COOPER INSTRUMENTS & SYSTEMS

DFI INFINITY CS

STRAIN METER/CONTROLLER

USER'S GUIDE

www.cooperinstruments.com
PH: 540-349-4746 • FAX: 540-347-4755

CONTENTS

PREFACE

Manual Objectives
This manual shows you how to set up and use the Programmable Digital Meter.

Standard Procedures:

- Checking voltage jumpers, or changing voltage power
- Mounting the panel
- Selecting the input type
- Selecting a decimal point position
- Scaling with known loads (on-line calibration)
- Scaling without known loads
- Selecting ratiometric/non-ratiometric operation
- Displaying the filtered/unfiltered input signal
- Selecting a display color
- Setting the setpoint's active band
- Selecting a latched or unlatched operation
- Setting setpoint deadbands
- Enabling/disabling setpoint changes
- Enabling/disabling the RESET button in the Run Mode

Optional Procedures:

- Setting input resolution
- Enabling/ disabling analog output
- Selecting analog output as current or voltage
- Assigning the output to net/gross reading
- Scaling analog output

Features with NEW are for the "B" version which has three-color programmable "Big" LED display – All segment characters shown are for the "B" version.

For first-time users: Refer to the QuickStart Manual for basic operation and set-up instructions.

Table A-1 Sections of the Manual

IF YOU WANT TO READ ABOUT:	REFER TO SECTION	
Unpacking; safety considerations	1	Introduction
Meter description and features	2	About the Meter
Main board power jumpers; panel mounting, sensor input, main power and analog and relay output	3	Getting started
Input type; decimal point position; reading scale & offset; reading configuration; display color; setpoint configuration; setpoint deadbands; output configuration (analog output); analog output scaling; lock out configuration; display brightness	4	Configuring the Meter
Display messages	5	Display Messages
Meter menu/sub-menu messages	6	Menu Configuration
Setpoint configuration messages	7	Setpoint Configuration Displays
Specifications	8	Specifications
Factory Preset Values	9	Factory Default Setup as Shipped

NOTES, WARNINGS and CAUTIONS
Information that is especially important to note is identified by three labels:

- NOTE
- WARNING
- CAUTION
- IMPORTANT

NOTE: provides you with information that is important to successfully setup and use the Programmable Digital Meter.

CAUTION or WARNING: tells you about the risk of electric shock.

CAUTION, WARNING or IMPORTANT: tells you of circumstances or practices that can affect the meter's functionality and must refer to accompanying documents.

TIP: provides you helpful hints.

1.0 INTRODUCTION

1.1 Unpacking

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call Cooper Instruments at 1-800-344-3921.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary. Verify that you receive the following items in the shipping box:

QTY	DESCRIPTION
1	Programmable Digital Meter indicator/controller with all applicable connectors attached.
1	Owner's Manual
1	Set Mounting brackets

If you ordered any of the available options, they will be shipped in a separate container to avoid any damage to your indicator/controller.

1.2 Safety Considerations

This device is marked with the **international caution symbol**. It is **important to read** this manual before installing or commissioning this device as it contains important information relating to **Safety and EMC** (Electromagnetic Compatibility).

This instrument is a **panel mount** device protected in accordance with EN 61010-1:2001, electrical safety requirements for electrical equipment for measurement, control and laboratory. Installation of this instrument should be done by qualified personnel. In order to ensure safe operation, the following instructions should be followed.

This instrument has **no power-on switch**. An external **switch or circuit breaker** shall be included in the building installation as a disconnecting device. It shall be marked to indicate this function, and it shall be in close proximity to the equipment within easy reach of the operator. The switch or circuit-breaker shall not interrupt the Protective Conductor (Earth wire), and it shall meet relevant requirements of IEC 947-1 and IEC 947-3 (International Electrotechnical Commission). The switch shall not be incorporated in the main supply cord.

Furthermore, to provide protection against **excessive energy** being drawn from the main supply in case of a fault in the equipment, an **overcurrent** protection device shall be installed.

- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.
- Unit mounting should allow for adequate ventilation to ensure instrument does not exceed operating temperature rating.

- Use electrical wires with adequate size to handle mechanical strain and power requirements. Install without exposing bare wire outside the connector to minimize electrical shock hazards.

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead (s) on signal wires close to the instrument if EMC problems persist.

Failure to follow all instructions and warnings may result in injury!

2.0 ABOUT THE METER

2.1 Description

The Digital Programmable Strain meter is a value packed indicator/controller. Four full digits and broad scaling capability allow for a display in virtually all engineering units. A wide variety of DC current and voltage input ranges cover typical strain applications. Standard features include sensor excitation and front panel or remote tare. Your meter may be a basic indicator or it may include analog output or dual relay output. Analog or dual relay output must be ordered at time of purchase. Analog output is fully scalable and may be configured as a proportional controller, or to follow your display. Dual 5 amp, form C relays control critical processes. A mechanical lockout has been included to guard against unauthorized changes.

2.2 Features

The following is a list of standard features:

- 4-digit, three color Programmable, Big LED display or
  4-digit, Standard LED display
- NEMA 4 Front Bezel
- ±0.03 % accuracy
- 8 DC input ranges: 0-100 mV, ±50 mV, 0-5 V, 1-5 V, 0-10 V, ±5 V, 0-20 mA, and 4-20 mA
- 5,10,12, or 24 Vdc sensor excitation
- Peak detection
- Front panel and remote tare function
- Nonvolatile memory-no battery backup
- 115 or 230 Vac 50/60 Hz power supply or
  10 – 32 Vdc or 26-56 Vdc

The following is a list of optional features:

- Dual 5 amp, form C relay output
- Scalable analog output
- Proportional control
- Easy setup for proportional control

