Figure 6.2 shows which displayed weight decades are affected by the tare switch.



Top View - Installed



KL8924-1
Thumbwheel Tare
Assembly



Front View
During Installation

FIGURE 8.1

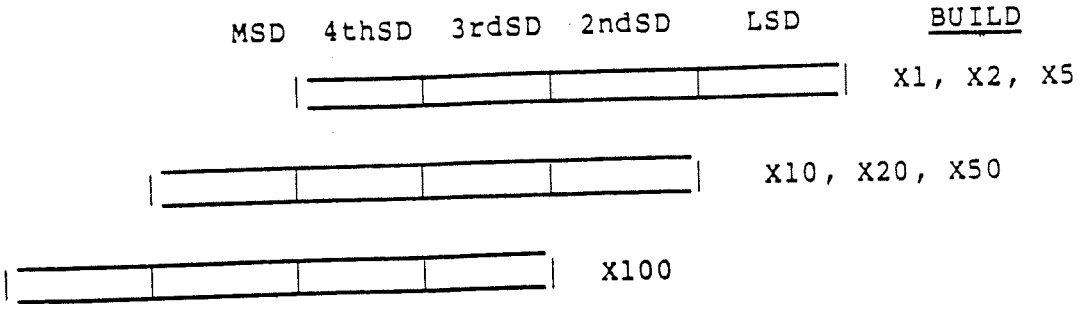
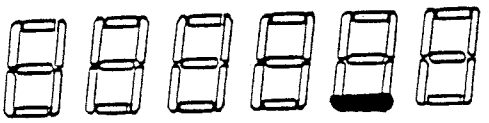


FIGURE 6.2

THUMBWHEEL TARE

11. Several precautions regarding Thumbwheel Tare must be observed. They include:

A. The unit protects against a "non-incremental Tare" entry. In other words, a tare of "121 Lb" cannot be entered if the unit is calibrated in 5lb graduations. If the operator attempts to do so, the display will show:



B. A tare greater than the full gross capacity of the scale cannot be entered. This is especially true in X10, x20, X50, X100 Builds.

SECTION 9

RECOMMENDED SPARE PARTS

PART NUMBER	DESCRIPTION
KE8924-2	CPU Assembly (UMC1000AAAA)
KE8924-3	CPU Assembly (UMC1000AABA, AACA)
KF8924-1	Display Board Assembly
KEE8924-1	LED Interface Assembly (UMC1000AACA)
KFM1918R	Microprocessor
KAU1921-7-1	EPROM - UMC1000AAAA
KAU1921-1-1	EPROM - UMC1000AABA
KAU1921-16-1	EPROM- UMC1000AACA
KJ7182	Front Panel - UMC1000AAAA, AABA
KDD7182	Front Panel - UMC1000AACA
KL2900-2	Solid State Switch Assembly - UMC1000 AACA
KW116-8	Panel Mounting Kit

SECTION 10

DRAWINGS

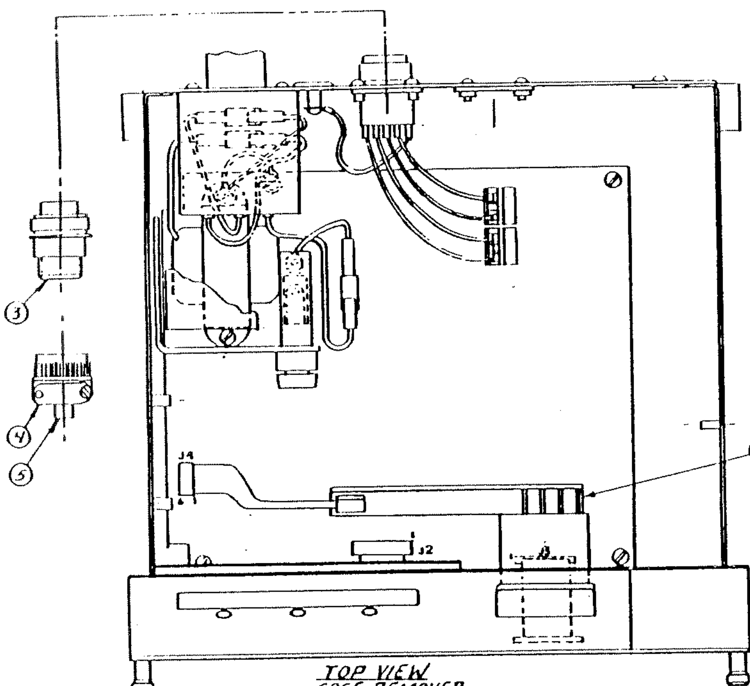
DRAWING NUMBER	DESCRIPTION
UMC1000	Overall Drawing

