UMC 600IS

Intrinsically Safe Weight Indicator

Installation Manual

FM APPROVED

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58645

Contents

May 2002

About This Manual

The UMC 600IS digital weight 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 UMC 600IS.

The installer should be familiar with the National Electrical Code and RP 12.6 (*Recommended Practice*) requirements for installation of equipment in hazardous areas (NEC Article 504, *Intrinsically Safe Systems*) published through the Instrument Society of America.

Warning *The UMC 600IS is a Factory Mutual-approved system. This approval is valid only if the installation conforms to the guidelines described in this manual. If modifications are made to the installation procedure, the enclosure is opened, or the instrumentation is changed in any way, Factory Mutual approval is void and the customer becomes fully responsible for such modifications.*

This instrument and accompanying equipment must be installed and serviced by an authorized technician in accordance with the instructions provided in this manual. Improper specification, installation, or service of this equipment could result in personal injury or property damage.

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

1.0 Introduction

The UMC 600IS is a single-channel digital weight indicator designed and approved to operate as an intrinsically safe system in a wide variety of scale and weighing applications. 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 21-button keypad, six digit, seven-segment display and 11 LED annunciators (see Figure 1-1 on page 2).

Features of the UMC 600IS 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, and PAZ and AZM values
- Ten-thousand displayed graduations; 80,000 graduation expansion available

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
- Ten updates per second, with selectable digital averaging and auto averaging; 5 Hz active analog filter for smooth response
- Excitation for four 350Ω load cells at 5 VDC
- Operable from DC power supply or optional battery
- Time and date print selection

1.1 Factory Mutual Approval

The UMC 600IS is Factory Mutual (FM) approved for:

- Classes I, II, and III,
- Divisions 1 and 2, and
- Groups A, B, C, D, E, F and G

The Factory Mutual (FM) approval is a system approval for all devices connected directly to the UMC 600IS digital weight indicator.

Other devices that have FM Entity Approval cannot be used with this system unless specifically listed in this manual as part of the Condec Factory Mutual systems approval. Failure to comply with this voids the FM approval. The control drawing is the guide to the installation of this system.

1.2 System Limitations and Restrictions

The following items represent limitations and restrictions on the use of the UMC 600IS:

- All instrumentation must have identification nameplates in compliance with the control drawing.
- All wiring, connections, conduit and grounds must comply with the National Electrical Code.
- The cable type and cable length must comply with the specifications in the control drawing
- No modifications can be made in the field.
- Factory Mutual Approval required (see Section 1.1 on page 1).
- It is mandatory to return the UMC 600IS to Condec for service.
- Component level repair is not permitted on Factory Mutual Approved equipment.
- Standard unit configuration is without local sense jumpers installed. Therefore, use either six-conductor loadcell cable or externally jump +SEN to +EXC and –SEN to –EXC.

1.3 Front Panel Keypad and Annunciators

Figure 1-1 shows the UMC 600IS front panel. The UMC 600IS display consist of a six digit, seven-segment display. Table 1-1 lists the front panel keys and their functions.

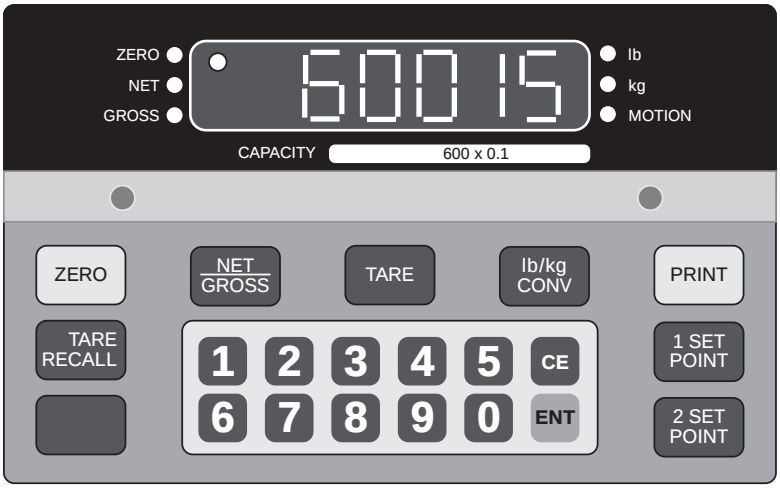


Figure 1-1. UMC 600IS Front Panel

Panel Key	Function
ZERO	Provides push-button auto zero (PAZ) over ±1.9% or 100% full scale capacity. Operates only in gross weighing mode.
NET/GROSS	Switches the unit between gross and net weighing modes.
TARE	Provides push-button tare entry over 100% of scale capacity. Pressing TARE key switches to net mode and enters tare.
PRINT	Provides a manual print function if unit is wired to serial printer or other data device.
lb/kg CONV	Switches the displayed weight unit between pounds and kilograms.
TARE RECALL	Press to recall tare value; LED annunciator flashes when tare value is displayed.
ON/OFF	Provides power to the indicator.
SETPOINT 1 & 2	No function. Setpoints are not supported for this indicator.
0–9, CE, ENT	Numeric keyboard for entry of manual tare and calibration data. Includes CE (Clear Entry) and ENT (Enter) keys.

Table 1-1. Front Panel Key Functions

Table 1-2 summarizes the front panel annunciator functions.

Annunciator	Function
LOW BATTERY	On when DC input voltage drops below normal operating range. (Located in the display window of the 600IS).
ZERO	On when scale weight is within ±0.25 displayed graduations of zero. Used in gross weighing mode only.
NET	On when the indicator is in net weighing mode.
GROSS	On when the indicator is in gross weighing mode.
lb/kg	lb or kg LED is lit to show the current displayed weight units.
MOTION	On when scale is in motion.
1 SETPOINT 2 SETPOINT	No function.
TARE RECALL	Part of the TARE RECALL key, LED flashes when tare value is displayed.

Table 1-2. Front Panel Annunciators

2.0 Installation and Wiring

This section describes the procedures for installing the UMC 600IS indicator, including load cell, digital input, and serial communications cabling.

Caution *It is mandatory to return the UMC 600IS to Condec for service. Component level repair is not permitted on Factory Mutual Approved equipment by other than the manufacturer.*

2.1 Hazardous Area Installation of the UMC 600IS

The following information is provided to help the installer use the correct conduit and load cells for installation of the UMC 600IS.

Drawings Required for this Installation

Table 2-1 shows the UMC 600IS control drawing numbers and titles. The UMC 600IS drawings are included in the back of this manual.

Control Drawing	Title
54136, Sheet 1	Installation Drawing I.S. system
54136, Sheet 2	Interconnect Diagram
54136, Sheet 3	Interconnect Diagram, Battery Operated
54136, Sheet 4	Standard Unit Dimensions
54136, Sheet 5	Battery Powered Unit Dimensions
54136, Sheet 6	Unit Mounting Diagram
54136, Sheet 7	Power Supply Mounting Diagram
54136, Sheet 8	Junction Box Diagram
54136, Sheet 9	Junction Box Diagram, Battery Operated
53146, Sheet 10	I/O Interface Mounting Diagram
56804	Summing Box Diagram, 2-4 Load Cells
56810	Summing Box Diagram, 5-8 Load Cells
65476, Sheet 1-5	Approved Load Cell List

Table 2-1. UMC 600IS Drawing Number Identification

2.1.1 Conduit System (Supplied by Customer)

Power Supply to Indicator

Conduit is not required for this installation. However, a separate conduit system is recommended. The type suggested for this application is 3/4 inch rigid steel conduit with pull boxes located at required intervals. The conduit provides additional noise protection for the low level signals, while automatically complying with the requirements for 2 inch separation between intrinsically safe circuits and other electrical cables. Conduit seals are required where a gas tight seal is required between the hazardous area and the safe area.

To protect the watertight integrity of the I/O barrier and junction box, the conduit should terminate adjacent to the respective enclosure with a union providing the proper thread to accept a Hubbel or Crouse Hinds cord connector for the cable to exit the conduit. All conduit, fittings, and conduit accessories are provided and installed by the customer.

NOTE: *The customer is responsible for the correct installation of all conduit seals in compliance with all National Electrical Code regulations.*

AC Line Voltage Feed

The installer must comply with Condec installation drawings as well as the National Electrical Code for installation of equipment in hazardous areas (NEC Article 504, *Instrinsically Safe Systems*).

2.2 Cable Requirements

Intrinsically safe cables used in the hazardous area are specified on the Control Drawings 54136, Sheets 2 and 3.

Since all cables have internal inductance and capacitance, only the cables listed are safe to use with this intrinsically safe system. Table 2-2 provides specifications for maximum cable length based on group classification. A list of Factory Mutual approved cables is shown in Table 2-3.

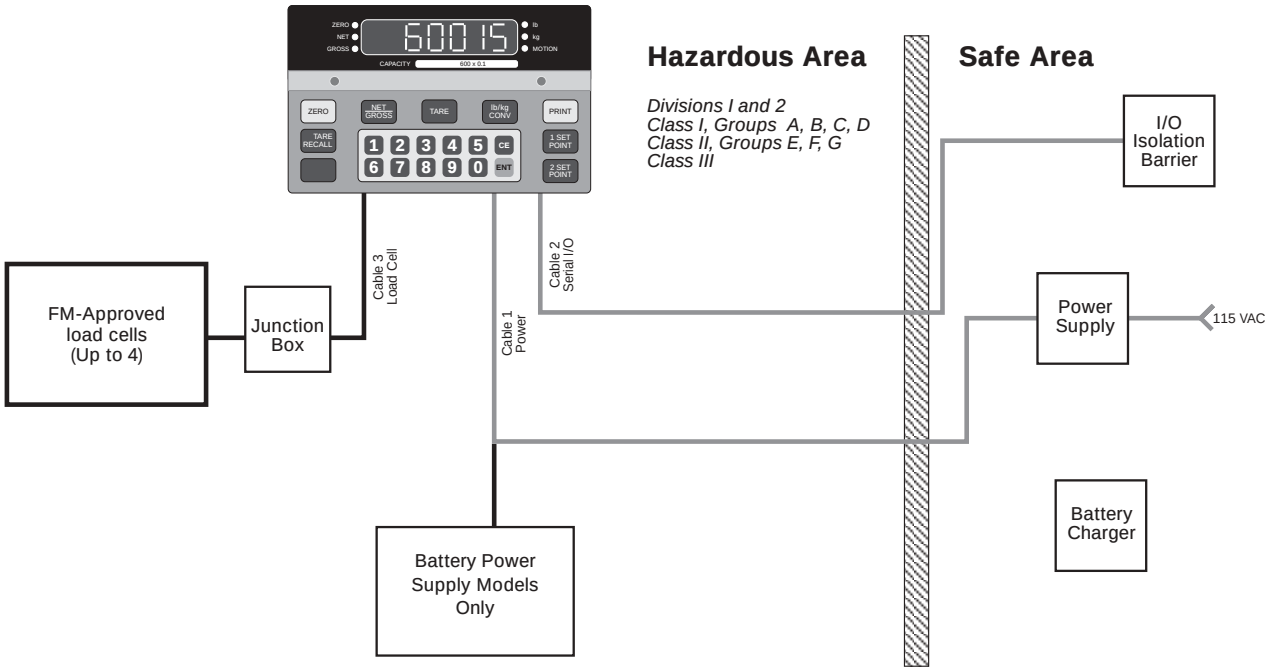


Figure 2-1. Intrinsically Safe System Diagram

Note: *Either power supply or battery can be used, but not both simultaneously.*

Maximum Cable Length,		
Group	Cable 1	Cables 2 & 3
A, B	75'	800'
C	300'	
D	500'	
E, F, G		

Table 2-2. Maximum Cable Lengths

Factory Mutual Approved Cable			
Cable	Type	Condec PN	Belden P/N
1	Power	45897 (*x*)	8618
2	Serial I/O	45898 (*x*)	9942
3	Load Cell	45898 (*x*)	9942
(*x*) = feet in increments of 50			

Table 2-3. FM Approved Cable Lengths

Caution *Use only Factory Mutual approved cables.*

2.3 AC Power Wiring

Standard units are powered by 115 VAC into Condec DC output power supply (Condec PN 58805).

2.4 Battery Option

The battery operated version of the UMC 600IS is powered by a 6-volt 10-ampere-hour battery that is enclosed in a stainless steel housing. It is mounted below the indicator and is removable for charging in the safe area.

Caution *Caution should be used when considering a battery powered unit for control applications where a discharged battery would cause serious problems.*

The battery is approved for use in hazardous environments and provides up to 51 hours of continuous operation in a four by 350Ω load cell system. Table 2-4 illustrates estimated operating times based on a fully charged battery.

Load Cell Size	Quantity of cells	Operating Time
350Ω load cell	1	70 hours
	2	62 hours
	3	56 hours
	4	51 hours
700Ω load cell	1	74 hours
	2	70 hours
	3	66 hours
	4	62 hours

Table 2-4. Operating Time

The battery pack is ideal for limited use operations such as bench scales and platform scales. A low battery LED annunciator indicates when the battery needs to be recharged (see Figure 2-2). The recommended initial battery charge time is 10 hours.

