UniMeasure, Inc.

MICRO P OWNERS MANUAL

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CONTENTS

1. INTRODUCTION

This series of panel instruments is a versatile, cost effective solution to a wide variety of monitoring and control applications. These instruments are easily set to produce an accurate display of temperature, pressure, flow, weight, voltage or current. Front panel push-button or RS-232/RS-485 setup allows the user to customize the unit for a specific application. Digital scaling of zero and span provides direct readout in engineering units. Concurrent Slope (Pat 5,262,780) is a new method of analog-to-digital conversion that provides 60 conversions per second (50 for 50 Hz operation) while integrating over a full cycle of the line for maximum noise rejection. Self calibration cycles reduce the average reading rate to 56 per second (47 for 50 Hz). This fast read rate provides an accurate display of peak signal input and quick response in control applications. The adaptive auto filter automatically supplies a time constant compatible with the signal noise level. This ensures stable displayed readings and outputs while responding rapidly to changes of the input signal that exceed a selected threshold value. Selective security lockout of the front panel setup protects against accidental changes to the meter. The instrument uses a lightweight, high-efficiency switching power supply operating from AC or DC voltages. The meter can be powered worldwide without changes to the supply. An optional low voltage supply operates on 9 to 37 Vdc from batteries or 8 to 28 Vac from sources such as 400 Hz aircraft power. Both supplies have isolated 5, 10, and 24 Vdc excitation outputs to power transducers. The NEMA 4 (IP65) 1/8 DIN case is made of high impact, 94V-0 UL-rated plastic. Mounting is from the front of the panel and requires less than 110 mm behind the panel. All wiring is by removable plugs conforming to IEC950 safety standards. All output options are isolated from meter and power ground by 250 Vac minimum.

The extended DPM is capable of linearizing a nonlinear input signal such as a thermistor, gallons of liquid in a irregularly shaped tank, or altitude. Up to 240 points may be linearized by a computer program that stores the parameters via RS232 into permanent nonvolatile memory. The meter is also capable of measuring rate of change. The level of a tank is measured and the difference between readings determines the flow rate in or out of the tank.

The dual setpoints have two form C (10 A @ 250 Vac) relays or solid state relay outputs for alarm and control capabilities. Either setpoint may be latching or nonlatching and separately configured to be energized above or below the setpoint, as deviation alarms, or in a fail-safe mode. Additionally, outputs may also be selected to operate from the filtered signal to reduce relay chatter or from the unfiltered signal for fast response. Snubber circuits, programmable relay switching time delay and selectable hysteresis extend relay contact life.

Isolation of the 4 to 20 mA and 0 to +10 V analog outputs eliminates ground loop problems. The output may be scaled by front panel push-buttons or RS-232/RS-485. For thermocouples and RTD's, the output is linearized. The 4 to 20 mA output will drive up to an 600 Ohm load with 12 V compliance

The meter offers RS232 or RS485 bidirectional communications or parallel, 3-state BCD output to interface with computers, PLC's or other digital devices. IBM PC compatible software is available for programming the unit by the RS232 and RS-485 interfaces.

2. RECEIVING AND UNPACKING

Your meter was carefully tested and inspected prior to shipment. Should the meter be damaged in shipment, notify the freight carrier immediately. In the event the meter is not configured as ordered or the unit is inoperable, return the unit to the place of purchase for repair or replacement. Please include a detailed description of the problem.

3. SAFETY CONSIDERATIONS

Warning : The use of this equipment in a manner other than specified may impair the protection of the device and subject the user to a hazard.

Visually inspect the unit for signs of damage. If the unit is damaged, do not attempt to operate.

This unit must be powered with AC (mains) from 85 to 264 Vac (90 to 370 Vdc) with the high voltage power supply option or 8 to 28 Vac (9 to 37 Vdc) with the low voltage power supply option. Verify that the proper power option is installed for the power to be used.

This meter has no AC (mains) switch; it will be in operation as soon as power is connected.

Caution: The 85 to 264 Vac (90 to 370 Vdc) mains connector (J1 Pins 1-3) is color coded Light Blue to differentiate it from other input and output connectors. The 8 to 28 Vac (9 to 37 Vdc) mains connector is not color coded because these voltages are not considered hazardous.

Do not make signal wiring changes or connections when power is applied to the instrument. Make signal connections before power is applied and, if reconnection is required, disconnect the AC (mains) power before such wiring is attempted.

To prevent electrical or fire hazard, do not expose the instrument to excessive moisture.

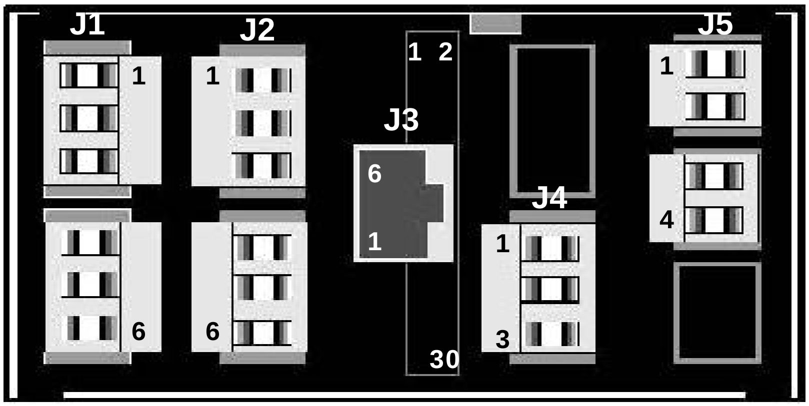
Do not operate the instrument in the presence of flammable gases or fumes; such an environment constitutes a definite safety hazard. This meter is designed to be mounted in a metal panel.

Verify the panel cutout dimensions and mount according to instructions.

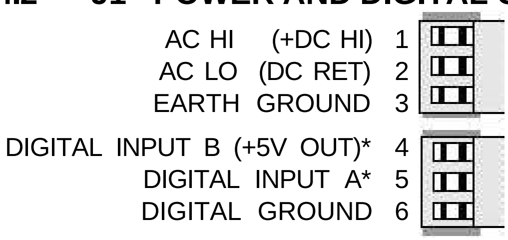
4. CONNECTOR WIRING INFORMATION

4.1 CONNECTOR LOCATION

The connectors are the screw terminals that plug into the mating jack mounted on the printed circuit board. P3 is either a 6 conductor phone plug for RS-232 and RS-485 or a 30 pin, mass termination, edge connector for parallel BCD.



4.2 J1 - POWER AND DIGITAL CONTROLS

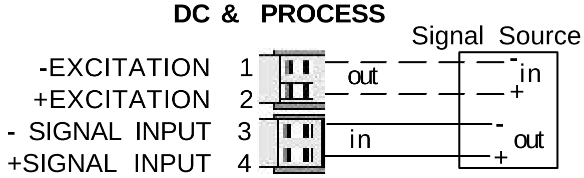


*Note: Non-isolated digital control inputs A and B are menu selectable for Tare, Peak Display, Hold, or Reset and external control of decimal points.

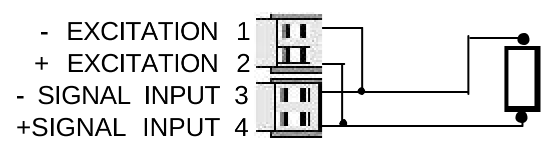
Digital Input B selected - Jumper "**h**"
+5V Output selected - Jumper "**g**"

4.3 J5 - SIGNAL INPUT

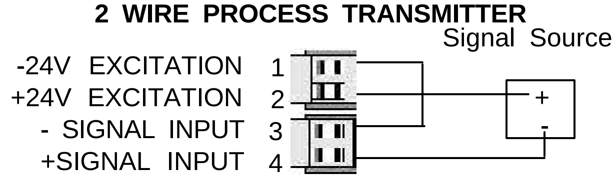
DC & PROCESS



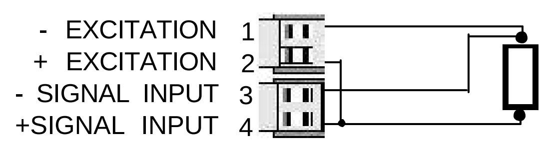
RTD (2-WIRE)



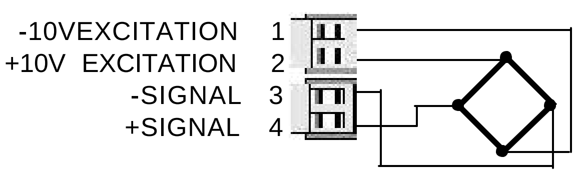
2 WIRE PROCESS TRANSMITTER



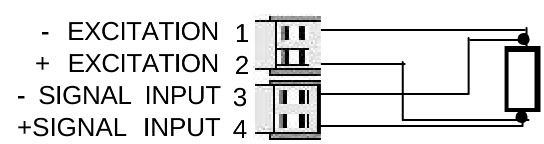
RTD (3-WIRE)



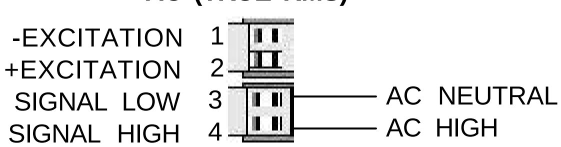
STRAIN GAUGE



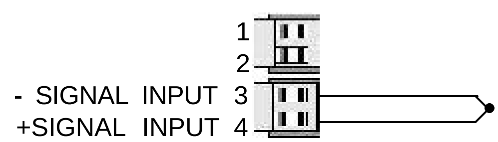
RTD (4-WIRE)



AC (TRUE RMS)



THERMOCOUPLE



4.3 J5 - SIGNAL INPUT (CONTINUED)

LOAD CELL METER

J5

-10 V EXCITATION	1
-SENSE	2
-SIGNAL	3
+SIGNAL	4
+10 V EXCITATION	5
+SENSE	6

4.4 J4 - ANALOG OUTPUT

0 TO 20 MA OUTPUT	1
0 TO 10 VDC OUTPUT	2
ISOLATED GROUND	3

4.5 J 2 - DUAL SETPOINT CONTROLLER

RELAY OUTPUTS

ALARM 1 - N/O CONTACT	1
ALARM 1 - N/C CONTACT	2
ALARM 1 - COMMON	3
ALARM 2 - N/O CONTACT	4
ALARM 2 - N/C CONTACT	5
ALARM 2 - COMMON	6

SOLID STATE RELAY OUTPUTS
Switching AC 125Vac @120 ma max.

ALARM 1 - SOURCE 1	1	AC
ALARM 1 - SOURCE 2	2	AC
ALARM 1 - DRAIN	3	
ALARM 2 - SOURCE 1	4	AC
ALARM 2 - SOURCE 2	5	AC
ALARM 2 - DRAIN	6	

SOLID STATE RELAY OUTPUTS
Switching DC 125Vdc @240 ma max.

ALARM 1 - SOURCE 1	1	+ DC
ALARM 1 - SOURCE 2	2	+ DC
ALARM 1 - DRAIN	3	- DC
ALARM 2 - SOURCE 1	4	+ DC
ALARM 2 - SOURCE 2	5	+ DC
ALARM 2 - DRAIN	6	- DC

*** SOLID STATE RELAY OUTPUTS**
Switching DC 125Vdc @120 ma max.

ALARM 1 - SOURCE 1	1	+ DC
ALARM 1 - SOURCE 2	2	
ALARM 1 - DRAIN	3	- DC
ALARM 2 - SOURCE 1	4	+ DC
ALARM 2 - SOURCE 2	5	
ALARM 2 - DRAIN	6	- DC

This configuration is directly compatible with the optotransistor output board.

