UMC222

Digital Weight Indicator

Installation Manual

CONDEC

65443

Contents

October 2000

About This Manual

The UMC222 indicator represents the latest in state-of-the-art microprocessor technology specifically applied to the weighing marketplace. This manual provides information on installation, calibration, configuration, and operation of the UMC222 digital weight indicator.

Authorized distributors and their employees can view or download this manual from the Condec distributor site at **www.4condec.com**.

1.0Introduction

The UMC222 is a single-channel digital weight indicator designed to operate in a wide variety of scale and weighing applications. The UMC222 digital weight indicator is ideally suited for platform or bench scale applications requiring exceptional performance but can also be utilized for tank and truck scales. The indicator is housed in a NEMA 4X stainless steel sealed case. The standard unit is equipped with a tilt stand base for tabletop or wall mounting applications. The indicator front panel consists of a 5-button keypad, six seven-segment display digits, and six LED annunciators (see Figure 1-1 on page 2).

Features of the UMC222 include:

- Full front panel digital configuration and calibration.
- Zero and span temperature compensation to ensure compliance with NTEP temperature range requirements (–10 to 40°C).
- Nonvolatile memory stores data for calibration, temperature compensation, configuration parameters, auto or fixed tare values, PAZ and AZM values, and setpoint values.
- 10,000 displayed graduations in legal-for-trade applications; 80,000 displayed graduation in Non-Legal-For-Trade, process weighing applications.

NOTE: *Use of more than 20,000 graduations may cause undesirable display instability in some applications.*

- Analog sensitivity to 0.3 µV/grad at 20,000 graduations.
- Fifteen updates per second, with selectable digital averaging and auto averaging.
- Excitation for four 350Ω load cells or eight 700Ω load cells at 5VDC.
- Time and date print selection.

Table 1-2 summarizes the front panel annunciator functions.

Annunciator	Function
ZERO	On when scale weight is within ±0.25 displayed graduations of zero. Used in gross or net weighing mode.
NET	On when the indicator is in net weighing mode.
lb/kg	lb or kg LED is lit to show the current displayed weight units.
MOTION	On when scale is in motion.
TOTAL	On when the display mode is recalling the accumulated weight data.

Table 1-2. Front Panel Annunciators

1.1.1 Gross/Tare/Net Weighing Operations

The UMC222 offers two methods of Gross/Tare/Net operations (Standard, European). By default the indicator is set to operate Gross/Tare/Net data in the more familiar USA (std.) conventional format. The selection of Eur sets the Gross/Tare/Net operation to operate per OIML requirements.

1.1.2 USA or Standard Operation

When the standard indicator is initially powered up the display automatically comes up in the last mode it was in (Gross or Net mode) prior to a power down.

2.0Installation and Wiring

This section describes the procedures for connecting load cell and serial communications cables to the UMC222 indicator. Instructions for battery and CPU board replacement are included, along with assembly drawings and parts list for the service technician.

Caution *Use a wrist strap to ground yourself and protect components from electrostatic discharge (ESD) when working inside the indicator.*

2.1Unpacking and Assembly

All indicators are configured and tested prior to shipment to ensure that they are fully functional.

Immediately after unpacking, visually inspect the UMC222 to ensure all components are included and undamaged. The shipping carton should contain the indicator with attached tilt stand, this manual, and a parts kit. If any parts were damaged in shipment, notify Condec and the shipper immediately.

The parts kit contains the following items.

RLWS Part Number	Description
19433	Square adhesive foot
15337	Wing knob
55450	Knob gasket

Table 2-1. UMC222 Parts Kit

2.2Enclosure Disassembly

The indicator enclosure must be opened to connect the load cell and communications cables.

Warning *The UMC222 has no on/off switch. Before opening the unit, ensure the power cord is disconnected from the power outlet.*

Ensure power to the indicator is disconnected then remove the screws that hold the front bezel to the enclosure body. Place the indicator face-down on an antistatic work mat, then lift the front bezel away from the enclosure. Set the enclosure aside.

2.3Cable Connections

The UMC222 provides four cord grips for cabling into the indicator: one for the power cord, one for the load cell cable, and two for serial communications.

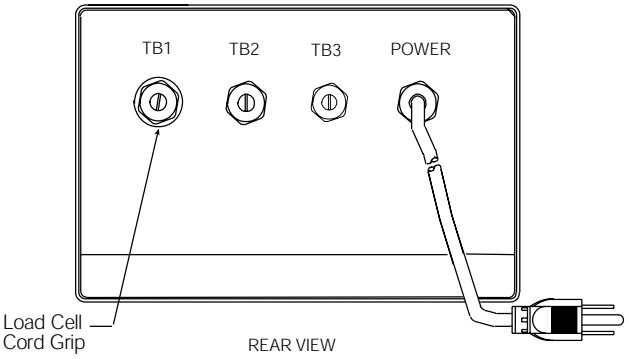

Figure 2-1. UMC222 backplate

2.4Power Connections

Standard units are powered by either 115 VAC or 230 VAC volts or by optional battery pack units.

2.4.1AC Units

Units are powered by standard AC power. The AC power cord must be plugged into a 3-prong polarized AC wall socket.

VAC Conversion

The UMC222 can be converted from 115VAC to 230VAC. The following steps are necessary to complete this conversion.

Warning *Before beginning, disconnect the AC power source. Failure to do so can result in injury or death.*

1. Disconnect the power source from the unit.
2. Remove rear outer case of the UMC222.
3. Remove rear connector bracket and four standoffs.
4. Remove the CPU board.
5. Remove the protective insulator panel from the solder side of the CPU board.
6. Cut circuit traces between E3/E4 and E5/E6 as indicated with a sharp instrument like a razor blade or an x-acto knife. Refer to Figure 2-2.

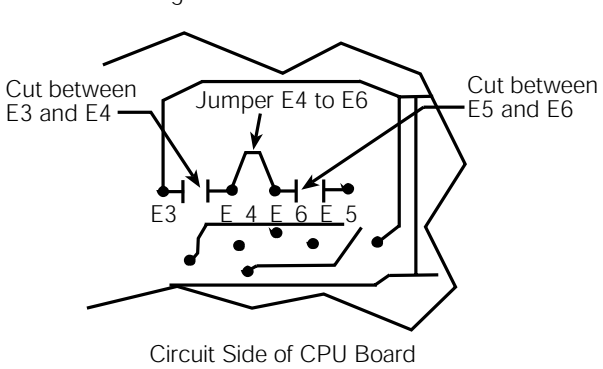

Figure 2-2. Circuit Trace Setup

7. Add jumper, E4 to E6 using a properly insulated wire with a minimum size of #22 AWG.
8. Replace the protective insulator panel.
9. Reassemble the unit, test, and label unit for 230VAC.
10. Change the power cord.

2.5Board Removal

If you must remove the UMC222 CPU board, use the following procedure:

1. Disconnect power to the indicator. Loosen cord grips and remove enclosure as described in Section 2.2.
2. Unplug all connections to the CPU board. See Figure 2-1 on page 4 for connector locations.
3. Remove the four nuts from the corners of the CPU board.
4. Remove the CPU board from the enclosure.

To replace the CPU board, reverse the above procedure. Be sure to reinstall cable ties to secure all cables inside the indicator enclosure. Replace enclosure and torque screws.

2.6Replacement Parts

Table 2-2 lists the replacement parts for the UMC222.

Part Number	Description
56649	Thumbscrew
64983	Membrane keypad
59784	Front panel
63926	CPU board w/ EPROM
55257	Tilt stand w/ wing knobs
15337	Wing knob
64745	ESD supressor board

Table 2-2. UMC222 Replacement Parts

2.7Instrument Setup

The UMC222 operates with the EPROM program KDK 1921. To verify the program installed in the indicator, turn on the indicator and observe the displayed value at the EP prompt (see Figure 2-3). The EP prompt displays the family, set, and version level of the installed EPROM.

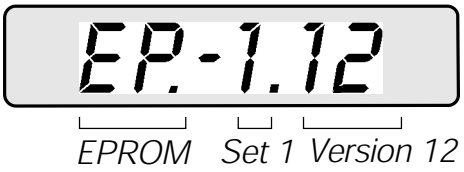

Figure 2-3. EPROM Display

To ensure that the UMC222 is in proper operating condition, the indicator can be tested with a load cell simulator. The input signal should be as close as possible to the normal system millivolt value. Figure 2-5 on page 6 shows the simulator-to-indicator wiring connection in a six-wire configuration. See Section 2.8 for more information.

NOTE: *Six-wire configuration requires that the +SEN lead be shorted to +EXC and the –SEN lead be shorted to –EXC at the simulator only.*

2.8Load Cell Wiring

Units are equipped with a six-wire load cell connection. Figure 2-4 shows the location of TB1 on the back of the indicator.

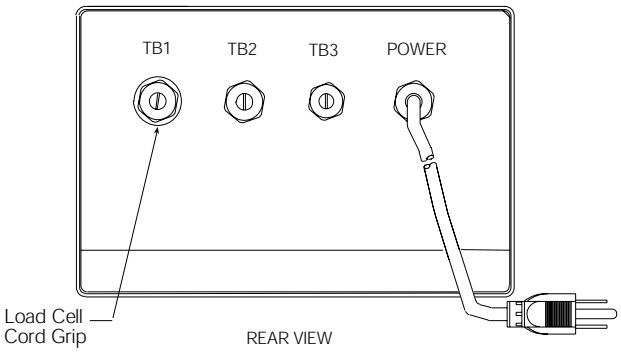

Figure 2-4. Load Cell Connector Location

The following diagram illustrates the load cell hookup TB1 as shown in Figure 2-5.

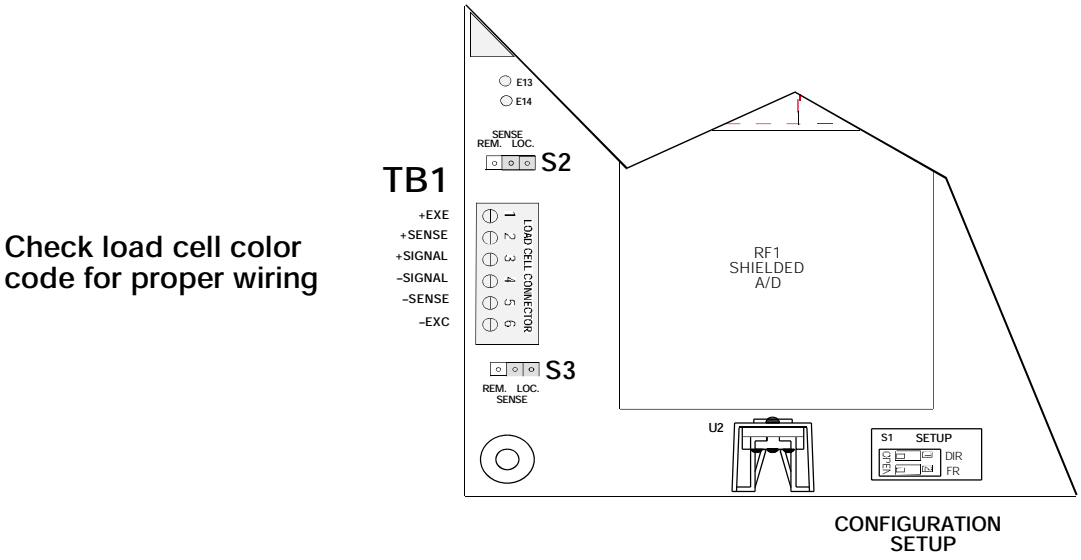

Figure 2-5. Load Cell Wiring From Indicator

NOTE:

S2 and S3 jumpers are for setting the load cell excitation for either REM(ote) or LOC(al) sensing.

2.9 Serial Port Wiring

The UMC222 serial port can be configured to communicate directly to a printer, remote display, or other device using RS232. The standard UMC222 comes equipped with two RS232 serial communication ports (TB2 on the back of the indicator). Port 1 is a bi-directional port that can be configured for either duplex or simplex operation. Port 2 is for output only.

NOTE: *The serial communications capability of the UMC222 is dependent on the product specifications of the receiving device.*

Access to this serial communication port is through the cord grip (TB2) located on the back of the UMC222 indicator (see Figure 2-6). Wiring is extended through this connector and wired inside the indicator. See the output connector diagram in Figure 2-7 for connector and wire identification.

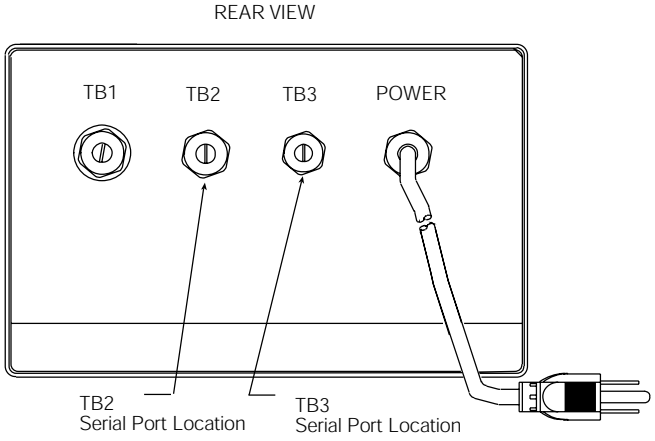

Figure 2-6. Serial Port Location

The standard serial port connection (TB2), is a 4-wire connector. Either a two position terminal block can be added or a six position replacement for TB2 can be installed in the adjacent E points (E13 and E14) shown in Figure 2-7 which can be used for optional input wiring.