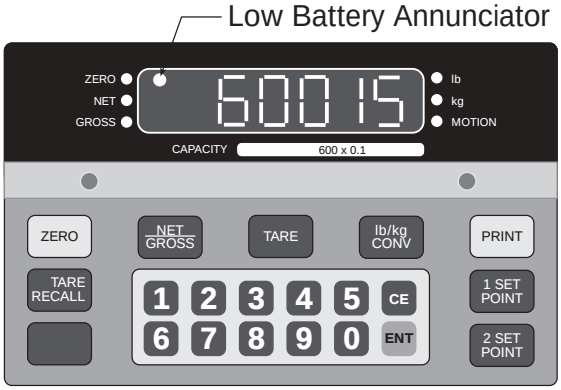


Figure 2-2. Low Battery LED Annunciator

The battery pack is designed for easy removal and can be recharged in a safe area in eight hours or less. The indicator also contains a programmable auto shutoff to power off the indicator when not in use.

Caution *All wiring must be done by qualified personnel and meet all appropriate safety and NEC electrical codes as noted on Condec Control Drawing 33476.*

2.4.1 Modes of Operation

The UMC 600IS battery powered unit has three modes of operation:

- Push on-off (controlled from the front panel on button).
- Push on with auto turn off after selected time (one to nine minutes).
- Auto turn off, same as above with restart of time cycle if motion is detected on the scale (prevents the scale from turning off while in use).

2.4.2 Configuration for Battery Operation

The configuration for battery operation is as follows:

1. The clock function in Option 3 must be enabled and set if Option 4 is to be used (see Section 3.3.3 on page 22).
2. Option 4 must be set as follows (see Section 3.3.4 on page 23 for further details).

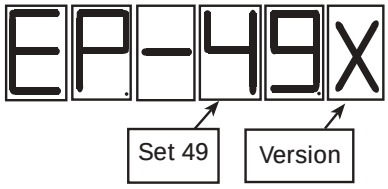
A. Option 4 off (unit operates as push on - push off)
B. Option 4 on (the turn off timer is enabled)
C. Parameter 4.1 selects the turn off time (1 to 9 minutes)
D. Parameter 4.2 set to off runs normally/turns off at end of time cycle.
E. Parameter 4.2 set to on will restart timing function when unit is timing and motion is detected on the scale.

Table 2-5. Configuration of Battery Operation

2.5 Instrumentation Setup

All indicators are configured and tested prior to shipment to ensure that they are fully functional. The unit can be turned on immediately after connecting the input power and the load cells.

The UMC 600IS operates with the program KDA—49 programmed onto a 27C512 EPROM. 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.



Where:

EP.	=	EPROM Program
49.	=	Set 49 within the KDA 1921 family
X	=	The version level of Set 49

Figure 2-3. Example of EPROM Display

NOTE: *Battery operated units are set up in the factory with the sleep timer enabled. When connecting the battery pack, press the ON/OFF button in the lower left hand corner of the indicator turning the unit on. At the end of the programmed time the unit automatically turns off. The factory preset power off time delay is configurable under option 4 and can be lengthened or shortened for the operators specific application.*

To ensure that the UMC 600IS is in proper operating condition, the indicator can be tested in a safe area with a load cell simulator. The input signal should be as close as possible to the normal system millivolt value. Figure 2-4 shows the simulator-to-indicator wiring connection in a six-wire configuration. See Section 2.6 on page 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.*

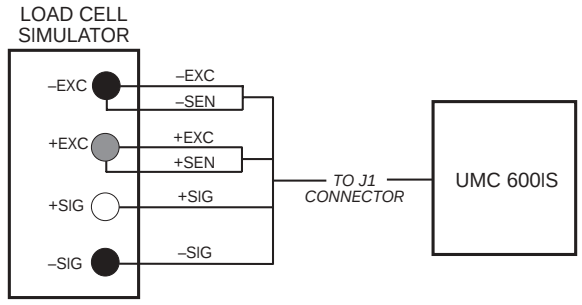


Figure 2-4. Wiring Connection to Simulator

Caution *Exceeding rated load cell load or shorting excitation wires may damage power supply.*

NOTES:

- Test weights or a water meter calibration can be used to verify scale performance.
- The tilt stand should be secured with 1/4-20 inch screws. The location should be selected to offer some degree of protection for the indicator and its associated hardware.
- Unprotected cable runs need to be installed in a method to protect the cable from damage.
- All wiring must conform to the National Electrical Code and RP 12.6.

See control drawing 54136, Sheet 2, in the back of this manual for system interconnection details.

2.6 Load Cell Wiring

All units are equipped with a six-wire load cell connector. Condec supplies load cell cable in various lengths (see Table 2-3 on page 5). One end of the cable attaches to the indicator; the other end has stripped and tinned wires for connection to a junction box. The UMC 600IS is supplied with a blank six-pin connector that can be attached to existing load cell cables by the installer.

Figure 2-5 shows the load cell output connector and the location of J1 on the back of the indicator. Table 2-6 shows the load cell connector pin assignments.

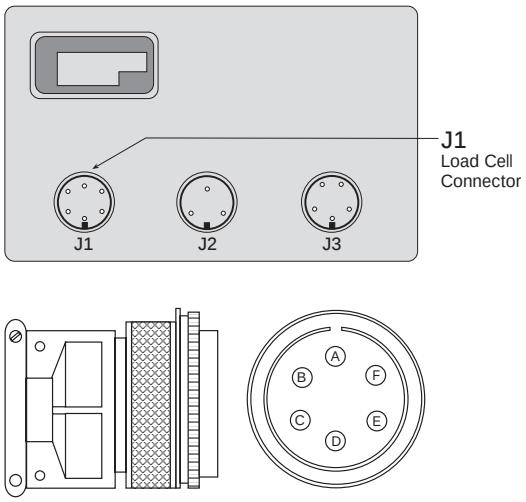


Figure 2-5. J1 Load Cell Connector-facing

Pin	Function
A	+EXCITATION
B	–EXCITATION
C	+SIGNAL
D	–SIGNAL
E	+SENSE
F	–SENSE

Table 2-6. Load Cell Connector Pin Assignments

For four-wire load cell connections, short the sense lines to the excitation lines as shown in Figure 2-6.

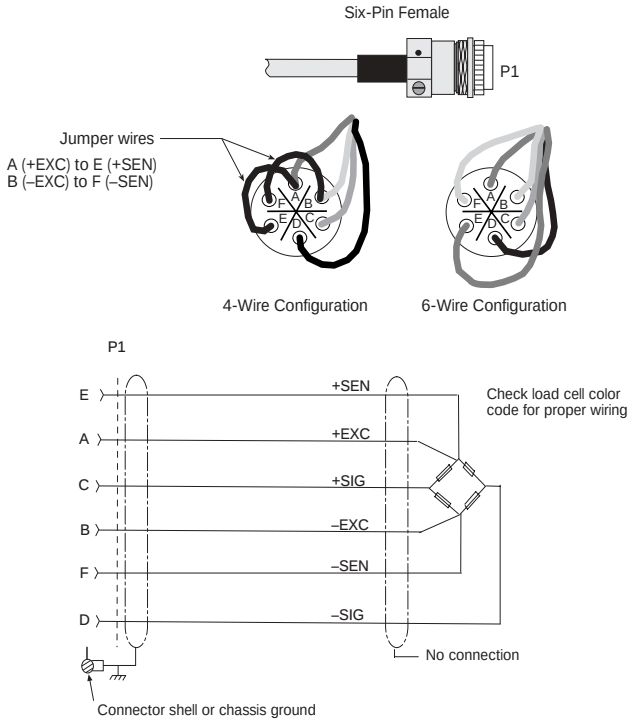


Figure 2-6. Load Cell Wiring

2.7 Serial Port Wiring

Serial Port 1 is a bidirectional (full duplex) port supporting active 20 mA current loop communications. Port 1 is optically isolated through the intrinsically safe I/O barrier.

The UMC 600IS serial port can be configured to communicate directly to a printer, remote display, or other device using 20 mA communications through the I/O interface barrier (see Figure 2-7). Since the I/O barrier is totally passive (not powered), the receiving device must also provide an active 20 mA current loop interface.

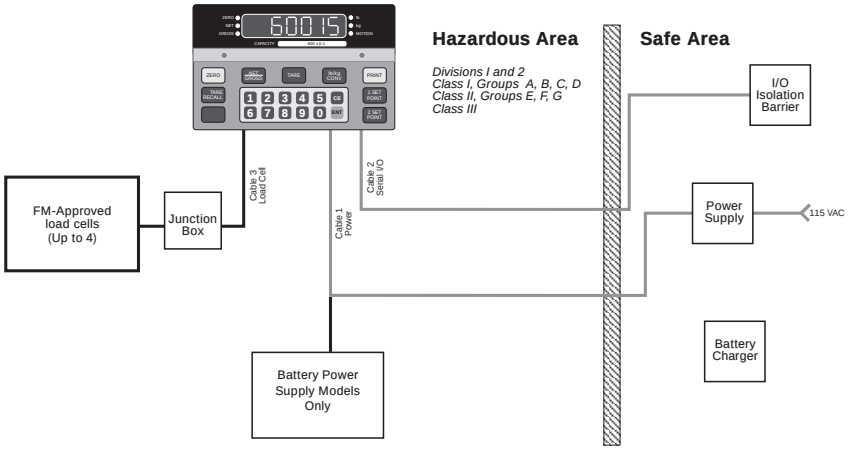


Figure 2-7. Intrinsically Safe System using Serial Communications

NOTE: *The serial communications capability of the UMC 600IS is dependent on the product specifications of the receiving device. All serial communications applications should be tested with the I/O barrier in place.*

Access to this serial communication port is through the five-pin female connector (J3) located on the back of the UMC 600IS indicator (see Figure 2-8). See the output connector diagram in Figure 2-8 and Table 2-7 for connector and wire identification.

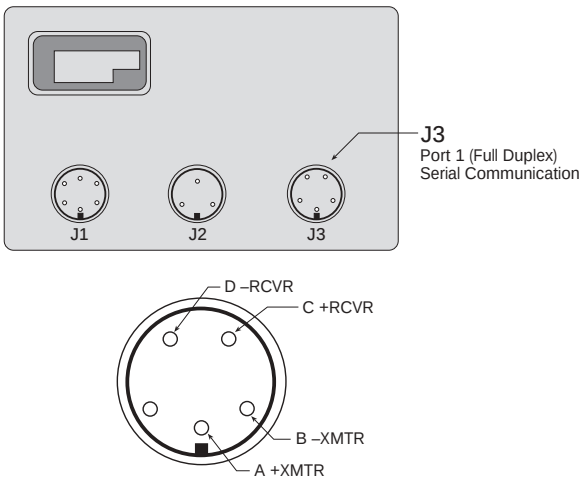


Figure 2-8. Serial Port, J3 Connector

J3 Pin	Function	I/O Barrier TB4	I/O Barrier TB5	End Unit
A	+XMTR	21	28	RXDCL+
B	–XMTR	22	27	RXDCL–
C	+RCVR	23	26	TXDCL+
D	–RCVR	24	25	TXDCL–
E	—			
—	SHIELD			

Table 2-7. Serial Port Connector Wiring

Serial Port configuration is explained in greater detail in Section 3.2 on page 16 of this manual.

2.8 Troubleshooting and Testing the 600IS

Troubleshooting the system components in a safe area can be done in the normal manner utilizing any test equipment that is necessary. However, prior to any test or measurement that is done in a hazardous area, the plant manager or safety official must be notified to obtain permission or specific instructions.

The following basic procedures should be observed to provide a safe installation.

- Follow all plant safety procedures.
- Verify what type test equipment is allowed in the hazardous area.
- Do not bring into the hazardous area any inductive continuity testers.
- Do not bring any capacative discharge type devices into the hazardous area.
- Ask the plant authority if the use of non-sparking tools are required.

2.8.1 Troubleshooting

The following should be a guide during the installation of the weighing system in a hazardous location.

- Troubleshooting should only be done by qualified field service scale installation personnel.
- Component level repair is not permitted on Factory Mutual approved equipment.
- A factory trained technician can replace plug-in IS barrier equipment in the safe area.
- It is manditory to return the UMC 600IS to the factory for repair and full testing.
- Tampering with the intrinsically safe equipment voids the Factory Mutual approval.
- Safe area voltage measurements are as follows:

Power Supply Output Voltage	
No load	8.0 +/- 0.2 VDC
One load cell	7.6+/- 0.2 VDC
Four load cells	6.5 +/- 0.2 VDC

Table 2-8. Output Voltage

The power supply output voltage can be measured at the following terminals:

- TB2-4 +VDC (positive lead)
- TB2-5 DC Com (negative lead)

Caution *Shorting these terminals will blow the fuse in the intrinsically safe barrier module 59267.*

Field replaceable parts are listed below for the UMC 600IS digital weight indicator.

Condec Part Number	Description
58805	Power supply
65004	Power supply board assembly
59267	Plug-in barrier
59942	Fuse, 0.25A
55683	I/O barrier
57415	I/O barrier board assembly
54966	Plug-in I/O barrier
56214	Battery pack module
54087	Battery charger
52216	Tilt stand (battery unit)
54074	Load cell connector (6 pin)
54080	Power connector (3 pin)
54084	I/O connector (5 pin)

Table 2-9. Field Replaceable Parts

3.0 Configuration

Prior to calibration, the UMC 600IS must be digitally configured, or assigned a set of operating parameters. The first three parameters are directly related to calibration and must be set before proceeding to calibration mode.