4.6 J3 DIGITAL INTERFACE

RS - 232 INTERFACE

NO CONNECTION	6	
ISOLATED GROUND	5	GROUND
RX	4	TRANSMIT
TX	3	RECEIVE
RTS	2	RTS
NO CONNECTION	1	

RS - 485 INTERFACE

ISOLATED GROUND	6	GROUND
BRX	5	TRANSMIT -
ARX	4	TRANSMIT +
ATX	3	RECEIVE +
BTX	2	RECEIVE -
ISOLATED GROUND	1	GROUND

BCD OUTPUT

1	1	2	2
4	3	4	8
10	5	6	20
40	7	8	80
100	9	10	200
400	11	12	800
1K	13	14	2K
4K	15	16	8K
10K	17	18	20K
40K	19	20	80K
100K	21	22	200K
400K	23	24	800K
+ POL	25	26	$\overline{\text{DATA READY}}$
$\overline{\text{BCD HOLD}}$	27	28	BCD ENABLE
ISOLATED GND	29	30	ISO 5 / 15VDC

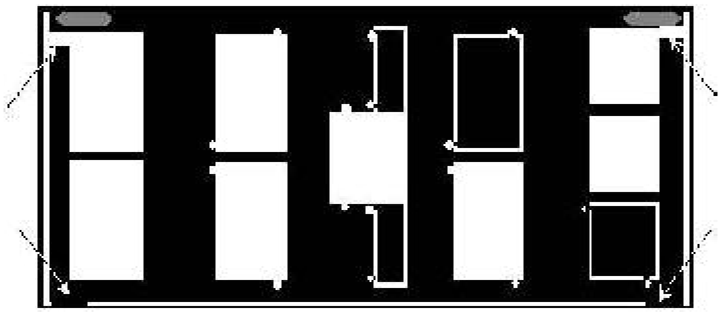
5. MECHANICAL ASSEMBLY

5.1 REMOVING THE REAR PANEL

To remove the rear panel, first remove any connectors that are installed. Press down on both rear panel retaining tab releases(see Fig. 5.1) and pull the top of the rear panel away from the case. The bottom of the rear panel will now lift out.

Retaining Tab and Release

Retaining Tab



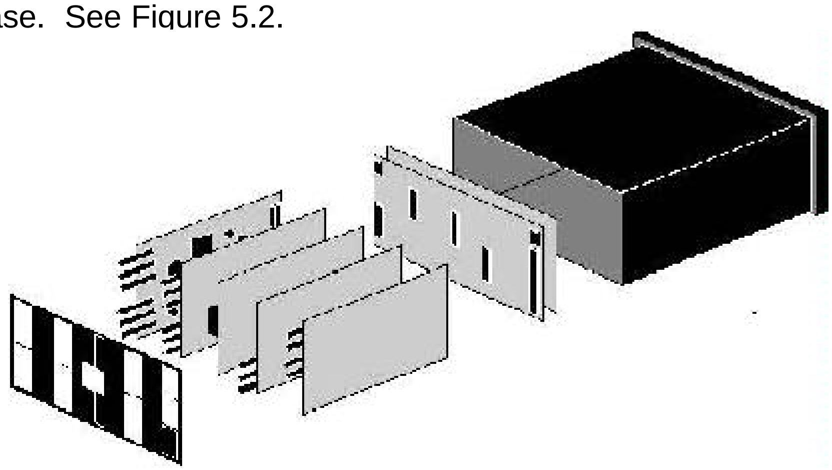
Retaining Tab and Release

Retaining Tab

Figure 5.1

5.2 Removing the meter from the case

After removing the rear panel, the meter can be taken out of the case by carefully grasping the power supply board and signal conditioner board at the connectors and sliding the unit out the back of the case. See Figure 5.2.

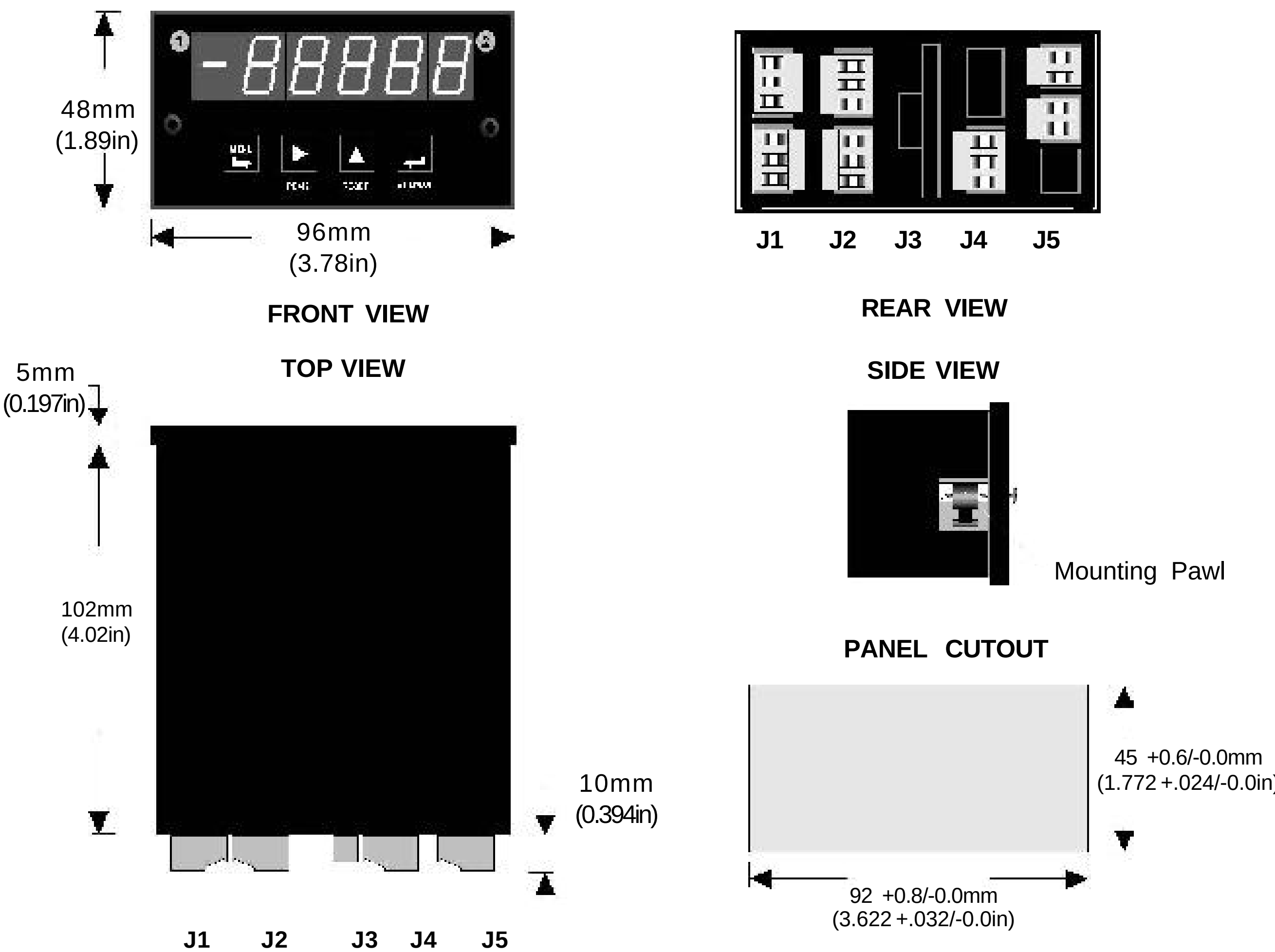


5.3 REASSEMBLING THE METER

Reverse the preceding procedures to reinstall the meter in the case. After the meter is in the case, insert the bottom tabs on the rear panel into the case first. Care must be taken to ensure the printed circuit boards are properly aligned by the board retaining pins on the inside of the rear panel.

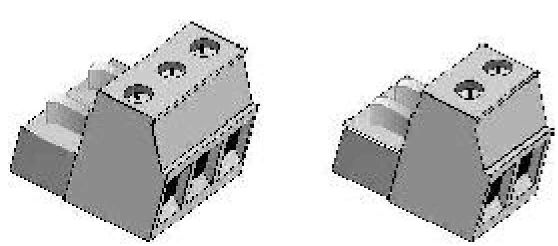
6. PANEL MOUNTING

Ensure the O-ring is in place. Turn the two mounting screws counterclockwise until the space between the mounting pawl and the bezel is greater than the panel thickness. Insert the meter in the panel cutout. Turn the mounting screws clockwise until the meter is securely mounted in the panel. Do not overtighten the mounting screws.



7. CONNECTORS

The meter uses UL/VDE rated screw terminal connections that plug into the mating PC jack.



8. FRONT PANEL SETUP KEYS

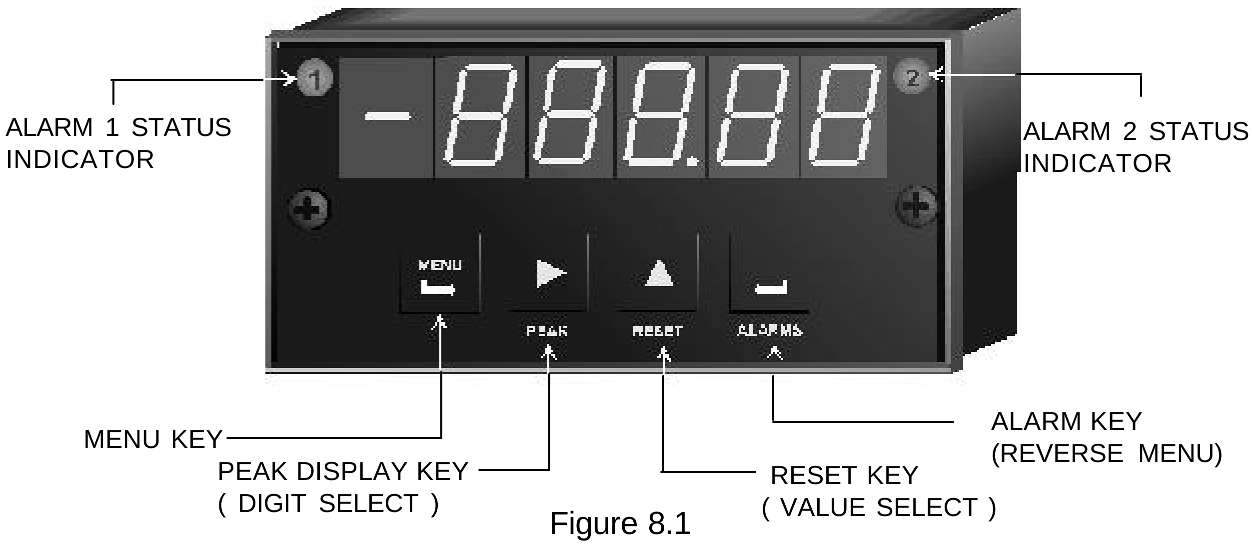


Figure 8.1

MENU KEY

The menu key steps through the various meter parameters that may be selected. These menu items may be “locked out” from front panel selection by software and hardware.

PEAK DISPLAY KEY (DIGIT SELECT)

In the **Operating Mode**, pressing the Peak Display Key causes the peak value of the input signal to be displayed. Pressing the key again returns the display to the present value. In the **Menu Mode** , the Digit Select Key (Peak Display Key) is used to select input type and decimal point or to select one of the five display digits for programming. In the main menu, pressing the Digit Select Key causes the value or code that is stored for that menu item to be displayed and the left hand digit flashes. Each time the key is pressed, the next digit to the right will flash. The value of the flashing digit may be changed using the Value Select Key. In the **Alarm Mode**, pressing the Digit Select Key causes the most significant digit of the displayed setpoint value to flash. Digits are then selected the same as in the Menu Mode.

RESET KEY (VALUE SELECT)

In the **Operating Mode**, holding the Reset Key depressed and pressing any other key causes a reset to occur. The Menu Key resets all meter functions, the Alarm Key resets any alarm conditions and the Peak Display Key resets the peak value to present value. In the **Menu Mode** or **Alarm Mode**, the Value Select Key (Reset Key) sets the value of the flashing digit. Each time the key is pressed, the value increases by one. Holding the key down causes the digit to automatically step through the numbers.

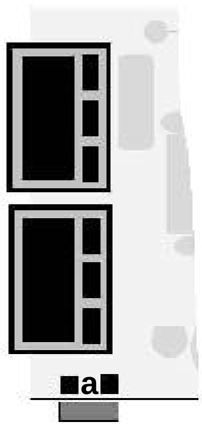
ALARM KEY (REVERSE MENU)

In the **Operating Mode**, pressing the Alarm Key displays the setpoint of Alarm 1 and then Alarm 2. These values may be changed using the Digit Select Key and the Value Select Key. In the **Menu Mode**, pressing the Alarm Key steps the display backward through the menu.

9. SETTING MENU LOCKOUTS

For security and ease of operation, any or all program menu items may be disabled. Each function to be disabled is set to "1" in the menu items, " Loc 1"," Loc 2" or "Loc 3". These lockout menu items may in turn be "locked-out" by installing an internal hardware shorting jumper. With the jumper installed, the operator has access only to enabled menu items.