2.3 Available Accessories

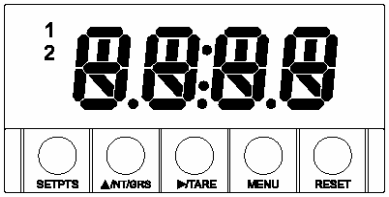
Table 2-1 Accessories and Add-Ons

Add-On Options	
FS	Special Calibration/Configuration
SPC4	NEMA-4 Splash proof Cover
SPC18	NEMA-4 Splash Proof Cover, NEW

Accessories	
TP1A	Trimplate panel adaptor - Adapts DIN1A/DIN2A cases to larger panel cutouts
RP18	19-in. Rack Panel for one (1) 1/8 DIN instrument
RP28	19-in. Rack Panel for two (2) 1/8 DIN instruments

2.4 Front of the Meter

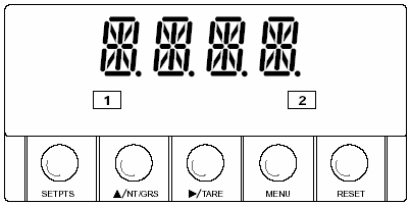
Figure 2-1 shows each part of the front of the three-color programmable “Big” LED display Meter (Version B).



Digital LED Display:
-1.9.9.9 or 9.9.9.9 4-digit three color programmable, 21 mm (0.83”) high LED display with programmable decimal point.

Figure 2-1 Front-Panel with Big Display

Figure 2-2 shows each part of the front of the standard LED display meter.



Digital LED Display:
-1.9.9.9 or 9.9.9.9 14 segment, 13.8 mm (0.54”)
high LED display with programmable decimal point.

Figure 2-2 Front-Panel with Standard Display

These meter display windows (both versions) light when appropriate:
1 Setpoint 1 status
2 Setpoint 2 status

5 Pushbuttons for programming the meter.

METER BUTTONS
SETPTS Button
In the Run Mode, this button will sequentially recall the previous setpoint settings. As necessary, use the **▲/NT/GRS** and **▶/TARE** buttons to alter these settings, and then press the **SETPTS** button to store new values.

Unless you press the **SETPTS, ▶/TARE,** or **▲NT/GRS** button within 20 seconds, the meter will scroll to setpoint 2 and then to the Run Mode.

Note If the dual relay option is not installed, or if L.3= I is displayed on the LW.CF menu, pressing the **SETPTS** button will display the meter’s firmware version.

▲/NT/GRS Button
In the Run Mode, this button will toggle between net/gross readings or peak readings, depending upon setup.

In the Configuration Mode, press this button to change the value of the flashing digit shown on the display and/or toggle between menu choices, such as R.I=R or R.I=N on Rd.CF menu . When configuring your setpoint values, press the **▲/NT/GRS** button to advance the flashing digit’s value from 0 to 9 by 1.

▶/TARE Button
In the Run Mode press the **▶/TARE** button to tare your reading (zeroing).

In the Configuration Mode, press this button to scroll to the next digit.

MENU Button
In the Run Mode, press the **MENU** button to terminate the current measuring strain and enter you into the Configuration Mode.

Note: Only if you have not installed the lock out jumpers on the main board.

In the Configuration Mode, press the **MENU** button to store changes in the nonvolatile memory and then advance you to the next menu item.

RESET Button
If you hard reset (press the **MENU** button followed by the **RESET** button) or power off/on the meter, it shows RSt, followed by StRN**.**

In the Run Mode, press the **RESET** button to reset the latched setpoints. The meter shows SP.RS and returns to the Run Mode.

In the Configuration Mode, press the **RESET** button once to review the previous menu. Press the **RESET** button twice to perform a hard reset and return to the Run Mode.

In the Peak Mode, press the **RESET** button to reset peak values. The meter shows PK.RS and returns to the Run Mode.

In the Setpoint Mode, press the **RESET** button to reset the latched setpoint. The meter shows SP.RS and enters the Run Mode.

In the Tare Mode, press the **RESET** to reset. The meter shows t.RSt**.**

Note: *When in setpoint or Configuration Mode, if the meter shows 9999 or –1999 with all flashing digits, the value has overflowed. Press the* ▲**INT/GRS** *button to start a new value.*

2.5 Back of the Meter

Figure 2-3 shows the label describing the connectors on the back of the meter. Table 2-2 on the following page gives a brief description of each connector at the back of the meter.

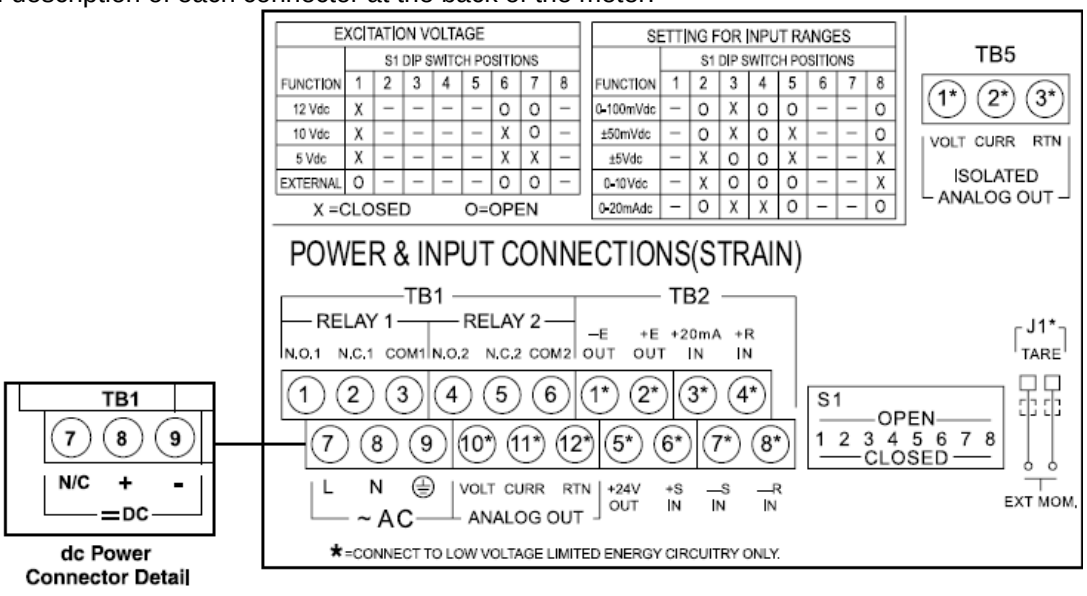


Figure 2-3 Connectors (AC-Powered and DC-Powered Detail)