THE END

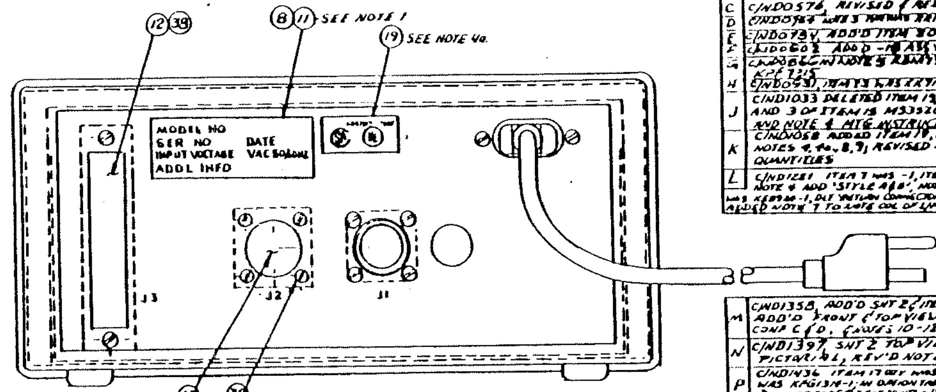
DWG NO UMC1000 SH 1

REVISIONS

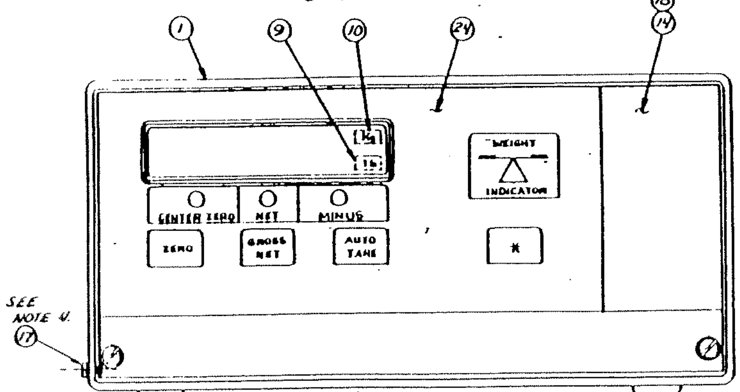
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	C	C/ND0576, REVISED & REDRAWN	5-4-[illegible]	[illegible]
	D	C/ND0[illegible] NOTE 3 [illegible]	[illegible]	[illegible]
	E	C/ND0734, ADD'D ITEM 20 [illegible]	[illegible]	[illegible]
	F	C/ND0[illegible] ADD'D -[illegible] ASSY, NOTE 7	[illegible]	[illegible]
	G	C/ND0[illegible] NOTE 5 [illegible] WAS KPE7215	[illegible]	[illegible]
	H	C/ND0931, ITEM 13 WAS KKY11G-2	[illegible]	[illegible]
	J	C/ND1033 DELETED ITEM 13, KDG7287 AND 3 OF ITEM 15 MS35206-225 [illegible] AND NOTE 4 MTG INSTRUCTIONS	4/7/85	[illegible]
	K	C/ND1058 ADDED ITEM 19, 23, P/N CODE, NOTES 4, 4a, 8, 9; REVISED ALL LIM QUANTITIES	4/4/85	[illegible]
	L	C/ND1261 ITEM 7 WAS -1, ITEM 23 WAS -12, NOTE 4 ADD 'STYLE A & B', NOTE 7 [illegible] WAS KE8924-1, DLT "RETURN CONNECTOR TO STOCK" FROM LOAD CELL & ADDED NOTE 7 TO NOTE COL OF LIM, ITEMS 6, 7, 22 & 23	[illegible]	[illegible]
	M	C/ND1358, ADD'D SHT 2 & ITEMS 24-35 ADD'D FRONT & TOP VIEW OF CPU CONF C & D, & NOTES 10-12	9/15/86	[illegible]
	N	C/ND1397, SHT 2 TOP VIEW REV'D PICTORIAL, REV'D NOTE 10	4/1/86	[illegible]
	P	C/ND1436 ITEM 17 QTY WAS 6, ITEM 34 WAS KFG13M-1; IN OPTION TABLE DLTD CONFIG D-[illegible] [illegible] DLTD NOTE 11: [illegible] ADD'D-C	[illegible]	[illegible]