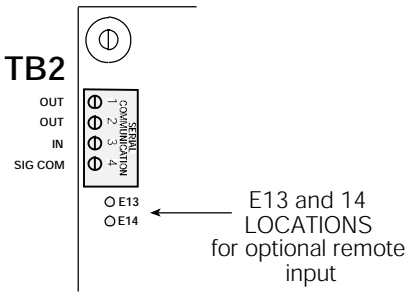

Figure 2-7. E13 and E14 Locations

Figure 2-8 illustrates a typical wiring pattern of a six position replacement.

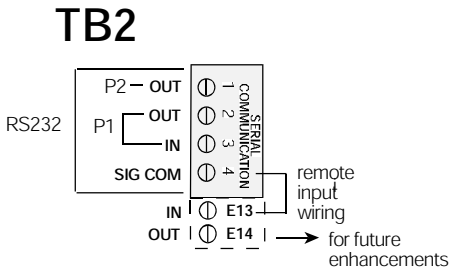

Figure 2-8. Alternate Serial I/O wiring

2.9.1 Serial I/O Wiring

Serial Port 1 is a bi-directional (full duplex) port supporting active/passive RS232 serial communications. The following table points out the TB2 wiring.

TB2 Serial I/O Wiring Table			
Port		TB2	
Port 1 (P1)	TransmitOUT	TB2-2	
	ReceiveINT	TB2-3	
		SIGCOM	TB2-4
Port 2 (P2)	TransmitOUT	TB2-1	
		SIGCOM	TB2-4

Table 2-3. Serial I/O Wiring

3.0Configuration

Prior to calibration, the UMC222 must be digitally configured, or assigned a set of operating parameters. To configure the UMC222 indicator, the indicator must be placed in setup mode.

3.1Setup Mode

To enter the setup mode, you must access the setup switch which is located on the CPU board. Remove the four large screws on the front of the indicator and open the enclosure.

There are three methods for entering the setup mode:

- Direct Full Menu Entry
- Direct Cal Entry Only
- Front Panel Setup Mode

3.1.1Direct Full Menu Entry

Set the setup rocker switch S1 position SW-1 (DIR) to the closed position on the CPU board. This allows you full access to all main menu entry functions.

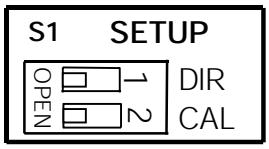

Figure 3-1. Configuration Setup Switch

Once configuration and calibration (Section 3.0 and Section 5.0) of the UMC222 is complete, open S1-1 and close up the unit.

3.1.2Direct Cal Entry Only

Set the setup rocker switch S1 position SW-2 to the closed position on the CPU board. This allows access to the calibration menu options.

Once calibration (see Sections 5.0) of the UMC222 is complete, open S1-1 and close up the unit.

3.1.3Front Panel Setup Mode

Set the setup rocker switch S1 position SW-1 to the closed position. Enable the front panel access in Option 1/parameter 5 Kbd, open S1, SW-1.

Press and hold the **MODE** and **UNIT** keys for approximately three seconds which allows the serial configuration option to appear.

Once serial configuration (see Section 3.4) of the UMC222 is complete, select **DONE**, by scrolling with the **ZERO** key in the main menu and press the **ENTER** (Print) key to exit.

3.2Main Menu Selection

Table 3-1 defines the functional operation of each key on the front panel of the indicator when the unit is in the set up mode.

Key	Function During Setup
ZERO	Menu select. When pushed will return operator to main menu.
MODE	Parameter/subparameter select
TARE	Parameter/subparameter data select
UNIT	Recalls parameter name and decrements parameter select
PRINT	Used as an Enter key for numeric data entry and calibration entry

Table 3-1. Front Panel Key Functions

Pressing the **ZERO** key on the indicator front panel while in the setup mode allows you to advance through the main menu selections. Those menu selections are listed in Table 3-2 shown below.

Display	Menu Selection
1. CAL	Calibration
2. Conf	Configuration
3. Ser	Serial Setup
4. Auto	Auto Setup
5. Opt1	Time and Date / Linear / Totalizer / Piece Count
6. Opt2	Smart Serial
7. Opt3	Adaptive Filtering
8. Opt4	Ticket Count
t. tESt	Expanded Resolution / Input mV value / Serial I/O port test
d. dOnE	Exit, Setup (only in front panel key access)

Table 3-2. Main Menu Selections

Figure 3-2 provides a graphic representation of configuration parameters associated with the UMC222.

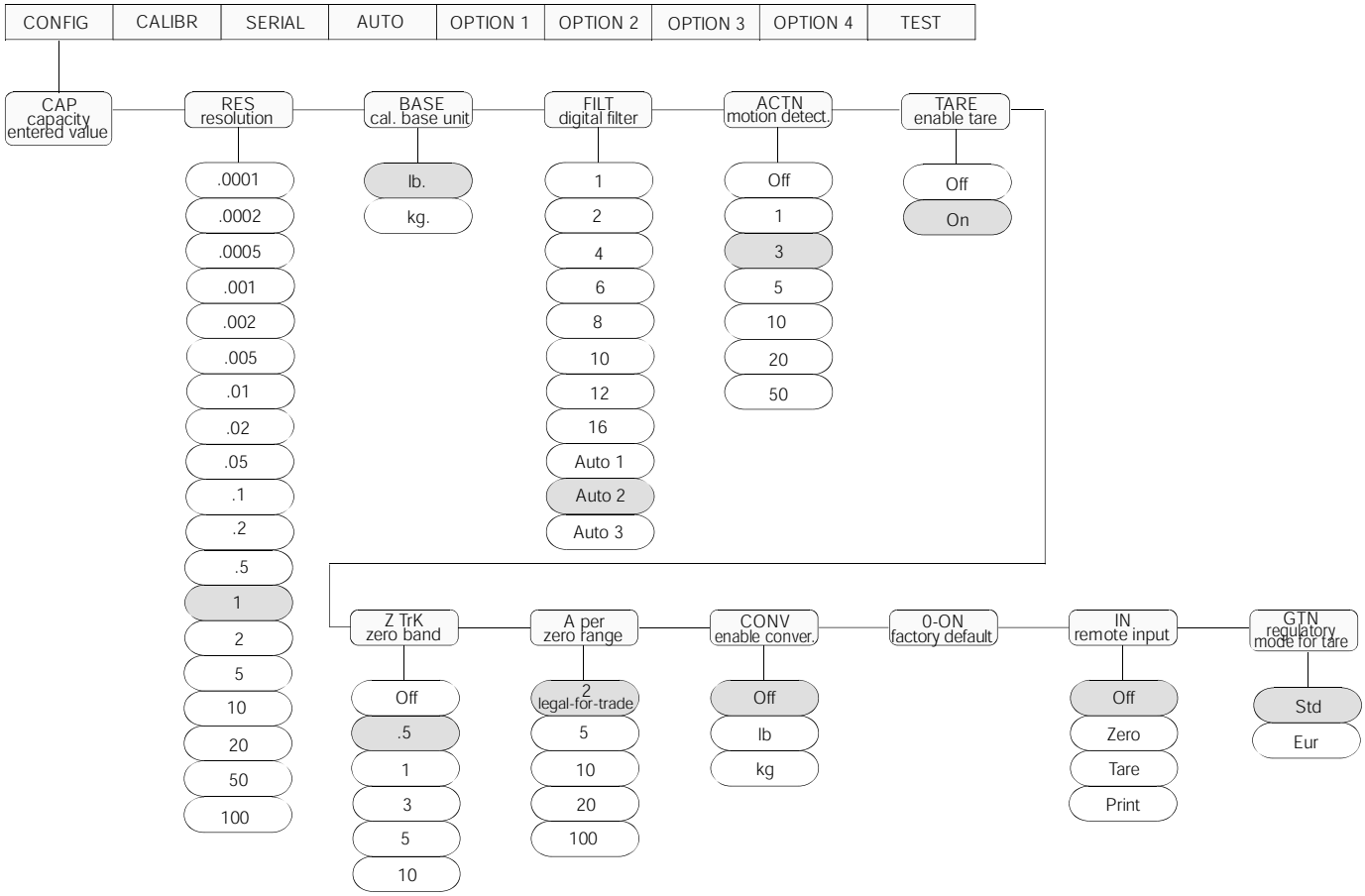

Figure 3-2. Configuration Menu

3.3Digital Configuration

3.3.1Parameter Overview

Table 3-3 on page 11 lists configuration parameters and describes their values. The following paragraphs give the procedure for configuring the UMC222.

Caution *Do not lean the front bezel with the exposed board against the housing enclosure without placing a static shield between exposed board and housing.*

3.3.2Configuration Procedure

1. Unscrew the four screws on the face plate bracket. Pull the face plate away from the enclosure.
2. Locate the setup switch S1 on the UMC222 CPU board (lower portion of board).
3. Close switch S1-1 by moving to the left (closed) position (Section 3.1). A prompt appears with a parameter number and parameter name.
4. Use the **ZERO** key to scroll through the Main menu selections, see Table 3-2 on page 9. Select display *2 Conf*.
5. Table 3-3 lists the configuration parameters available.
6. Scroll through the parameter selections by using the **MODE** key and select which parameter to change.
7. Use the **TARE** key to change data.
8. If numeric data entry (such as capacity), press the **TARE** key to activate the data entry mode. Press the **TARE** key to select the digit to be modified.
9. Use the **ZERO** key to increment the digit and the **MODE** key to decrement the digit.

10. Press the **PRINT** key to enter that value and exit out of the numeric data entry mode.
11. To abort the data entry mode, press the **UNIT** key.

When configuration is complete, set SW1-1 open (right) to return the unit to normal operating mode.

Parameter	Description	Data Value Selection
1	Capacity - enter desired capacity	NTEP to **10,000** (up to 999990 available).
2	Resolution - enter resolution.	.0001 to .1, .0002 to .2, .0005 to .5, **1**, 2, 5, 10, 20, 50, 100
3	Base unit - unit of calibration	**lb** or kg conversion
4	Digital filtering	1, 2, 4, 6, 8, 10, 12, 16, Auto 1, **Auto 2**, Auto 3 (1 least filtering, 16 most filtering, auto 1 least filtering-quick response, auto 3 most filtering-slow response)
5	Motion (action)	Off, 1, **3**, 5, 10, 20, 50
6	Tare mode	Off, **on**
7	Zero track	Off, **.5**, 1, 3, 5, 10 graduations
8	Zero aperture	**2**, 5, 10, 20, 100 % of full scale. Only default is legal-for-trade
9	Conversion select - enable conversion	**Off**, lb, kg
10	Stored zero	Stored – factory default
11	Remote input selections	**Off**, zero, tArE, print. Recommended factory installation. This option requires a 2-position connector (part number 55391) be soldered to the board for easy access).
12	Mode selection – G/T/N	**Std**., Eur - gross/tare/net mode selection EUR=OIML

Table 3-3. Configuration Parameter Overview

NOTE: *Values marked in bold denote pre-programmed factory default settings.*

3.4 Serial Configuration

The UMC222 has two serial ports. Both Serial Ports 1 and 2 are ASCII-compatible RS232 outputs. The serial format is compatible with most printers, scoreboards, and other remote devices. Each output can be disabled, set for print on demand mode, or set to output data continuously.

Table 3-4 shows the configuration selections for Parameter 3 which control the configuration of Ports 1 and 2.

Parameter (Mode Key)	Subparameter Selection (Mode Key)	Data Value Selection (Unit Key)	Explanation
1P1	Off, On	Port 1 enable,	Smart Serial files 2.1 – 2.4
2baud	600, 1200, 2400,	4800, **9600**, 19200	Port 1 baud rate
3 Par	None,	**Even**, Odd, One	Port 1 parity
4dUPL		**Off**, On, Adr	Port 1 duplex enable as standard or address (RS485)
	4.1Chk	**None**, or, CkS	Duplex check select
	4.2 res	None, **Echo**, Ack	Duplex response format
	4.3 AdrA	dr *xx* (**01**)	Address (1 to 98)
5P1-		**Print**, Cont, none	Serial type selection. If Par 4 Dupl = adr only none selectable.
	5.1datGtn,	**DISP**	Port 1 G/T/N or display data
	5.2EOL	**CrLF**, Cr	Port 1 End of line cr/lf or cr
	5.3SOt	**None,** StX	Port 1 Start of test
	5.4EOt	**None**, Eot, FF, LF	Port 1 End of text
	5.5del	**Off**, 1 Sec, 2 Sec, 3 Sec, 4 Sec	Port 1 Print delay after Cr Smart Serial: Code 700 delays serial xmit for # of seconds.
6P2		**Off**, Print, Cont	Port 2 enable Smart serial: Files 2.5 – 2.8
	6.1datGtn,	**DISP**	Port 2 G/T/N or display data
	6.2EOL	**CRLF**, Cr	Port 2 End of line cr/lf or cr
	6.3SOt	**None**, StX	Port 2 Start of test
	6.4EOt	**None**, Eot, FF, LF	Port 2 End of text
	6.5delt	**Off**, 1 Sec, 2 Sec, 3 Sec, 4 Sec	Port 2 Print delay after CR Smart serial Code 700 delays serial xmit for # of seconds
7baud	600, 1200, 2400,	4800, **9600,** 19200	Port 2 baud rate if port 1 not set for DU
8 Par	None,	**Even**, Odd, One	Port 2 parity if port 1 not set for DU

Table 3-4. Serial Configuration Prompts

All serial characters in the data format are in ASCII and consist of the following:

Data Formats
1 Start Bit
7 Data Bits
1 Parity Bit (Even Parity)
2 Stop Bits

Table 3-5. Data Formats

The transmission of serial data can be initiated in either demand mode, continuous mode, or RS232. Refer to Section 7 for advanced detailed information on serial configuration options.