Table 2-2 Connector Description

Connector	Description
TB1-1	Setpoint 1: Normally open (N.O.1) connection
TB1-2	Setpoint 1: Normally closed (N.C.1) connection
TB1-3	Setpoint 1: Common (COM1) connection
TB1-4	Setpoint 2: Normally open (N.O.2) connection
TB1-5	Setpoint 2: Normally closed (N.C.2) connection
TB1-6	Setpoint 2: Common (COM2) connection
TB1-7	AC line connection (no connections on DC-powered units)
TB1-8	AC neutral connection (+ Input on DC-powered units)
TB1-9	AC earth ground (DC-power return on DC-powered units)
TB1-10	Analog voltage output
TB1-11	Analog current output
TB1-12	Analog return
TB2-1	-E: Negative excitation connection from meter (5,10,12 V)
TB2-2	+E: Positive excitation connection from meter (5,10,12 V)
TB2-3	+20 mA connection for analog input
TB2-4	+R (Not used)
TB2-5	+24 V output connection
TB2-6	+S: Positive signal input
TB2-7	-S: Negative signal input and return for +20 mA or +24 V
TB2-8	-R (Not used)
TB5-1	Isolated Analog Voltage Output
TB5-2	Isolated Analog Current Output
TB5-3	Isolated Analog Output Return
J1 (1-2)	Remote tare connection with a momentary switch

The DIP switches are located at the S1 position (Refer to **Figure 3-2**). Use a small instrument such as a paper clip to change the switches from open to closed. **Table 2-3** lists DIP switch settings at the S1 position required to complete the setup of your meter.

Table 2-3 DIP Switch Positions/Input Range & Excitation

Function	**S1 DIP Switch Positions**							
C= Closed O= Open	1	2	3	4	5	6	7	8
Settings for Excitation Voltage								
Internal 5/10/12 excitation	C	-	-	-	-	-	-	-
External 5/10/12 excitation	O	-	-	-	-	O	O	-
Internal 12 Vdc Excitation	C	-	-	-	-	O	O	-
Internal 10 Vdc Excitation	C	-	-	-	-	C	O	-
Internal 5 Vdc Excitation	C	-	-	-	-	C	C	-
Settings for Input Ranges								
0-100 mV dc	-	O	C	O	O	-	-	O
±50 mV dc	-	O	C	O	C	-	-	O
±5 Vdc	-	C	O	O	C	-	-	C
0-10 Vdc	-	C	O	O	O	-	-	C
0-20 mA dc	-	O	C	C	O	-	-	O

The display must also be configured to the selected input type after setting the DIP switches (see **Section 4.1**, Selecting the Input Type)

2.6 Disassembly

You may need to open up the meter for one of the following reasons:

- To check or change the 115 or 230 Vac power jumpers.
- To install or remove jumpers on the main board.

Note Disconnect the power supply before proceeding.

To remove and access the main board, follow these steps:

- Disconnect main power from the meter.
- Remove the back case cover.
- Lift the back of the main board upwards and let it slide out of the case.

3.0 GETTING STARTED

Caution: The meter has no power-on switch, so it will be in operation as soon as you apply power.

If you power off/on the meter, or perform a hard reset (press the **RESET** button twice), the meter shows RSt followed by StRW.

3.1 Rating/Product Label

This label is located on top of the meter housing (refer to **Figure 3-4**).

3.2 Main Board Power Jumpers (Refer To Figure 3-1)

Note **Important:** If you want to change the Factory preset jumpers, do the following steps, otherwise go to **Section 3.3**.

Warning: Disconnect the power from the unit before proceeding. This device must only be reconfigured by a specially trained electrician with corresponding qualifications. Failure to follow all instructions and warnings may result in injury!

1. Remove the main board from the case. Refer to **Section 2.6**.

2. Locate the solder jumpers W1, W2, and W3 (located near the edge of the main board alongside the transformer).

3. If your power requirement is **115 Vac, solder jumpers W1 and W3 should be wired, but jumper W2 should not.** If your power requirement is **230 V ac, solder jumper W2 should be wired, but jumpers W1 and W3 should not.**

Note: W4 jumper is not used.

Figure 3-1 shows the location of solder jumpers W1 through W3.

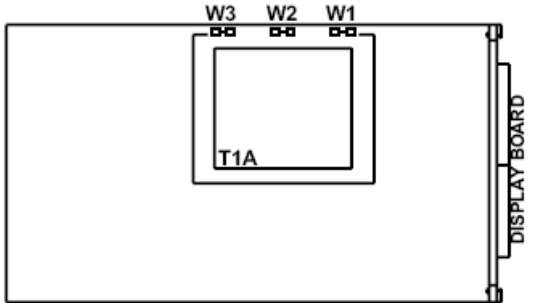


Figure 3-1 Main Board Power Jumpers

Figure 3-2 shows the location jumper positions on the main board.