TOP VIEW
CASE REMOVED
CPU CONFIGURATION A & B
FOR CPU CONFIGURATION C & D SEE SHEET 2



REAR VIEW
CPU CONFIGURATION A & B



FRONT VIEW
CPU CONFIGURATION A & B
FOR CPU CONFIGURATION C & D SEE SHEET 2

NOTES

1. STAMP IDENTIFICATION PLATE WITH APPLICABLE MODEL NUMBER AND INFORMATION PER MARKING INSTRUCTIONS (B) KE7135
2. FOR UMC1000 FIELD INSTALLED OPTIONS, SEE KK7116-[ ].
3. UII OF CPU ASSEMBLY TO BE PROGRAMMED PER KAU192 1-7-1 OR PER CUSTOMER REQUIREMENTS AS SPECIFIED ON SALES ORDER.
4. STYLE A&B - USE 4-40 x 1/16" SCREW, ITEM 17, AS A LOCKING DEVICE TO PREVENT REMOVAL OF UNIT FROM PROTECTIVE CASE AFTER FINAL ASSEMBLY
4a. CSA/UL LABEL (ITEM 19) AFFIXED WHERE EASILY VISIBLE. VERIFIES THE PROVISION OF THIS SAFETY FEATURE ON ALL 117 VOLT (IMP) UNITS.
5. TEST PROCEDURE KNH7317.
6. TO INSTALL ITEM 22, A RECTANGULAR CUTOUT MUST BE MADE IN ITEM 1 AND ALIGNED WITH A KNOCK-OUT IN THE CHASSIS BEHIND THE "WEIGHT INDICATOR" MARKING.

(NOTES CONTINUED SHT 2 OF 2)

(LIST OF MATERIAL CONTINUED SHT 2 OF 2)

	C	A	ITEM NO	NOMENCLATURE OR DESCRIPTION	DWG SIZE	PART OR IDENTIFYING NO	SPECIFICATION	MATERIAL OR NOTE	REMARKS
OPTIONAL ITEMS	-	-	24	FRONT PANEL KEYBOARD	D	KJ7182			
	-	-	23	CPU ASSY	A	KE8924-3		NOTE 9 & 7	
	-	-	22	SWITCH ASSY, TARE	C	KL8924-1		NOTE 6 & 7	
BULK ITEMS	3	-	21	POUCH, KIMCELL	-	SF426			12" x 18"
	-	1	20	IDENTIFICATION PLATE	B	KEV7236			NOT SHOWN
	-	1	19	NAMEPLATE, CSA/UL	B	KDN7236			
	-	2	18	NUT, KEPS	B	KMV117B			#6-32
	-	1	17	SCREW, SEMS	B	KKP83A			#4-40 x 5/16
			16						
			15						
	-	1	14	FILLER PLATE	C	KFR7272-1			
	-	1	13	COVER PLATE	B	KJA2272-1			
	-	1	12	COVER PLATE	C	KWD1272-1			
	1	1	11	IDENTIFICATION PLATE	B	KBU7236			
	1	1	10	LENS	B	KY373A			Kg
	1	1	9	LENS	B	KY373B			lb
	-	1	8	NAMEPLATE OVERLAY	B	KEW7236			
STD ITEMS	1	-	7	CPU ASSY	D	KE8924-2		NOTE 7	
	1	-	6	DISPLAY ASSY	C	KF8924-1		NOTE 7	
	-	1	5	BUSHING	-	MS3420-6			
	-	1	4	CABLE CLAMP	-	MS3057-6A			
	-	1	3	CONNECTOR PLUG	-	MS3106A14S-5S			
			2						
	-	1	1	MAIN FRAME ASSY	D	KE8913-1			