4.00ptions Configuration

The UMC222 offers a selection of features that are available in the configuration of the indicator. The options setup mode allows the operator to expand the capabilities of the indicator. The available features are:

- Option 1 - Enables/Disables
- Option 2 - Smart Serial I/O
- Option 3 - Special Filtering
- Option 4 - Ticket Counter
- Option t - Test Mode

To access options configuration, go into the setup mode and scroll to the options menu. Close switches SW1 (Figure 4-1). If the option mode has been enabled, selections are available.

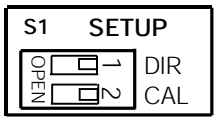

Figure 4-1. Closed Configuration Switches

In the option mode, primary function keys (**ZERO** **MODE**, etc.) operate as secondary function keys (Figure 4-2).

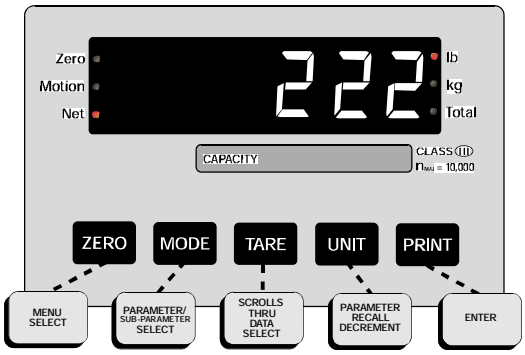

Figure 4-2. Front Panel Keys With Alternate Functions in Options Menu

Use the **ZERO** key to select options 1 through 4 and test menu. Push the **MODE** key to access the sub parameters.

Some options, once enabled, may have an option submenu available. Use the **MODE** key to access the option submenu. To make parameter data selections in the option submenu, use the **TARE** key. Display prompting is provided in each case.

Key Functions Summary

Use the list below as a quick reference when selecting and configuring the options.

ZERO **ZERO** – *Increments option number (menu select)*

MODE **MODE** – *Parameter and subparameter select*

TARE **TARE** – *Data select*

UNIT **UNITS** – *Recalls parameter name and decrements parameter select*

PRINT **PRINT** – *Enter key for numeric data entry and for calibration entry*

Figure 4-3. Quick Key Functions for Options

4.10ption 1–Enables/Disables

Option 1 enables or disables various parameters that enhance the indicator's functionality. Those parameters that can be enabled or disabled include:

- Time and date (parameter 2)
- Five point linearization for span calibration (parameter 3)
- Ten digit totalizer (parameter 4)
- Front panel keyboard access (parameter 5)
- Count feature (parameter 6)

Option 1 configuration parameters are shown in Table 4-1 and the menu structure is graphically illustrated in Figure 4-4 on page 16.

Parameter (mode key)	Subparameter Selection	Subparameter Data Selection (tare key)	Explanation
1	OP.1	Off, **On**	Expanded RAM option enable
2 time & date		**Off**, OnTime and date enable. *Smart serial codes 400 to 402 brings time/date into the serial data.*	
	2.1 dLS	**Std**, dLSDaylight savings enable	
	2.2 Hr	**12**, 2412 or 24 hour selection for print	
	2.3 A–Pt	**AM**, PMSubparameter of 2.2 hr - 12	
	2.4 ti	*hh.mm.ss*	Time recall/setting (setting in 24 hour mode)
	2.5 EurOn, **oFF**		Date print format enabled for day/mo/yr. dd/mm/yr
	2.6 dat	*xx.xx.xx*	Date recall/setting (setting in mo/day/yr) mm/dd/yy
	2.7 pos	**On**, Under, Above	Location of printed time/date Above, on, or under the weight information
	2.8 typeLetter, **No.**		Print letters (May 1, 2000) or numbers (05/01/00)
3 Lin		**Off**, On5 point linearity enable	
4 Tot - net gross		**Off**, OnTotal enable. Smart serial codes 230 to 233 to print total mode data	
	4.1 bnd	**Off**, 1 to 9, 10, 20, 30, 40, 50	Total zero band
5 kbdOff, On		**Off**, OnFront panel keyboard access to configuration of non-legal-for-trade options (time and date, serial I/O setup and ticket counter)	
6 CntOff, On		**Off**, OnEnable count mode. Smart serial codes 234-237 and 240 to 243 to print count mode data	

Table 4-1. Option 1 Configuration Prompts

Option 1 Menu

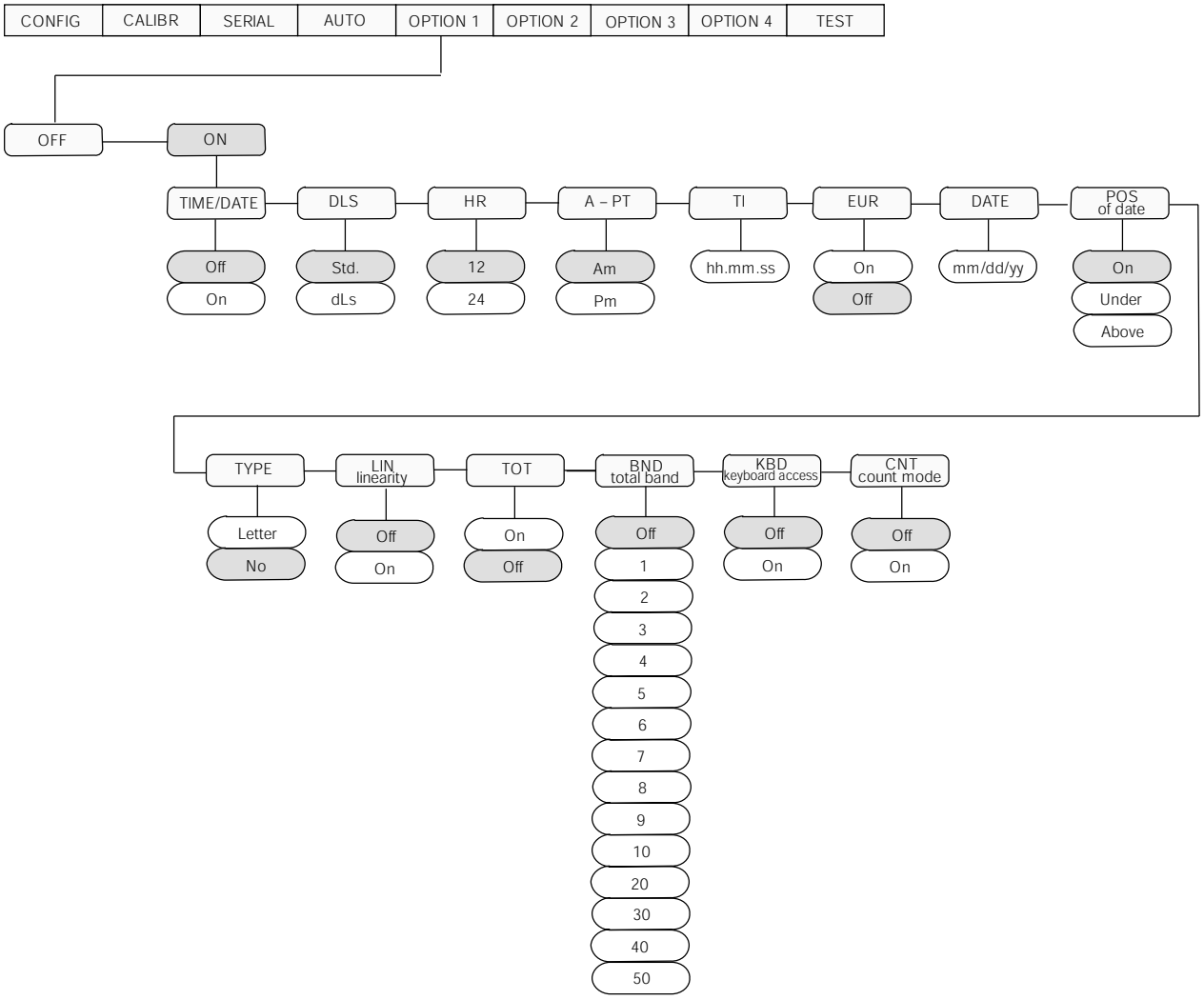

Figure 4-4. Option 1 Menu

4.1.1Time and Date–Daylight Savings–Parameter 2

The main purpose for time and date access through the front panel display is to allow the operator to quickly change the time when the time changes between standard and daylight savings time.

Enter the setup mode as described in the following steps.

1. Press and hold the **MODE** and **UNIT** keys for approximately three seconds – 5. Opt. 1 Kbd must be enabled.
2. Go to Main menu selection **5. OPt.1**
3. In **5. OPt.1** go to parameter **2.1 dLS**.
4. Select the appropriate time selection (**Std** or **dLS**). The time either increments or decrements based on the selection.
5. To exit, press the **ZERO** key repeatedly until **d. dOnE** is reached in the main menu selection.
6. Press the **PRINT** key (Enter) to enter the new configuration setting and exit the set up.

NOTE: *Prior to setting the time and date, select the current time (dLs-daylight savings time or Std-standard). This feature selection allows the operator to increment or decrement the time by one hour when clocks are changes from dLs or Std without having to re-program the entire program.*

4.1.25 Point Linearity Enable–Parameter 3

There are five calibration points that can be entered sequentially. Calibrations using fewer than five points will linearize the curve up to the last data point. Enabling option 1, parameter 3 places the indicator in a linearization calibration when the unit is in the calibration mode. Note that one of the five linearization points should be the full span (capacity) value for effective calibration.

The five-point linearization calibration (OP.3) is shown in Table 4-2.

Prompt Display	Interpretation	Notes
Five-point linearization		
OP.3oFF	Off	—
OP.3on	OnEnter	up to five linearization points

Table 4-2. Linear Calibration Parameters

NOTE: *The linearization calibration is reset when the first (SP1) calibration is entered.*

4.1.3Totalizer Operation–Parameter 4

The accumulate (totalizer) function is used to add weight data to a register for later access by the user. The accumulator can keep a running total of weights entered by manually pressing the **PRINT** key when the accumulate function is enabled. The accumulator will accumulate displayed weight values. If the count mode is enabled, count will accumulate.

The UMC222 has a ten digit accumulator available when option 1, parameter 4 is enabled.

To protect against multiple accumulations of data, the accumulator option has a selectable **return to zero accumulation band** feature. This feature insures that the weight display must return to a value inside the zero band before another accumulation can be performed.

Option	Prompt Display	Description
OP.1 O	P.1 oF OP.1 on	off on – totalizer enabled
	4.1 bnd	off – zero band "off" data accumulated, anytime the **Print** key is pressed.
	1	± 1 Display graduations
	2	± 2 Display graduations
	3	± 3 Display graduations
	4	± 4 Display graduations
	5	± 5 Display graduations
	6	± 6 Display graduations
	7	± 7 Display graduations
	8	± 8 Display graduations
	9	± 9 Display graduations
	10	± 10 Display graduations
	20	± 20 Display graduations
	30	± 30 Display graduations
	40	± 40 Display graduations
	50	± 50 Display graduations

Figure 4-5. Accumulator Function Parameters

Enter the accumulator mode as described in the following steps

1. Press the **PRINT** key to accumulate the display data. The current displayed weight value is added to the accumulator.
2. If the accumulator zero band is set (parameter 4.1 bnd not off) another accumulation of the weight data cannot occur until the weight returns through zero band.
3. When the total command is issued:

   If a serial port is set up in demand mode, the display (**Tot -Pr**) indicates that both a print (**Ptr**) and an accumulation of the total (**tl**) has occurred.

   If there is no printer port configured, the display indicates that an accumulation of the total (**totAL**) has occurred.

Total Recall

To view the content of the accumulation register on the display, use the following steps.

1. Press **MODE** which is defined as mode key when Option 1 is enabled. The tare recall LED illuminates indicating the instrument is in the total recall mode.
2. A momentary press of the **MODE** key displays the total for approximately three seconds before returning to the normal weighing mode display. Pressing and holding the **MODE** key displays the total for as long as the key is held in.
3. While in the total recall, the contents of the accumulator can be printed out when the **PRINT** key is pressed. If the serial output is configured for continuous output, the total will be continuously printed out anytime the indicator is placed in total recall mode.