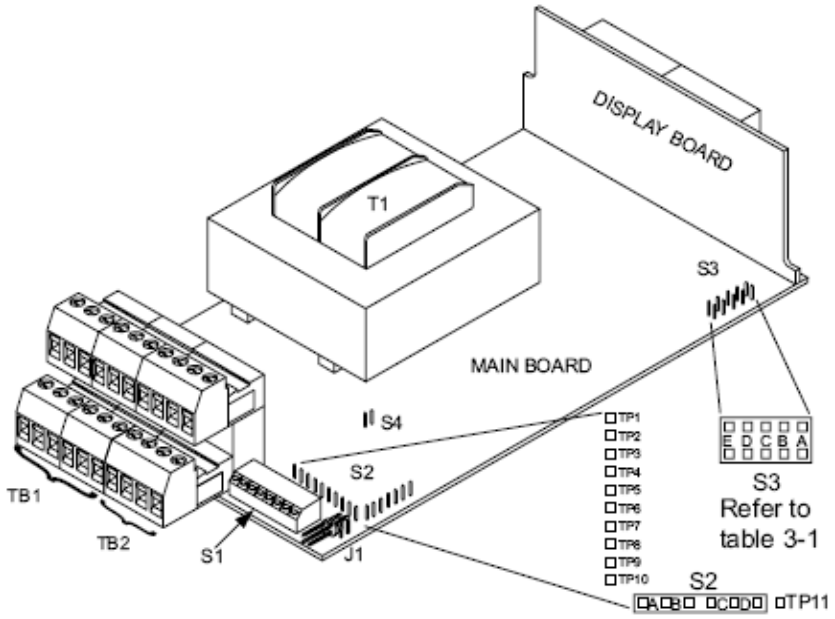


Figure 3-2 Main Board Jumper Positions

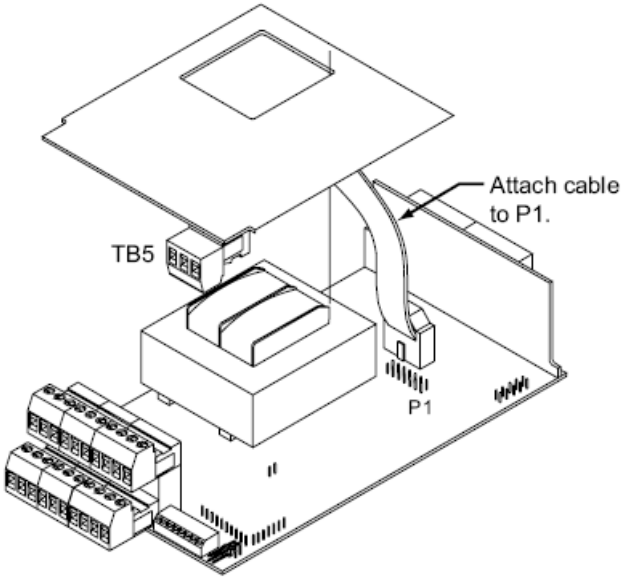


Figure 3-3 Upper Isolated Analog Output Option Board Installation

S2 jumpers are used for testing purposes. Do not use as reading errors may result.

S3 jumpers are used for the following (refer to **Figure 3-2**):

- To enable or disable the front panel push-buttons
- To allow for an extremely low resistance load button for analog output
- To disable the **MENU** button
- To perform factory calibration procedure

Test pins TP1 – TP11 are for testing purposes. Do not use as reading errors may result.

S4-A factory default jumper is removed.

Table 3-1 S3 Jumper Functions

Jumper	Description
S3-A	Install to enable front panel push buttons. Remove to disable all front panel push-buttons
S3-B	Removed. For factory calibration only.
S3-C	Removed. Not Used
S3-D	Installed for external ratiometric.
S3-E	If installed without S3-B, the **MENU** button locks out. If you press the **MENU** button, the meter shows **LOCK**.

3.3 Panel Mounting

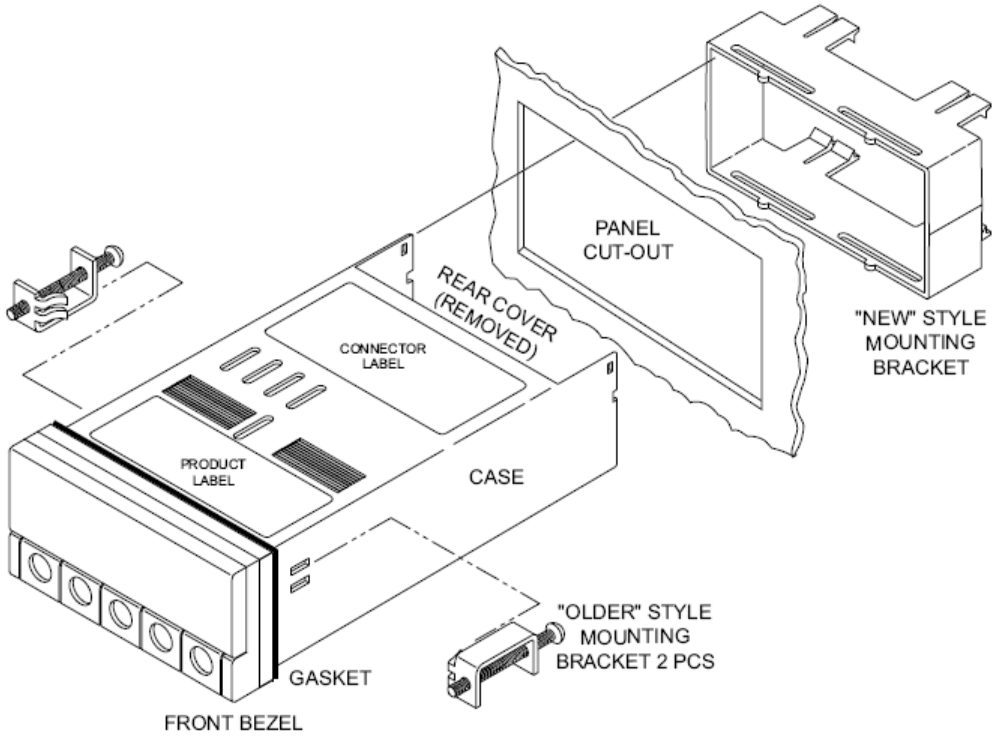
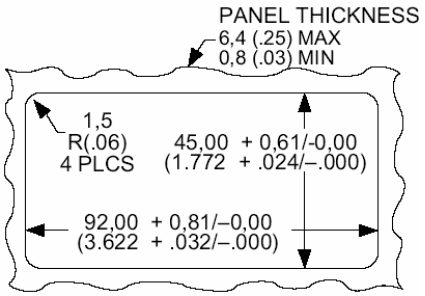