9.1 SETTING HARDWARE LOCKOUT JUMPER



Power Supply Board
Figure 9.1

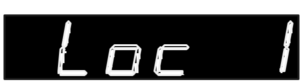
Lockout Jumper

To access the jumper, remove the rear panel per Section 5.1. Remove jumper "a" located on the lower portion of the power supply board next to the input connectors (see figure at left) to enable the software lockouts. Replace the jumper to disable software lockouts.
Jumper Removed - Loc 1,2 and 3 are displayed as menu items and allow other menu items to be locked out or enabled.
Jumper Installed - Loc1, 2 and 3 are not displayed on program menu

9.2 SETTING SOFTWARE LOCKOUTS

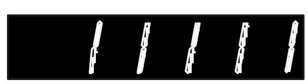
When setting up the meter, it may be necessary to enable some of the menu items. Any digit set to "1" in Loc 1, Loc 2 or Loc 3 indicates that item is locked out. By setting the digit to "0", the item will appear in the menu. Be sure to reset the lockout bit to "1" after selection if you do not want the value changed by the operator.
Note: The hardware lockout jumper must be removed to access Loc 1, 2 and 3 (see section 9.1)

MENU KEY ➥



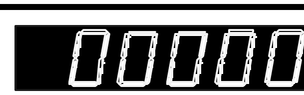
Press the ➥ key until Loc 1 is displayed.

DIGIT SELECT KEY ▶



Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash. "1" indicates the menu item is disabled. "0" indicates the item is enabled.

VALUE SELECT KEY ▲



1 2 3 4 5

Press ▲ to select "0" or "1" for flashing digit
1 - Input type selection
2 - Meter setup, configuration & decimal pt.
3 - Filter selection
4 -Scale or Lo, Hi Input
5 - Offset or Lo, Hi Reading

MENU KEY ➥	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
Loc 2 Press the ➥ key until Loc 2 is displayed.	1111 Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash. "1" indicates the menu item is disabled. "0" indicates the item is enabled.	0000 2 3 4 5 Press ▲ to select "0" or "1" for flashing digit 2 - Alarm Setup 3 - Alarm setpoint value programming 4 - Analog output scaling 5 - Serial interface setup
Loc 3 Press the ➥ key until Loc 3 is displayed. Lockout 3 controls the operation of the front panel push-buttons when the meter is in the normal mode of operation.	1111 Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash. "1" indicates the menu item is disabled. "0" indicates the item is enabled.	0000 2 3 4 5 Press ▲ to select "0" or "1" for flashing digit 2 - View peak value 3 - View alarm setpoints 4 - Reset (peak and latched alarms) 5 - Reset (meter reset)

10. SETUP MENU

INPUT SIGNAL SCALING METHOD

MENU KEY ➥	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
Lo in Low signal input value (not available for tC & rtd)	**0.021** Set the input signal to zero or a known low value	**0.021** Press the ▲ key to store the low signal input.
Hi In High Signal Input Value	**20.094** Set the input signal to a known high value	**20.094** Press the ▲ key to store the high signal input.
Lo rd Set Low Displayed Reading for Low Signal Input	0.0000 0.0000 0.0000 0.0000 0.0000 Select digit. Digit will flash	**0.000** Select 0 through 9 for flashing digit. Decimal point location is fixed by dEC.Pt.
Hi rd Set High Displayed Reading for High Signal Input	0.0000 0.0000 0.0000 0.0000 0.0000 Select digit. Digit will flash	**0.000** Select 0 through 9 for flashing digit. Decimal point location is fixed by dEC.Pt.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲

TEMPERATURE SIGNAL CONDITIONER

InPut Input signal type	**tC** Thermocouple Note: Display ⊢ = K	**J°F** **J°C** **K°F** **K°C** **t°F** **t°C** **E°F** **E°C** **S°F** **S°C** **r°F** **r°C** **n°F** **n°C** Types J, K, T, E, N, S, R in °C or °F
	rtd Pt 100 Ohm RTD	**4d °F** **4d °C** DIN 4-wire **4A °F** **4A °C** ANSI 4-wire **3d °F** **3d °C** DIN 3-wire **3A °F** **3A °C** ANSI 3-wire **2d °F** **2d °C** DIN 2-wire **2A °F** **2A °C** ANSI 2-wire **Short** Compensation for 2-wire lead resistance

DC SIGNAL CONDITIONER

dC U DC Volts	**0.2U** **2.0U** **20.0U** **200.0U** **660.0U** 0.2, 2, 20, 200, 660 V FS
dC A DC Amperes	**2.0a** **20.0a** **200.0a** **5.0A** 2 , 20, 200 mA, 5 A FS
rAtio Strain Gauge	**0.2U** **2.0U** **20.0U** 0.2, 2, 20 V FS

TRUE RMS SIGNAL CONDITIONER

AC U AC Volts	**0.2U** **2.0U** **20.0U** **200.0U** **660.0U** 0.2, 2, 20, 200, 660 V FS
AC A AC Amperes	**2.0a** **20.0a** **200.0a** **5.0A** 2 , 20, 200 mA, 5 A FS

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲

LOAD CELL SIGNAL CONDITIONER

InPut Input signal type (continued)	**Strn** Load cells	**20.0** **50.0** **100.0** **250.0** **500.0** 20, 50, 100, 250, 500 mV FS
	dC u DC millivolts	**20.0** **50.0** **100.0** **250.0** **500.0** 20, 50, 100, 250, 500 mV FS
SEtuP Meter Setup	**00000** Display selection	**0** 4 1/2 digits (0.1 Degree) **1** Remote display **2** 4 1/2 digits [meter counts by 10] (.01 Degree) **3** 3 1/2 digits (1 Degree)
	00000 Line frequency	**0** 60 Hz **1** 50 Hz
	00000 Display of leading zeros	**0** Blank leading zeros **1** Display leading zeros
	00000 Method of scaling meter	**0** Scale factor and offset **1** Coordinates of 2 points
	00000 Rear connector inputs A & B	**0** A: Reset B: Meter Hold **1** A: Function Reset B:Peak Display **2** A: Meter Hold B: Peak Display **3** A: Meter Hold B: Tare **4** A: Peak Display B: Tare **5** A: Tare B: Reset **6** External Decimal Pts.1 **7** External Decimal Pts.2

A & B Logic levels for 6 & 7

A	B	DP1	DP2
1	1	XXXXX	XXXX.X
0	1	XXXX.X	XXX.XX
1	0	XXX.XX	XX.XXX
0	0	XX.XXX	X.XXXX

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
ConFG Meter Configuration	**00000** Operates as a rate of change meter **Extended version only**	**0** Not rate of change **1** Rate x 0.1 **2** Rate x 1 **3** Rate x 10 **4** Rate x 100 **5** Rate x 1000 **6** Rate x 10000
	00000 Selection of scaling by reading input signal or by Setup selection	**0** Use setup scaling method **1** Scale by reading input
	00000 Selects between continuous (unlatched) data or single value (latched) of RS232 data when RTS is high or open	**0** Unlatched **1** Latched
	00000 RS485 interface operates in the full duplex or half duplex mode	**0** Full duplex mode **1** Half duplex mode
	00000 Scaling for nonlinear input **Extended version only**	**0** Linear input **1** Custom curve
FiLtr Filtering	**00000** Alarm filtering	**0** Output is unfiltered **1** Output is filtered
	00000 Peak display filtering	**0** Peak of unfiltered signal **1** Peak of filtered signal
	00000 Display filtering	**0** Batch average, 16 rdgs **1** Display filtered signal

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
FiLtr Filtering (continued)	**00000** Adaptive filter response	**0** Low threshold level **1** High threshold level
	00000 Input signal filtering	**0** Autofilter **1** Batch avg, 16 rdgs. **2** Moving avg, .08 sec. **3** Moving avg, .15 sec. **4** Moving avg, .3 sec. **5** Moving avg, .6 sec. **6** Moving avg, 1.2 sec. **7** Moving avg, 2.4 sec. **8** Moving avg, 4.8 sec. **9** Moving avg, 9.6 sec. **A** Unfiltered
dEc.Pt Decimal point selection	d.dddd	d.dddd dd.ddd ddd.dd dddd.d ddddd. .ddddd
(Scale and Offset selected) **SCALE** Scale factor multiplier (not available for tC)	0.0000 0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit and decimal point location when decimal point is flashing
OFFSt Offset or Zero Value	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal point location is fixed by dEC.Pt selection
(coordinates of 2 pts method) **Lo in** Low signal input value (not available for tC & rtd)	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal point location is fixed by input range chosen.
Lo rd Low Displayed Reading at Low Signal Input	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal point location is fixed by dEC.Pt selection
Hi In High Signal Input Value	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal point location determined by input range chosen.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
Hi rd High Displayed Reading at High Signal Input	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal location is fixed by dEC.Pt selection.
ALSEt Alarm Operation Setup (Only enabled if relay output is installed).	00000 Relay state when alarm is active	**0** Relay 1 on, Relay 2 on **1** Relay 1 off Relay 2 on **2** Relay 1 on, Relay 2 off **3** Relay 1 off, Relay 2 off
	00000 Alarm latching or nonlatching	**0** Alarm 1 nonlatching, Alarm 2 nonlatching **1** Alarm 1 latching, Alarm 2 nonlatching **2** Alarm 1 nonlatching, Alarm 2 latching **3** Alarm 1 latching, Alarm 2 latching
	00000 Alarm status	**0** AL1 active high AL2 active high **1** AL1 active low AL2 active high **2** AL1 disabled AL2 active high **3** AL1 active high AL2 active low **4** AL1 active low AL2 active low **5** AL1 disabled AL2 active low **6** AL1 active high AL2 disabled **7** AL1 active low AL2 disabled **8** AL1 disabled AL2 disabled

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
ALSEt (continued) Alarm Operation Setup	**00000** Selection of Hysteresis mode or Band Deviation mode of alarms.	**0** AL1 Band deviation AL2 Band deviation **1** AL1 Hysteresis AL2 Band deviation **2** AL1 Band deviation AL2 Hysteresis **3** AL1 Hysteresis AL2 Hysteresis **4** No deviation or hysteresis in menu
	00000 Number of readings in the alarm zone to cause an alarm	**0** After 1 reading **1** After 2 readings **2** After 4 readings **3** After 8 readings **4** After 16 readings **5** After 32 readings **6** After 64 readings **7** After 128 readings
dEU1H Amount of deviation or hysteresis - Alarm 1 (Only enabled if relay output is installed).	**00000** **00000** **00000** **00000** **00000** When the deviation value is >0, the alarms operate above and below setpoint by the value entered.	Select 0 through 9 for flashing digit.
dEU2b Amount of deviation or hysteresis - Alarm 2 (Only enabled if relay output is installed).	**00000** **00000** **00000** **00000** **00000** When the deviation value is >0, the alarms operate above and below setpoint by the value entered.	Select 0 through 9 for flashing digit.
An Set Setup of analog output. (Only enabled if analog output board is installed).	**00** Calibrated output is current or voltage.	**0** Current output **1** Voltage output
	00 Analog output filtering	**0** Analog output unfiltered **1** Analog output filtered

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
(if analog output installed) **An Lo** Displayed value for 0 voltage or current output	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal point location fixed by dEC.Pt selection.
An Hi Displayed value for 10 volts or 20 mA output	0.0000 0.0000 0.0000 0.0000 0.0000	Select 0 through 9 for flashing digit. Decimal fixed by DEC.Pt selection.
(if serial interface is installed) **Ser 1** Serial interface setup <u>Fixed Parameters</u> No parity 8-bit word 1 stop bit	000 Output filtering	**0** Send unfiltered signal **1** Send filtered signal
	000 Baud rate	**0** 300 baud **1** 600 baud **2** 1200 baud **3** 2400 baud **4** 4800 baud **5** 9600 baud **6** 19200 baud
	000 Digital output rate (in seconds)	<u>60 Hz</u> <u>50 Hz</u> **0** Line frequency **1** .28 sec .34 sec **2** .57 sec .68 sec **3** 1.1 sec 1.4 sec **4** 2.3 sec 2.7 sec **5** 4.5 sec 5.4 sec **6** 9.1 sec 10.9 sec **7** 18.1 sec 21.8 sec **8** 36.3 sec 43.5 sec **9** 72.5 sec 87 sec
Ser 2 Serial interface setup	0000 Line Feed	**0** None after carriage rtn **1** LF after carriage return
	0000 Alarm data transmitted with meter readings	**0** No alarm data **1** Alarm data with reading
	0000 Control of digital output	**0** Continuous output **1** Output on RS-232 / RS-485 command only