3.1 Digital Configuration

3.1.1 Parameter Overview

Table 3-1 on page 12 lists configuration parameters and describes their values. The following paragraphs give the procedure for configuring the UMC 600IS.

3.1.2 Configuration Procedure

1. Unscrew the two screws on the face plate bracket (See Figure 3-1). The bracket drops down, exposing four program switches on the left.

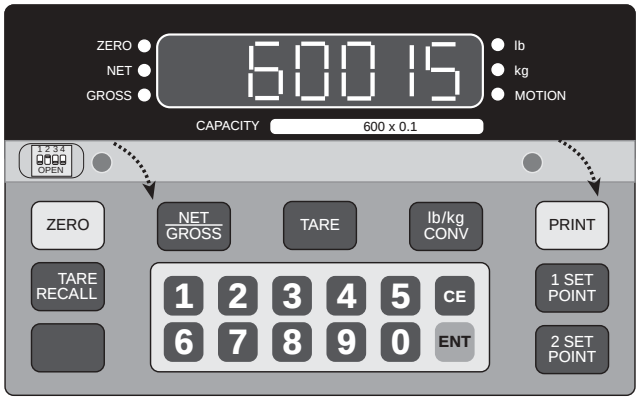


Figure 3-1. Accessing the Program Switches

2. Temporarily remove the unit's flexible black display panel by gently pushing down and lifting the panel up and out at its center to expose the configuration and calibration instructions printed on the surface below. The switch function table defines the appropriate front panel switch settings for the CONF and CAL modes.
3. Close switch SW1-2, marked CONF (2), by moving to the up position (see Figure 3-2). A prompt appears with a parameter number and data value.

The parameter identifier is a number, 1–14, that correlates to the CONFIG chart on the upper left of the switch map panel. Selected data represents the value being entered into the unit configuration data. For example, 1 100 sets the indicator to 10,000 graduations (see Table 3-2 on page 13).

When configuration is complete, set SW1-2 open (down) to return the unit to normal operating mode.

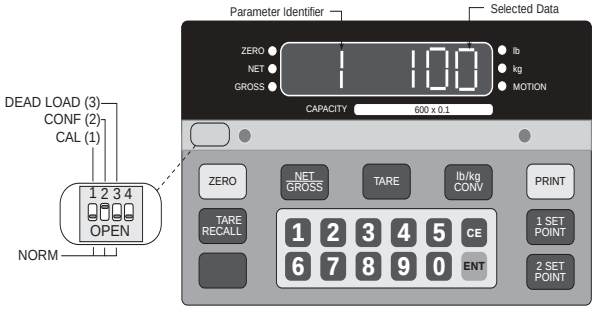


Figure 3-2. Closing Switch 2

The function keys shown in the table in Figure 3-3 have alternate functions during digital configuration.

Zero	Net/Gross	Tare	lb/kg Conv
Parameter Select	Parameter Data Select	Subparameter Select	Subparameter Data Select

Figure 3-3. Front Panel Key Functions

NOTE: *The* TARE RECALL *key functions as a previous screen key in CONFIG mode.*

3.1.3 Digital Configuration Parameters

Table 3-2 on page 13 lists the configuration display prompts (Prompt 1) and their value selections for displayed graduations. Prior to calibration, the UMC 600IS must be digitally configured, or given its set of operating parameters. The first three parameter selections are directly related to calibration and must be set up before proceeding to the calibration mode. These parameters include the number of graduations, the resolution, and the decimal point location in the weight data, all of which define the scale capacity.

Table 3-3 lists Prompts 2 and 3 and Table 3-4 has Prompts 5, 6, and 7. Prompts 8, 9, and 10 are shown in Table 3-5 and Prompts 11 through 14 are listed in Table 3-6 both on page 15.

Parameter	Description	Values
1	Graduations	NTEP to 10,000 (80,000 available).
2	Display resolution	1, 2, 5, 10, 20, 50, 100
3	Decimal point	0, 0.0, 0.00, 0.000, 0.0000
4	Span select	Parameter 4 is not configurable: Span selection is automatically set for the following ranges: Lo = 1.7 – 3.3 mV/V; Hi = 0.5 – 2.0 mV/V
5	Digital averaging	1, 2, 4, 8, 16, 32, A1 = 8-4-2; A2 = 16-8-2
6	Tare mode	ATNR, AUTO, FIXED, BOTH (inhibit with motion)
7	AZM band	Off, 0.5, 1, 3, 5, and 10 divisions Use 0.5 for H-44, bench, counter and livestock applications; use 3 for vehicle, axle-load, and railroad scales
8	AZM/PAZ aperture	±1.9%, 100% of capacity includes push-to-zero, H-44: 1.9%
9	Motion	Off, 1, 3, 5, 10, 20, 50 divisions H-44: vehicle, axle, livestock, RR, 3.0; all other 1.0
10	Displayed units	Lb and kg conversion
11	Setpoint mode	Not supported
12	Zero band	Not supported
13	Weigh mode	Not supported
14	Serial output	Port 1, demand, continuous, baud rate, G/T/N, or display (Port 2 not supported)

Table 3-1. Parameter Overview

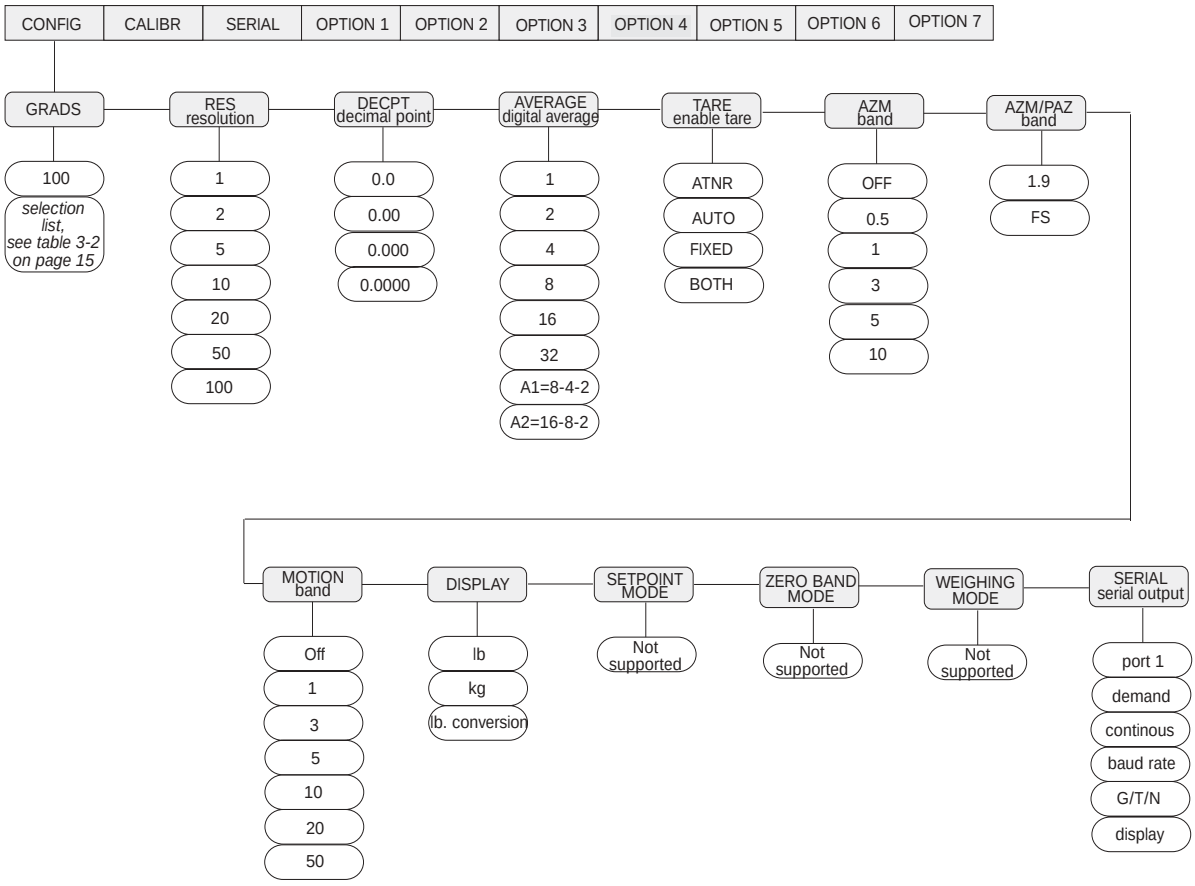


Figure 3-4. Configuration Menu

Prompt Display		Interpretation	Notes
Displayed Graduations			*Number of Graduations* = $\frac{\textit{Scale Capacity}}{\textit{Resolution}}$ Legal for trade values: 500–10000 (Refer to Paragraph 4.3)
1	5	500	
1	10	1000	
1	15	1500	
1	20	2000	
1	25	2500	
1	30	3000	
1	40	4000	
1	50	5000	
1	60	6000	
1	80	8000	
1	100	10000	
1	120	12000	Not valid in legal-for-trade applications
1	140	14000	
1	160	16000	
1	180	18000	
1	200	20000	
1	300	30000	Not valid in legal-for-trade applications These selections available only if Option 1 (expanded resolution) is enabled
1	400	40000	
1	500	50000	
1	600	60000	
1	700	70000	
1	800	80000	

Table 3-2. Configuration Display Prompt 1

Prompt Display		Interpretation	Notes
Resolution / display divisions			*Scale capacity = displayed graduations x resolution* Resolution is determined by the combination of Parameters 2 and 3. For example: • If Parameter 2 = 1 and Parameter 3 = 0.00, display resolution is 0.01 • If Parameter 2 = 5 and Parameter 3 = 0.0, display resolution is 0.5 • If Parameter 2 = 10 and Parameter 3 = 0, display resolution is 10 (Refer to Paragraph 4.3)
2	1	1	
2	2	2	
2	5	5	
2	10	10	
2	20	20	
2	50	50	
2	100	100	
Decimal Point Location			
3	0	No decimal point	
3	0.0	*xxxxx.x*	
3	0.00	*xxxx.xx*	
3	0.000	*xxx.xxx*	
3	0.0000	*xx.xxxx*	

Table 3-3. Configuration Display Prompts 2 – 3

Prompt Display		Interpretation		Notes
Digital Averaging		No. Averages	Update Rate	
5	1	1	10/sec	
5	2	2	5/sec	
5	4	4	2.5/sec	
5	8	8	1 sec	
5	16	16	2 sec	
5	32	32	4 sec	
5	A1	8-4-2	Variable	
5	A2	16-8-2	Variable	
Tare Enable				Selection of either fixed tare (Ft) or fixed tare and auto tare (both) in Parameter 6 allows up to a six digit fixed tare entry to be made using the numeric front panel keys or, when configured for full duplex serial communication, a fixed tare entry can be down loaded through the serial port.
6	Atnr	Auto (stored) tare only – no recall		
6	AUto	Auto (stored) tare only		
6	Ft	Fixed (manual) tare only		
6	both	Auto or fixed tare		
AZM Capture Band (Displayed Grads)				
7	oFF	Off		
7	0.5	±0.5		
7	1	±1.0		
7	3	±3.0		
7	5	±5.0		
7	10	±10.0		

Table 3-4. Configuration Display Prompts 5 – 7

Prompt Display	Interpretation	Notes
AZM/PAZ Aperature		
8 1.9	±1.9% of full scale	
8 FS	100% of full scale	
Motion Band		
9 oFF	Off	
9 1	±1.0	
9 3	±3.0	
9 5	±5.0	
9 10	±10.0	
9 20	±20.0	Selections available when Option 1 is enabled
9 50	±50.0	
Display Base (lb/kg)		
10 lb	lb display only	
10 kg	kg display only	
10 Con	lb (base) conversion	lb/kg CONV key functions only if Parameter 10 is set to 10 Con

Table 3-5. Configuration Display Prompts 8 –10

Prompt Display	Interpretation	Notes
11 Setpoint mode		Not supported
12 Zero Band Control output		Not supported
13 Weighing Mode		Not supported
14 Serial Configuration		See Section 3.2 on page 16.

Table 3-6. Configuration Display Prompts 11 – 14

3.2 Serial Port Configuration

Serial Port 1 is an ASCII-compatible, 20 mA current loop output that is compatable with most printers, scoreboards, and other remote devices. (Port 2 is not available). Port 1 output can be disabled, set for demand mode, or set to continuous output data and is optically isolated through the intrinsically safe I/O barrier.

Table 3-7 shows the configuration selections for Parameter 14, which controls the configuration of Port 1. There is no external access to Port 2 and it should therefore be disabled (Parameter 14.5 set to OFF).

NOTE: RS232 communication is not available from the UMC 600IS. If RS232 is required, it is recommended that the Analog Option P/N 19578 be ordered and have U14, C6, C7, C8 and C9 installed.