LIST OF MATERIAL

CONDEC Consolidated Controls Bethel CT 06801

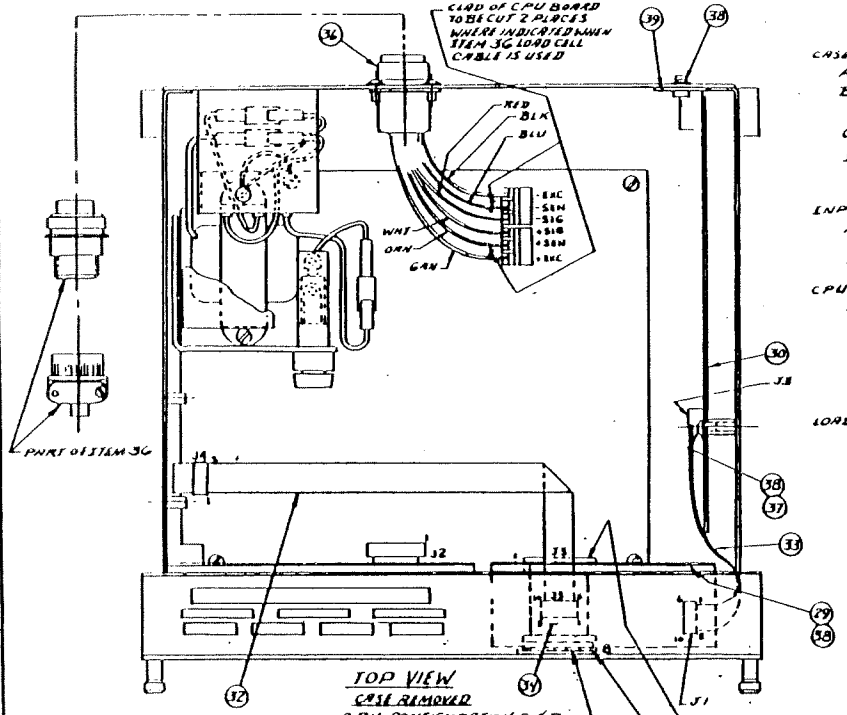
DIGITAL WEIGHT INDICATOR

DRAWN 6 [illegible] 3-14-83
CHECKED [illegible] 5-11-83

SIZE D | FSCM NO 02750 | DWG NO UMC1000

NEXT ASSY UMC1000 | USED ON | APPLICATION

MATERIAL —
FINISH —



TOP VIEW
CASE REMOVED
CPU CONFIGURATION C & D

UMC1000

CASE STYLE
- A. STANDARD ____ CODE 1
- B. STANDARD (STYLE A) PLUS DIGITAL THUMBWHEEL TARE, ITEM 22, QTY 1 (NOTE 6)
- C. UNCASED
- D. UNCASED (STYLE C) PLUS DIGITAL THUMBWHEEL TARE, ITEM 22, QTY 1 (NOTE 7)

INPUT VOLTAGE ____ CODE 2
- A. STANDARD 117 VAC 50/60 Hz (NOTE 4 & 4A)
- B. 237 VAC 50/60 Hz (NOTE 8)

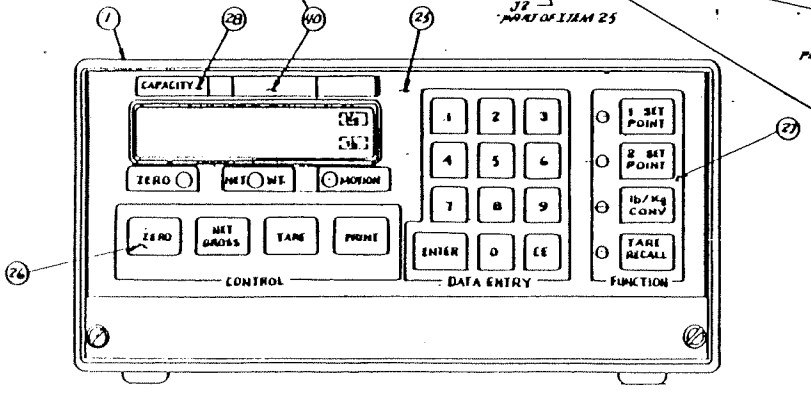
CPU CONFIGURATION ____ CODE 3
- A. STANDARD
- B. AUTO CALIBRATION
- C. KEYBOARD TARE & 2 SETPOINTS

LOAD CELL CONNECTIONS ____ CODE 4
- A. STANDARD MS CONNECTOR (SHOWN IN TOP VIEW SHT 1)
- B. TERMINAL STRIP ONLY-NO CONNECTOR
- C. SHIELDED 6-WIRE CONNECTOR ITEM 36, QTY 1, (SEE NOTE 12) (SHOWN IN TOP VIEW SHT 2)

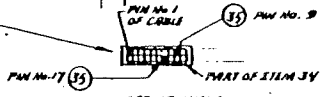
NOTES: (CONTINUED FROM SHT 1)