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲

Ser 2 (continued) Serial interface setup	**0000** Meter address for RS-232/RS-485 communication (digit display, address number of meter) **Note:** Addresses 1 through 15 are denoted by 1 through 9 and A through F. Addresses 16 through 31 use the same character followed by a decimal point.	**Meter#** / **Display** 1 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 10 a 11 b 12 C 13 d 14 E 15 F 16 0. 17 1. 18 2. 19 3. 20 4. 21 5. 22 6. 23 7. 24 8. 25 9. 26 A. 27 b. 28 C. 29 d. 30 E. 31 F.
Loc 1 Lockout of Menu Items (Lockout jumper must be removed to access Loc 1, 2, 3. See Figure 9.1)	**00000** Input type selection	**0** Enabled **1** Disabled
	00000 Meter setup, configuration and decimal point selection.	**0** Enabled **1** Disabled
	00000 Filter	**0** Enabled **1** Disabled

MENU KEY	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
Loc 1 (continued) Lockout of Menu Items (Lockout jumper must be removed to access Loc 1, 2, 3. See Figure 9.1)	00000 Scale or Lo, Hi Input	0 Enabled 1 Disabled
	00000 Offset or Lo, Hi Reading	0 Enabled 1 Disabled
Loc 2 Lockout of Front Panel Keys (Lockout jumper must be removed to access Loc 1, 2, 3. See Figure 9.1)	0000 Alarm Setup	0 Enabled 1 Disabled
	0000 Alarm setpoint programming	0 Enabled 1 Disabled
	0000 Analog output scaling	0 Enabled 1 Disabled
	0000 Serial interface setup	0 Enabled 1 Disabled
Loc 3 Lockout of Front Panel Keys (Lockout jumper must be removed to access Loc 1, 2, 3. See Figure 9.1)	0000 View peak value pushbutton	0 Enabled 1 Disabled
	0000 View alarm setpoints pushbutton	0 Enabled 1 Disabled
	0000 Reset pushbutton (peak and latched alarms)	0 Enabled 1 Disabled
	0000 Reset pushbutton (meter reset)	0 Enabled 1 Disabled

11. DC VOLTS & AMPS

This section is designed to provide basic meter setup instructions when a direct readout of voltage or current is required. When an external shunt is used to monitor current, the setup for process signals, section 12, should be used. Some menu items, such as leading zero blanking, display filtering, etc., are not discussed in this section and have been set to the most commonly used values. Should these items require change, refer to section 10 for selection information. For configuration of optional boards, see the appropriate section elsewhere in the manual.

11.1 RANGE JUMPER SELECTIONS

Voltage

Input	Jumpers Required
200mV	E, b
2V	E, a
20V	F, g, b
200V	F, g, a
660V	F, h, a

Current

Input	Jumpers Required
2mA	D, h, b
20mA	C, h, b
200mA	B, h, b
5A	A, h, b

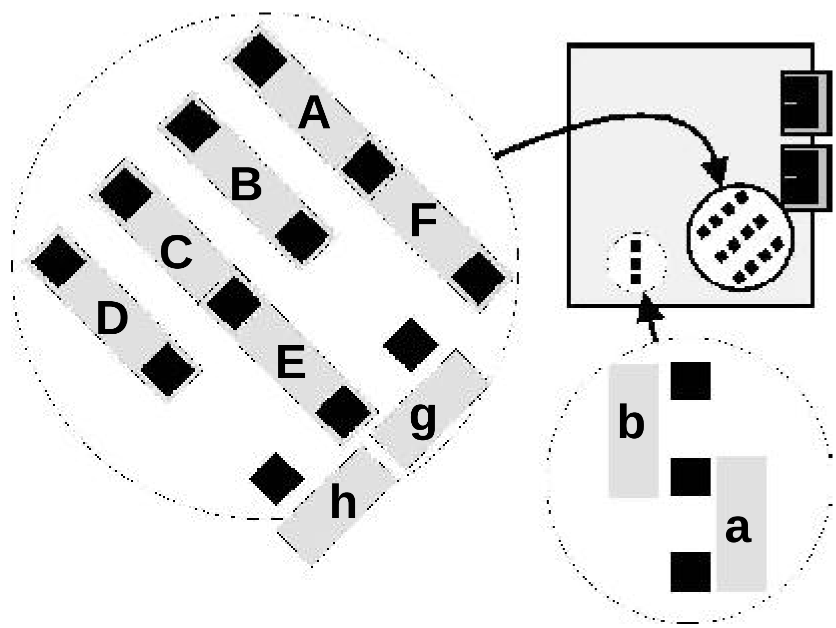


Figure 11.1 DC Signal Conditioner

Notes 1. See Section 22 to select 5,10 or 24Vdc excitation.
2. Jumpers designated by capital letters require 5mm (0.2in) jumpers. Jumpers designated by lower case letters require 2.5mm (0.1 in) jumpers.
3. Spare jumpers should be stored on single unused jumper posts not associated with capital letter designations

11.2 MENU SELECTION

Whenever the scale factor is 1.0 and offset is zero, the meter displays a direct readout of the signal input in (milli)volts or (milli)amperes. In the following example, the meter is configured for a full scale display of 0 to 20V or 0 to 20mA equals 0 to 20.000. Other ranges follow the same setup format. Note that the decimal point selection does not affect the displayed value. A full scale value of 20000 may be displayed as 20.000 milliamps or 20000 microamps. During setup, it may be necessary to enable some menu items that are locked out. See Section 9 for further information.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
InPut Press the ➡ key to display InPut (Input type selection). **Note:** Selection of input type & range must match jumper selection in Section 11.1	dC U Press ▶ until dC U (dc Volts) is displayed dC A or dC A (DC Amps) is displayed.	20.0U Press ▲ to select 0.2V, 2.0V, 20.0V, 200.0V, 660.0V 20.0a or 2.0a, 20.0a, 200.0a (milliamps) or 5.0A (Amps)
SEtuP Press the ➡ key to display SEtuP. (Basic setup) See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	30001 1 2 3 4 5 Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash.	00000 1 2 3 4 5 Press ▲ to select value for flashing digit. Digit 1: "0"= 20,000 cts. full scale "3"=2,000 cts. full scale Digit 4: "0" = scale and offset method
dEc.Pt Press the ➡ key to display dEcPt (Decimal point)	d.dddd Press ▶ to display location of decimal point.	dd.ddd Press ▲ to change decimal point location.
SCALE Press the ➡ key to display SCALE (Scale factor).	005.00 Press ▶ to display value and select left digit. Press again to select another digit.	1.0000 Use ▲ to set digit values. Set value and decimal to 1.0 (1.0000, 01.000, etc)
OFFSt Press the ➡ key to display OFFSt (Zero offset).	01.250 Press ▶ to display value and select left digit. Press again to select another digit.	00.000 Use ▲ to set digit values. Set value to 00.000. Decimal point is fixed by Dec.Pt.

rESEt

20.000

Press the ➡ key. Continue to press ➡ (or ➡ and ▲ simultaneously) until rESEt is displayed. The meter will now go to the operating mode and display the value of the input signal.

12. PROCESS SIGNAL INPUTS

This section provides basic meter setup instructions for a direct readout in engineering units such as psi, rpm, etc. The signal input may come from a transducer or other voltage or current source. Some menu items, such as leading zero blanking, display filtering, etc., are not discussed in this section and have been set to the most commonly used values. Should these items require change, refer to section 10 for selection information. For configuration of optional boards, see the appropriate section elsewhere in the manual.

12.1 RANGE JUMPER SELECTIONS

Voltage

Input	Jumpers Required
200mV	E, b
2V	E, a
20V	F, g, b
200V	F, g, a
660V	F, h, a

Current

Input	Jumpers Required
2mA	D, h, b
20mA	C, h, b
200mA	B, h, b
5A	A, h, b

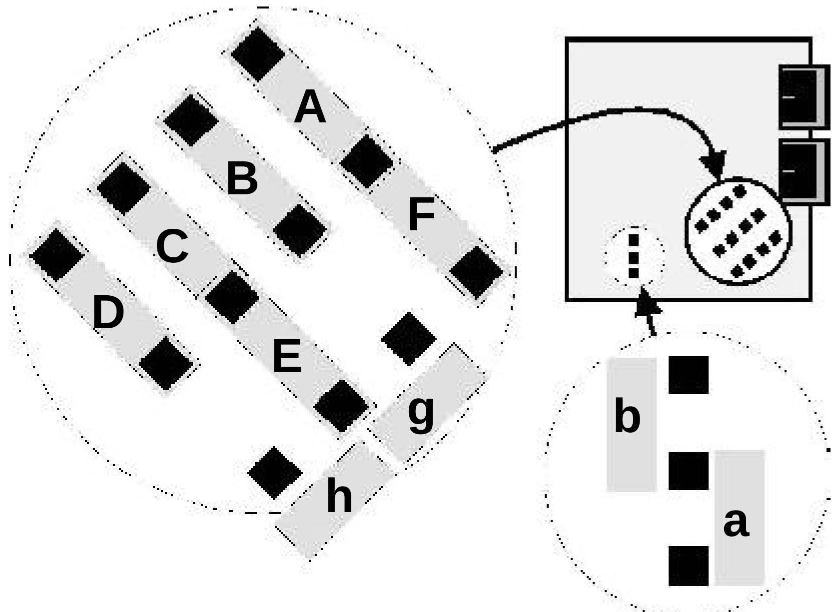


Figure 12.1 DC Signal Conditioner

Notes

1. See Section 22 to select 5, 10 or 24Vdc excitation.
2. Jumpers designated by capital letters require 5mm (0.2in) jumpers. Jumpers designated by lower case letters require 2.5mm (0.1 in) jumpers.
3. Spare jumpers should be stored on single unused jumper posts not associated with capital letter designations

12.2 MENU SELECTION

Display in engineering units is most easily programmed using the coordinates of 2 points. There are two methods. The first is to enter the 4 values (low signal input, desired reading at the low signal input, high signal input, and desired reading at the high signal input) directly via the front panel pushbuttons or the RS232 interface. The second method is to have the meter read the signal input at a known low value and store that reading as the low in and read a known high signal value and store that value as high in. The low and high known values are entered as the lo rd and hi rd. An example of using the reading the input method of coordinates of 2 points is shown for the load cell meter, Section 17. Selecting the reading method (menu item "config" digit 2 set to 1) overides either method of scaling selected in "setup". The following example is the 2 coordinate method of directly entering the 4 values.

To set up the range using coordinates of 2 points, values for low signal input, low display, high signal input and high display are entered. The following example uses this scaling method. Signal input is 4 to 20mA and displayed value is 000.00 (at 4mA) to 100.00 (at 20mA). When setting up the meter, it may be necessary to enable some menu items. See Section 9 for further information.

MENU KEY ➥	**DIGIT SELECT KEY ▶**	**VALUE SELECT KEY ▲**
InPut Press the ➥ key to display InPut (Input type selection). **Note:** Selection of input type & range must match jumper selection in Section 12.1.	dC A Press ▶ until dC A (DC Amperes) is displayed. (dC U if voltage input).	20.0a Press ▲ to select 2.0a, 20.0a, 200.0a (milliamps) or 5.0A (Amps). (.20U, 2.0U, 20.0U, 200.0U or 660.0U if voltage input)
SEtuP Press the ➥ key to display SEtuP. (Basic setup) See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	30000 1 2 3 4 5 Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash.	00010 1 2 3 4 5 Press ▲ to select value for flashing digit. Digit 1: "0"= 20,000 cts "3"=2,000 cts Digit 4: "0"=scale & offset "1"=2- coordinate
dEc.Pt Press the ➥ key to display dEcPt (Decimal point).	d.dddd Press ▶ to display decimal point location	ddd.dd Press ▲ to change decimal point location.
Lo in Press the ➥ key to display Lo in (Low signal input value).	00.000 Press ▶ to display value and select left digit. Press ▶ again to select another digit.. Dec pt. fixed by input range	04.000 Use ▲ to set digit values and set to 04.000 (4 mA). Most significant digit may be set to 0 thru 9 and -0 thru -9.
Lo rd Press the ➥ key to display Lo rd (Desired meter reading at low signal input).	000.00 Press ▶ to display value and select left digit. Press ▶ again to select another digit. Decimal point set by Dec.Pt.	000.00 Use ▲ to set digit values and set to 000.00 .
Hi In Press the ➥ key to display Hi in (High signal input value).	00.000 Press ▶ to display value and select left digit. Press ▶ again to select another digit. Dec pt. fixed by input range	20.000 Use ▲ to set digit values and set to 20.000 (20 mA).