Parameter	Subparameter	Interpretation
14. oFF		Serial communications disabled
14. S1		Port 1: simplex
14. dU		Port 1: duplex
14.1	Demand print configuration in net mode	
	14.1Gtn	Three-line output G-N-T
	14.1nEt	Single line, net print
14.2	Delay after carriage return (CR) enabled	
	14.2 oFF	No delay after CR
	14.2 1	1 second delay after CR
	14.2 2	2 second delay after CR
	14.2 3	3 second delay after CR
	14.2 4	4 second delay after CR
14.3	Port 1 configuration	
	14.3 oFF	Port 1 disabled
	14.3 dE	Demand output
	14.3 Co	Continuous output
14.4	Port 1 baud rate	
	14.4 3	300 bps
	14.4 6	600 bps
	14.4 12	1200 bps
	14.4 24	2400 bps
	14.4 48	4800 bps
	14.4 96	9600 bps
14.5	Port 2 configuration	
	14.5 oFF	Port 2 disabled

Table 3-7. Parameter 14 Configuration Prompts

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

Data Formats
1 Start bit
7 Data bits
1 Parity bit (odd parity)
1 Stop bit

Table 3-8. Data Formats

3.3 Options Configuration

The UMC 600IS offers a selection of optional 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 options are:

- Option 1 - Expanded resolution
- Option 2 - Analog output
- Option 3 - Time and date
- Option 4 - Auto shutoff
- Option 5 - Not used
- Option 6 - Five-point linearization
- Option 7 - Smart serial I/O

To access digital option configuration, close switches SW1-2 and 1-3 (Figure 3-5). If the option mode has been enabled, selections are available. If the option mode is not enabled (all options turned off), dashes appear across the display (**- - - - -**). Press and hold the ENT key until *OPtion* appears on the display.

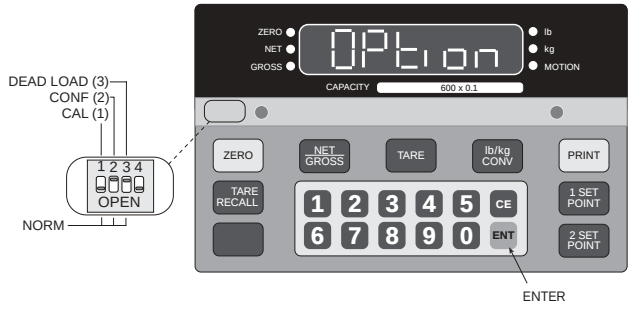


Figure 3-5. Close Switches SW1-2 and 1-3 for Option Configuration

In the option mode, primary function keys (ZERO, NET/GROSS, etc.) operate as secondary function keys (Figure 3-6).

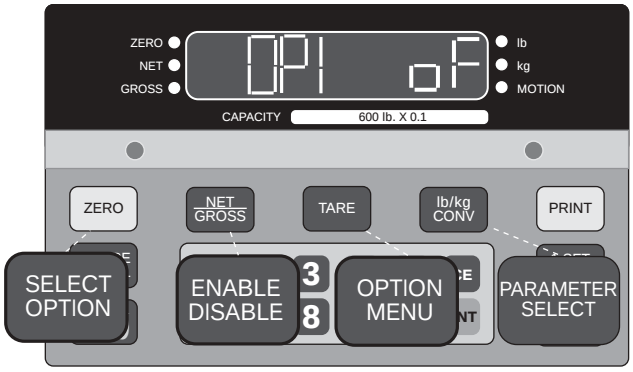


Figure 3-6. Front Panel Keys with Alternate Functions in Options Menu

Use the ZERO key to select Options 1, 2, 3, 4, 6, or 7, or the TARE RECALL key to scroll backward through the options. To enable a selected option, use the NET/GROSS key.

Some options, once enabled, may have an option submenu available. Use the TARE key to access the option submenu. To make parameter selections in the option submenu, use the lb/kg CONV 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 – *Increments option number*

NET/GROSS – *Turns options ON/OFF*

TARE – *Steps through subparameters or functions as ENTER for numeric changes*

lb/kg CONV – *Selects subparameters or digit position/decrements digit for numeric changes*

PRINT – *Increments digit for numeric entries*

TARE RECALL – *Provides backstep in configuration mode*

0 – 9 – *Used to enter numeric values directly, including ZERO/SPAN values in Option 2 or TIME/DATE in Option 3 mode*

3.3.1 Option 1 – Expanded Resolution

Enabling Option 1 increases the indicator resolution by allowing display graduation selections beyond the normal 20,000 in Parameter 1 of the configuration mode.

Up to 80,000 displayed graduations are available when this option is on; however, applying such high gains to the data may cause undesirable display instability in some applications.

The expanded resolution (OP.1) is shown in Table 3-9.

Prompt Display	Interpretation
Expanded Resolution	
OP.1 oF OP.1 on	Off On (expanded up to 80,000 displayed graduations)

Table 3-9. Expanded Resolution Options

The Option 1 parameters are graphically illustrated in Figure 3-7, shown below.

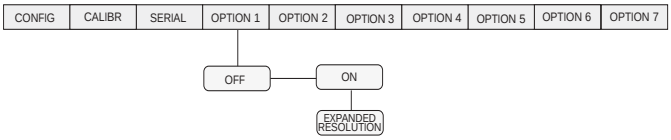


Figure 3-7. Option 1 Menu

3.3.2 Option 2 – Analog Output

Option 2 enables the analog output option. The following features of analog output are;

- Converts serial data into analog: 0–10VDC or 4–20 mA
- Ordered as a kit, it must be operated remotely from the digital weight indicator
- Self-powered, 115 VAC provides isolated output
- Automatic data checking/verification
- Analog output tracks gross, net, or displayed weight
- Full digital calibration (indicator front panel)
- Serial data “pass-through”

Serial data from the indicator is modified to include scaled information special for the analog output module. The standard communications are also included to allow the module to pass-through printer or scoreboard information.

NOTE: *The serial pass-through does not have duplex capability.*

The analog output is fully isolated with its own power supply and current loop communications. The analog module can be located remotely up to 1000 feet from the indicator ***but must be located in the safe area***. After wiring and setting the module’s baud rate, the remaining setup and calibration is done at the indicator.

Specifications

Current output is 4–20 mA with a maximum impedance less than or equal to 600Ω.

Voltage output is 0–10 VDC with a minimum load resistance of 1kΩ.

Test Modes

Switch settings are provided to force the analog output to zero, full scale, or to provide a continuous sawtooth waveform for system checking.

Error Checking

Serial data is continually checked for parity, valid characters, and presence of communication. Loss of data is indicated by forcing the analog output to a minimum value of 0.5 VDC or 3.2 mA (approximate). If the indicator is in an overload condition, the analog output is forced to 5% over full scale. With the 4–20 mA output, an additional alarm is provided to detect the lack of current (break) in the loop.

Communication Verification

An LED (DS1) is provided on the analog module:

- ON = Communications OK
- Pulse = Communications errors
- OFF = No power

Calibration

Using the host, settings are provided for zero, span, and trim adjustments. The settings are all digital therefore no potentiometers are required. During the trim adjustments for zero/span, the analog output is forced to the zero/span previously selected in option mode parameters 2.5 and 2.6. While reading the analog output, the trim is increased or decreased from 0 to ± 175 until the reading agrees with the values entered in 2.5 and 2.6.

Table 3-10 shows the Option 2 configuration parameters.

Option	Prompt Display	Interpretation	Notes
All off	--------	Mode not enabled (Options 1 through 7 turned off)	—
OP.2	OP.2 o F OP.2 o n	Off Analog option disabled On Analog option enabled	—
	2.1 dSP Gr net	Analog tracks display Analog tracks gross weight Analog tracks net weight	—
	2.2 P.1 P.2	Indicator data out on Port 1 (to analog) This port is not used	Use standard indicator setup for serial configuration under menu 14 (configuration Switch S-2 closed) to establish communications before using the Option 2 menu. Port 1 from the indicator to the analog module must be set for the desired baud rate and be in continuous output mode. In the Option 2 menu, set the indicator port to 1. On analog board S1, set baud rate switches (1 and 2) to match Menu 14.
	2.3 OFF dE Co	Analog module does not pass serial data Analog module outputs serial on demand Analog module outputs serial continuously	
	2.4 12 24 48 96	Pass-through serial output baud rate 1200 baud 2400 baud 4800 baud 9600 baud	—
	2.5 Zr	Enter weight value for analog zero using the numeric keys. The TARE key stores new value; the display responds with ENTER.	The display for Parameters 2.5 through 2.8 alternate between the parameter selection and the actual data value currently entered. This alternation will continue until the data for the parameter has been increased or decreased. NOTE: *After entering new data, use TARE key to store.* The display will again resume switching between parameter and data.
	2.6 FS	Use the same procedure as 2.5 to enter analog full scale value.	
	2.7 Zr.A	ZERO TRIM: While measuring the analog output, use the lb/kg CONV and PRINT keys to increment/decrement the zero value. Increment/decrement function forces a test mode zero output. The TARE key stores the new value.	
	2.8 SP.A	SPAN TRIM: Same as 2.7 except a span test mode output is provided.	

Table 3-10. Option 2 Analog Output

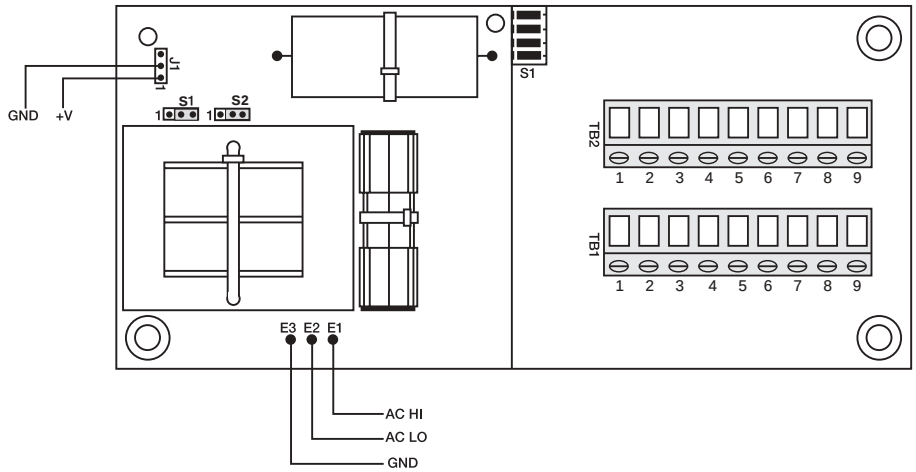


Figure 3-8. Analog Module Setup and Wiring

Baud rate	SW1 Setting	
	1	2
1200	Off	Off
2400	On	Off
4800	Off	On
9600	On	On
Mode	3	4
Normal operation	Off	Off
0 VDC/4 mA (test only)	On	Off
10 VDC/20 mA (test only)	Off	On
0–10 VDC/4–20 mA ramp (test only)	On	On

Table 3-11. Baud Rate and Switch SW1 Settings

TB1	Description	TB2	Description
1	4–20 mA	1	Zero
2	Ground	2	Gross/Net
3	0–10 VDC output	3	Tare
4	Alarm	4	Start
5		5	Ground (–20 mA input) common
6	+20 mA TXD	6	RS-232 TXD
7	–20 mA TXD	7	+5 VDC
8	+20 mA RXD	8	–20 mA
9	-20 mA RXD	9	Demand print
NOTE: Jumper TB1-8 to TB2-7 (5 VDC) to make the analog output module an active device.			

Table 3-12. Description of Terminal Boards TB1 and TB2

Communication Wiring to Host Indicator

Analog Module Serial Pass-Through

The serial data from the host digital weight indicator is provided as a simplex output with the same format as the host.

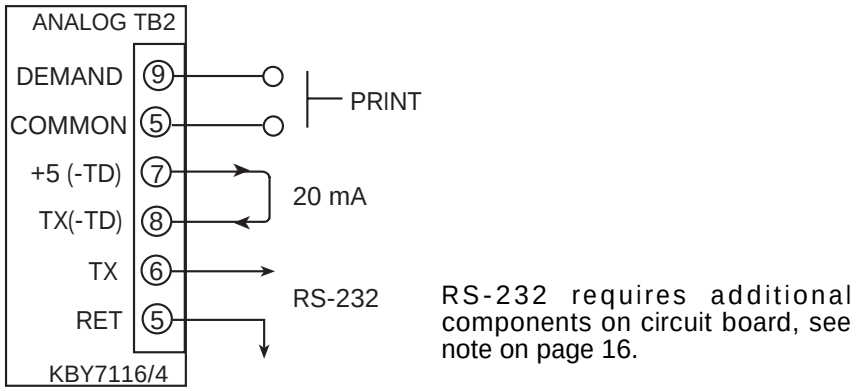


Figure 3-9. Analog Module Pass Through Wiring

The Option 2 menu parameters are graphically illustrated in Figure 3-10 shown below.