7. APPLY ITEM 11 TO OUTSIDE SURFACE OF HEATSINK ON CPU ASSEMBLY (ITEM 7) AND WRAP CPU & DISPLAY ASSEMBLIES IN BUBBLE BAGS (ITEM 21). WRAP THUMBWHEEL (ITEM 22) IN BUBBLE BAG, IF APPLICABLE.
8. MODIFY CPU - REMOVE JUMPERS ON J1 (1-3 & 2-4). ADD JUMPER ON J1 (2-3).
9. RETURN CPU ASSEMBLY KEB924V-2 BACK TO STOCK. U11 OF CPU TO BE PROGRAMMED PER KAU1921-1-1 OR PER CUSTOMER ORDER.
10. U11 OF CPU ASSEMBLY TO BE PROGRAMMED PER KAU1921-161 OR PER CUSTOMER REQUIREMENTS AS SPECIFIED ON SALES ORDER.
11.
12. REMOVE LOAD CELL CABLE ASSEMBLY KBA7314-1 FROM MAIN FRAME ASSEMBLY. RETURN THIS, AS WELL AS, ITEMS 3, 4 & 5 TO STOCK.
13. OVERLAYS ITEM 31 & 40 TO BE SHIPPED LOOSE AND INSTALLED BY CUSTOMER. ITEM 40 TO BE MARKED BY CUSTOMER

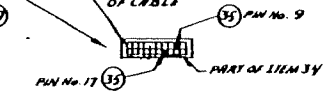
CODE 3 CPU CONFIG	ITEM NO. AND QTY 23	24	25	26	27	28	29	30	31	32	33	34	35	37	38	39	40	SEE NOTE (S)	RETURN TO STOCK ITEM (S)
A	–	1	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	3	
B	1	1	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	9	
C	1	1	1	1	1	1	1	–	1	1	–	1	3	–	6	–	1	9, 10	18, 19



FRONT VIEW
CPU CONFIGURATION C & D



MATING VIEW



MATING VIEW

OPTIONAL ITEMS

C	A	ITEM NO	NOMENCLATURE OR DESCRIPTION	DWG SIZE	PART OR IDENTIFYING NO	SPECIFICATION	MATERIAL OR NOTE	REMARKS
–	–	40	OVERLAY, CHARCNTY LABEL	B	KAN7238A		NOTE 13	
–	–	39	PLATE, COVER	C	KWD12773			
–	–	38	SCREW, SEMS	B	KKA933B			#6-32 x 1/4 LG
–	–	37	SPACER	C	KNM22V1			#6-32 x 1/2 LG
–	–	36	LOAD CELL CABLE ASSY	B	KBA7314-2			
–	–	35	PLUG POLARIZING	B	KD7496A			
–	–	34	CABLE ASSEMBLY	B	KAN7314-1			
–	–	33	CABLE ASSEMBLY	B	KLY1314-5			
–	–	32	CABLE ASSEMBLY	B	KLY1314-1			
–	–	31	OVERLAY, SWITCH LABEL	B	KAG7238A		NOTE 13	
–	–	30	ASSY, SERIAL I/O	D	KED8924-1			
–	–	29	ASSY, LED/BUTTON MTG	C	KEE8924-2			
–	–	28	INSERT SWITCH LABEL	B	KAF7238A			
–	–	27	INSERT SWITCH LABEL	B	KAF7238A			
–	–	26	INSERT SWITCH LABEL	B	KAD7238A			
–	–	25	FRONT PANEL KEY BOARD	D	KDD7182			

SIZE	FSCM NO	DWG NO	REV
D	02750	UMC1000	P

Load Cell Connection		
+ Excitation	=	Red
- Excitation	=	Black
+ Signal	=	Green
- Signal	=	White

Summing:

This must be performed before calibration is done so that both load cells read the same.

A. Turn all four potentiometers in the summing box to their maximum reading.

B. Place a weight (at this point we are not concerned with the calibration as long as we get an increase in the readout when weight is applied) on one side of the hopper and record weight.

C. If they are not equal, using the potentiometer next to the load cell connection of the highest reading, decrease the value to equal lower value. The value of the lower reading will decrease with the higher, but at a slower rate.

D. Repeat steps A & C until both readings are the same. NOTE: Never reduce the value of the load cell giving the lesser value when you started.

UMC 1000 AA-CA

Calibration Steps

S-3 (CPU) is used to set the four mode listed below and is located in the front center of the panel. Only S-3 switch 1 & 2 will be used and switches 3-8 must be left in the open position.