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
Hi rd	000.00	100.00
Press the ➡ key to display Hi rd (Desired meter reading at high signal input).	Press ▶ to display value and select left digit. Press ▶ again to select another digit. Decimal point set by Dec.Pt.	Use ▲ to set digit values and set to 000.00 .
rESEt	100.00	

Press the ➡ key. Continue to press ➡ (or ➡ and ▲ simultaneously) until rESEt is displayed. The meter will now go to the operating mode and display the value of the input signal.

13. THERMOCOUPLES

13.1 RANGE JUMPER SELECTIONS

Thermocouple Type

Type	Jumpers Required
J, K, E, N	f
T, R, S	e

Open Thermocouple

Open TC Indication	Jumpers Required
Upscale	c
Downscale	d

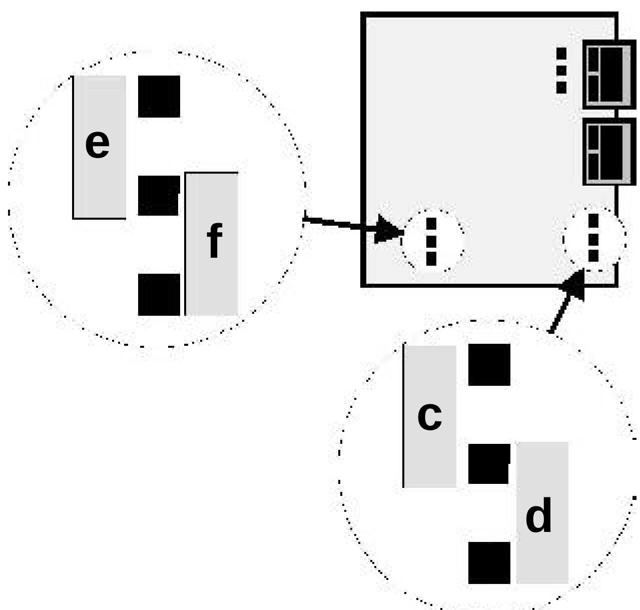


Figure 13.1 Temperature Signal Conditioner

13.2 MENU SELECTION

Thermocouple type and Celsius or Fahrenheit scale are selected by input type. However, Kelvin or Rankine may be displayed by entering the appropriate offset to the selected scale. Although 0.01 degree resolution may be selected, it is not recommended for use with thermocouples. When setting up the meter, it may be necessary to enable some of the menu items. See Section 9 for further information.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
InPut Press the ➡ key to display InPut (Input type selection). **Note:** Selection of input type & range must match jumper selection in Section 13.1.	**tC** Press ▶ to display input selected. Press ▶ again until tC (thermocouple) is displayed.	**J °C** Press ▲ to select thermocouple type J, K, T, E, R, S and °C or °F scale (J°F, J°C, K°F, K°C, t°F, t°C, E°F, E°C, r°F, r°C, S°F, S°C)
SEtuP Press the ➡ key to display SEtuP. (Basic setup) See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	**30000** Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash.	**00000** 1 2 3 4 5 Press ▲ to select value for flashing digit. Digit 1: "0"= 0.1 degree resolution "3"=1 degree resolution
OFFSt Press the ➡ key to display OFFSt (Zero offset).	**0000.0** Press ▶ to display value and select left digit. Press ▶ again to select another digit.	**0000.0** Use ▲ to set digit values and set to 000.00 for °F and °C or **0273.2** set value to 273.2 if °C is selected to display in °Kelvin and 459.7 if °F is selected to display in ° Rankine.

rESEt **451.9**

Press the ➡ key. Continue to press ➡ (or ➡ and ▲ simultaneously) until rESEt is displayed. The meter will now go to the operating mode and display the value of the input signal.

14. Pt100 RTD'S

14.1 RANGE JUMPER SELECTION

All RTD Types

Jumpers Required 2-,4-wire
b, f

Jumpers Required 3--wire
a, f

Note: See Section 22 to select 10 Vdc excitation.

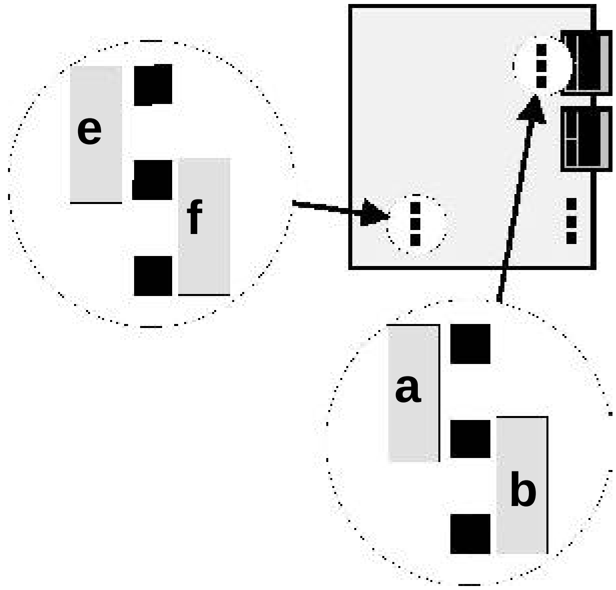


Figure 14.1 Temperature Signal Conditioner

14.2 2-WIRE RTD LEAD COMPENSATION

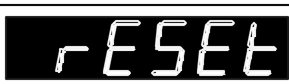
This section describes how to remove the error caused by lead resistance in a 2-wire RTD. Ambient temperature changes will cause some error in the readings; the higher the lead resistance, the greater the error. When performing this procedure, the leads should be shorted together as close as possible to the RTD. This step is not necessary when using 3- or 4-wire RTD's since lead resistance compensation is automatic in the meter. When setting up the meter, it may be necessary to enable some of the menu items. See Section 9 for further information.

MENU KEY ⮩ | **DIGIT SELECT KEY ▶** | **VALUE SELECT KEY ▲**

Press the ⮩ key to display InPut (Input type selection).

Press ▶ to display input selected. Press ▶ again until rtd is displayed.

Press ▲ to select short.



Press the ⮩ key until rESEt is displayed. Short the input leads at the RTD sensor. Press the ▶ key to store value. Set up for RTD per section 14.3

14.3 MENU SELECTIONS

The following example is setup for a 4-wire DIN RTD. When setting up the meter, it may be necessary to enable some of the menu items. See Section 9 for further information.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
InPut Press the ➡ key to display InPut (Input type selection). **Note:** Selection of input type & range must match jumper selection in Section 14.1.	**rtd** Press ▶ until rtd (resistance temperature detector) is displayed	**4d °C** Press ▲ to select rtd type (4d°F, 4d°C, 4A°F, 4A°C, 3d°F, 3d°C, 3A°F, 3A°C, 2d°F, 2d°C, 2A°F, 2A°C) Number = # of leads Letter = Din or ANSI RTD
SEtuP Press the ➡ key to display SEtuP. (Basic setup) See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	**30000** Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash.	**00000** 1 2 3 4 5 Press ▲ to select value for flashing digit. Digit 1: "0"= 0.1 degree resolution "2" = 0.01 degree resolution "3"=1 degree resolution
SCALE Press the ➡ key to display SCALE. Divide 100 by resistance of RTD at 0° C to calculate scale factor.	**005.00** Press ▶ to display value and select left digit. Press again to select another digit.	**.99706** Use ▲ to set digit values. Set value and decimal to calculated scale factor.
OFFSt Press the ➡ key to display OFFSt (Zero offset).	**0000.0** Press ▶ to display value and select left digit. Press ▶ again to select another digit.	**0000.0** Use ▲ to set digit values and set to 0.0 for °F and °C or **0273.2** set value to 273.2 if °C is selected to display in °Kelvin and 459.7 if °F is selected to display in ° Rankine.

rESEt **85.00**

Press the ➡ key. Continue to press ➡ (or ➡ and ▲ simultaneously) until rESEt is displayed. The meter will go to the operating mode and display the value of the input signal.

15. 1 RANGE JUMPER SELECTIONS

Voltage

Input	Jumpers Required
200mV	E, b
2V	E, a
20V	F, g, b

Notes

1. See Section 22 to select 10V removejumpers for externa tion.
2. Jumpers designated by lowe letters require 2.5mm (0.1 in) j
3. Spare jumpers should be st single unused jumper posts.

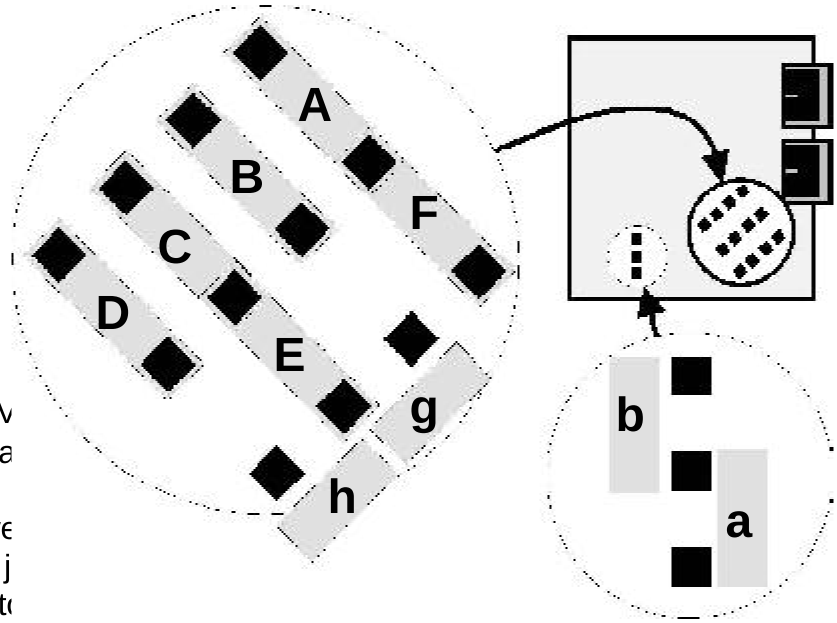
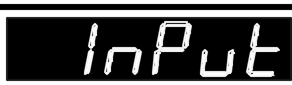


Figure 15. 1 DC Signal Conditioner

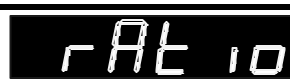
15. 2 MENU SELECTION

Display in engineering units is most easily programmed using the coordinates of 2 points. There are two methods. The first is to enter the 4 values (low signal input, desired reading at the low signal input, high signal input, and desired reading at the high signal input) directly via the front panel pushbuttons or the RS232 interface. The second method is to have the meter read the signal input at a known low value and store that reading as the low in and read a known high signal value and store that value as high in. The low and high known values are entered as the lo rd and hi rd. An example of using the reading the input method of coordinates of 2 points is shown for the load cell meter, Section 17. Selecting the reading method (menu item "config" digit 2 set to 1) overides either method of scaling selected in "setup". To set up the range using coordinates of 2 points, values for low signal input, low display, high signal input and high display are entered. The following example uses this scaling method. Signal input is 0 to 20mV and displayed value is 000.00 (at 0mV) to 100.00 (at 20mV). When setting up the meter, it may be necessary to enable some menu items. See Section 9 for further information.

MENU KEY ➡ | **DIGIT SELECT KEY ▶** | **VALUE SELECT KEY ▲**



Press the ➡ key to display InPut. **Note:** Range selection must match jumper selection in Section 15. 1 .



Press ▶ until rAtio (Ratiometric operation) is displayed.

Press ▲ to select 0.2U, 2.0U or 20.0U (200mV, 2V or 20Vdc).