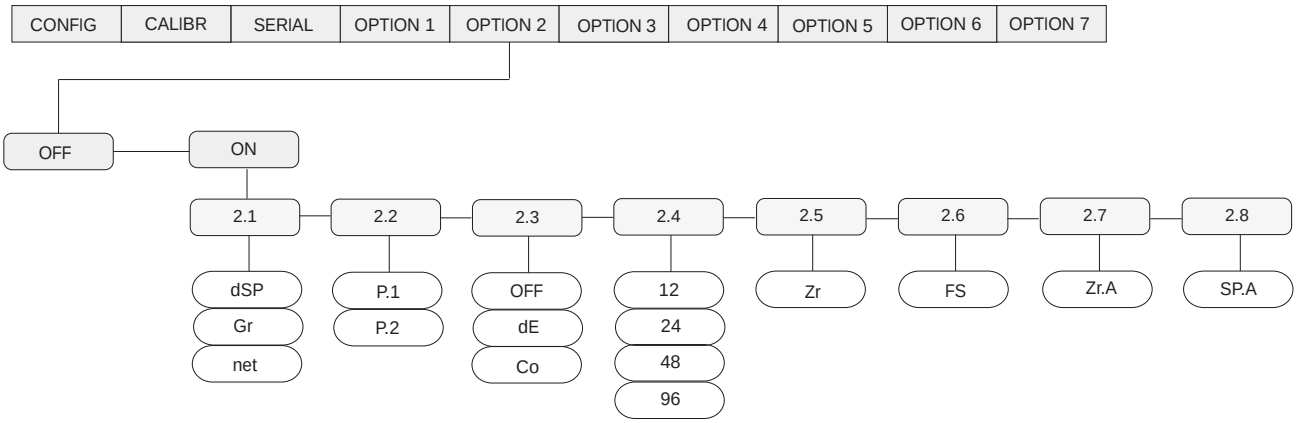


Figure 3-10. Option 2 Menu

3.3.3 Option 3 – Time and Date

The time and date clock is attached to the battery-backed memory (U4) and will continue running when the indicator is off. A variety of formats for printout are available, and access is provided for adjustments (see Table 3-13).

NOTE: *Option 3 must be enabled when using the Option 4 auto shutoff feature.*

Prompt Display		Interpretation	Notes
Time and date option			Time and date settings can be directly accessed in normal running mode by holding down both the 0 and 3 keys for a few seconds. The operator can then make changes without using option switches. To exit, press the 0 key.
OP.3	oFF	Off (time and date disabled)	
OP.3	On	On (time and date enabled)	
3.1	Std dLs	Standard Time Daylight Savings Time	
3.2	12 24	Selects 12- or 24-hour time display	
3.3	A P	AM (A) or PM (P) setting when 12-hour clock is selected	
3.4	Un Ab on	Selects the location of printed time and date data: under (Un), above (Ab), or on the same line (On) as weight data.	
3.5	LEt nO	Prints date in letters (LEt) or numbers (nO). For example: Sept 1, 1999 vs. 09/01/99	
3.6	tI	Time. Use numeric keys to enter the time in hours, minutes and seconds (HHMMSS), then press the ENTER key (see Note below)	The display for parameters 3.6 and 3.7 alternates between the parameter and the current data value. This continues until new data is entered using the numeric keys. After entering new data, press ENTER again to alternate the display.
3.7	dA	Date. Use numeric keys to enter the date in month, day and year format (MMDDYY), then press the ENTER key (see Note below)	

NOTES:

- Prior to setting the time and date, select the current time for parameter 3.1(either dLS or Std). This feature selection now allows the operator to increment or decrement the time by one hour when clocks are changed from dLS to Std. To change the time, access Option 3 using the TARE key and then push the Lb/kg key to toggle from dLS to Std or vice versa.
- The display for parameters 3.6 and 3.7 alternates between the parameter selection and the current data value. This continues until new data is entered via the numeric keys. After keying in new numeric data, press the ENTER key to save the new value. The display will again alternate.
- Time and date can be directly accessed in normal running mode by pressing both the 0 and 3 keys for a few seconds. This allows the time or date to be changed without using the option switches. To exit, press the 0 key.

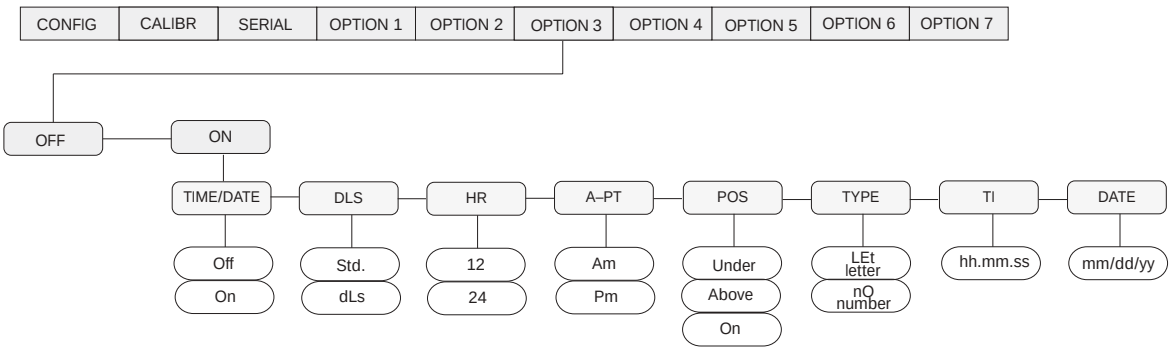


Figure 3-11. Option 3 Menu

3.3.4 Option 4 – Auto Shutoff Mode

The auto shutoff mode can prolong battery life for applications using the battery input power to the indicator.

Option 4 allows the indicator to be configured to shut off automatically when idle for a specified time (1–9 minutes). Parameter 4.2 can be enabled to reset the shutoff timer if motion is detected on the scale after the timer is started.

Option 4 is not a "sleep mode"; once the indicator shuts off, it must be turned on again. With Option 4 enabled, the on/off switch becomes active (see Figure 3-12) and can be used to restart the unit.

NOTES:

- Option 4 requires hardware setup inside the indicator enclosure and must be enabled at the factory.
- Option 3 (time and date) must be enabled and set to use Option 4.

Prompts for auto shutoff mode (OP.4) are shown in Table 3-13.

Prompt Display	Interpretation
Auto Shutoff Mode	
OP.4 oFF	Off: Auto shutoff mode disabled
OP.4 on	On: Auto shutoff mode enabled
Shutoff timer value	
4.1 *n*	Set number of minutes, 1–9, before shutoff
Motion detection	
4.2 on	On: Shutoff timer is reset if motion is detected before timer expires
4.2 oFF	Off: Indicator always shuts down when shutoff timer expires

Table 3-13. Option 4 Configuration Selections

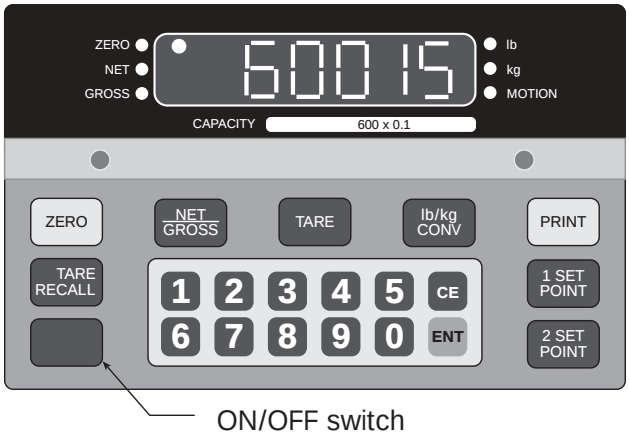


Figure 3-12. On/Off Switch for Option 4

3.3.5 Option 6 – Five-Point Linear Calibration

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 6 places the indicator in a linearization calibration when the unit is in the calibration mode (SW1-1 closed on front panel DIP switch). Use the five-point linearization procedure outlined in Section 4.3 on page 30 to perform a scale calibration when Option 6 is enabled.

The five-point linearization calibration (OP.6) is shown in Table 3-14.

Prompt Display	Interpretation	Notes
Five-point linearization		
OP.6 oFF	Off	—
OP.6 on	On	Enter up to five linearization points

Table 3-14. Option 6 Configuration Selections

3.3.6 Option 7 – Smart Serial I/O

The smart serial I/O option offers flexibility for an operator to customize the serial output format for individual system requirements. The selections under Option 7 can be divided into three groups.

- Customizing of serial output data.
- Setup of MACRO files.
- Those files that affect serial operation.

These sections are addressed in detail below.

Customizing Files

The smart serial I/O option offers flexibility for an operator to customize the serial output format for individual system requirements. The selection of the associated custom print file is performed automatically by serial port and the data mode (gross, net, total recall, or special) that the UMC 600IS is currently in at the time of a print.

The custom print supports:

- Specifying starting and terminating characters like -STX, CR, LF.
- Adding printer control characters.
- Custom headers and titles.
- Customizing units to ounce, tons, or pounds.
- Customized parameters such as “gross weight” instead of “GR”.
- Custom insertion of special parameters such as time/date and identification number.
- Delays where and when required.
- Custom “P” print out in duplex mode.

NOTE: *Custom print does not support RS 485 protocol.*

3.4 Setting Up Custom Transmits (Smart I/O)

The following sections serve to give a more detailed explanation of Option 7.

3.4.1 Enabling Option 7

To enable Option 7:

1. Put the indicator into digital option configuration mode by closing front panel DIP switches 2 and 3. If all of the options are turned off, the display shows dashes (------).
2. Press and hold the ENTER key on the keypad until the word *OPtIon* appears on the display.
3. Release the ENTER key and the display changes to *O P . I o F*, indicating that you are at Option 1 and that it is currently turned off (*o F* indicates the option is off, *o n* indicates that the option is on). At this point, the ZERO key steps forward through the options and the TARE RECALL key steps backward through the options. For instance, if you press the ZERO key once, the display shows *O P .2 o F*, indicating that Option 2 is currently turned off.
4. Press the ZERO key again and the display shows *O P .3 o F*.
5. Press the TARE RECALL key to step back to option 2.
6. Press the ZERO key until the display reads *O P .7 o F*.
7. Press the NET/GROSS key to turn on Option 7.

Custom Transmit Files

The indicator has two custom transmit files for Port 1 (there is a third file - file 7.4 - for Port 1, but it is reserved for future use). Each of the custom transmit files may contain up to 30 character codes. If you need a custom transmit to print more than 30 character codes, you need to use the custom transmit macros which are explained in a later section. The codes may be any of the ASCII codes (see Table 6.2 on page 37) or parameter control codes (see Table 3-20 on page 29).

The following sections call out what each file is used for.

File 7.1: Gross Weight Data on Port 1

File 7.1 is used to customize the format of the gross weight. This changes the way the printout appears when the indicator is in the normal mode and the gross weight is on the display.

File 7.2: Net Weight Data on Port 1

File 7.2 is used to customize the net data (for example, gross, tare and net weights).

NOTE: *You must have a tare weight (press the* TARE *key) in order for File 7.2 to be printed. Without a tare weight, the indicator defaults to printing File 7.1 or the standard printout if File 7.1 does not contain a custom transmit or an invalid custom transmit.*

File 7.4: Special on Port 1

File 7.4 is currently reserved for future use by Condec.

Macro Files

There may be times when you need to print more than the 30 character codes that are allowed in the custom transmit files (7.1 - 7.4). To do custom transmits larger than 30 character codes, the indicator provides eight macro files (7.9 - 7.16) that may be called in from the custom transmit files. This is done by putting a parameter code of 600, 601, 602, 603, 604, 605, 606 or 607 in your custom transmit files. Each macro file can contain up to 30 character codes. You can, however, call more than one macro in your custom transmit or even call the same macro more than once. Any codes that you can enter into the custom transmits can also be entered into the macro files. A string of up to 250 characters may be printed by using a custom transmit and any combination of macro files.

Planning Custom Transmits and Macros

Starting with a very simple example, suppose that you want to print the TIME and DATE on the weight tickets using the indicator's custom transmit feature (you must enable and configure the TIME and DATE option: Option 3). The example uses normal weigh mode.

Although it is not absolutely necessary to write out the codes first, you may find this advisable the first few times until you understand doing custom transmits. These pages could also be put into the job files for later reference (in case the indicator has to be replaced for example).

Make sure to denote the specific file you are working on and add some sort of file description. The indicator formats the output according to the File 7.1 when the gross weight is on the display. It is used to print the gross weight only. You should not attempt to print the tare or net weights in File 7.1 (you must use File 7.2 for gross/tare/net printouts). If you attempt to print the net or tare weights from File 7.1, the indicator will consider that to be an invalid file and print the gross weight data using its default format.

The Parameter Code Command Chart (see Table 3-20 on page 29) lists special codes that are not actually sent to the printer, but instead tell the indicator to send one of its internal parameters such as weight data and TIME and DATE. All of the parameter control codes are numbers above 127. The indicator uses an eight data bit word, meaning that it can only send ASCII characters 1-127 (0 is a NULL and ignored by the indicator). The parameter control codes tell the indicator to print one of the indicator's parameters or to call one of the macro files.

At this point, it is recommended that you get your indicator, printer (hook up per instructions), and manual and follow along, or read first and then go through programming with the indicator.

NOTE: *Parameters 200-223 are used in the normal mode.*

Enter the digital option configuration mode (see Section 3.3 on page 17), then use the ZERO key to advance to Option 7. The display shows *OP7 of*. Press the GROSS/NET key to turn Option 7 ON. Press the TARE key to advance to File 7.1. Turn on File 7.1 by pressing the LB/KG CONV key. To access the first line of the file press 1SET POINT key. The display shows *01 XXX*. The left two digits show the line number of your file. The right three digits display the ASCII equivalent of the character you enter. Refer to the ASCII Control Code Chart (see Table 6.2 on page 37) or the Parameter Control Code Chart (see Table 3-20 on page 29) for the ASCII code you wish to enter.