STEP 1: Digital Configuration
S-3 Switch 1 not open or closed
Switch 2 open.

The unit is now in Digital Configuration mode and the front panel switches functions are as follows:

1. Parameter Key = Zero
This key will change from parameter to parameter.

2. Data Key = Gross/Net
This key will change the data within a given parameter.

3. Entry Key = Enter
This key is used to enter the data to memory.

Set Digital Configuration parameters as noted on Digital Configuration Chart. (Chart A)

CHART A

PARAMETER		DISPLAY	JM-600
0	Capacity	0	2500
1	Resolution	1-	5
2	Decimal Point	2-	0.00
3	Averaging	3-	1
4	Motion Band	4-	3
5	AZM Band	5-	3.0
6	Paz Aperture	6-	100
7	AZM Mode	7-	1
8	Display/Base	8-	2
9	Tare Mode	9-	2
10	Serial Port #1 Enable	10	0
14	Serial Port #2 Enable	14	0
16	Function Key Enable	16	1
17	Setpoint #1	17	1
18	Setpoint #2	18	2
19	Lb/Kg Conversion	19	3
20	Display Check	20	5

STEP 2: Analog Calibration
S-3 Switch 1 not open or closed
Switch 2 not open or closed

Calibration must be done in lbs.

Unit is now in Analog Calibration mode. While in this mode, use only zero switches and pot (located on right-back of the CPU panel and marked ZERO) and span switches and pot (located on right-front of the panel and marked SPAN).

A. With no weight in the weigh hopper or on the scale spout (gross baggers), use the switches to obtain a reading close to zero (note which switches give a gain or loss of weight). If you receive a half eight (0) in the upper left corner of the display, you have gained too much and must decrease the value. If you receive a minus half eight (-0) in the lower left corner of the display, you have gone too low and must increase. With a display close to zero use the pot to bring the display to zero and the zero light on the front will light.

B. Place a weight of 20% of full scale capacity (note on chart A) in the weigh hopper or on the spout. Using the span switches (in the same manner as the zero), bring the display as close to the known weight as possible. Then use the pot to bring the display to the correct reading.

C. Remove the weight and re-check zero, if not correct repeat steps "A" and "B". In some cases, this may have to be done several times.

D. Remove all weight when completed.

STEP 3: Final Digital Calibration
S-3 Switch 1 open
Switch 2 not open or closed

The unit is now in Final Digital Calibration mode and all functions are performed on the front panel. All three LEDs will be illuminated and the front panel switches are as follows:

Zero = Zero
Gross/Net = Span up
Tare = Span down

A. With no weight in the weight hopper or on the spout (gross bagger) the instrument should display close to zero or zero. Depress the zero key.

B. Place your known weight on the weigh hopper and using the Span Up & Span Down keys to reach this weight.

C. Remove all weight when completed.

STEP 4: Normal Operation
S-3 Switch 1 open
Switch 2 open

STEP 5: Calibration Mode

The digital indicator has the following buttons that are used in your scale.

Preset #1
This is the same as cutoff number 1 and controls the cutoff of the bulk or full feed feeder. This cutoff basically controls the speed of the scale.

Preset #2
This is the same as cutoff number 2 and controls the final or dribble feed mode of the scale. This cutoff is basically the cutoff used to control accuracy.

Lb./Kg.
This converts the digital readout from lbs. to kgs. The digital display will display a small kg. or lb. to indicate which mode the scale is in.

Zero
This switch will zero the digital indicator. This should only be used when there is a minor weight in the display. This should not be used to zero out a completely loaded weigh hopper.

Keyboard
The keyboard contains 0 through 9 push buttons and enter button (e) and a clear entry button (ce). The display is used for entering presets.

STEP 6: Initial Setup

Before beginning, remember that the feeders are used to produce a constant and uniform flow of product. The full feed is basically for speed and the dribble feed is for accuracy. Both feeders are mechanically adjustable to allow more or less product flow. Check mechanically how you can set the feeders to obtain the best feed rate for your individual products. The feeders have been set at the factory on test product and may need to be adjusted for different actual products.

Turn scale to ON position and the power light should come on.

Initially set cutoff 1 at 0.00. The decimal place has been set at the factory. Press the preset number 1 button, the red light beside this will begin flashing. This will allow you 3 seconds to make your initial entry. If, for some reason, you fail to enter a value in the preset time, simply hit preset button 1 again and the light will again begin to flash. Press zero button 3 times until 0.00 appears in the display. The lb. or kg. light will flash, press enter.