Figure 3-4 Meter – Exploded View

1. Cut a hole in your panel, as shown in **Figure 3-4**. For specific dimensions refer to **Figure 3-5**.
2. Insert the meter into the hole. Be sure the front bezel gasket is flush to the panel.
3. Slide on mounting bracket to secure.
4. Proceed to **Section 3.4** to connect your sensor input and main power.

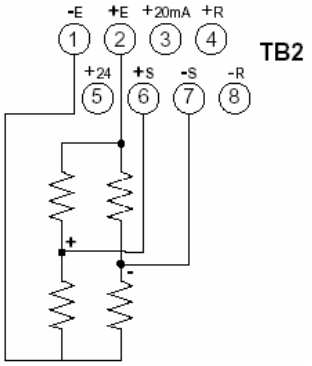


NOTE: Dimensions in Millimeters (Inches)

Figure 3-5 Panel Cut Out

3.4 Connecting Sensor Inputs

Figure 3-6 shows excitation supplied from the meter's internal supply (50mA maximum). Select 5,10, or 12 volt excitation at DIP switch.

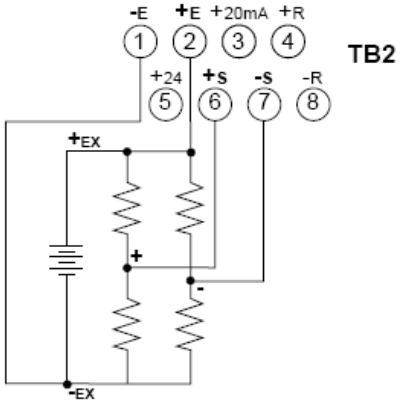


Connections with ”typical wire colors”

+E = Positive Excitation (red)
-E = Negative Excitation (black)
+S = Positive Signal Input (green)
-S = Negative Signal Input (white)

Figure 3-6 Meter-powered Bridge Input

Figure 3-7 shows the connections required for an externally-powered bridge input: the external supply is brought to the meter’s buffer circuits to permit ratiometric readings. Set S1 DIP switch for external excitation for **Figure 3-7** and **3-8**.



Connections with ”typical wire colors”

+E = Positive Excitation (red)
-E = Negative Excitation (black)
+S = Positive Signal Input (green)
-S = Negative Signal Input (white)

Figure 3-7 Externally-powered Bridge Input

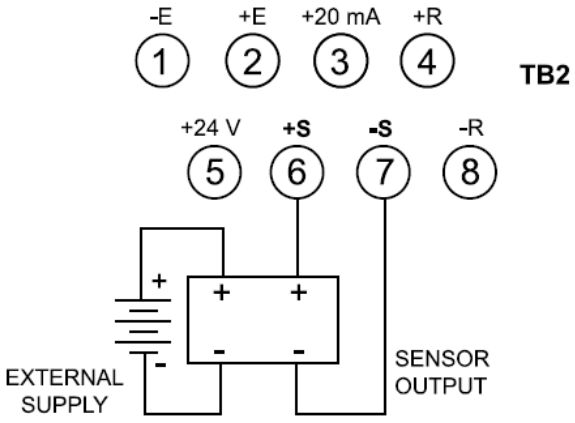


Figure 3-8 4-Wire DC Input Connections with External Excitation

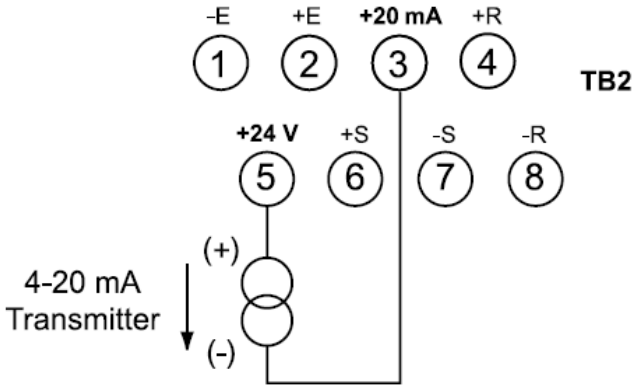


Figure 3-9 Current Input Connections with Internal Excitation

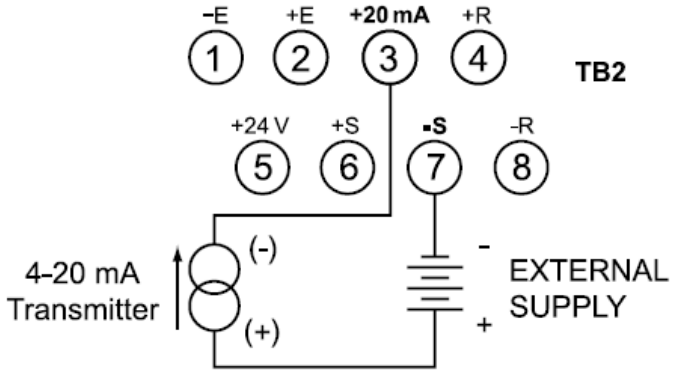


Figure 3-10 Current Input Connections with External Excitation

3.5 Connecting Main Power

Connect the AC main power connections as shown in **Figure 3-11**.

WARNING: Do not connect AC power to your device until you have completed all input and output connections. This device must only be installed by a specially trained electrician with corresponding qualifications. Failure to follow all instructions and warnings may result in injury!