MENU KEY ↦	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
SEtuP Press the ↦ key to display SEtuP. (Basic setup). See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	30000 Press ▶ to display status. Press ▶ again to select another digit. Selected digit will flash.	000 10 1 2 3 4 5 Press ▲ to select value. Digit 1:"0"= 20,000 cts. FS "2"=LSD fixed zero "3"=2,000 cts. FS Digit 4: "1" for 2 point scaling
dEc.Pt Press the ↦ key to display dEcPt (Decimal point).	d.dddd Press ▶ to display decimal point location.	ddd.dd Press ▲ to select decimal point location.
Lo in Press the ↦ key to display Lo in (Low signal input value).	.00000 Press ▶ to display value. Press ▶ again to select another digit. **Note:** Decimal point is fixed by input range selection.	.00000 Use ▲ to set digit values and set to .00000 (0mV). **Note:** Most significant digit may be set to 0 thru 9 and -0 thru -9.
Lo rd Press the ↦ key to display Lo rd (Desired meter reading at low signal input).	000.00 Press ▶ to display value. **Note:** Decimal point is fixed by dEcPt selection.	000.00 Use ▲ to set digit values and set to 000.00
Hi In Press the ↦ key to display Hi in (High signal input value).	.00000 Press ▶ to display value. **Note:** Decimal point is fixed by input range selection.	.02000 Use ▲ to set digit values and set to .02000 (20mV)
Hi rd Press the ↦ key to display Hi rd (Desired meter reading at high signal input).	000.00 Press ▶ to display value. **Note:** Decimal point is fixed by dEcPt selection.	100.00 Use ▲ to set digit values and set to 100.00
rESEt Press the ↦ key. Continue to press ↦ (or ↦ and ▲ simultaneously) until rESEt is displayed. The meter will now go to the operating mode and display the value of the input signal.	100.00	

16. AC (RMS) VOLTS & AMPS

This section provides basic setup instructions for true RMS voltage or current monitoring. An RMS signal conditioner is required. Some menu items, such as leading zero blanking, display filtering, etc., are not discussed in this section and have been set to the most commonly used values. Should these items require change, refer to section 10 for selection information. For configuration of optional boards, see the appropriate section elsewhere in the manual.

16. 1 RANGE JUMPER SELECTIONS

Voltage

Input	Jumpers Required AC Coupled
200mV	E, k
2V	E, j
20V	F, g, k
200V	F, g, j
660V	F, h, j

Current

Input	Jumpers Required AC Coupled
2mA	D, h, k
20mA	C, h, k
200mA	B, h, k
5A	A, h, m

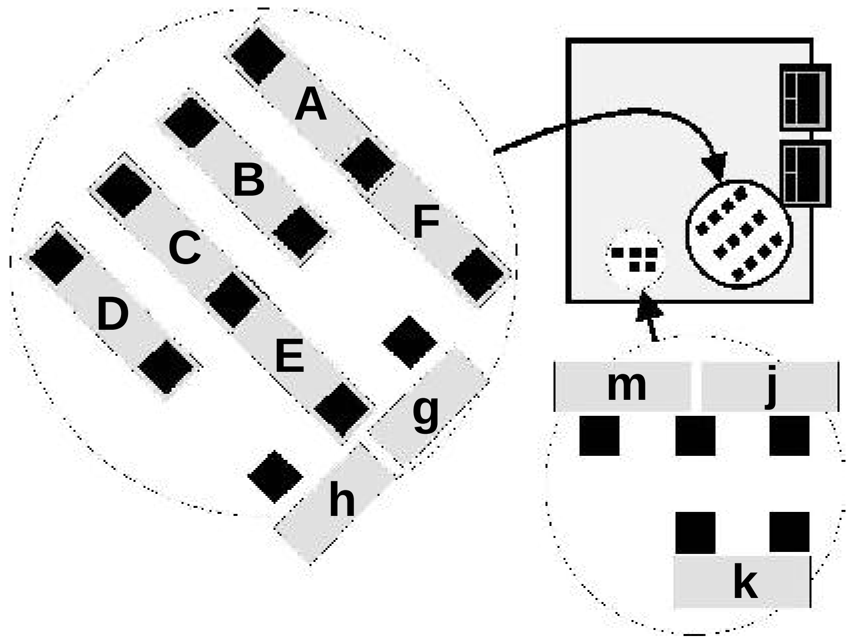


Figure 16. 1 RMS Signal Conditioner

Notes
1. Jumpers designated by capital letters require 5mm (0.2in) jumpers. Jumpers designated by lower case letters require 2.5mm (0.1 in) jumpers.
2. Spare jumpers should be stored on single unused jumper posts <u>not</u> associated with capital letter designations

16. 2 MENU SELECTION

Whenever the scale factor is 1.0 and offset is zero, the meter displays a direct readout of the signal input in (milli)volts or (milli)amperes. In the following example, the meter is configured for a full scale display of 0 to 20V or 0 to 20mA equals 20.000. Other ranges follow the same setup format. Note that the decimal point selection does not affect the displayed value. A full scale value of 20000 may be displayed as 20.000 Volts or 20000 millivolts. When an external shunt or current transformer is used to monitor current, the appropriate scale factor must be entered. A 5A CT input to the meter displays 20000 (2000 when 3 1/2 digit is selected). For an 800 Amp CT, divide 8000 (desired full scale display with .1 Amp resolution) by 20000 (full scale when the scale factor is 1.0) for the correct scale factor. Enter .4 as a scale factor. During setup, it may be necessary to enable some menu items that are locked out. See Section 9 for further information.

MENU KEY ➥	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
InPut Press the ➥ key to display InPut (Input type selection). **Note:** Selection of input type & range must match jumper selection in Section 16. 1.	**AC U** Press ▶ until AC U (ac Volts) is displayed or **AC A** AC A (ac Amperes) is displayed.	**20.0U** Press ▲ to select 0.2V, 2.0V, 20.0V, 200.0V or 660.0V or **20.0a** 2.0a, 20.0a, 200.0a (milliamps) or 5.0A (Amps)
SEtuP Press the ➥ key to display SEtuP. (Basic setup). See Section 9, Page 10 for detailed description of selections for digits 1 through 5.	**30000** Press ▶ to display status and select left digit. Press ▶ again to select another digit. Selected digit will flash.	**00000** 1 2 3 4 5 Press ▲ to select value for flashing digit. Digit 1: "0"= 20,000 cts. full scale "2"=Same as "0" but LSD is fixed zero. "3"=2,000 cts. full scale Digit 4: Set to "0" for scale and offset
dEc.Pt Press the ➥ key to display dEcPt (Decimal point).	**d.dddd** Press to display decimal point location.	**ddddd** Press ▲ to select decimal point location.
SCALE Press the ➥ key to display SCALE (Scale factor).	**005.00** Press ▶ to display value and select left digit. Press again to select another digit.	**1.0000** Use ▲ to set digit values. Set value and decimal to 1.0 or appropriate multiplier for external shunts or CT's.
OFFSt Press the ➥ key to display OFFSt (Zero offset).	**01.250** Press ▶ to display value and select left digit. Press again to select another digit.	**00.000** Use ▲ to set digit values. Set value to 00.000. Decimal point is fixed by Dec.Pt.

rESEt **20.000**

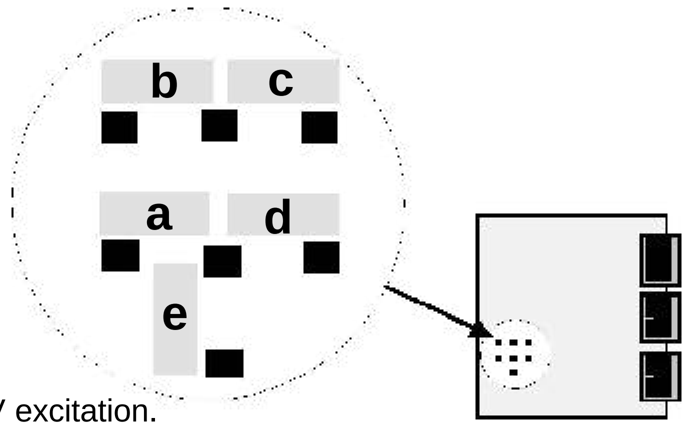
Press the ➥ key. Continue to press ➥ (or ➥ and ▲ simultaneously) until rESEt is displayed. The meter will now go to the operating mode and display the value of the input signal.

17. LOAD CELLS AND MICROVOLT INPUTS

This section provides setup instructions for use as a microvoltmeter or with load cells and strain gauges. 10 Volt excitation will power up to 4 350 Ohm load cells. Sense leads may be used to compensate for lead resistance of the excitation supply. For configuration of optional boards, see the appropriate section elsewhere in the manual.

17.1 RANGE JUMPER LOCATIONS

Input	Jumper Locations	Full Scale Display Scale factor = 1
20mV	e	20000
50mV	a	50000
100mV	b	10000
250mV	c	25000
500mV	d	50000



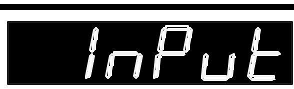
Notes
1. See Section 22 to select 10V excitation.
2. Jumpers are 2.5mm (0.1 in).

Figure 17.1 Load Cell Signal Conditioner

17.2 MENU SELECTION

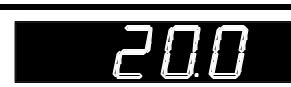
To scale the meter using the reading method of coordinates of 2 points, the low signal input and high signal input are read directly by the meter and are stored as Lo in and Hi in. For example, the full scale range of a load cell is 500 pounds and has an output of 2mV/V. With 10V excitation, the full scale range of 20mV selected. The resolution is .01 pounds. With no weight on the scale, the meter should read 0.00 and with a 500 pound weight on the scale the meter should display 500.00 pounds. With no weight on the scale, press the menu key to select Lo inand press the digit select key. The meter will take readings and display the millivolt value of the input signal. Pressing the value select key will store this reading as Lo in. Press the menu key to select Hi in, place the 500 pound weight on the scale and repeat the procedure the same as for Lo in. Press the menu key to select lo rd (Low reading) and enter 000.00, then press the menu key to select Hi rd (High reading) and enter 500.00. Advantages of this method are accuracy, since reading the value corrects for any error in the transducer, and ease of recalibration. To recalibrate the meter, take readings at 0 and 500 pounds, Lo rd and Hi rd do not need to be reentered. If a 500 lb. weight was not available, the same result can be achieved by using any known weight. During setup, it may be necessary to enable some menu items. See Section 9 for further information. See Section 12, Process Meters, for an example scaling by direct entry of the input values.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲



Press the ➡ key to display InPut (Input type selection).

Press ▶ until Strn (ratiometric) is displayed.



Press ▲ to select 20.0, 50.0, 100.0, 250.0 or 500.0mV

MENU KEY ↦	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
ConFG Press the ↦ key to display ConFG(configuration). See Section 9, Pg 13 for detailed description of digits 1 thru 5.	00000 Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash.	0 1000 1 2 3 4 5 Press ▲ to select value. Digit 2:"1"= Reading input 2 coodinate method of scaling.
dEc.Pt Press the ↦ key to display dEcPt (Decimal point)	d.dddd Press ▶ to display decimal point location.	ddd.dd Press ▲ to change decimal point location.
rESEt Press the ↦ key. Continue to press ↦ (or ↦ and ▲ simultaneously) until rESEt is displayed. The meter will go to the operating mode and display the value of the input signal		000.29
Lo in Press the ↦ key to display Lo in (Low signal input value). Apply an input for a known low value.	000.29 Press ▶ to display input signal. Meter will momentarily blank and then display a reading.	000.29 Use ▲ to store reading as low input
Hi In Press the ↦ key to display Hi in (High signal input value). Apply an input for a known high value.	19.957 Press ▶ to display input signal. Meter will momentarily blank and then display a reading.	19.957 Use ▲ t o set digit values and set to 20.000mV.
Lo rd Press the ↦ key to display Lo rd (Desired meter reading at low signal input).	00000 Press ▶ to display value and select left digit. Press ▶ again to select another digit. Decimal point set by dEc.Pt	00000 Use ▲ to set digit values and set to 0.
Hi rd Press the ↦ key to display Hi rd (Desired meter reading at high signal input).	500.00 Press ▶ to display value and select left digit. Press ▶ again to select another digit. Decimal point set by dEc.Pt .	500.00 Use ▲ to set digit values and set to 500.00.
rESEt Press the ↦ key. Continue to press ↦ (or ↦ and ▲ simultaneously) until rESEt is displayed. The meter will go to the operating mode and display the value of the input signal.		500.00

18. DUAL ALARM OUTPUTS

18.1 OPERATING MODE MENU SELECTION

When setting up the meter, it may be necessary to enable some of the menu items. See Section 9 for further information.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
ALSEt Press the ➡ key until ALSEt (Alarm setup) is displayed. See Section 9, ALSEt for detailed selection information for Digits 1 through 5.	00000 Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash.	200 13 1 2 3 4 5 Press ▲ to select value for flashing digit **Digit 1**:Relay state in alarm **Digit 2:** Latching or non-latching output **Digit 3:** Alarm high, low, or disabled **Digit 4:** Hysteresis or deviation **Digit 5:** Time delay
dEU 1b Press the ➡ key and dEU1b (Alarm 1 band deviation) or dEU1H (Alarm 1 hysteresis) is displayed if ALSEt digit 4 is not set to 4.	00000 Press ▶ to display value. Press again to select digit. Selected digit will flash.	00200 Using ▲ to select digit and ▶ to set digit value, enter deviation value for setpoint 1 Relays turn on and off at setpoint if value is zero.
dEU.2H Press the ➡ key and dEU2b (Alarm 2 band deviation) or dEU2H (Alarm 2 hysteresis) is displayed if ALSEt digit 4 is not set to 4.	00000 Press ▶ to display value. Press ▶ again to select digit. Selected digit will flash.	00200 Using ▲ to select digit and ▶ to set digit value, enter deviation value for setpoint 2 Relays turn on and off at setpoint if value is zero.