Total Reset

The total can be cleared to zero when in the total recall display mode by:

1. Press the MODE key to recall the totalizer mode.
2. Press the ZERO key to reset the totalizer back to zero.

4.1.4Front Panel Keyboard Entry–Parameter 5

The UMC222 offers limited front panel access to set up parameters that are not regulated under the guidelines of legal-for-trade requirements. This allows those non legal data types to be changed without having to break seals to enter the set up mode for reconfiguration. Front panel access allows the operator to alter:

- Serial I/O configuration
- Time/Date option
- Ticket counter (option 4)

Use the following steps to set up the front panel mode.

1. Press and hold the MODE and UNIT key for approximately three seconds.
2. Step to the desired main menu selection using the ZERO key.
3. Select the parameter to be changed with the MODE key.
4. Alter data using the TARE key as described in the set up mode section (See “Front Panel Setup Mode” on page 9.)
5. To exit the set up mode, press the ZERO key repeatedly until d. dOnE is reached in the main menu selection.
6. Press the PRINT key (Enter) to enter the new configuration settings and exit the set up mode.

4.1.5Count Feature–Parameter 6

The UMC222 has a count feature available. The internal processing resolution during sampling and counting of pieces is 500,000 full scale with a maximum piece count of 999,000. The number of sample selections that can be selected are: 5, 10, 20, 50, 75, 100, 150, and 200.

To enter the count mode the following steps are used:

1. Press the **ZERO** key to zero the scale and reset the unit if in the count mode with the scale empty. The display reads **ZERO** then **CLEAR** (if a valid zero).
2. Press the **MODE** key to select piece count (display reads **no cnt**).
3. Press the **TARE** key and unit performs an automatic tare and indicates the number of samples to be placed on the scale.
4. Sequentially, press the **TARE** key until the number of samples required is selected, example 5, 10, 15. The number of samples will default to the last selected number when first indicated. The display indicates the select as **SA 5** for five sample selection.
5. Add or remove (if count-out mode), the samples on the scale as the display prompts with a flashing **Add** and sample size. As soon as the scale is no longer in motion, the display reads **Enter**. If following motion the scale returns to zero the unit returns to the add mode.
6. Press the **TARE** key again. The samples are accepted and the scale is ready to count. The display prompts with momentary count indication and then displays the piece count.
7. The Total LED solid **ON** indicates total piece count on display. The recall of the total accumulated pieces with the **MODE** key is annunicated with an **A** flashing in the left most digit and the Total LED on.
8. The Total LED flashing indicates the current piece count on the display.

4.20ption 2–Smart Serial I/0

The smart serial I/O option offers flexibility for an operator to customize the serial output format for individual system requirements. Smart serial I/O custom print supports:

- Eight custom print files
- Eight macro files for easy setup of headers and titles
- Capability to upload and download the custom print files to a host computer
- Macros can be nested up to three deep. Macros can communicate with other macros.
- Special multiple line feed and space codes
- Special code for custom conversion labels
- Maximum file length is 30 character. Maximum number of characters in an output string is 320.

NOTE: *Custom print does not support RS485 protocol.*

Option 2 configuration allows the user to create or edit files. Table 4-3 illustrates the configuration parameters and is the menu graphically illustrated in Figure 4-6.

Option	Prompt Display	Interpretation
6 OPt2	1 OP2 **oFF** 1 OP2 On	Custom Print Option off – Option disabled (default printout) on – Option enabled (custom printout)
	2.1 – 2.8 FLx **oFF** FLx On	Main Print Files 1 through 8 Selected file disabled (x=1-8). Default printout Selected file enabled (x=1-8). Custom printout
	3.1 – 3.8 EFx **oFF** EFx On	Macro Files 1 through 8 Selected macro file (x=1-8 disabled) Selected macro file (x=1-8 enabled)

Table 4-3. Option 2 Configuration Parameters

Option 2 Menu

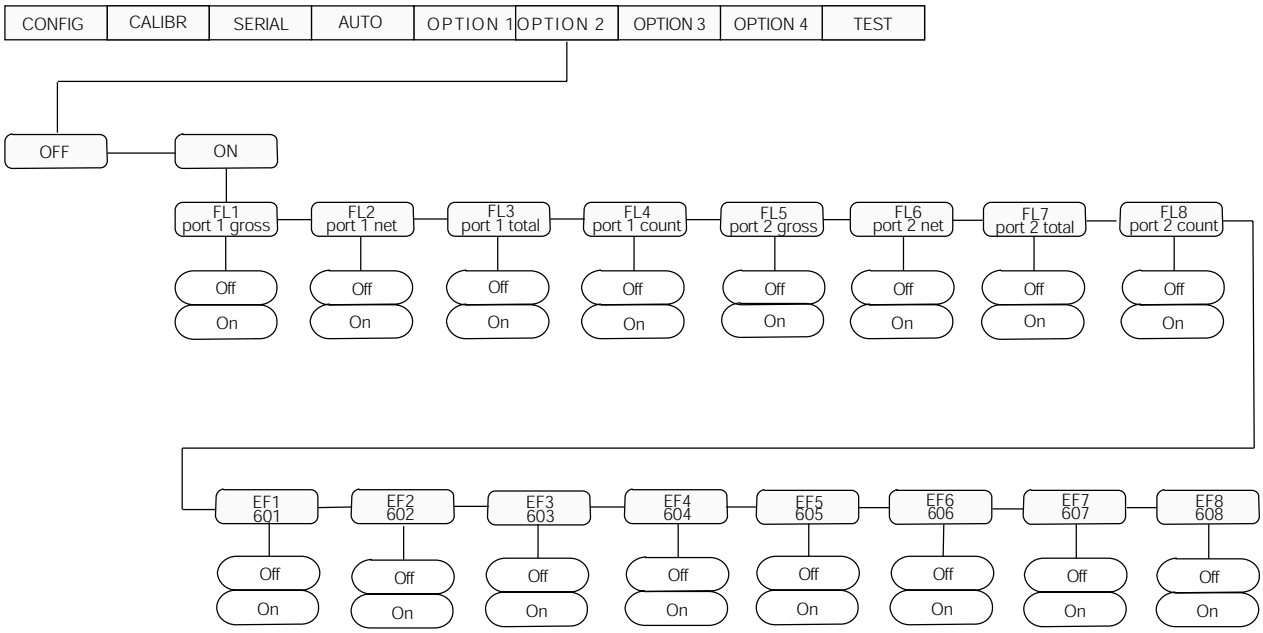

Figure 4-6. Option 2 Menu

Key Function Summary

Use the list below as a quick reference when selecting and configuring Option 2.

Key	Serial I/O setup function description
Zero	• Selects the option 2 group • In data entry mode increments the selected digit.
Mode	• Selects the files in OPt2 (FL1–FL8 and EF1–EF8) • In data entry mode decrements the selected digit.
Tare	• Selects the data values of the parameter selected. • In data entry mode selects the digit position.
Unit	• Selects the line position in a selected file. • In data entry mode aborts the selected line.
Print	• Adds a line to a selected file. • In data entry mode is used as an **ENTER** key.
Unit and Print	• NA • In data entry mode, deletes a line.

Table 4-4. Option 2 Quick Key Summary

The first eight files (2.1 FL1 to 2.8 FL8) which can store up to 30 ASCII and parameter codes, are files pertaining to the actual customization of serial output data and are themselves divided into Port 1 files and Port 2 files.

The second group of files pertains to the eight Macro files (3.1 EF1 to 3.8 EF8 that may be entered into the primary files by their associated parameter codes 601 through 608.

Those files are shown in Table 4-5 and scale data control codes are located in the parameter control code chart on page 44, Table 9-2.

Customizing			
	File	Subparameter	Normal Mode Macros (8) Macro Parameter Codes
Port 1	2.1	Off, on Gross data	3.1 601
	2.2	Off, on Net data	3.2 602
	2.3	Off, on Total data	3.3 603
	2.4	Off, on Coun	t 3.4 604
Port 2	2.5	Off, on Gross data	3.5 605
	2.6	Off, on Net data	3.6 606
	2.7	Off, on Total data	3.7 607
	2.8	Off, on Coun	t 3.8 608

Table 4-5. Customizing Files

NOTE: *When Option 2 is disabled (off), the unit will print default formats. If Option 2 is enabled (on), but a designated file is set to off then that print mode will print its default format.*

4.2.1To Create a File

To create a new file use the following steps:

1. Select the Option 2 group using the **ZERO** key.
2. Go to the desired file (2.1 FL1 to 2.8 FL8) using the **MODE** key.
3. Set file to on using the **TARE** key.
4. Step to the first file line (1) using the **UNIT** key.
5. Using the **TARE** key for digit position and **ZERO** and **MODE** for value, enter the ASCII character or parameter code (Section 9.0, Table 9-2) using the **PRINT** key.

   Note that all codes are a three digit decimal number. Leading zeros need not be entered.
6. Step to the next line using the **UNIT** key.
7. Repeat steps four and five until the file is complete. End the file with the code 999.

4.2.2To Edit a File

Files may be edited in one of three ways:

- A new code can be added/modified
- Codes can be deleted from the file
- Codes can be inserted into a file

Add/Modify a Code

To add or modify an existing code:

1. Select the file position to be added or modified using the **UNIT** key.
2. Enter the new code using **TARE** for digit position and **ZERO** and **MODE** for value, entering the ASCII character or parameter code using the **PRINT** key.

Delete a Code

To delete a code:

1. Select the file position to be deleted using the **UNIT** key to increment.
2. Press and hold the **TARE** key and the abort key **UNIT** to delete the code line.

Insert a Code

To insert a code:

1. Select the file position where the new code is to be inserted using the **UNIT** key as described above.
2. Press the **PRINT** key
3. Enter the new code using the **TARE** key for digit position and **ZERO** and **MODE** keys for value, entering the ASCII character or parameter code using the **PRINT** key.

Macro File Setup

There are eight macro files that can be accessed in any of the prime print files 1–8 (2.1 to 2.8), using the 600 series codes listed in Table 4-6 and Table 9-2. Each macro file holds up to 30 ASCII characters and parameter codes. Refer to the ASCII character chart in Section 9.0 for the ASCII characters and Table 9-2 in Section 9.0 for parameter codes.

Sample Print File

A header stating the company's name AC Inc. is desired when Port 1 outputs Gross mode weight data.

Printout = *AC Inc.*

30000 Lb Gr 10/01/00 1:30pm

Print File 2.1 – Port 1 gross mode data		
Line #	Code	Code definition
01002	STX	start of text
02600	*	macro file #1 (3.1 EF1)
03200	gross	weight with lb/kg gr
04032	SP	(space)
05601	*	macro file #2 (3.2 EF2)
06013	CR	(carriage return)
07010	LF	(line feed)
08999	end	of file

Table 4-6. Print File Data Parameters

Code 601 – macro file 3.1 EF1		
Line #	Code	Code definition
01065	A	character
02067	C	character
03032	SP	(space)
04073	I	character
05110	n	character
06099	c	character
07046	.	(period)
08013	CR	(carriage return)
09010	LF	(line feed)
10999	end	of file

Table 4-7. Code 601 Parameters

Code 602 – macro file 3.2 EF2		
Line #	Code	Code definition
01402	date	per setup
02032	SP	(space)
03401	time	per setup
04999	end	of file

Table 4-8. Code 602 Parameters

4.30ption 3–Special Filtering

The UMC222 offers a variety of custom filtering features when option 3 is enabled. Custom filtering is an option that gives the indicator added capability by selecting the filtering level based on the individual need of the indicator. Averaging is based on threshold, sensitivity, and delay settings. Table 4-9 and Figure give information regarding option 3 menu setup.

Parameter	Sub parameter	Description
1 Opt.3	**Off**, On Enables special filter and disables standard filter	
2 uPd	**15 CPS**, 3 CPS, 7 CPS A/D conversion rate	
3 tYpe	**Auto**, Fill Selects type of special filter	
4 FLt1	1-15 (**5**) Prerunning average filter, Auto 1, Auto 2, Auto 3	
5 FLt2	1-5, **10**, 15, 20, 25, 30, 45, 60, 75, 90, 120, 150	Main running average filter
6 thrWt.	entry (**10**) Threshold in weight	
7 Sen	**Off**, 1-5, 10, 15, 20, 25, 30, 45, 60	Sensitivity factor for auto averaging
8 del	**None**, 1-15	Number of consecutive scale readings that must fall outside the threshold before digital filtering is suspended or modified.
9 dsp	1, 2, **4**, 15	Display updates per second
A data(live weight)	Live gross weight. Total LED on indicates out of bank and Net LED on indicates return to in band test mode.	