To initiate the print:

1. Enter a Start of Text (STX) character in line 1. Press 2, then press ENT.

   NOTE: *An alternative way to enter the STX {002} character is to press 2 then advance to the next entry by pressing 1SET POINT, but you will not see the code you just entered. The display momentarily shows ENTER, then shows 01 002.*

2. Since we want to print TIME and DATE with our weight data, press keys 4, 0, 0, and then ENT (this tells the indicator to print the TIME and DATE as you have it set up in Option 3). Display shows *02 400.*
3. Press 1 SET POINT to advance to line 3. TIME and DATE are on one line, so end it with a Carriage Return/Line Feed (CR/LF).
4. Press 1,3 then ENT. The display shows *03 013*.

   NOTE: *Leading zeroes are not required.*

5. Press 1SET POINT to advance to line 4. The display shows *04 000*.
6. Press 1, 0 and ENT. The display shows *04 010*.
7. Press 1 SET POINT for line 5. According to the Parameter Control Code Chart 200 will print the weight as we have it set up in parameter 14.
8. Press 2, 0, 0 and ENT. The display shows *05 200.* Advance to the next line, enter the code for carriage return. The next line is line feed.

9. Press 9, 9, 9 and ENT to end this file. To review the file, press the 2 SET POINT key. With each press of this key we step back one line. Check against Table 3-15.

Line Number	Code	Code Definition
01	002	STX (start of text)
02	400	Time and date
03	013	Carriage return (CR)
04	010	Line Feed (LF)
05	200	Gross Wt. “LB/KG GR”
06	013	Carriage Return (CR)
07	010	Line Feed (LF)
08	999	End of file

Table 3-15. Print File 7.1 (7.1, T/D, Gross Wt.)

In the GROSS mode, press PRINT to produce a ticket in this format:

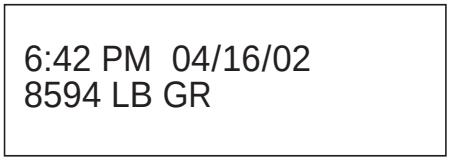


Figure 3-13. Sample Print from File 7.1

NOTE: *If the control code 400 is used in a custom print, you must enable and set Option 3.*

Notice that the sample print format does not exceed 30 lines of code. Now add a company name or logo to the ticket. We can do this by setting up a MACRO. This MACRO can be called into any format that is set up by using the correct Parameter Control Code. According to the Parameter Control Code Chart, if this information is to be used in a print format, enter a code 600 - call Macro 1.

Use the following example:

GLEN CO inc. (line 1)
GLENWOOD MN. (line 2)
Time/Date (line 3)
Format 1: GROSS weight (line 4)
Format 2: GROSS (ln 4), TARE (ln 5), NET (ln 6)

Line Number	Code	Code Definition
01	002	STX (start of text)
02	600	call MACRO 1 (File 7.9)
03	400	Print Time and Date
04	013	Carriage return
05	010	Line feed
06	200	Gross wt. “LB/KG GR”
07	013	Carriage return
08	010	Line feed
09	999	END OF FILE

Table 3-16. Print File 7.1 Example (7.1, Co. Logo, T/D, Gross Wt.)

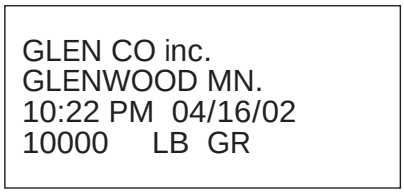


Figure 3-14. Sample Print from File 7.1

Line Number	Code	Code Definition
01	002	STX (start of text)
02	600	call MACRO 1 (File 7.9)
03	400	Print Time and Date
04	013	Carriage return
05	010	Line feed
06	220	Gross wt. “LB/KG GR”
07	013	Carriage return
08	010	Line feed
09	220	Tare wt. “LB/KG TR”
10	013	Carriage return
11	010	Line feed
12	210	Net wt. “LB/KG NT”
13	013	Carriage return
14	010	Line feed
15	999	END OF FILE

Table 3-17. Print File 7.2 Example (7.2, Co. Logo, T/D, GR, TR, NT)

```
GLEN CO inc.
GLENWOOD MN.
10:22 PM  04/16/02
10000     LB  GR
 5000     LB  TR
 5000     LB  NT
```

Figure 3-15. Sample Print from File 7.2

Line Number	Code	Code Definition
01	071	G alphabetic character
02	076	L alphabetic character
03	069	E alphabetic character
04	078	N alphabetic character
05	032	SP (space)
06	067	C alphabetic character
07	079	O alphabetic character
08	032	SP (space)
09	105	i alphabetic character
10	110	n alphabetic character
11	099	c alphabetic character
12	046	. (period)
13	013	Carriage return (CR)
14	010	Line feed (LF)
15	071	G alphabetic character
16	076	L alphabetic character
17	069	E aphabetic character
18	078	N alphabetic character
19	087	W alphabetic character
20	079	O alphabetic character
21	079	O alphabetic character
22	068	D alphabetic character
23	032	SP (space)
24	077	M alphabetic character
25	078	N alphabetic character
26	046	. (period)
27	013	Carriage return (CR)
28	010	Line feed (LF)
29	999	End of MACRO, return to main file

Table 3-18. File 7.9 Macro 1

NOTES:

- When necessary, the start of text (STX) character tells the printer that data is being transferred for printing.
- A macro does not repeat the start of text character. Only the main file has the STX character.
- Macros can be called as many times as needed in a print file.
- The code 999 serves as END OF FILE as well as RETURN TO MAIN PRINT FILE command.
- Files and MACROS have a maximum of 30 lines each.
- If the indicator is in the GROSS mode, it will print File 7.1. If the indicator has a tare value entered and is in the net mode, it will print File 7.2.
- It is a good idea to write out the custom print format you want on a worksheet, then enter it into the indicator. Keep this in your records for that indicator - if something happens to the unit, you will not have to recreate the custom print format.

Depending on the type of printer that you are using, you could also send special code sequences to the printer itself, as long as the ASCII codes are 127 or lower. For example, with the Epson TM-295 printer, it is possible to include the code sequence to release the paper (ASCII characters 27, then 113) after the ticket is printed. Different printers have different commands that are available using special codes like this. For more information about printer codes, refer to the documentation that was supplied with the printer.

There is one code that has not been covered yet but may come in handy if working with an older printer, such as a Hecon tape printer. Code 700 is the parameter control code that the IS indicator interprets as DELAY PER SETUP. Some older printers may have limited buffering capability or memory enough for just a few lines of text. Therefore, it is very easy to overrun the printer and you can lose an entire line of text or get several lines garbled together. To prevent this, insert a code 700 between the carriage return and the line feed. This causes the indicator to pause for the amout of time specified in parameter 14.2. A delay of 1 or 2 seconds should be adequate for most of these printers.

Entering the Custom Transmits and Macros

After some examples of planning custom transmits and macros, next enter the first two example files and see what results.

Follow the diagram in Figure 2-1 on page 4 to connect the printer through the I/O barrier to port 1 of the IS indicator.

NOTE: *If the printer can not provide an active current loop to retrieve the information from the barrier, you must install an interface unit that can and will output the format used by your printer.*

Enable Option 7 if it is not already enabled (see Section 3.4.1 on page 24). You can then select the desired custom transmit file (we will enter files 7.1 and 7.2 from the first example) using the TARE and TARE RECALL keys. The TARE key takes you forward and the TARE RECALL key goes backwards. With *O P .7 o N* displayed, press the TARE key once to bring up file 7.1 (you will see *7 . 1. O F F* displayed). If you go too far, use the TARE RECALL key to go backwards. Now turn on custom transmit by pressing the lb/kg CONV key if it is not already enabled.

In the same way that the TARE and TARE RECALL keys step through the custom transmit files, the 1 SETPOINT and 2 SETPOINT keys step forward and backward through the individual characters in the file (the lines on your worksheet). Press the 1 SETPOINT key to display the first character of File 7.1. If the custom transmit has never been configured before, the memory used to store the codes may be in a random state. This could produce codes that do not seem to make any sense. Enter File 7.1 per Table 3-15 on page 26. Exit setup mode.

If the indicator is not displaying the gross mode, press the NET/GROSS key to display the gross weight. Attach a weight simulator to the indicator, then dial the weight up to 500 pounds and press the PRINT key. You get a ticket with the following format:

```
10:22 PM  04/16/02
500 LB GR
```

Figure 3-16. Print Example

Enter File 7.2 per Table 3-17 on page 26 and File 7.9 per Table 3-18 on page 27. Tare the indicator then dial the weight up to 800 pounds and press the PRINT key.

```
GLEN CO inc.
GLENWOOD MN.
10:22 PM  04/16/02
1300 LB GR
500 LB TR
800 LB NT
```

Figure 3-17. Print Example

The first time the PRINT key was pressed, a ticket was printed using custom transmit file 7.1. With a tare weight in the indicator and the net weight on the display, the ticket was printed using custom transmit File 7.2. Although this may seem rather obvious, we have received a few phone calls from technicians who insisted that the custom transmit was not working properly when they simply had not done a tare or were not in the net mode.

Summary

The following are some general points summarizing what is covered in this document.

- Custom transmits are configured using option 7 of the indicator.
- Close DIP switches 2 and 3 to enter option configuration mode.
- If the display shows "------" with dip switches 2 and 3 closed, press and hold ENT for the option menu.
- ZERO steps forward through the options.
- NET/GROSS toggles the option on or off.
- TARE steps forward through the option's subparameters (7.1, 7.2, 7.3, etc.).
- TARE RECALL steps backward through the options and subparameters.
- Lb/kg CONV toggles subparameters on and off.
- 1 SETPOINT steps forward through the codes in a custom transmit or macro.
- 2 SETPOINT steps backward through the codes in a custom transmit or macro.
- Files 7.1 and 7.2 print the gross data and net data in normal mode on port 1.
- Custom transmit files may contain up to 30 codes.
- Macros (7.9 - 7.16) may be called by your custom transmit files to print custom transmits up to 250 characters long.
- You may use any of the ASCII codes (see Table 6.2 on page 37) and parameter control codes (see Table 3-20 on page 29).

- You may use any of the control codes listed in your printer's programming guide as long as those codes are between 1 and 127 inclusive.
- Parameters 600-607 call macros 1-8, respectively, from your custom transmit files.
- Parameter 700 causes the UMC 600IS to pause for the delay period specified in parameter 14.2.
- Parameters 400-402 print the time and/or date according to Option 3 setup.
- To enter a code into a file, enter the code number and press the ENT key to enter it or 1 SETPOINT to enter the code and move on to the next code.
- To insert a code, press the ENT key to move all of the codes from the current code on one place to the right, making an open space (a null code 0) that you may replace by typing the new code and pressing either the ENT or 1 SETPOINT key.
- To delete a code from the table, select the code using the 1 SETPOINT and 2 SETPOINT keys, then press the CE key.

Port Number	File Number	Normal Mode
1	7.1	Gross Weight Data
1	7.2	Gross/Tare/Net Weight Data
1	7.4	Special

Table 3-19. UMC600IS Custom Transmit Files

Code Number	Description	Code Number	Description
200	Gross Wt. "LB/KG GR"	400	Time & Date per setup
201	Gross Wt. "LG/KG"	401	Time per setup
202	Gross Wt.	402	Date per setup
203	Gross Wt. (no 0 blanking)	600	Macro file 1 (File 7.9)
210	Net Wt. "LB/KG NT"	601	Macro file 2 (File 7.10)
211	Net Wt. "LN/KN"	602	Macro file 3 (File 7.11)
212	Net Wt.	603	Macro file 4 (File 7.12)
213	Net Wt. (no 0 blanking)	604	Macro file 5 (File 7.13)
220	Tare Wt. "LB/KG TR"	605	Macro file 6 (File 7.14)
221	Tare Wt. "LT/KT"	606	Macro file 7 (File 7.15)
222	Tare Wt.	607	Macro file 8 (File 7.16)
223	Tare Wt. (no 0 blanking)	700	Delay per setup (parameter 14.2)
300	Status character (m=motion, etc.)	999	End of file

Table 3-20. Parameter Code Command Chart

4.0 Calibration

The UMC 600IS indicator can be calibrated using single slope span calibration or five-point linearization. Zero must be calibrated (see Section 4.1) before either span or linearization calibration can be performed.

The analog option is calibrated after the unit is calibrated using option 2. Analog output, (Section 3.3.2) provides settings for zero, span, and trim adjustments. The settings are all digital therefore no potentiometers are required. During the trim adjustments for zero/span, the analog output is forced to the zero/span previously selected in option mode parameters 2.5 and 2.6. While reading the analog output, the trim is increased or decreased from 0 to ± 175 until the reading corresponds with the values entered in parameters 2.5 and 2.6.

4.1 Zero Calibration

Zero calibration is accomplished by the following steps:

1. Clear the scale (no load).
2. Close SW1-3 (dead load). The leftmost display digit should be flashing *C* as shown in Figure 4-1.