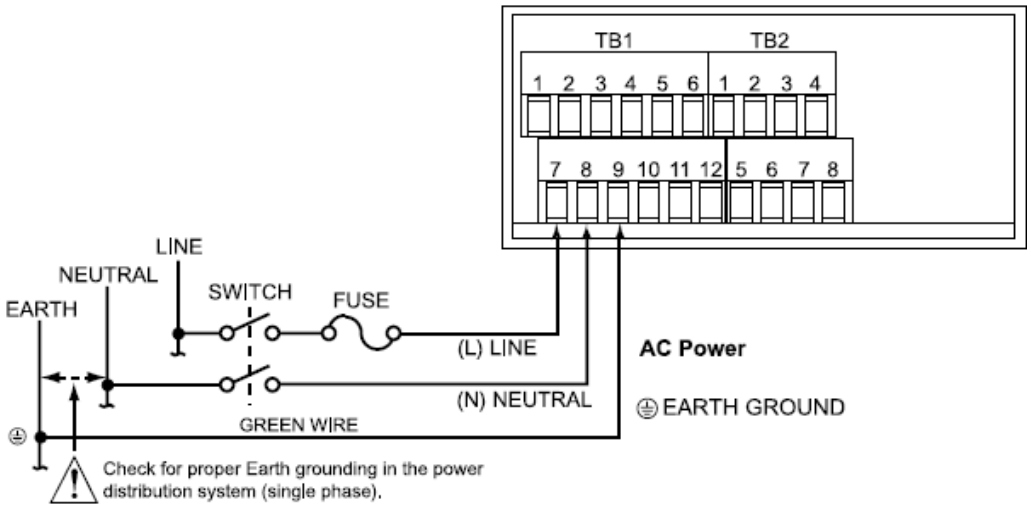


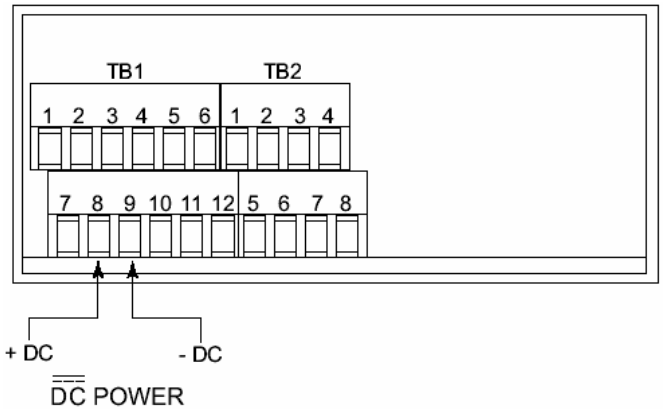
Figure 3-11 Main Power Connections - AC

Table 3-2 shows the wire color and respective terminal connections for both USA and Europe.

Table 3-2 AC-Power Connections

		WIRE COLORS	
TB1	**AC POWER**	**EUROPE**	**USA**
7	∿AC Line	Brown	Black
8	∿AC Neutral	Blue	White
9	∿AC Earth	Green/Yellow	Green

Connect the DC main power connections as shown in **Figure 3-12**.



When using DC power, refer to **Table 8-1** Color Chart in the Specifications Section for Display Color, Intensity, Excitation Voltage and Current, and Analog Output Isolated Option. Failure to use proper ratings may result in damaging the unit.

Figure 3-12 Main Power Connections DC

3.6 Connecting External Tare Switch

Connect external tare connections as shown in **Figure 3-13**.

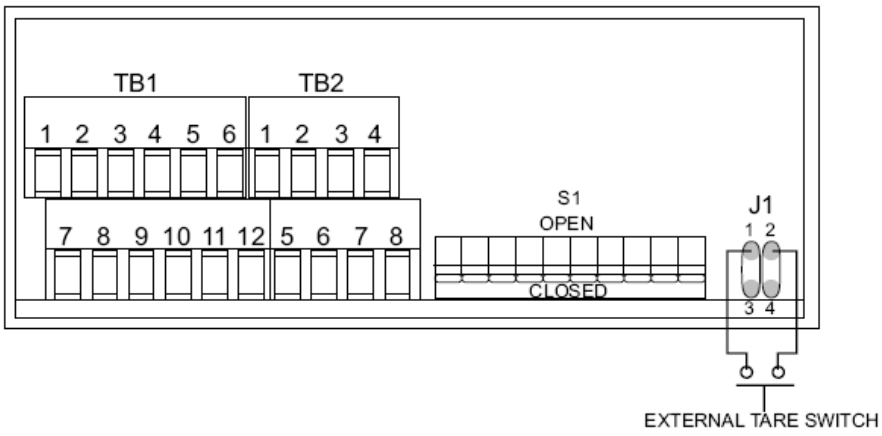


Figure 3-13 External Tare Connections

3.7 Connecting Analog and Relay Outputs

If your have purchased a meter with analog or dual relay or isolated analog output, refer to the following drawings for output connections.