Enter preset number 2 at the target weight. Press preset number 2 button, the red light side present number 2 will flash. You have 3 seconds to enter the first digit. If, for some

reason, you fail to enter the digit, the light will stop flashing and you will have to press preset number 2 again. For example, if the target weight is 50.00 lbs., you should enter 5, then 0, then 0, then 0 until 50.00 appears in the digital display, then press enter. The lb. or kg. light should stop flashing.

You have now entered 0.00 in preset number 1 and 50.00 in preset number 2. Press preset number 1 button and preset number 2 button to check this. Remember, if you lose power for any reason, these values will appear in the display, however, they must be reentered.

STEP 7

Press discharge button on 5GV models or place bag on air operated spout of JM-600 and CM-780 models. Scale will begin to cycle.

If not, is power light on?
Is air connected?
If belt feeder is on scale, is 3 phase power connected?

Scale will fill only in dribble mode. Lights on panel will signal all scale functions. Monitor these until you become familiar with the scale functions. Digital display will monitor actual weight. When the target weight is reached, feeder will stop by cutoff signal provided by cutoff number 2.

Compare actual weight with target weight. Do this several times. The actual weight will be over, as material in suspension has not been compensated for. After you have determined the amount of material in suspension or overweight, this weight should be subtracted from the preset weight of number 2. For example, if the average weight is 51.00 lbs. and the target weight is 50.00 lbs., the material in suspension is 1.00 lb. and the target weight should be reduced by 1.00 lb. Reset the second cutoff from 50.00 lbs. to 49.00 lbs., this takes into account the 1.00 lbs. of material in suspension.

Repeat the testing of the scale and see if your accuracy has been improved to acceptable levels.

The lights on the panel will signal the time that the full feed is operating, the time the dribble feed is operating, and the cycle light is activated after the dribble feed has been on long enough. This is the most important light to monitor.

The cycle light will come on approximately 1 second after the dribble cycle begins. This is controlled by a spike delay timer inside the panel. The cycle light must come on in order for an accurate weighment. The idea of the cycle light is to be on as short a time as possible, but to always come on. Generally, settings between .5 seconds and 1 second is acceptable.

After you have obtain the acceptable accuracy levels on the scale, you are now ready to improve the speed. Set cutoff number 1 at approximately 50% of the desired weight. For example, if the target weight is 50.00 lbs., set cutoff number 1 at 25.00 lbs. Monitor the cycle light and see how much improvement this made over the initial setting of 0.00. To decrease the amount of time the cycle light is on, you must increase preset number 1.