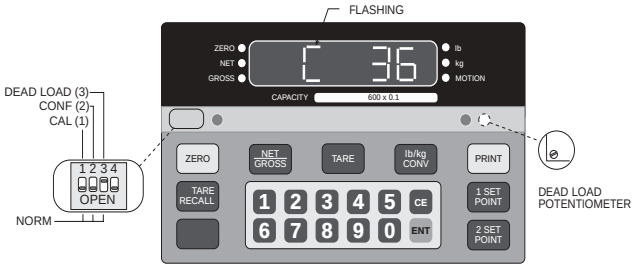


Figure 4-1. Close Switch 3

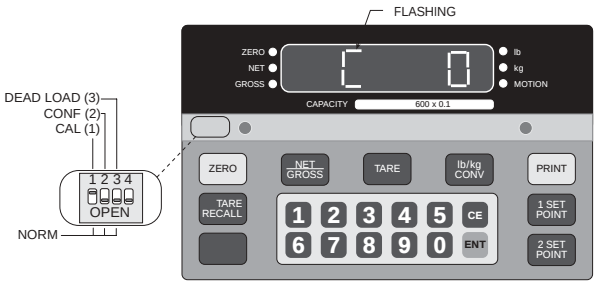


Figure 4-2. Close Switch 3 and Open Switch 1

3. Adjust dead load potentiometer to obtain a reading at or near zero (see Figure 4-2).
4. Open SW1-3 and close SW1-1 to put the indicator in the digital calibration mode. The display may change from a zero reading, which is acceptable.
5. Press the ZERO key. The display should read *---CAL*, then return to a zero reading.

4.2 Single Slope Span Calibration

1. Place a test weight on the scale and wait for the motion LED to go out.
2. Enter weight value using keyboard. When correct, press ENT. The display will read *---CAL* briefly, then return to the correct reading.
3. Recheck by clearing scale.
4. Open all switches to place the unit in normal weighing mode (Figure 4-3).

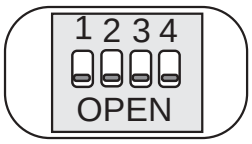


Figure 4-3. SW1 with All Switches Open

5. Reinstall the black overlay if previously removed.
6. Close center bar and tighten center bar screws. Seal the unit if used in a legal-for-trade application.

4.3 Five-Point Linear Calibration

There are five calibration points (La, Lb, Lc, Ld, and Le) that can be entered sequentially. Calibrations using fewer than five points will linearize the curve up to the last data point. The curve is then extrapolated from the last entry point. For best results, use values of 20%, 40%, 60%, 80%, and 100% of full scale for the five linearization points.

1. Turn on Option 6 (see Section 3.3.5 on page 23).
2. After performing a zero calibration as described in Section 4.1, place the first test weight on the scale platform. Allow ten or more seconds for stabilization (motion LED goes out).

NOTE: *Straight averaging is applied during calibration.*

3. Enter test weight value for the first calibration point using the numeric keyboard.
4. When the display is correct, press the ENT key. The display will read *CAL* briefly. The value of the last calibration point entered will then appear with a flashing display prompt *L_* indicating the next calibration point to be entered (Lb, Lc, Ld, or Le).
5. Repeat Steps 2, 3 and 4 for Lb, Lc, Ld, and Le with the appropriate test weights.
6. Recheck the zero weight by emptying the scale.

NOTE*: AZM is off during calibration. Dead load display provides signal reference.*

7. When complete, open all switches on SW1.
8. Re-install faceplate overlay and bracket. Tighten the knurled fasteners. Seal the unit if used in a legal-for-trade application.

Note: *If the response is more critical within a certain range, four of the five points can be in that area. The fifth point is always 100% full scale.*

4.4 Calculations Example

Capacity = 200,000 lb x 20 lb

Number of graduations = 200,000 ÷ 20 = 10,000

Configuration:

- Parameter 1 = 100 (10,000 graduations)
- Parameter 2 = 20 (resolution)
- Parameter 3 = 0 (no decimal point)

Other Factors to Note

AZM/PAZ: 1.9% x 200,000 = 3800 lb

Overrange: 103% x 200,000 = 206,000 lb

Minimum calibrated load: 10% x 200,000 = 20,000 lb

Analog Sensitivity

Analog signal input range: 0.7 to 3.2 mV/V

Analog signal sensitivity: 0.3 μV/graduations at 20,000

For H-44 requirements, use a factor of 4 (1.2 μV/grad). If the lower signal range is used for calibration, the indicator may fail acceptance testing with 0.3 μV/grad.

NOTE: *Check for a minimum live load of 12 mV for 10,000 graduations. If less than 12 mV, increase the number of graduations accordingly.*

Live Load Signal Range

The following table gives examples to determine the live load signal range:

Load Cells	Rated at 2mV/V	Rated at 3mV/V
5V Excitation	2mV/V x 5V = 10 mV	3mV/V x 5V = 15 mV
Dead load (est)	2 mV	5 mV
Live load	8 mV	10 mV

Table 4-1. Live Load Range Signal Range

5.0 Normal Weighing Mode Operations

This section provides the operator with a description of front panel key functions and associated annunciators (LEDs) used to operate the UMC 600IS 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 1-4 open). In this mode, the weight indicator displays live weight data that is presently on the scale.

5.1 Display Test

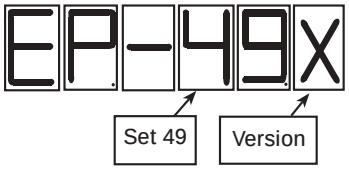
The display check and EPROM verification are used to test the indicator LEDs.

5.1.1 Display Check

Observe the display when power is first applied to the indicator. All six indicator LEDs (Zero, Net, Gross, lb, kg, and Motion) 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.

5.1.2 EPROM Verification

Upon completion of the display check an EP. 49.x momentarily appears on the display. This value indicates to the operator the current EPROM that has been installed in the UMC 600IS.



Where:
EP. = EPROM Program
49. = Set 49 within the KDA 1921 family
X = The version level of Set 49

Figure 5-1. Eprom Verification

The UMC 600IS operates with an EPROM family group KDA 49.x (x is the version).

5.2 LED Annunciators

Table 5-1 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
GROSS	On when indicator is in gross weighing mode
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
LO BAT	Input voltage low if on. Unit may not operate.

Table 5-1. Annunciator Definitions

NOTE: *When motion is detected the following functions are inhibited:*

- Demand print
- Zero acquisition (both push to zero and auto zero)
- Auto tare acquisition

5.3 Function Keys

Table 5-2 describes the various functions of the UMC 600IS keys.

Key	Functional Description
ZERO	Rezeroes scale if the gross weight is within the band of zero selected in the configuration mode (1.9% or full scale)
NET GROSS	Selects the desired weight data to be viewed (GROSS or NET). The gross and net LED annunciators indicate which display mode is active.
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.
lb/kg CONV	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 5-2. Function Key Description

5.4 Gross/Tare/Net Weighing Operations

In normal mode, the UMC 600IS displays gross, tare, or net weights using the LED annunciators to indicate scale status and the type of weight value displayed.

5.4.1 Display Mode on Power Up

When the UMC 600IS is initially powered up, the display automatically appears in the gross mode.

5.4.2 ZERO 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

5.4.3 TARE Key Function

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

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

5.4.4 Overload and Underrange Conditions

Overload conditions occur when the weight exceeds the selected scale capacity by greater than 105%. Overload may indicate a defective load cell, load cell simulator input, mis-wiring or no remote sense connection. External sense leads are required.

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 less than -400 grads, or underload may indicate a defective load cell, load cell simulator input, or no remote sense connection. Figure 5-2 shows the indicator display associated with over and underrange conditions.

See Section 6.1 on page 35 for information about additional error messages.

Overload

Underrange

Figure 5-2. Overload and Underrange Error Displays

5.4.5 Lb/Kg Conversion

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

5.5 Fixed Tare Entry

Do the following to enter a fixed tare through the front panel:

1. In normal weighing mode, press NET/GROSS to place the unit into the net mode.
2. Using the front panel numeric keys, key in the desired tare weight. If the displayed tare value is correct, press the Enter (ENT) key. The display changes from gross to net. Press the Clear Entry (CE) key to clear an incorrect value.

Both auto and fixed tare values can be recalled by pressing the TARE RECALL key. The flashing LED on the TARE RECALL key indicates that the unit is displaying the current tare value.

5.6 Serial Output

There are two ways in which the user can issue the print command:

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

Warning *An intrinsic safety barrier must be installed in the system before using serial I/O functions.*

5.6.1 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 (odd)
- One stop bit

Table 5-3 lists characters used in the UMC 600IS serial data string.

Character	Description
<STX>	Non-recording “start of text” character
<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 DATA>	Six-digit numeric data field with no decimal point and no leading zeroes.
<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>
<L/K>	One-character data field identification for weighing in continuous mode: Weight in lb = <L> Weight in kg = <K>
<GR/NT>	Two-character data field identification for weighing mode in demand mode: Gross mode = <GR> Net mode = <NT>
<G/N>	One-character data field identification for continuous output mode: Gross mode = <G> Net mode = <N>
<P>	Print command
<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 5-3. Serial Data Character Descriptions

Status Character Definitions

The status character (<STAT>) provides information to the receiving device about the current indicator operation. Table 5-4 shows the status characters returned by the UMC 600IS indicator.

Status Characters	Description
<D> (44H)	Digital calibration mode
<A> (42H)	Analog calibration mode
<I> (49H)	Invalid data
<O> (4FH)	Over or under range
<M> (4DH)	Scale in motion
<X> (58H)	Setpoint 1 displayed *
<Y> (59H)	Setpoint 2 displayed *
<Z> (5AH)	Tare recall data displayed
<SP> (20H)	Normal display (valid data)
* Setpoint support is not enabled for this indicator.	

Table 5-4. Status Data Character Descriptions

5.6.2 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

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:

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

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

Downloading/Recall Commands

The format for fixed tare data entry (see Table 5-5) is:

<FE>(XXXXXX)<CR>

The format for fixed tare data recall (see Table 5-5) is:

<FR>(XXXXXX)<CR>

Character	Identification Definition
<,>	Bracket delimiters are not sent
SE	Setpoint entry (53H, 45H)
SR	Setpoint recall (53H, 52H)
FE	Fixed tare entry (46H, 45H)
FR	Fixed tare recall (46H, 45H)
n	Setpoint parameter 0-6
(	Data opening parenthesis (28H)
)	Data closing parenthesis (29H)
CR	Command terminator (0DH)
xxxxxx	DATA characters must be six or less including decmal point if configured: 999999 or 999.99. Space and polarity characters can not be used in fixed tare data entry.

Table 5-5. Data String Characters

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.

6.0 Appendix

6.1 Error and Status Messages

The UMC 600IS indicator provides a number of error and status messages. When an error occurs, the message is shown on the indicator display. Table 6-1 lists these messages and their meanings.

Error Message	Description	Solution
Err1	Loss of configuration	Reconfigure
Err1a	Loss of option configuration	
Err1b		
Err1c		
Err2	Loss of zero calibration	Recalibrate
Err3	Loss of span calibration	
Err5	Loss of auto tare	Acquire tare
Err6	Loss of auto zero	Acquire zero
Err9	Not in span calibration	Program span value before entering
Err 10H	Input > 3.3 mV/V at full scale	Recalibrate span to set full scale in the range 0.4–3.3 mV/V
Err 10L	Input < 0.4 mV/V at full scale	
Err 10P	PTZ (push to zero) > 2%	Perform zero calibration
Err 10–	PTZ > weight used for span calibration	
OL	Gross overload	Check load cell wiring
UL	Gross underrange	
CAL	Calibration successful	—

Table 6-1. UMC 600IS Error and Status Messages

6.2 Parameter Control Code Chart

Use the following code values for parameter descriptions listed in Table 6.2 when specifying the format string. The actual character depends on the character mapping used by the output device

Code	Description	Code	Description
200	Gross weight & *LB/KG GR*	300	Status character
201	Gross weight & *LG/KG*	400	Time & date per setup
202	Gross weight	401	Time per setup
203	Gross weight (no 0 blanking)	402	Date per setup
210	Net weight & *LB/KG NT*	600	Macro file 1 (7.9)
211	Net weight & *LN/KN*	601	Macro file 2 (7.10)
212	Net weight	↕	↕ (7.11 – 7.15)
213	Net weight (no 0 blanking)	607	Macro file 8 (7.16)
220	Tare weight & *LB/KG TR*	700	Delay per setup
221	Tare weight & *LT/KT*	800	Not used
222	Tare weight	801	Not used
223	Tare weight (no 0 blanking)	802	Not used
		803	Not used
		999	End of file

Table 6-2. Parameter Code Control Chart

Serial Command Option Parameters

The following table lists the option parameter serial commands for the UMC 600IS.