Table 4-9. Option 3 Special Filtering Selections

Option 3 Menu

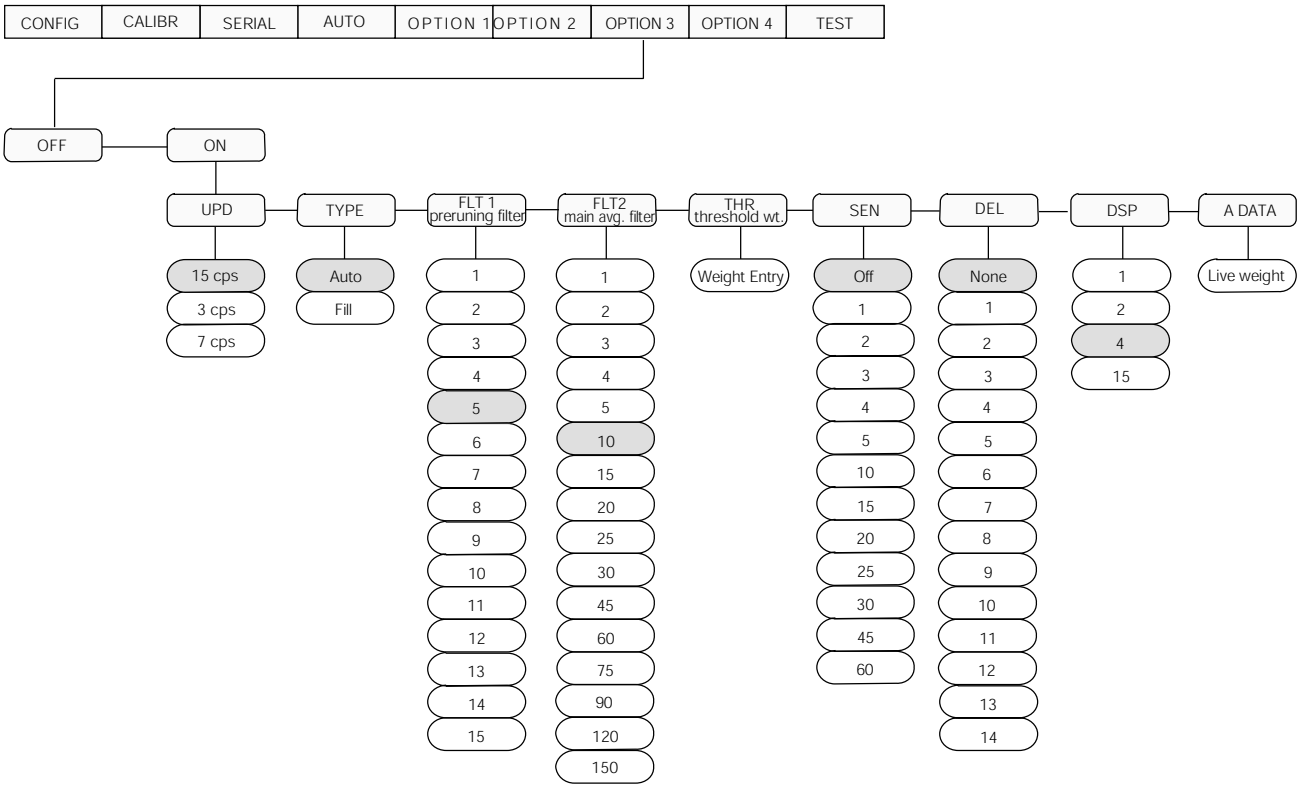

Figure 4-7. Option 3 Menu

There are three stages of special filtering:

- First stage – low pass
- Second stage – running average
- Third stage – Adaptable running average

4.3.1 First Stage

Is adjustable for 3.75, 7.5, or 15HZ. Select for removal of unwanted higher frequency. Set with an update rate of 3, 7, or 15 respectively.

4.3.2 Second Stage

Averages 1-15 updates. Select for best fit stability versus required response. An example would be a second state filter set for three, running average drops the oldest with each new update.

4.3.3 Third Stage

Select from choices of updates with the selection based on best fit stability versus the final value. Adaptation is based on fill or auto mode and parameters for threshold, sensitivity, and delay.

An example would be fill mode switches from output 3 to output 2 if the threshold is exceeded beyond the delay setting. The threshold is then doubled to provide hysteresis for a smooth return to output 3.

Auto mode adjusts the amount of averaging in the third stage relative to the amount of change above threshold delay and a sensitivity parameter to adjust the rate of change.

Auto Averaging

Auto averaging allows the indicator to rapidly respond to initial weight change and upon scale stabilization returns the scale to the maximum filtering for that setting (Auto 1, Auto 2, or Auto 3).

Selection	Response	Digital Filtering
Auto 1	Fast	Least filtering
Auto 2	Medium	More filtering
Auto 3	Slow	Most filtering

Table 4-10. Auto Averaging Filtering

Auto averaging is based on threshold, sensitivity and delay settings:

- In threshold band - the main running average has an update weight of one.
- Leaving threshold band – the pre-average weight must be out of the threshold bank (thr) for a set consecutive number of conversions (DEL).
- Out of threshold band – The update weight of each update is derived by the formula: [Error/(Sen*thr)]FLT2 (rounded to a whole digit).

  Where: Error = difference between pre-running and main running average.

  SEN = sensivity number.

  SEN1 = has the greatest running sensitivity

  THR = threshold setting in weight

  FLT2 = size of the main running average.
- Re-enter threshold band – to return to within the threshold unit enters a TEST mode for a time equal to half the number of ain filter conversions. During this period the update weight is set to one and the threshold is doubled to leave the band.
- Fill type mode – Used to switch from full filter to suspended filter. During the re-enter band TEST mode, the filter is held in the suspended filter mode.
- Auto type mode - The main filter is never suspended but the filter consists of auto averaging.

4.40ption 4 – Ticket Counter

The ticket count feature (Option 4), is a six digit counter that sequentially increments by one on each valid print command in the net mode only. The counter range is from 0 to 999,999. The counter can be set to start at any value within its range. The counter can be recalled or changed from the Option 4 setup menu or from the front panel (if enabled).

To set up the ticket counter feature use the following table and Figure 4-8 for graphical illustration of Option 4 menu options.

Parameter	Data Select	Description
1 Opt. 4	Off, On	Turn ticket counter on through Option 4 in setup mode
2 Strt	*xxx*	Starting number
3 Cnt	Current count	

Table 4-11. Ticket Counter Option

Option 4 Menu

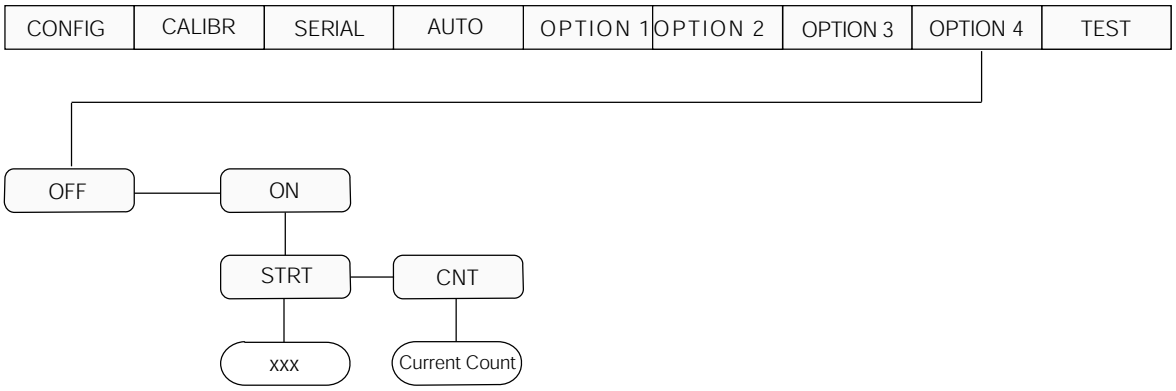

Figure 4-8. Option 4 Menu

NOTE: *The ticket counter starting count and current count can be accessed directly from the front panel by:*

- *Parameter 5 KBD (front panel direct access set to on).*
- *Option 4 (ticket counter) set to on.*
- *Press and hold* **MODE** *and* **UNIT** *keys for approximately three seconds.*

4.5Option Test – Test Mode

The UMC222 has three diagnostic tests under the **t. test** menu.

Parameter	Data Select	Description
1 Tst 1	Live Weight (X10)	Weight value with ten times normal weight resolution • Used to verify filter setting effectiveness.
2 Tst 2	SerialPort 1 and 2 serial test	• Performs serial test on 1 and 2 when a jumper is placed between inputs and outputs. • Place jumper between P1 out and P1 in to test port 1. • Place jumper between P2 out and P1 in to test port 2. • Press **Print** key and display will prompt with a passed message if good and failed message if failed.
3 Tst 3	Load cell signal in mV	Load cell signal output in millivolts (mV) • Excitation is 5 volts

Table 4-12. Test Mode Options

Test Menu

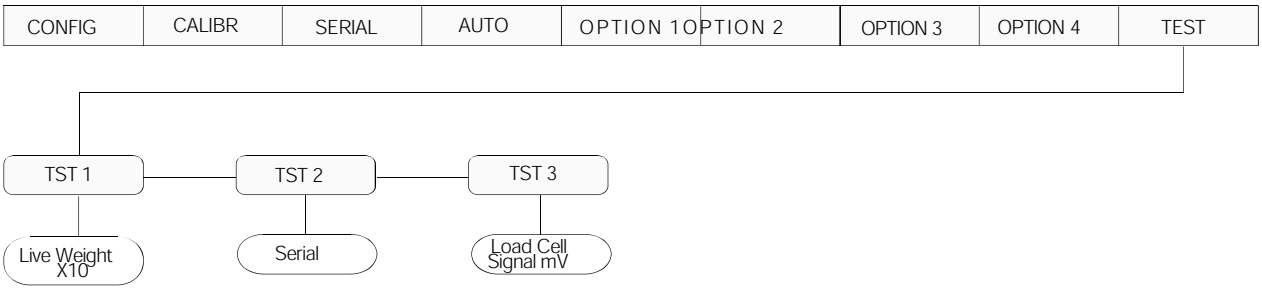

Figure 4-9. Option 8 Menu

5.0 Auto Set Up

The Auto setup mode for the UMC222 is designed for rapid setup of the indicator's configuration and calibration parameters. By simply stepping through only three parameter selections and choosing the appropriate sub parameter for each parameter, the indicator can be set up and ready for calibration in just a few short minutes.

All calibration and configuration parameters are tabled in firmware (EPROM) and loaded into permanent memory storage upon exiting the setup mode. Before exiting the setup mode the operator can alter any of the calibration or configuration selections from their predefined settings under auto setup.

The three parameter selections are:

- 1 TyPE – Capacity selection
- 2 Ser – Serial I/O
- 3 Opt – Options

5.11 TyPE – Capacity Selection

Table 5-1 provides a summary of the entire configuration for the capacity of 10,000 lbs.

NOTE: ***Changes can be made to any one of the configuration parameters pre-defined in the automatic set up including the capacity itself in standard setup mode.***

Auto Setup Commands – 1 tYPE		
Display	Parameter	Conf 1
1 tYPE	CAL	
	1 Zero	
	2 tarG	10000
	3 SPAn	
	Lin	
	2 trG	12000
	3 SPn1	
	4 trG	24000
	5 SPn3	
	6 trG	36000
	7 SPn3	
	8 trG	48000
	9 SPn4	
	AtrG	510000
	B SPn5	
	CONF	
	1 CAP	10000
	2 rES	1
	3 BasELb	
	4 FILt	Auto 2
	5 Actn	3
	6 tArEOn	
	7 Ztrk.	5
	8 APEr	2
	9 ConuoFF	
	100-on	Stored
	11 InOFF	
	12 GtnStd	

Table 5-1. 1 tYPE Auto Setup Commands

5.22 Ser – Serial I/O

Parameter 2 allows the technician to set up the serial I/O.

Auto Setup Commands – 2 Ser			
Display	Parameter	Sub Parameter	Ptr 1
2 Ser	1 P1		On
	2 baud	9600	
	3 PariEven		
	4 dUPLo		FF
		4.1 Chk	None
		4.2 resEcho	
		4.3 Adr1	
	5 P1-	Print	
		5.1 dat	Disp
		5.2 EOL	CrLf
		5.3 SOt	None
		5.4 EOt	None
		5.5 del	oFF
	6 P2	o	FF
		6.1 dat	Disp
		6.2 EOL	CrLf
		6.3 SOt	None
		6.4 EOt	None
		6.5 del	oFF
	7 baud	9600	
	8 PariEven		

Table 5-2. 2 Ser Auto Set up Commands

5.33 Opt – Options

Auto Setup Commands – 3 OPT			
Display	Parameter	Subparameter	Set 1
OPT 1:			
	1 OPt.1	oFF	
	2 t-do		FF
		2.1 dLSStd	
		2.2 Hr12	
		2.3 A-PA	
		2.4 tl	–
		2.5 EuroFF	
		2.6 dat	–
		2.7 POSOn	
		2.8 typNo.	
	3 Lino		FF
	4 Toto		FF
		4.1 bnd	oFF
	5 kbd	on	
	6 Cnto		FF
OPT 2:			
	1 OPt.2	oFF	
		2.1 to 3.8	oFF
		all data 0	1999
		all data 02	30000
OPT 3:			
	1 OPt.3	oFF	
	2 uPd15	CPS	
	3 TypeAuto		
	4 FLt1	5	
	5 FLt2	10	
	6 thr	10	
	7 Seno	FF	
	8 del	None	
	9 dSP	4	
	A data		–
OPT 4:			
	1 OPt/4	oFF	
	2 Strt	1	
	3 Cnt	1	

Table 5-3. 3 OPT Auto Set up Commands

6.0Calibration

The UMC222 indicator can be calibrated using zero calibration or single slope span calibration.

Key Functions Summary

Use the list below as a quick reference when entering numeric data entry or calibration weights (targets).