18.2 NORMAL OPERATION

When deviation and hysteresis are not enabled or deviation is set to zero, the alarm energizes at and above the setpoint and deenergizes below the setpoint if high alarm is selected. The alarm energizes at and below the setpoint and deenergizes above the setpoint if low alarm is selected. The setpoint value is not displayed if the alarm is disabled.

18.3 BAND DEVIATION

When deviation is selected from the setup menu, a value is entered for the amount of deviation required. This value represents the number of counts at which the relay will be energized above and below the setpoint. For example, if the setpoint is set to 10,000 and a deviation value of 200 was entered, the relay will activate below 9800 and above 10,200.

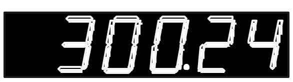
18.4 HYSTERESIS

When hysteresis is selected from the setup menu, a value is entered for the amount of hysteresis required. This value represents the number of counts at which the relay will be energized above and deenergized below the setpoint. For example, if the setpoint is set to 10,000 and a hysteresis value of 200 was entered, the relay will activate at 10200 and deactivate at 9800.

18. 3 VIEWING AND CHANGING SETPOINTS

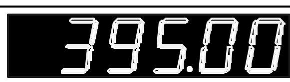
When viewing or changing the setpoint values, it is not necessary to enter the setup menu. This allows the meter to continue conversions and provide outputs when the setpoints are displayed.

ALARM KEY ↵	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲

<table>
<tr>
<td>

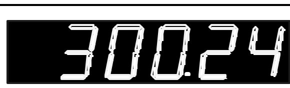
Press the ↵ ALARMS key to display Alarm 1 value.</td>
<td>

Alarm value blinks and Alarm 1 LED indicator lights. Press ▶ to select digit.</td>
<td>

Using ▶ to select digit and ▲ to set digit value, enter setpoint 1 value.</td>
</tr>
<tr>
<td>

Press ↵ ALARMS key again to display Alarm 2 value</td>
<td>

Alarm value blinks and Alarm 2 LED indicator lights. Press ▶ to select digit.</td>
<td>

Using ▶ to select digit and ▲ to set digit value, enter setpoint 2 value.</td>
</tr>
<tr>
<td colspan="3">

Press ↵ ALARMS key again. The meter resets and then displays the present reading.</td>
</tr>
</table>

19. ANALOG OUTPUT

The analog output option provides a 0 to 20mA and a 0 to 10Vdc linear signal derived from the displayed reading. The low signal output and high signal output may be set to equal any displayed value. Although both outputs are available, only one is calibrated to specifications. The other output is accurate to +/-1% of the displayed value typical (2%max).

19. 1 4 TO 20MA OUTPUT SCALING

The output is scaled by selecting a displayed value for the low signal output and a displayed value for the high signal output. For a current output, the low value is 0mA and the high output is 20mA. To scale a signal for 4 to 20 mA, the following procedure must be used:

1. Desired display value for 20mA - Desired display value for 4mA = Display span
2. Display span / 4 = Offset value
3. Desired display value for 4mA - Offset value = **An Lo**
4. **An Hi** = Desired display value for 20mA

19. 2 ANALOG OUTPUT SETUP SOFTWARE

The following menu items are accessible only with an Analog Output option installed and appropriate lockouts enabled. See Section 10 for further information. Setup Example: 4mA to 20mA out = 5000 counts to 15000 counts (See Section 19.1).

MENU KEY ➥	DIGIT SELECT KEY ▶	VALUE SELECT KEY▲
An SEt Press the ➥ key until An Set (Setup of analog output) is displayed. See Section 9, An Set for detailed selection information for Digits 1 through 6.	00 Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash.	12 1 2 3 4 5 6 Press ▲ to select value for flashing digit **Digit 5:** Current or Voltage **Digit 6:** Filtering
An Lo Press the ➥ key until An Lo (Displayed value at 0mA or 0V) is displayed.	00000 Press ▶ to display value. Press ▶ again to select digit. Selected digit will flash.	02500 Press ▲ to select value for flashing digit
An Hi Press the ➥ key until An Hi (Displayed value at 20mA or 10V) is displayed.	00000 Press ▶ to display value. Press ▶ again to select digit. Selected digit will flash.	15000 Press ▲ to select value for flashing digit

20. RS-232 AND RS-485 INTERFACE

20. 1 OPERATING MODE MENU SELECTION

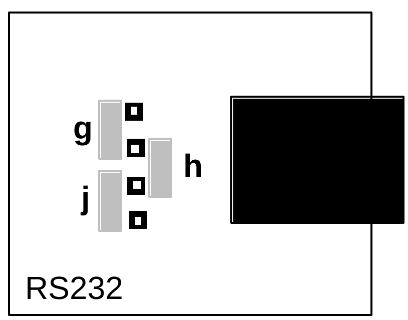
The following menu items are accessible only with an RS-232 or RS-485 option installed and appropriate lockouts enabled. See Section 10 for further information.

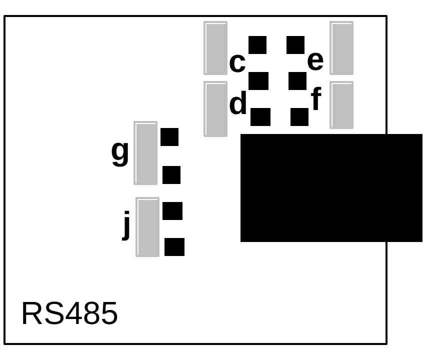
MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
SEr 1 Press the ➡ key until SEr 1 (Serial interface setup 1) is displayed.	000 1 2 3 4 5 Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash. **Digit 3:** Output filtering **Digit 4:** Baud rate **Digit 5:** Output update rate	158 1 2 3 4 5 Press ▲ to select value for flashing digit **3**: "0"- Send unfiltered signal "1"- Send filtered signal **4**: "0" - "6" -300 to 19.2K baud **5:** "0"- "9"-60/sec to 1/15min
SEr 2 Press the ➡ key until SEr 2 (Serial interface setup 2) is displayed.	0000 1 2 3 4 5 Press ▶ to display status. Press ▶ again to select digit. **Digit 2:** Line feed **Digit 3:** Alarm data sent with meter readings **Digit 4:** Control of output **Digit 5:** Meter address	001E 1 2 3 4 5 Press ▲ to select value for flashing digit **2**: "0"-no line feed "1"-<LF> after <CR> **3**: "0"-no alarm data "1"-alarm data sent **4**: "0"-continuous output "1"-output on command **5:** "1" to "F" & "0." to "F." - Meter #1 to Meter #31

20.2 JUMPER SELECTION

RS232

Jumper g - installed for normal operation
Jumper h - installed when used as slave display
Jumper j - provides pull up resistor on RTS line
Shipped with jumpers g and j installed





RS485

Jumper g and j - add 121 ohm load resistors andare installed with long cables. If multiple meters are on same line, only the last meter in the line should be jumpered.
Jumper d and **f** - installed for full duplex operation
Jumper c and **e** - installed for half duplex operation
Shipped with jumper d and f installed.

21. PARALLEL BCD OUTPUT

21. 1 OPERATING MODE MENU SELECTION

The following menu items are accessible only with a BCD option installed and appropriate lockouts enabled. See Section 9 for further information.

MENU KEY ➡	DIGIT SELECT KEY ▶	VALUE SELECT KEY ▲
SEr 1	0_0 1 2 3 4 5	0_0 1 2 3 4 5
Press the ➡ key until SEr 1 (Serial interface setup 1) is displayed.	Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash. **Digit 3:** Output filtering **Digit 5:** Output update rate	Press ▲ to select value for flashing digit **3**: "0"-Send unfiltered signal "1"-Send filtered signal **5:** "0"-Line frequency "1" to "9" - Batch display rate (3.5/ sec) to Batch display rate / 256 (1 every 15 min.)

21. 2 BCD OUTPUT LEVELS

The BCD option provides isolated, buffered, stored, 3-state parallel outputs that are selectable for either 0 to 5V logic levels (LSTTL, CMOS compatible) or 0 to 15Vdc. Selection jumpers are located on the BCD board. BCD outputs are positive true. Polarity bit is positive true for +sign.

LOGIC LEVEL	JUMPER REQUIRED
0 to 5Vdc	b
0 to 15Vdc	a

21. 3 BCD CONTROL SIGNALS

Enable	Logical 0 - All outputs go to the high impedance state Logical 1 - BCD information is available at outputs.
$\overline{\text{BCD Hold}}$	Logical 0 - BCD from last update prior to BCD Hold going low is stored Logical 1- BCD information updates at selected rate.
$\overline{\text{Data Ready}}$	Logical 0 - BCD outputs are valid Logical 1 - BCD outputs are not valid

22. 5, 10 AND 24 VDC EXCITATION OUTPUTS

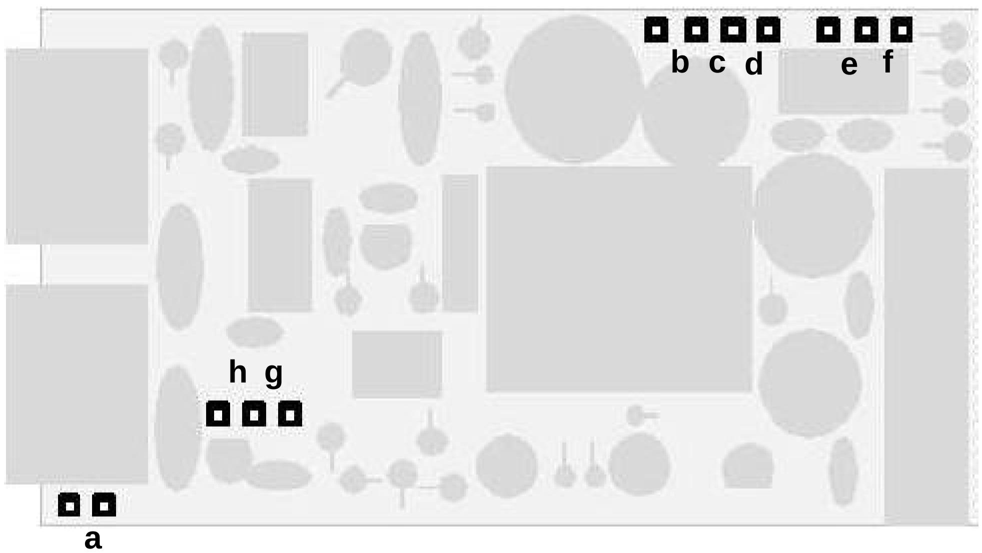
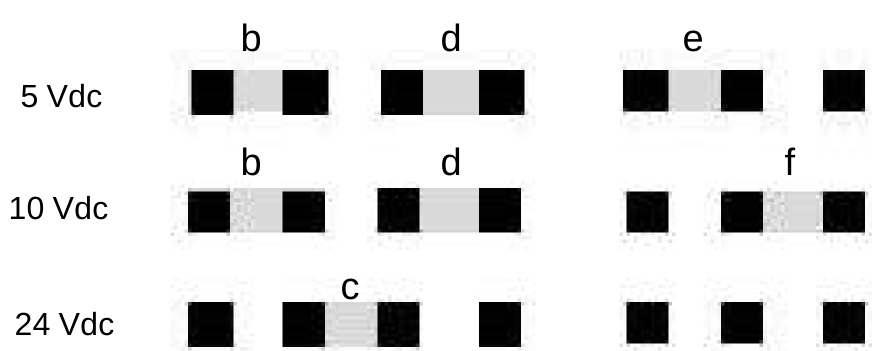


Figure 22. 1 - Power Supply

22. 1 SELECTION OF 5, 10 OR 24VDC OUTPUT

Voltage Output	Jumper Locations
5 Vdc	b, d and e
10 Vdc	b, d and f
24 Vdc	c



22. 2 SELECTION OF OTHER JUMPERS

Jumper ' **a** ' - Front panel menu lockout, locked when installed (see Section 10.1)

Jumper ' **g** ' - Provides +5V power output at P1-4 when installed
Jumper ' **h** ' - Connects "Digital Input B" to P1-4 when installed

23. DIGITAL INPUTS

23.1 FUNCTION OF DIGITAL INPUTS

$\overline{\text{Tare}}$ Logical 0 - The present display value is set to zero and stored as an offset value.
Logical 1 - The displayed value is equal to the signal input minus the tare value.