Option 1	K0306 00 = TI (time entry)	K0714 00 = Off
K0100 00 = Off	K0306 01 = DA (date entry)	K0714 01 = On
K0100 01 = On		
	Option 6	K0715 00 = Off
Option 2	K0600 00 = Off	K0715 01 = On
K0200 00 = Off	K0600 01 = On	
K0200 01 = On		K0716 00 = Off
K0201 00 = DSP	Option 7	K0716 01 = On
K0201 01 = GR	K0700 00 = Off	
K0201 02 = NET	K0700 01 = On	K0717 00 = Off
		K0717 01 = On
K0202 00 = P.1	K0701 00 = Off	
K0202 01 = P.2	K0701 01 = On	K0718 00 = Off
		K0718 01 = On
K0203 00 = Off	K0702 00 = Off	
K0203 01 = DE	K0702 01 = On	K0719 00 = ODD
K0203 02 = CO		K0719 01 = EVN
	K0703 00 = Off	K0719 02 = SPC
K0204 00 = 12	K0703 01 = On	K0719 13 = ONE
K0204 01 = 24		
K0204 02 = 48	K0704 00 = Off	K0720 00 = Off
K0204 03 = 96	K0704 01 = On	K0720 01 = On
K0205(*xxxxxxxx*)–Zero	K0705 00 = Off	
K0206(*xxxxxxxx*)–Span	K0705 01 = On	
K0207(*xxxxxxxx*)–Zero Trim		
K0208(*xxxxxxxx*)–Span Trim	K0706 00 = Off	
	K0706 01 = On	
Option 3		
K0300 00 = Off	K0707 00 = Off	
K0300 01 = On	K0707 01 = On	
K0301 00 = STD		
K0301 01 = DLS	K0708 00 = Off	
	K0708 01 = On	
K0302 00 = 24		
K0302 01 = 12	K0709 00 = Off	
	K0709 01 = On	
K0303 00 = A		
K0303 01 = P	K0711 00 = Off	
	K0711 01 = On	
K0304 00 = Ab		
K0304 01 = On	K0712 00 = Off	
K0304 02 = Un	K0712 01 = On	
K0305 00 = No.	K0713 00 = Off	
K0305 01 = Let	K0713 01 = On	

Table 6-3. Option Parameter Serial Commands

6.3 ASCII Character Chart

Control	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex	ASCII	Dec	Hex
Ctrl-@	NUL	00	00	space	32	20	@	64	40	`	96	60
Ctrl-A	SOH	01	01	!	33	21	A	65	41	a	97	61
Ctrl-B	STX	02	02	“	34	22	B	66	42	b	98	62
Ctrl-C	ETX	03	03	#	35	23	C	67	43	c	99	63
Ctrl-D	EOT	04	04	$	36	24	D	68	44	d	100	64
Ctrl-E	ENQ	05	05	%	37	25	E	69	45	e	101	65
Ctrl-F	ACK	06	06	&	38	26	F	70	46	f	102	66
Ctrl-G	BEL	07	07	’	39	27	G	71	47	g	103	67
Ctrl-H	BS	08	08	(	40	28	H	72	48	h	104	68
Ctrl-I	HT	09	09	)	41	29	I	73	49	i	105	69
Ctrl-J	LF	10	0A	*	42	2A	J	74	4A	j	106	6A
Ctrl-K	VT	11	0B	+	43	2B	K	75	4B	k	107	6B
Ctrl-L	FF	12	0C	,	44	2C	L	76	4C	l	108	6C
Ctrl-M	CR	13	0D	-	45	2D	M	77	4D	m	109	6D
Ctrl-N	SO	14	0E	.	46	2E	N	78	4E	n	110	6E
Ctrl-O	SI	15	0F	/	47	2F	O	79	4F	o	111	6F
Ctrl-P	DLE	16	10	0	48	30	P	80	50	p	112	70
Ctrl-Q	DC1	17	11	1	49	31	Q	81	51	q	113	71
Ctrl-R	DC2	18	12	2	50	32	R	82	52	r	114	72
Ctrl-S	DC3	19	13	3	51	33	S	83	53	s	115	73
Ctrl-T	DC4	20	14	4	52	34	T	84	54	t	116	74
Ctrl-U	NAK	21	15	5	53	35	U	85	55	u	117	75
Ctrl-V	SYN	22	16	6	54	36	V	86	56	v	118	76
Ctrl-W	ETB	23	17	7	55	37	W	87	57	w	119	77
Ctrl-X	CAN	24	18	8	56	38	X	88	58	x	120	78
Ctrl-Y	EM	25	19	9	57	39	Y	89	59	y	121	79
Ctrl-Z	SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
Ctrl-[	ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
Ctrl-\	FS	28	1C	<	60	3C	\	92	5C	|	124	7C
Ctrl-]	GS	29	1D	=	61	3D	]	93	5D	}	125	7D
Ctrl-^	RS	30	1E	>	62	3E	^	94	5E	~	126	7E
Ctrl-_	US	31	1F	?	63	3F	_	95	5F	DEL	127	7F

Table 6-4. ASCII Character Chart

6.4 Specifications

Power

Power Input	Intrinsically safe power supply (7.5 VDC output) or optional 6 VDC battery

Analog Specifications

Full Scale Input Signal	Up to 45 mV
Load Cell Excitation	5 VDC, fixed
Load Cell Current	60 mA (4 x 350 Ω load cells)
Load Cell Cabling	6-wire configuration with remote sensing
Analog Signal Input Range	0.7 mV/V to 3.2 mV/V
Analog Signal Sensitivity	0.3 μV/graduation
Resolution	10 000 dd (NTEP), 80 000 expanded
Measurement Rate	10 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% or 100% of full scale
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 20 mA at 9600, 4800, 2400, 1200, 600, or 300 bps

Operator Interface

Display	6-digit LED display. 7-segment, .6 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	9.0 in x 6.44 in x 4.0 in 23 cm x 16 cm x 10 cm See Figure 6-1 on page 41
Rating/Material	NEMA 4X, stainless steel

Certifications and Approvals

NTEP

CoC Number	89-023A299-010
Accuracy Class	III/III L
	n_{max} : 10 000

FM #0Z0AZ.AX

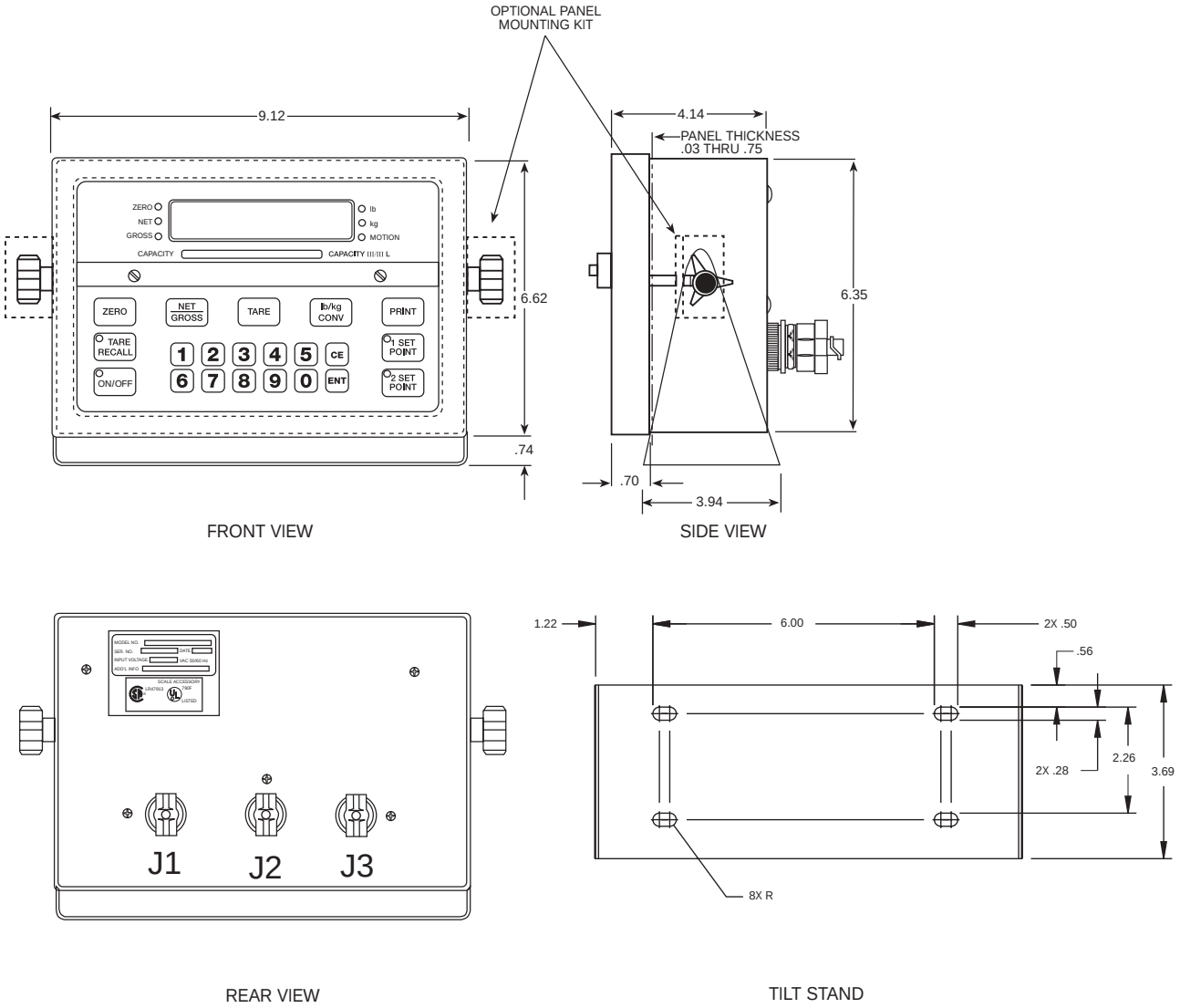


Figure 6-1. Standard Unit Dimensions

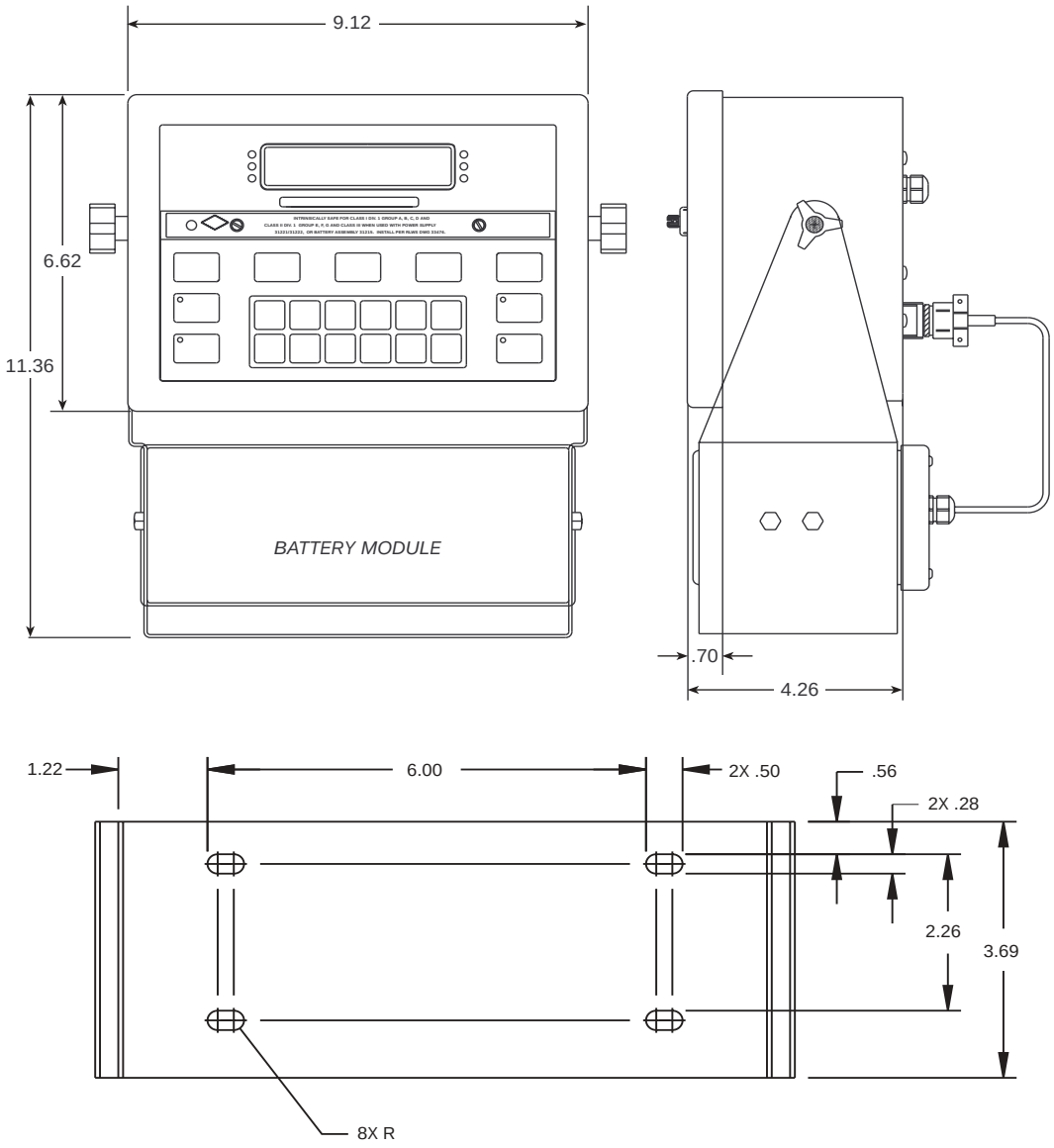


Figure 6-2. Battery-Powered Unit Dimensions

UMC 600IS 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 RLWS. All systems and components are warranted against defects in materials and workmanship for two years.

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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