Key Illustration	Key	Function
ZERO	Zero	Increments the selected digit
MODE	Mode	Decrements the selected digit
TARE	Tare	Selects digit position
UNIT	Unit	Aborts data entry
PRINT	Print	"Enter" key - enters the selected value and exits

Table 6-1. UMC222 Quick Numeric Data Entry Reference Keys

Also refer to the graphical representation of the UMC222 in the menu listed below.

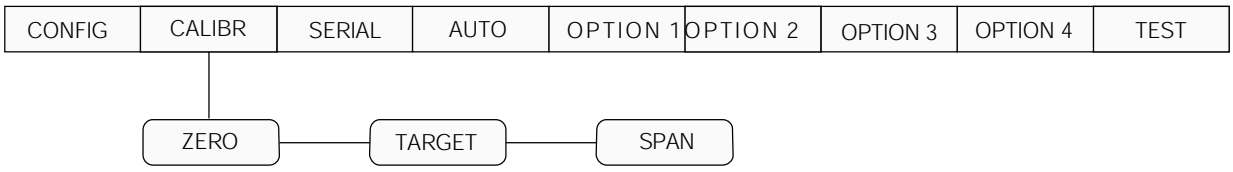

Figure 6-1. Calibration Menu

Calibration is done in the *CAL* menu when the indicator is placed in the CAL or Setup mode via S1 on the CPU board. In the following calibration procedure, the deadload (initial load) is entered under the ZERO parameter and calibration weights are entered under SPAN.

Front Panel Keyboard Calibration Procedure

To calibrate via the front panel keyboard, use the following procedures.

1. Remove the four thumbscrews from the display front panel.
2. Close S1 position SW#2 for CAL only or close the S1 position SW#1 for Full Menu.
3. The display reads *1 CAL*. Remove all weight from the scale platform.
4. Press the **MODE** key. *Zero* appears on the display, then a flashing *"c"----------0* (*live weight*).
5. Press the **PRINT** key to zero calibration. The display shows **----------**, then *CAL OK*, then a flashing *"c"----------0 (live weight).*
6. Press the **MODE** key. *2 Targ* appears on the displays then the recalled target value. Key in the value of the weights to be used for calibration by using keys to increment/decrement the displayed value and apply weight to the system. Refer to Table 6.1 for key function definitions.
7. Press the **MODE** key. *3 Span* displays, then a flashing *c* – value (*live weight).*
8. Place weight on the scale.
9. Press the **PRINT** key to span cal. The display shows ----------, then *CAL OK,* then *c* (*live weight*).
10. Change S1 on SW1 back again.

7.0Normal Weighing Mode Operations

This section provides the operator with a description of front panel key functions and associated annunciators (LEDs) used to operate the UMC222 in the normal weighing mode.

After the unit has been configured and calibrated, the unit is then placed in the weighing or normal weighing mode (SW 1-1 through SW 1-2 open). In this mode, the weight indicator displays live weight data that is presently on the scale.

7.1Display Test

The display check and EPROM verification are used to test the indicator LED.

7.1.1Display Check

Observe the display when power is first applied to the indicator. All six indicator LEDs (Zero, Motion, Net, Lb, Kg, and Total) should be turned on and each seven segment display, with its associated decimal point, will advance across the display field, allowing the operator to check for any missing segments or decimal points.

7.1.2EPROM Verification

Upon completion of the display check the software version momentarily appears on the display. This value indicates to the operator the current EPROM that has been installed in the UMC222. The UMC222 operates with an EPROM family group KDK1.x.

7.2LED Annunciators

Table 7-1 shows the display panel annunciator and the definitions of the annunciator.

Annunciator	Annunciator Definition
ZERO	On when gross weight data is within ±1/4 graduation of the center of zero
NET	On when indicator is in net weighing mode
Total	On when indicator is recalling total weight or count. If flashes if piece count is displayed.
lb/kg	Shows units of displayed weight data
MOTION	On when display data is changing by the number of graduations selected in Parameter 9 in configuration mode

Table 7-1. Annunciator Definitions

7.3Function Keys

Table 7-2 describes the various functions of the UMC222 keys.

Key	Functional Description
ZERO	Rezeroes scale if the gross weight is within the band of zero selected in the configuration mode (2%, 5%, 20%, or full scale)
MODE	Selects the desired weight data to be viewed (GROSS or NET), ACCUMULATED WT., PIECE COUNT, and ACCUMULATED PIECE COUNT (if enabled). The net LED annunciators indicate when the indicator is in net mode (there is no gross LED).
TARE	When used in the gross mode, the indicator will acquire the tare value and automatically shift to the net display mode. If a tare acquisiton is negative or the weight data is in motion, the indicator remains in the present mode and no tare is performed.
UNIT	If the indicator is set up to perform lb/kg conversion, this key toggles weight data between its calibrated base weight unit in lb to kg units. The lb and kg annunciator LEDs indicate which units are displayed.
PRINT	Issues a demand print command to the serial output.

Table 7-2. Function Key Description

7.4Gross/Tare/Net Weighing Operations

In normal mode, the UMC222 displays gross or net weights using the LED annunciators to indicate scale status and the type of weight value displayed.

7.4.1Display Mode on Power Up

When the UMC222 is initially powered up, the display automatically appears in the gross mode.

7.4.2ZERO Key Function

If the gross weight zero is within the zero band, press the zero key. There are various things that would make invalid zero conditions. They are:

- Gross weight data above the defined zero band
- Gross weight data in motion
- Overload/underload condition

7.4.3TARE Key Function

If the tare acquisition is greater than zero (+1/2 graduation), set the display to the net mode and apply the new tare.

If the tare acquisition is negative or in motion, the indicator stays in the current mode and no tare is performed.

7.4.4Overload and Underrange Conditions

Overload conditions occur when the weight exceeds the selected scale capacity by greater than 105%, or overload may indicate a defective load cell or load cell simulator input.

NOTE: *If the indicator is configured for legal-for-trade (PTZ = 2%), overload occurs at 103% of full scale capacity if push-to-zero has already captured 2% of full scale (105% minus 2% = 103%).*

Underload conditions will occur when scale input is greater than -400 grads, or underload may indicate a defective load cell or load cell simulator input. Figure 7-1 shows the indicator display associated with over and underrange conditions.

See Section 8.3 on page 61 for information about additional error and display messages.

Overload

Underrange

Figure 7-1. Overload and Underrange Error Displays

7.4.5Lb/Kg Conversion

When Parameter 10 in the configuration mode is set to Con (conversion), pressing the **Unit** key toggles the weight display units from lb (calibrated base units) to kg units (converted units from base weight data) and vice versa.

7.4.6Auto Averaging

Auto averaging allows the indicator to rapidly respond to initial weight change and upon scale stabilization returns the scale to the maximum filtering for that setting (Auto 1, Auto 2, or Auto 3).

Selection	Response	Digital Filtering
Auto 1	Fast	Least filtering
Auto 2	Medium	More filtering
Auto 3	Slow	Most filtering

Table 7-3. Auto Averaging Filtering

Auto averaging is based on threshold, sensitivity and delay settings:

- In threshold band - the main running average has an update weight of one.
- Leaving threshold band – the pre-average weight must be out of the threshold bank (thr) for a set consecutive number of conversions (DEL).
- Out of threshold band – The update weight of each update is derived by the formula: [Error/(Sen*thr)]FLT2 (rounded to a whole digit).

  Where: Error = difference between pre-running and main running average.

  SEN = sensivity number.

  SEN1 = has the greatest running sensitivity

  THR = threshold setting in weight

  FLT2 = size of the main running average.
- Re-enter threshold band – to return to within the threshold unit enters a TEST mode for a time equal to half the number of ain filter conversions. During this period the update weight is set to one and the threshold is doubled to leave the band.
- Fill type mode – Used to switch from full filter to suspended filter. During the re-enter band TEST mode, the filter is held in the suspended filter mode.
- Auto type mode - The main filter is never suspended but the filter consists of auto averaging.

7.5 Serial Output

Pressing the local **PRINT** key or issuing a serial print command (unit must be set up for bidirectional serial communication).

7.5.1 Serial Data Formats

Serial data is transmitted in ASCII-compatible format and consists of the following:

- One start bit
- Seven data bits
- One parity bit (even)
- Two stop bits

Table 7-4 lists characters used in the UMC222 serial data string.

Character	Description
<POL>	Polarity sign; space for positive data, minus (–) for negative data
<DATA>	Seven-digit numeric data field including decimal point or fixed (dummy) zero when selected. Leading zero suppression with leading zeroes transmitted as space characters.
<ID>	Two character label field for identification (ID)
<NO>	Three ASCII character label field for Identification Number (NO)
<SP>	Space character
<LB/KG>	Two-character data field identification for weighing units in demand mode: Weight in lb = <LB> Weight in kg = <KG>
<p1>	One-character data field units identification for weighing in continuous mode: Weight in lb = <L> Weight in kg = <K> Piece count = <P> Accumulated piece count = <A>
<GR/NT>	Gross mode = <GR> Two-character data field identification for weighing mode in demand mode: Net mode = <NT> Five-character label field for total mode. 5 character label field for total mode.
<p2>	One-character data field identification for continuous output mode: Gross mode = <G> Net mode = <N> Tare mode = <T> Piece count = <C> Accumulated piece count or weight count = <A>
<CR>	Carriage return (message terminator)
<CR/LF>	Two-character data field: carriage return followed by line feed; used in both transmission modes to indicate end of message
<STAT>	One-character data field identification in continuous mode, used to indicate the status of the indicator display. Characters are listed in order of priority: higher priority status characters override lower priority status characters.
NOTE: Bracket delimiters (< and >) are shown for clarity only; delimiters are not sent in the serial data stream.	

Table 7-4. Serial Data Character Descriptions

Status Character Definitions

The status character (<STAT>) provides information to the receiving device about the current indicator operation. Table 7-5 shows the status characters returned by the UMC222 indicator.

Status Characters	Description
<D> (44H)	Digital calibration mode
<A> (41H)	Gross weight Lb
<I> (49H)	Invalid data
<O> (4FH)	Over range
<M> (4DH)	Scale in motion
<U> (58H)	Under range
<B>	Tare recall data displayed
<G>	Gross/Tare/Net
<C>	Center of Zero
<SP> (20H)	None of above
* Setpoint support is not enabled for this indicator.	

Table 7-5. Status Data Character Descriptions

NOTES:

- Response data (*xxxxxx*) is six characters with no decimal point, seven with decimal point. Leading zeroes are shown as space characters.
- Invalid data requests or entries are responded to with an echo of valid portion and the letter I indicating the invalid portion.

7.5.2 Demand Mode versus Continuous Data Output

Demand mode is used to interface with printers and requires a manual Print command from the front panel to initiate the output data. To comply with legal-for-trade regulations, demand output data is inhibited during the following conditions:

- Scale in motion
- Positive overload
- Negative overload
- Negative gross weight displayed
- Unit in display check mode
- Other display modes

NOTE: *In legal-for-trade applications, the motion detection parameter (parameter 9) must be turned ON.*

In demand mode, the operator may choose to print Gross/Tare/Net when in net mode. If the serial port is set to Print on Demand mode, the format is:

<POL><DATA><SP><LB/KG><SP><LABEL>
<CR><LF>

General Continuous Mode Output Data Format

Continuous mode is used to interface to computers, scoreboards, and other remote devices requiring constant data updating. Continuous mode transmission occurs at the end of each display update.

<POL><DATA><p1/p2><STAT><CR><LF>

The ticket counter printer format (enabled in option 4) appears as the first line of the serial output as follows:

<TICKET NUMBER XXXXXX> where XXXXXX is the number with leading zero blanking.

The time and date printer format (enabled in option 1) appears as follows:

If **On** is selected in setup for position (2.7 pos in 5.Opt 1) the time/date data is printed with the first line of data (not including the ticket no. line):

Example: 123.4 lb GR 8:36am 02/06/00

If **Above** is selected in setup, the time/date or date is printed as the first line (not including the ticket no. line)

If **Under** is selected in setup, the time/date is printed as the last line.

8.0 Optional and Advanced Features

8.1 Serial Communications

The UMC222 has two serial ports. Both serial ports 1 and 2 are ASCII-compatible, RS232 outputs. The serial format is compatible with most printers, scoreboards, and other remote devices. Each output can be disabled, set for “print on demand” mode, or set to output data continuously.

NOTE: *While the UMC222 supports RS485 serial format and advanced duplex serial protocol, additional information is available from your authorized Rice Lake Weighing Systems distributor.*

8.1.1 Demand Output Serial Data Format

You can use the EDP port or keypad to fully customize the ticket to work with a wide variety of printers, scoreboard displays, and other remote equipment. To comply with “legal-for-trade” regulations, demand output data is inhibited during the following conditions:

- Scale in motion
- Negative gross weight displayed
- Positive overload
- Negative overload
- Unit in “display check” mode
- Other “non normal” display mode

In demand mode, selection can be made to print Gross/Tare/Net when in net. If either port is set to print on demand mode, use the following format.