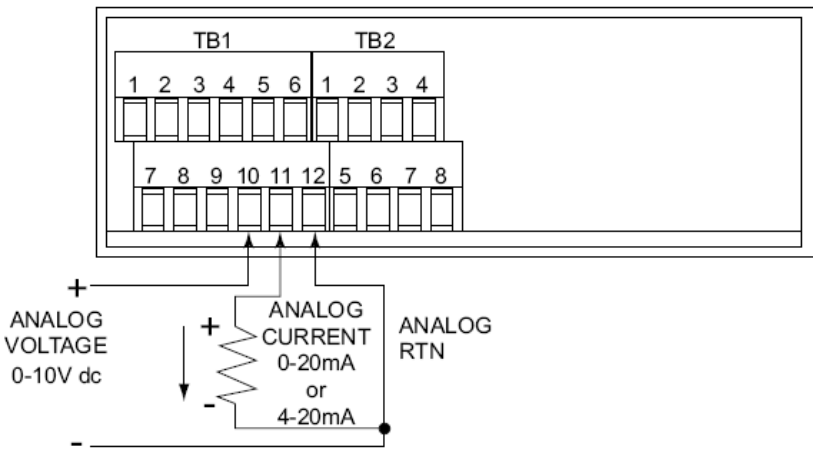


Figure 3-14 Analog Output Connections

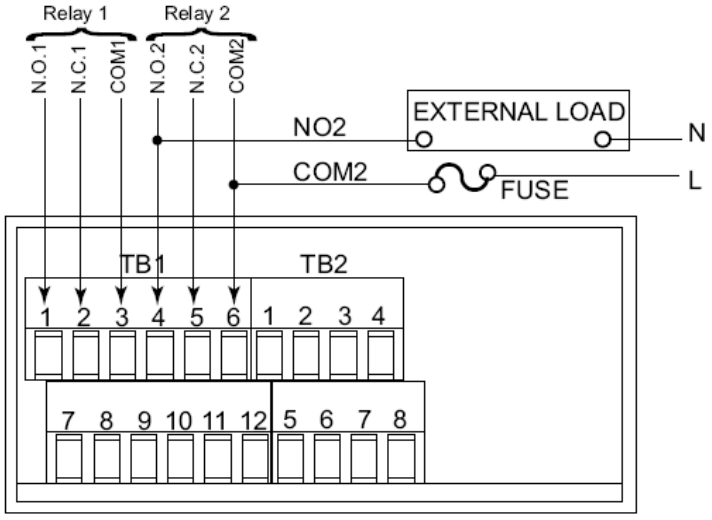


Figure 3-15 Relay Output Connections

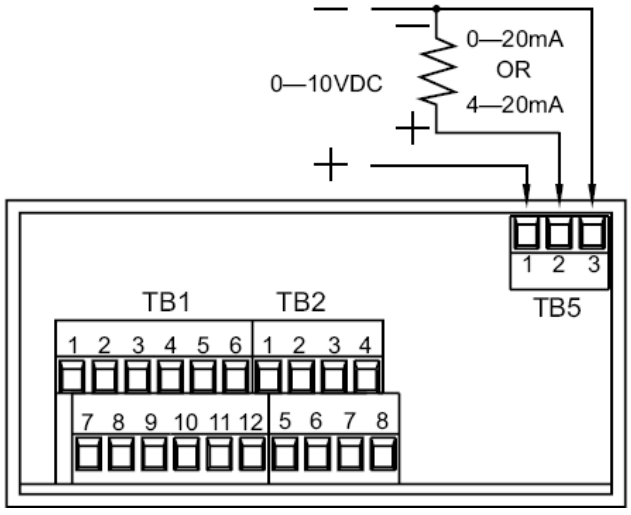


Figure 3-16 Isolated Analog Output Connections

4.0 CONFIGURING THE METER

Note Refer to Table 6-1 for a summary list of menu configuration.

Tip For first-time users: Refer to the QuickStart Manual for basic operation and set-up instructions.

4.1 Selecting the Input Type INPE

Note To select your appropriate input type signal, follow these steps:

Before proceeding, set the input DIP switch settings at the back of your meter. (Refer to **Table 2-3**).

1. Press the **MENU** button. The meter shows INPE.
2. Press the ▶**/TARE** button. The meter flashes one of the following:
   - 100M ***(for 0-100 mV dc) (Default)***
   - ±50M (for ±50 mV dc)
   - 10V (for 0-10 V dc)
   - ±5V (for ±5 V dc)
   - 0-20 (for 0-20 mA dc).
3. Press the ▲**/NT/GRS** button to scroll through available choices.
4. Press the **MENU** button to store your selection. The meter momentarily shows StRd**,** followed by dEC.P (Decimal Point).

4.2 Selecting a Decimal Point Position dEC.P

Note Refer to **Table 6-1** for a summary list of menu configuration.

To select a decimal point display position, follow these steps:

1. Press the **MENU** button until the meter shows dEC.P
2. Press the ▶**/TARE** button. The meter shows one of the following:
   - FFF.F
   - FF.FF
   - F.FFF
   - FFFF (Default)
3. Press the ▲**/NT/GRS** button to scroll between available choices.
4. Press the **MENU** button to store your choice. The meter momentarily shows StRd**,** followed by Rd.S.O (Reading Scale and Offset). Or you can press the **RESET** button to abort and go back to the dEC.P menu.

4.3 Using Reading Scale and Offset Rd.S.O

Note Refer to **Table 6-1** for a summary list of menu configuration.

To scale the meter to show readings in engineering units. There are two methods. One method is to scale with known inputs. Another method is to scale without known inputs: you calculate input values based on the transducer specifications and manually enter them through the keyboard.

4.3.1 Scaling with Known Loads (On-Line Calibration)

Note For maximum resolution, find the maximum signal that will be applied to the meter input.
- For regular voltage input, refer to the main body of **Table 4-1**.
- For millivolt or milliamp input, refer to the main body of **Table 4-2**.

Set the DIP switch positions as indicated at the top of either **Table 4-1** or **4-2**. The numbers 1 through 8 in the top row of either table represent dip switches 1 through 8 and the O, C or X directly below the number indicates the correct position of each switch.

- 'O' switch should be open or up.

- 'C' switch should be closed or down.
- 'X' switch is used to control excitation (refer to **Table 2-3** to determine correct position of these switches).

Once DIP switches have been positioned correctly, apply power. Proceed to the Rd.CF (Reading Configuration) and set R2 equal to the value in the right hand column of the chart.