$\overline{\text{Peak Display}}$ Logical 0 - The peak value of the input signal is displayed.
Logical 1 - The present value of the input signal is displayed.

$\overline{\text{Hold}}$ Logical 0 - The meter display and outputs are held at the last reading.
Logical 1 - The display and outputs are updated normally

$\overline{\text{Reset}}$ Logical 0 - The microcomputer reads and resets the meter to nonvolatile memory values
Logical 1 - The meter display and outputs operate normally.

$\overline{\text{Function Reset}}$ Logical 0 - The microC resets peak to present value and resets alarms.
Logical 1 - The meter display and outputs operate normally.

External Decimal Points	Input A	Input B	Decimal Pts 1	Decimal Pts 2
	1	1	XXXXX	XXXX.X
	0	1	XXXX.X	XXX.XX
	1	0	XXX.XX	XX.XXX
	0	0	XX.XXX	X.XXXX

23.3 MENU SELECTIONS

MENU KEY ➡ | **DIGIT SELECT KEY** | **VALUE SELECT KEY ▲**

SEtuP

Press the ➡ key until SEtup (Basic meter setup) is displayed.

00000
1 2 3 4 5

Press ▶ to display status. Press ▶ again to select digit. Selected digit will flash. **Digit 5:** digital inputs A & B at J1, Pins 5 and 4.

00005
1 2 3 4 5

Press ▲ to select value for flashing digit
0 A: Reset B: Meter Hold
1 A: Function Reset
B: Peak display
2 A: Meter Hold B: Peak
3 A: Meter Hold B: Tare
4 A: Peak B: Tare
5 A: Tare B: Reset
6 External Decimal Pts.1
7 External Decimal Pts.2

24. CALIBRATION

All ranges of the meter have been digitally calibrated at the factory prior to shipment. The calibration equipment is certified to NIST standards. Calibration constants are stored in non-volatile memory in EEPROM on the signal conditioner. This eliminates much of the analog circuitry that causes drift and provides superior long term accuracy and stability.

Since the calibration is stored on the signal conditioner and analog output boards, all boards may be mixed and interchanged without requiring recalibration. If recalibration is required, the meter may be returned to the factory or any authorized distributor.

For the customer requiring on site calibration, an RS-232 or RS-485 option must be installed to perform the calibration. The interface card may be temporarily installed and then removed upon completion of calibration. Step-by-step instructions for calibration and the equipment required is available from the factory.

25. SPECIFICATIONS

BASIC METER

Display

Type .... 5 LED, 7-segment, 14.2mm (.56") high digits & 3 LED indicators
Color .... Red or green
Range .... -99999 to +99999 and -99990 to +99990

A to D Conversion

Technique (Pat.5,262,780) .... Concurrent Slope™
Rate .... 60/s for 60 Hz NMR, 50/s for 50 Hz NMR
Output Update Rate .... 56/s at 60 Hz, 47/s at 50 Hz
Display Update Rate .... 3.5/s at 60 Hz, 3/s at 50 Hz

Noise Rejection

CMV from DC to 60 Hz .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
CMR from DC to 60 Hz .... 130 dB
NMR at 50/60 Hz .... 90 dB with minimum digital filtering

External Inputs/Outputs (CMOS/TTL Levels)

$\overline{\text{Hold}}$ input .... 0 - holds display and outputs
$\overline{\text{Peak}}$ input .... 0 - displays peak value
$\overline{\text{Tare}}$ input .... 0 - offsets input value to zero
$\overline{\text{Reset}}$ input .... 0 - resets all meter functions
$\overline{\text{Function Reset}}$ input .... 0 - resets peak values and alarms
Decimal Point input .... overrides internal DP selections and controls DP position

ACCURACY

DC Volts

VOLTAGE RANGE	RESOLUTION	INPUT OHMS	ERROR AT 25°C
200.00 mV 2.0000 V 20.000 V 200.00 V 660.0 V	10 uV 100 uV 1 mV 10 mV 100 mV	1 G 1 G 1 M 1 M 1 M	.01% Full Scale +/-2 Ct.

DC Amperes

CURRENT RANGE	RESOLUTION	INPUT OHMS	ERROR AT 25°C
2.0000 mA 20.000 mA 200.00 mA 5.000 A	0.1 uA 1.0 uA 10 uA 1.0 mA	100 10 1 .01	.01% Full Scale +/-2 Ct.

Ratio

VOLTAGE RANGE	RESOLUTION	INPUT OHMS	ERROR AT 25°C
200.00 mV 2.0000 V 20.000 V	10 uV 100 uV 1 mV	1 G 1 G 1 M	.01% Full Scale +/-2 Ct.

True RMS Volts (1 to 100% Full Scale)

VOLTAGE RANGE	RESOLUTION	INPUT OHMS	ERROR AT 25°C
200.00 mV 2.0000 V 20.000 V 200.00 V 660.0 V	10 uV 100 uV 1 mV 10 mV 100 mV	22 M 22M 1 M 1 M 1 M	.1% FS +/-10 Ct. from 10 Hz to 10kHz

True RMS Amperes (1 to 100% Full Scale)

CURRENT RANGE	RESOLUTION	INPUT OHMS	ERROR AT 25°C
2.0000 mA 20.000 mA 200.00 mA 5.000A	0.1 uA 1.0 uA 10 uA .25 mA	100 10 1 .01	.1% FS +/-10 Ct. from 10 Hz to 10kHz

RTD's (.01, .1, 1.0 Degree Resolution)

PT100 TYPE	RANGE	ERROR AT 25°C
DIN .00385	-202°C to +850°C -331°F to +1562°F	.01% FS +/- 0.03°C .01% FS +/- 0.05°F
ANSI .003925	-202°C to +631°C -331°F to +1168°F	.01% FS +/- 0.04°C .01% FS +/- 0.07°F

Thermocouple
(.1, 1.0 Degree Resolution)

TC TYPE	RANGE	ERROR AT 25°C
J	-210°C to +760°C -347°F to +1400°F	.01% FS +/- 0.09°C .01% FS +/- 0.16°F
K	-244°C to +1372°C -408°F to +2501°F	.01% FS +/- 0.1°C .01% FS +/- 0.17°F
T	0°C to +400°C -257°C to 0°C +32°F to 752°F -430°F to +32°F	.01% FS +/- 0.03°C .01% FS +/- 0.2°C .01% FS +/- 0.05°F .01% FS +/- 0.36°F
E	-240°C to +1000°C -400°F to +1830°F	.01% FS +/- 0.18°C .01% FS +/- 0.32°F
N	-244°C to +1372°C -408°F to +2501°F	.01% FS +/- 0.1°C .01% FS +/- 0.17°F
S	-46°C to +1768°C -51°F to +3213°F	.01% FS +/- 0.12°C .01% FS +/- 0.22°F
R	-45°C to +1768°C -49°F to +3214°F	.01% FS +/- 0.17°C .01% FS +/- 0.31°F

Load Cell Inputs

INPUT RANGE	RESO-LUTION	OUTPUT ZERO RANGE	OUTPUT SPAN RANGE	ERROR AT 25°C
20.000 mV 50.000 mV 100.00 mV 250.00 mV 500.00 mV	1 uV 2.5 uV 5 uV 12.5 uV 25 uV	-99,999 to +99,999	0 to +/-99,999	.01%Full Scale +/-1Ct.

Span Tempco .... 0.003% of reading/°C
Load Cell Meter only .... 0.0015% of reading/°C
Zero Tempco .... 0.2 uV/°C
Reference Junction .... 0.03 degree/degree

POWER SUPPLIES

Input Voltage (std) .... 85 to 264 Vac, 90 to 370 Vdc
Input Voltage (opt) .... 8 to 28 Vac, 9 to 37 Vdc
Frequency .... DC and 47 to 440 Hz
Consumption .... 5.3 Watts max.

Excitation Power Supplies
Outputs .... 5 Vdc, 5%, 100 mA max
10 Vdc, 5%, 120 mA max.
24 Vdc, 5%, 40 mA max.
Ripple .... 100 mVp max.
Isolation .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test

DUAL CONTROLLER OPTION

Basic

Power .... Provided by basic meter
Update Rate .... 56/s at 60 Hz, 47/s at 50 Hz
Setup .... setpoint values may be entered by front
panel pushbuttons or via RS-232 or RS-485
Lockouts .... Front panel pushbuttons control display and change of
setpoints, only control display of setpoints, or are disabled.
Output Operation .... either output may be set to operate above, below or
around the setpoint, latching or non-latching or output disabled
Filtering .... comparison to the setpoints may be either
from the filtered or unfiltered input signal
Time Delay .... selectable time delay of output status
change of 1 to 128 readings
Hysteresis .... selectable from 0 to +/- 99,999 counts

Alarm Status Indicators

Type .... 2 red LED lamps

Relay Output

Contact Rating .... 10 A @ 240 Vac, 8 A @ 24 Vdc
Safety Certification .... VDE, UL, and CSA

Isolation
  Coil to Contacts .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
  Between Open Contacts .... withstand 4.2kVp for 1 min
  Pickup .... 26 ms typ.
  Release .... 22 ms typ.

Solid State Relay Output

Voltage Rating .... 125Vac, 150 Vdc max.
Current Rating .... 120 mAac, 240mAdc
Safety Certification .... VDE, UL and CSA
Isolation .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
Response to input signal .... 17 ms typ.

ANALOG OUTPUT OPTION

Isolation .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
Power .... supplied by basic meter
Accuracy .... basic meter +/-0.1% Analog Full Scale
Response Time .... 17 ms for unfiltered input, same as basic meter for filtered input
Compliance
  0 to 20 mA .... 12 V (0 to 600 Ohms)
  0 to 10 V .... 2 mA (5 kOhms min.) load
Scaling
Reading for Zero Output .... -99,999 to +99,999
Reading for Full Scale Output .... -99,999 to +99,999

RS-232 / RS-485 INTERFACE OPTION

Isolation .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
Power .... supplied by basic meter
Type .... full or half duplex (RS-485)
Baud Rates 300, 600, 1200, 2400, 4800, 9600, 19200
Signal Levels .... Meet RS-232 and RS-485 standards

BCD OUTPUT OPTION

Isolation .... Safety-rated to 250Vac, 4.2kVp per High Voltage Test
Power .... supplied by basic meter
Type .... 3-state, stored, parallel
Signal Levels .... LSTTL, CMOS compatible
Controls .... BCD Enable, Hold, Data Ready

ENVIRONMENTAL

Operating Temperature .... 0°C to 55°C
Storage Temperature .... -40°C to 85°C
Relative Humidity .... 90% from 0°C to 40°C

WARRANTY

UniMeasure meter products are warranted for one year from date of shipment against defects in materials and workmanship. During the warranty period, UniMeasure, at its option, will promptly repair or replace defective units at no charge to the purchaser if the product is returned to the factory freight prepaid. The warranty is void if the product is misused, damaged by accident, disassembled or intentionally abused. UniMeasure makes no other warranties either expressed or implied other than that above. UniMeasure assumes no liability for consequential damages under any circumstances. Prices, specifications and product appearance are subject to change without notice.