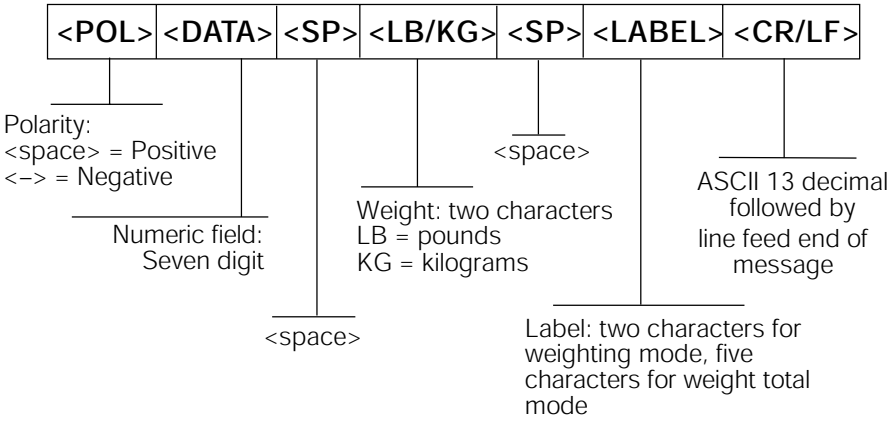

Figure 8-1. Demand Output Serial Data Format

8.1.2Continuous Default Output Serial Data Format

The continuous default mode output serial data format is used to interface computers, scoreboards, and other remote devices requiring constant data updating. Continuous mode transmission occurs at the end of each display update

NOTE: ***There is no continuous serial transmission when in the setup/calibration mode or when a loss of serial configuration is detected.***

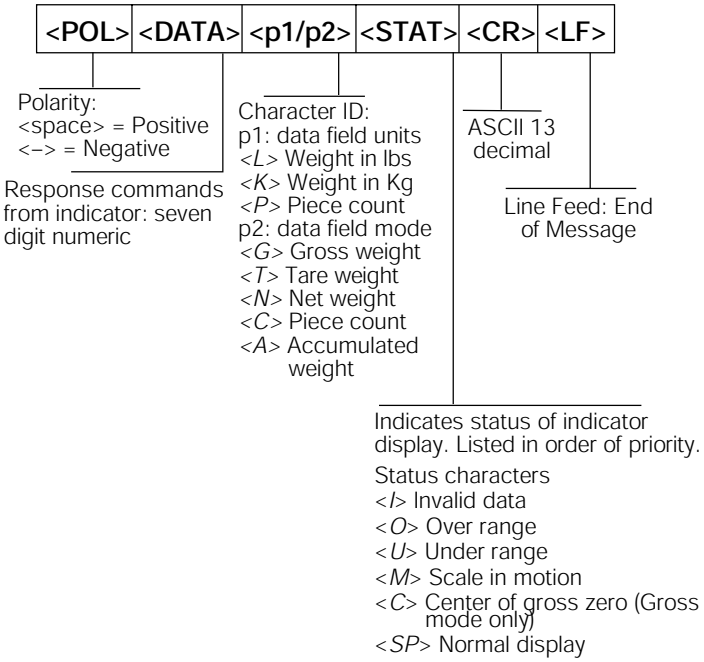

Figure 8-2. Continuous Default Output Serial Data Format

8.1.3Multiple Continuous Data Field Formats

The UMC222 has a multiple continuous data field software protocol which enables you to transmit multiple data in the net mode:

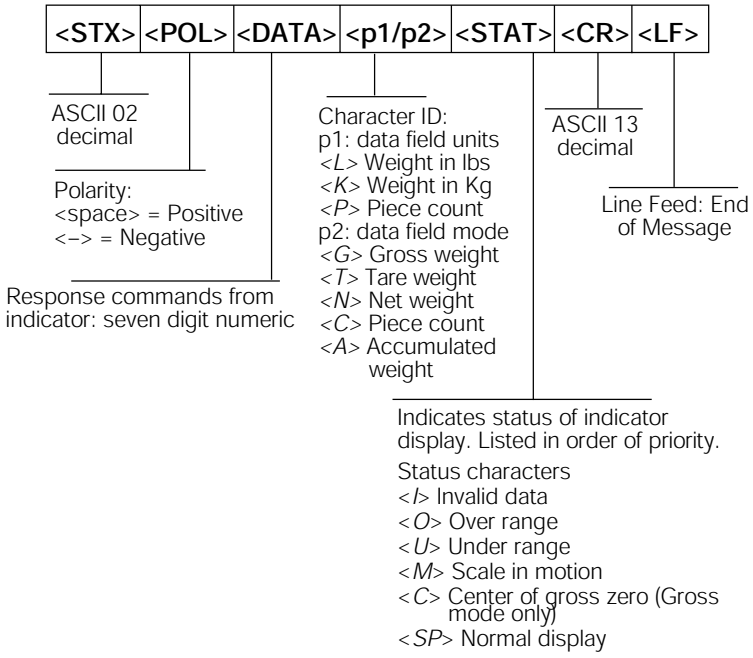

Figure 8-3. Multiple Continuous Data Field Format

8.2Battery Option – PN 55260

The UMC222 has an optional battery that can be installed. The indicator enclosure must be opened to connect the battery to the CPU board. Use the following steps:

1. Disconnect AC power by unplugging the indicator.
2. Remove the screws that hold the front bezel to the enclosure body.
3. Place the indicator face down on an antistatic work mat, then lift the back of the indicator away from the front bezel.
4. Set the enclosure aside.
5. Remove the following components from the CPU board (shown in Figure 8-4)
   - F1 – Fuse, time delay
   - T1 – Transformer
   - C4 – Capacitor

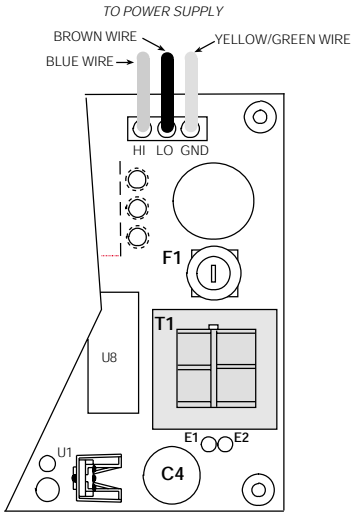

Figure 8-4. F1, T1, C4 Location

6. Strip insulator approximately 1/4” and tin the bare wire for black and red wire.
7. Solder the red wire to E1 and solder the black wire to E2 as shown in Figure 8-5.

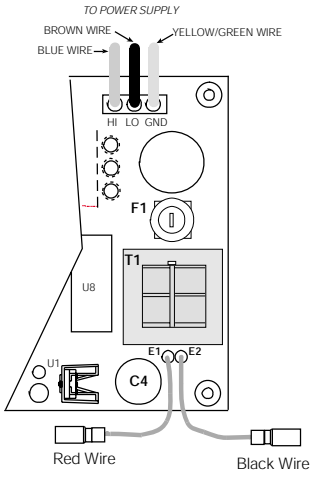

Figure 8-5. E1 and E2 Wire Locations

8. Remove the bushing and power cord from the backside of the enclosure and replace with connector.
9. Install a toggle switch which is used to flip between AC power and battery power shown in Figure 8-6.

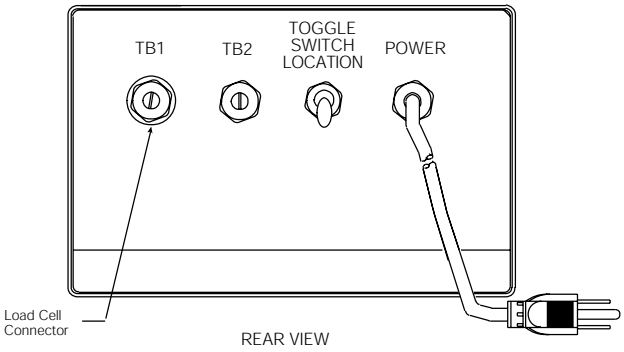

Figure 8-6. Toggle Switch Location

Figure 8-7 illustrates the wiring diagram for installing the optional battery.

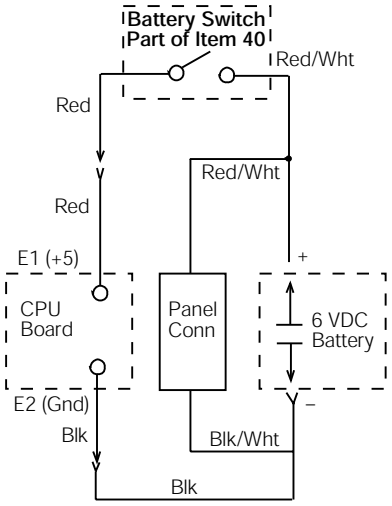

Figure 8-7. Battery Wiring Schematic

8.2.10ptional Battery Charger

The UMC222 has an available battery charger which is included as a component of the battery option. Plug the charger into the recharge unit.

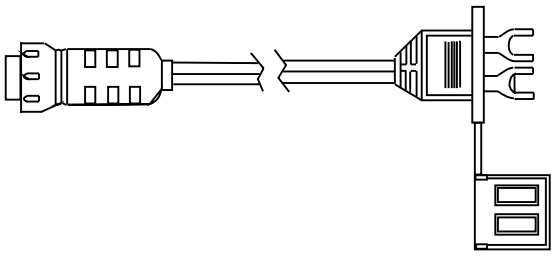

Figure 8-8. Battery Charger Cable

Operating Time

All estimated operating times are based on a fully charged battery. A fully charged battery is one that has been charged until the charger pilot lamp has switched from red to green (signifying 95% charged).

Charging times for 350Ω load cells are:

- One load cell.....30 hours
- Four load cells.....24 hours

Charging Time

Charging a dead battery takes a maximum of ten hours.

8.3Panel Mount Kit–PN 55262

The UMC222 has an available panel mount kit and its dimensions are illustrated in Figure 8-9

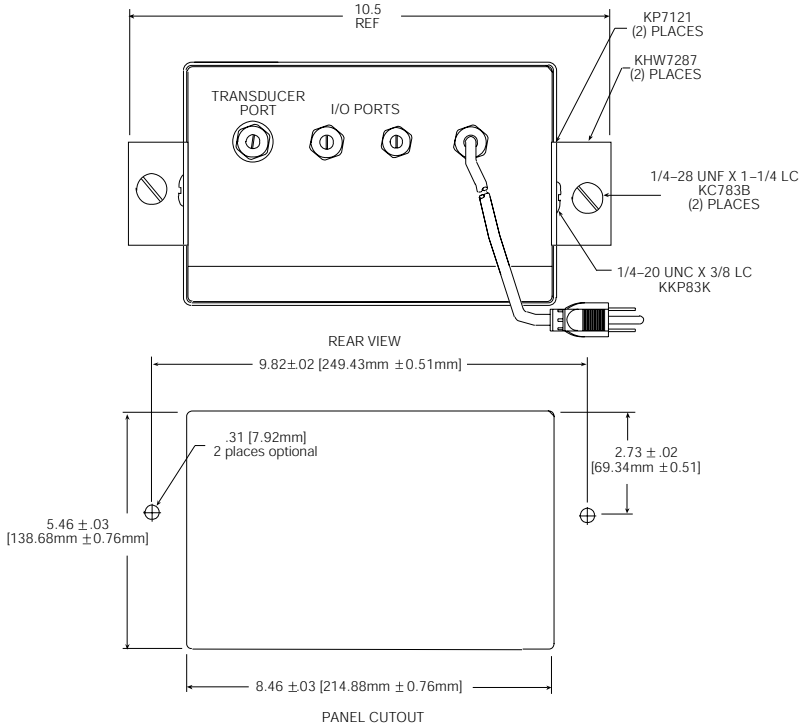

Figure 8-9. Optional Panel Mount Kit

8.4Tilt Stand Kit–PN 55257

The UMC222 has an available tilt stand kit and its dimensions are illustrated in Figure 8-10.

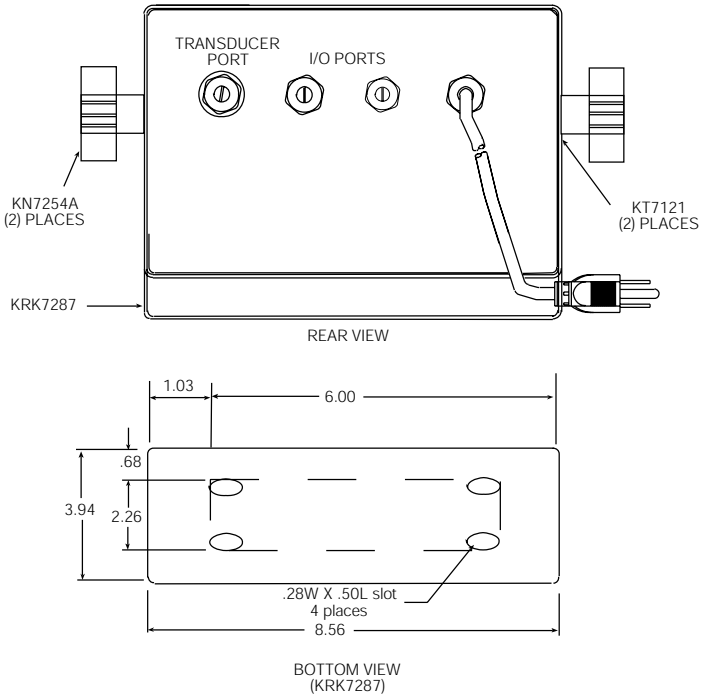

Figure 8-10. Optional Tilt Stand Kit

8.5Serial Expansion Board–PN 55255

The UMC222 has an available serial expansion board which can greatly enhance the capabilities of this indicator. By installing this optional board allows the user RS485, RS422, and 20mA loop.