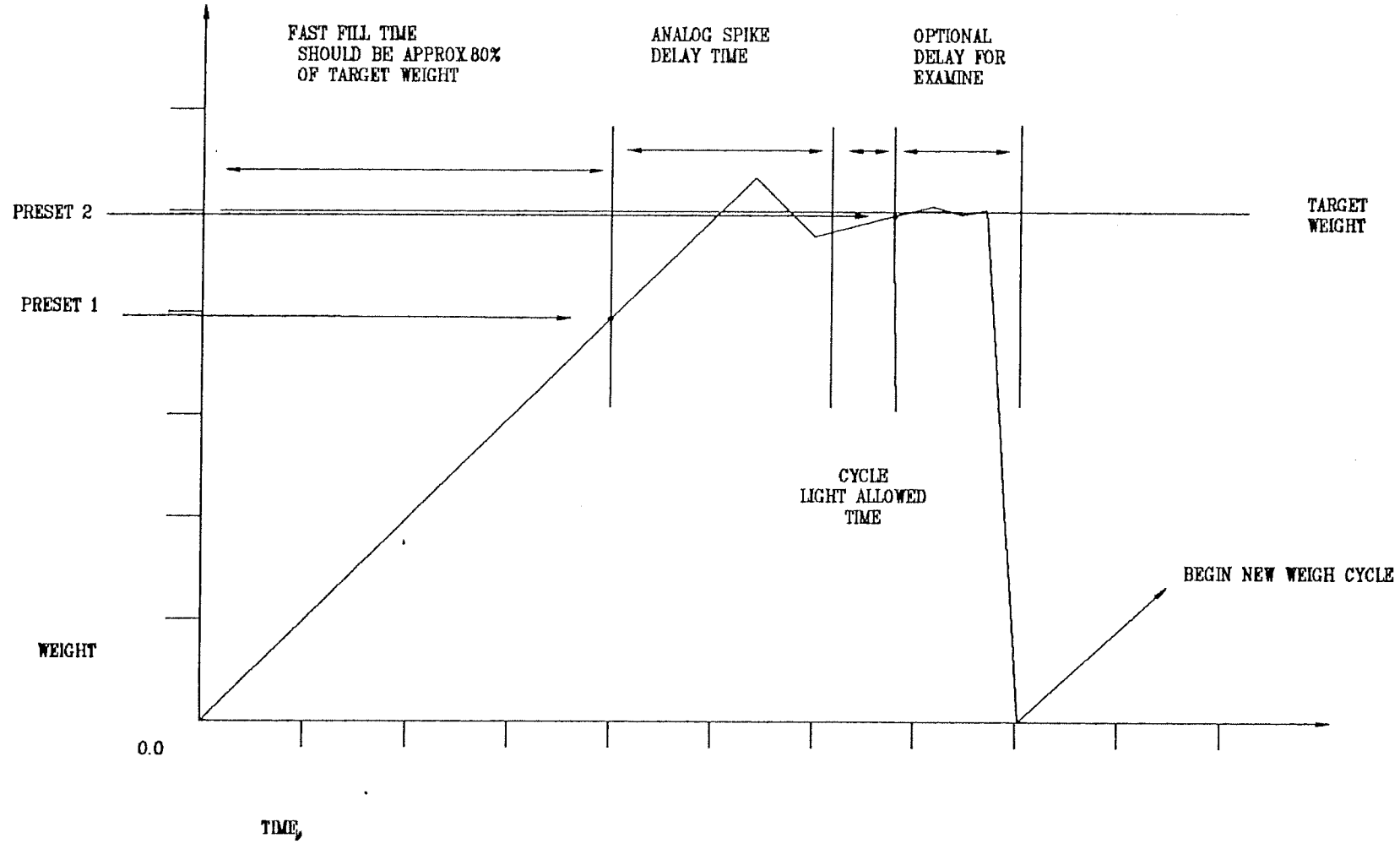
Once you have mastered the preset cutoffs, the scale should be placed in the run position and it will operate in the normal mode. When learning the scale, it is best not to change values in preset number 1 and preset number 2 at the same time. The operator will really not learn by doing this. It is best to enter preset number 1 or preset number 2 and then monitor several bag weights before adjusting further.

If an incorrect preset value is entered, you may press the clear entry (ce) button, This will clear out the latest incorrect data and you may now reenter it. If it is entered incorrectly, you can simply press the preset button again and reenter the correct value and then press enter.

If a half circle appears on the left side of the digital display on the upper half of the display, this is a gross overweight mode and the UMC indicator is out of tolerance levels. See the instruction manual for reasons for this.

If a half circle appears on the left side of the digital display in the lower half of the display, this is a gross underweight mode. See the UMC manual for reasons for this.

Many problems occur because of power failures, incorrect data being entered, weigh hoppers being zeroed at incorrect times, and gross over or under sequences. Many times these problems can be corrected by simply unplugging the power to the unit, leaving it disconnected for at least 30 seconds and then re-connecting power and starting the entire sequence over again.



NOTES –

TO SET UP PRESETS FIRST SET PRESET 1 AT 0.00,
THEN SET PRESET 2 AT TARGET WEIGHT AND RUN ONE WEIGHMENT,
CHECK SPEED OF SLOW FILL.WEIGHT SHOULD INCREMENT 10–15 GRADUATIONS
PER SECOND,ADJUST SLOW SPEED TO THIS.
AFTER SCALE HAS GONE WEIGH COMPLETE RECORD WEIGHT AND SUBTRACT
TARGET AMOUNT, SUBTRACT REMAINDER FROM TARGET, THIS IS THE VALUE
FOR PRESET 2. THEN BEGIN RUNNING SCALE AND RAISING PRESET 1 UNTIL
CYCLE LIGHT JUST COMES ON A BRIEF PERIOD. ADJUST DISCHARGE TIME
SO THAT LIGHTEST DENSTIY PRODUCT JUST ESCAPES HOPPER BEFORE DOORS CLOSE

TYPICAL FILLING CYCLE

EXPRESS SCALE PARTS

GRAPH

UMC1000 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all Condec equipment and systems manufactured and sold by RLWS and properly installed by an authorized RLWS Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.