To install the optional serial expansion board use the following steps:

1. Disconnect power to the indicator by unplugging the unit.
2. Remove screws that hold the front bezel to the enclosure body.
3. Place the indicator face down on an antistatic work mat, then lift the front bezel away from the enclosure. Set the enclosure aside.
4. Loosen cord grips and remove
5. Remove the RS232 device from U13 on the CPU board (Figure 8-11).

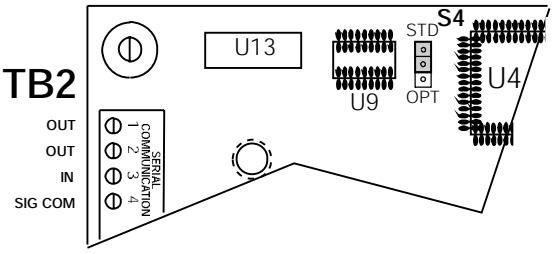

Figure 8-11. Serial Expansion Board Assembly Jumpers

6. Move the jumper plug P4 to S4 positions 2 and 3 (opt) on the CPU board assembly.
7. Insert J13 on the serial expander assembly into U13 on the CPU board.
8. C o nfigure the unit per Section 3.0.

The following tables give serial expander jumper plug configuration, terminal identification and rocker switch configurations.

Jumper Configuration			
Switch	Jumper Configuration	Switch Position	Serial Function
S5P5	1 and 2	RS422 out	enabled
S5P5	2 and 3	RS485	enabled

Table 8-1. Serial Expander Assembly Jumper Configuration

Terminal Identification	
Terminal Position	Function
TB3-1	RS232 port 2 out
TB3-2	RS232 port 1 out
TB3-3	RS232 port 1 in
TB3-4	RS232 signal common
TB3-5	20mA loop port 1 +out
TB3-6	20mA loop port 1 –out
TB3-7	20mA loop port 1 +in
TB3-8	20mA loop port 1 –in
TB3-9	20mA loop port 2 +out
TB3-10	20mA loop port 2 –out
TB3-11	2 wire RS485 in/out (A)
TB3-12	2 wire RS485 in/out (B)
TB3-11	4 wire RS485 out (A)
TB3-12	4 wire RS485 out (A)
TB3-13	4 wire RS485 out (A)
TB3-14	4 wire RS485 out (A)
TB3-11	4 wire RS422 out (A)
TB3-12	4 wire RS422 out (B)
TB3-13	4 wire RS422 in (A)
TB3-14	4 wire RS422 in (B)

Table 8-2. Serial Expander Assembly Terminal Identification

Rocker Switch Configuration Open = Disabled, Closed = Enabled	
Switch Positions	Serial Function
S6-1	RS232 mode disabled
S6-2	20 mA mode disabled
S6-3	RS485 mode disabled
S6-4	RS422 mode disabled

Table 8-3. Serial Expander Assembly Rocker Switch Configuration

9.0Appendix

9.1ASCII Character Chart

Use the decimal values for ASCII characters listed in Table 9.1 when specifying print format string. The actual character depends on the character mapping used by the output device.

The UMC222 can send or receive any ASCII character value (decimal 0-255), but the characters that can be shown on the indicator are limited by the 14-segment display. Text strings formatted for display on the indicator should be limited to upper case, unaccented character to ensure legibility.

Control	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex
Ctrl-@	NUL	000	00	space	032	20	@	064	40	`	096	60
Ctrl-A	SOH	001	01	!	033	21	A	065	41	a	097	61
Ctrl-B	STX	002	02	“	034	22	B	066	42	b	098	62
Ctrl-C	ETX	003	03	#	035	23	C	067	43	c	099	63
Ctrl-D	EOT	004	04	$	036	24	D	068	44	d	100	64
Ctrl-E	ENQ	005	05	%	037	25	E	069	45	e	101	65
Ctrl-F	ACK	006	06	&	038	26	F	070	46	f	102	66
Ctrl-G	BEL	007	07	’	039	27	G	071	47	g	103	67
Ctrl-H	BS	008	08	(	040	28	H	072	48	h	104	68
Ctrl-I	HT	009	09	)	041	29	I	073	49	i	105	69
Ctrl-J	LF	010	0A	*	042	2A	J	074	4A	j	106	6A
Ctrl-K	VT	011	0B	+	043	2B	K	075	4B	k	107	6B
Ctrl-L	FF	012	0C	,	044	2C	L	076	4C	l	108	6C
Ctrl-M	CR	013	0D	-	045	2D	M	077	4D	m	109	6D
Ctrl-N	SO	014	0E	.	046	2E	N	078	4E	n	110	6E
Ctrl-O	SI	015	0F	/	047	2F	O	079	4F	o	111	6F
Ctrl-P	DLE	016	10	0	048	30	P	080	50	p	112	70
Ctrl-Q	DC1	017	11	1	049	31	Q	081	51	q	113	71
Ctrl-R	DC2	018	12	2	050	32	R	082	52	r	114	72
Ctrl-S	DC3	019	13	3	051	33	S	083	53	s	115	73
Ctrl-T	DC4	020	14	4	052	34	T	084	54	t	116	74
Ctrl-U	NAK	021	15	5	053	35	U	085	55	u	117	75
Ctrl-V	SYN	022	16	6	054	36	V	086	56	v	118	76
Ctrl-W	ETB	023	17	7	055	37	W	087	57	w	119	77
Ctrl-X	CAN	024	18	8	056	38	X	088	58	x	120	78
Ctrl-Y	EM	025	19	9	057	39	Y	089	59	y	121	79
Ctrl-Z	SUB	026	1A	:	058	3A	Z	090	5A	z	122	7A
Ctrl-[	ESC	027	1B	;	059	3B	[	091	5B	{	123	7B
Ctrl-\	FS	028	1C	<	060	3C	\	092	5C	|	124	7C
Ctrl-]	GS	029	1D	=	061	3D	]	093	5D	}	125	7D
Ctrl-^	RS	030	1E	>	062	3E	^	094	5E	~	126	7E
Ctrl-_	US	031	1F	?	063	3F	_	095	5F	DEL	127	7F

Table 9-1. ASCII Character Chart

9.2Parameter Control Code Chart

Use the following code values for parameter descriptions listed in Table 9.2 when specifying the format string when doing a macro file setup (page 23). The actual character depends on the character mapping used by the output device.

Code	Description	Code	Description	Code	Description
200	Gross weight & *LB/KG GR*	240	Piece count & *PCS*	601	Macro file 1
201	Gross weight & *LG/KG*	241	Piece count & *PC*	602	Macro file 2)
202	Gross weight	242	Piece count only	603	Macro file 3
203	Gross weight (no 0 blanking)	243	Total piece count (no 0 blanking)	604	Macro file 4
				605	Macro file 5
210	Net weight & *LB/KG NT*	300	Status character	606	Macro file 6
211	Net weight & *LN/KN*			607	Macro file 7
212	Net weight	31x	Repeat space character x times (x=1-9)	608	Macro file 8
213	Net weight (no 0 blanking)	32x	Repeat line feed character x times (x=1-9)	610	If in base units call macro file 1, if in secondary units, call file 2
220	Tare weight & *LB/KG TR*	400	Time & date per setup	700	Delay per setup
221	Tare weight & *LT/KT*	401	Time per setup		
222	Tare weight	402	Date per setup	999	End of file
223	Tare weight (no 0 blanking)				
		510	Ticket No. & number		
230	Total weight & *LB/KG*	511	Ticket number		
231	Total weight & *LA/KA*				
232	Total weight only				
233	Total weight (no 0 blanking)				
234	Total piece count & *total pcs.*				
235	Total piece count & PA				
236	Total piece count only				
237	Total piece count (no 0 blanking)				

Table 9-2. Parameter Control Code Chart

9.3Smart Serial Count

A print out of piece count is available in serial demand or continuous. It is enabled when option 1, parameter 6 is on and has a range from 0 - 9,999,999,999 with a visual display of gross weight, net weight, piece count, and accumulated piece total.

Code	Function
234	Total piece count and total pieces
235	Total piece count and "pc"
236	Total piece count only
237	Total piece count (no zero blanking)
240	Piece count and "pcs" - smart serial codes used to print count mode data
241	Piece count and "pc"
242	Piece count only
243	Piece count (no zero blanking)

Table 9-3. Smart Serial Count Codes

9.4Display and Error Messages

Display Messages		
Display	Explanation	Corrective Action
LOSSoF Zero	Loss of zero calibration	Enter digital calibration mode and recalibrate
LOSSoF SPan	Loss of span calibration	Enter digital calibration mode and recalibrate unit
LOSSoF ConF	Loss of config u r a t i o n s e t u p	E n t e r c o nfiguration (2 ConF)
LOSSoF Serial	Loss of serial setup	Enter serial setup (3. Ser)
LOSSoF Opt 1	Loss of option 1 setup	Enter option 1 setup (5. Opt 1)
LOSSoF Opt 2.xx	Loss of option 2 file (xx) setup. see note 1	Enter option 2 setup file (6. Opt 2). See note 1.
LOSSoF Opt 3	Loss of option 3 setup	Enter option 3 setup (7. Opt 3)
LOSSoF Opt 4	Loss of option 4 setup	Enter option 8 setup (8. Opt 4)
CAL Ok	Indicates successful zero and span calibration	
no CAL	Indicates unsuccessful zero and span calibration	
-no-	Indicates that the cal target in the linearity mode is less than the previous value upon entry attempt.	Enter a greater value
LoSt-0	Loss of auto zero	Acquir e zero
LOSSoF tare	Loss of auto tare	Acquire tare
OL Gro	ss overload	Check load cell wiring
UL Gro	ss underrange	Check load cell wiring

Table 9-4. Display and Error Messages

NOTES:

The xx in LOSSoF Opt. 2xx indicates smart serial files 2.1 to 2.8 and 3.1 to 3.8 has lost its data.

F1 indicates files 2.1 FL1 and E1 indicates macro file 3.1 EF1 has lost its data.

Input must be greater than 0.02mV/V and less than 4.25 mV/V @ full scale. If a calibration is performed on a value that is less than full scale where the full scale cannot be obtained, no warning prompt is given.

While in Calibration mode a display of OL prompts above 4.25 mV/V. However, when the input exceeds 4.5 nV/V a data value is displayed and a incorrect calibration takes place.

9.5 Specifications

Power

Power Input 115/230 VAC, 50-60 Hz, 5W,

Analog Specifications

Full Scale Input Signal Up to 33 mV
Load Cell Excitation 5 VDC, fixed
Load Cell Current 60 mA (4 x 350 Ω load cells)
Load Cell Cabling 4-wire standard
6-wire with remote sensing
Analog Signal Input Range 0.1 mV/V to 4.5 mV/V
Analog Signal Sensitivity 0.3 µV/graduation
Resolution 10 000 (NTEP)
Measurement Rate 15 measurements/sec
Display Increments 1, 2, 5, 10, 20, 50, 100
Decimal Point 0, 0.0, 0.00, 0.000, 0.0000
AZM (Zero Tracking) Gross mode only: configurable to ±0.5 grads, ±1.0 grads, ±3.0 grads, or off
PAZ and ATM Aperture Configurable to ±1.9% full scale or 100% FS
Motion Band Configurable to ±1 or ±3 grads; 1-second delay or no delay
Calibration Method Software, with optional five-point linearization

Serial Communications

Port 1 Full duplex RS232 at 9600, 4800, 2400, 1200, 600, or 300 bps
Port 2 Simplex RS232 at 9600, 4800, 2400, 1200, 600, or 300 bps, 7 data bits, odd, 1 stop bit

Operator Interface

Display 6-digit LED or LCD display. 7-segment, .8 in (15 mm) digits
Annunciators Center of zero, Gross, Net, Motion, lb/kg
Keyboard 21-key flat membrane panel with 0–9 numeric keys, ENT (Enter), CE (Clear Entry), ZERO, GROSS/NET, TARE, TARE RECALL, PRINT, lb/kg CONV, SP1, SP2, ON/OFF

Environmental

Operating Temperature –10 to +40 °C (14 °F to 104 °F)

Enclosure

Enclosure Dimensions 8.7 in x 5.25 in x 3.5 in
23 cm x 16 cm x 10 cm ?????

Rating/Material

NEMA 4X, polished stainless steel

Certifications and Approvals

NTEP
CoC Number 00-095
Accuracy Class III/III L
n_{max}: 10 000

UMC222 Limited Warranty

Condec warrants that all Condec equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by Condec. All systems and components are warranted against defects in materials and workmanship for one year.

Condec warrants that the equipment sold hereunder will conform to the current written specifications authorized by Condec. Condec warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, Condec 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, Condec will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to Condec 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 Condec Equipment Return Department.
- Examination of such equipment by Condec confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; Condec shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than Condec or its duly authorized repair agents.
- Condec will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will Condec be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will Condec be liable for the cost of any repairs made by others.

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