Table 4-1 Range Selection DIP Switch Positions for Regular Voltage Input

12345678 XCOOOXXC	12345678 XCOOCXXC	RD.CF* R2=
0 – 10 V	±5 V	4
0 – 5 V	±5 V	3
0 – 3 V	±3 V	2
0 – 2 V	±2 V	1
0 – 1 V	±1 V	0

Table 4-2 Range Selection DIP Switch Positions for Millivolt/Milliamp Input

12345678 XOCOOXX0	12345678 XOCOCXX0	12345678 XOCCOXX0	RD.CF* R2=
0 – 100 mV	±50 mV	0 – 20 mA	4
0 – 50 mV	±50 mV	0 – 10 mA	3
0 – 30 mV	±30 mV	0 – 6 mA	2
0 – 20 mV	±20 mV	0 - 4 mA	1
0 – 10 mV	±10 mV	0 – 2 mA	0

* Reading Configuration

To scale with known inputs: apply known loads to a transducer connected to a meter, or simulate the transducer output with a voltage or current simulator. To scale with known inputs, follow these steps:

1. Apply a known load equal to approximately 0% of the transducer range.
2. Press the **MENU** button until the meter shows Rd.S.0**.**
3. Press the **▶/TARE** button. The meter shows IN 1 (Input 1).

   Note IN 1 **(**Input 1) is the unscaled display reading at minimum input.
4. Press the **▶/TARE** button again. The meter shows the last stored value for Input 1.
5. Press the **▶/TARE** button once more. The meter shows the actual signal being received.
6. Press the **MENU** button to store this value as IN 1 (Input 1). The meter shows Rd 1 (Read 1).

   Note Rd 1 (Read 1) is the desired display reading at Input 1.
7. Press the **▶/TARE** button. The meter shows the last stored value for Read 1.
8. Press the **▲/NT/GRS** button to change the value of your digits.
9. Press the **▶/TARE** button to scroll horizontally to the next digit.
10. Press the **MENU** button to store this value as Rd 1 . The meter shows IN 2 (Input 2).

    Note IN 2 (Input 2) is the unscaled display reading at maximum input.
11. Apply a known load equal to approximately 100% of the transducer range.
12. Press the **▶/TARE** button again. The meter shows the last stored value Input 2.
13. Press the **▶/TARE** button once more. The meter shows the actual signal being received.
14. Press the **MENU** button to store Input 2 value. The meter shows Rd 2 (Read 2).

    Note Rd 2 (Read 2) is the desired display reading at Input 2.
15. Press the **▶/TARE** button. The meter shows the last stored value for Read 2.
16. Press the **▲/NT/GRS** button to change the value of your digits.
17. Press the **▶/TARE** button to scroll horizontally to the next digit.
18. Press the **MENU** button to store this value as Rd 2 (Read 2). The meter momentarily shows StRd**,** followed by Rd.CF. Meter scaling is now complete.

4.3.2 Scaling without Known Loads

To scale without known inputs, calculate input values based on transducer specifications and manually enter them via the front-panel push buttons. The following example assumes load cells with these specifications:

Maximum Load:	100.0 lbs
Output:	3.1 mV/V
Sensor Excitation:	10 Vdc
Output:	31 mV = (3.1 mV/V) x (10 V)

1. Determine the correct values for IN 1 and IN 2, based on the load cell specifications. In most cases, Rd 1 & Rd 2 are equal to the minimum and maximum of the transducer output span. The example assumes Rd 1 & Rd 2 are equal to the range of the load Rd 1 = 0 and Rd 2 = 100.0). Calculate IN 1 and IN 2 using the load cell output span and the following equation:

   IN = (Sensor Output) x (Natural Gain) x (Multiplier).

Table 4-3 Natural Gain

Input range	Span units	Natural gain
0 to 100 mV	Millivolts	100 cts/mV
±50 mV	Millivolts	40 cts/mV
0 to 10 V	Volts	1000 cts/V
±5 V	Volts	400 cts/V
0 to 20 mA	Milliamps	500 cts/mA

2. Determine the multiplier by the Input Resolution setting (R.2 in the Rd.CF menu) and the input range selected. Typically R.2 = 4 is suitable for most applications.

Table 4-4 Input Resolution Multiplier

INPUT RANGE	R.2 = 4	R.2 = 3	R.2 =2	R.2 = 1	R.2 =0
0 to 100 mV	1.000	2.000	3.333	5.000	10.00
0 to 10 V	1.000	2.000	3.333	5.000	10.00
0 to 20 mA	1.000	2.000	3.333	5.000	10.00
±50 mV	1.000	1.000	1.667	2.500	5.000
±5 V	1.000	1.000	1.667	2.500	5.000

3. Determine IN 1 and IN 2 input range and resolution. The example selects the 0 to 100 mV range and 10 uV resolution (R.2 = 4).
   Example: IN 1 = (0 mV) x (100 cts/mV) x (1.000) =0
   IN 2 = (31 mV) x (100 cts/mV) x (1.000) = 3100
   Rd 1 = 0000
   Rd 2 = 100.0
4. Press **MENU** button until the meter shows Rd.S.0**.**
5. Press the ▶**/TARE** button. The meter shows IN 1.
6. Press the ▶**/TARE** button again. The meter shows the last Input 1 value, with the fourth digit flashing.
7. Press the ▲**/NT/GRS** button to change the value of your digits.
8. Press the ▶**/TARE** button to scroll horizontally to the next digit.
9. Press the **MENU** button to store this value. The meter shows Rd 1.
10. Press the ▶**/TARE** button. The meter shows the last value for Read 1.

Repeat steps 7, 8 and 9 until Rd 1, IN 2 and Rd 2 have been displayed, verified, changed (if necessary) and stored.

4.4 Using Reading Configuration Rd.CF

Note Refer to **Table 6-1** for a summary list of menu configuration.

You may use Reading Configuration Rd.CF to configure your meter for the following:

- To select ratiometric or non-ratiometric operation
- To set the input resolution of your meter
- To display the filtered/unfiltered signal input value
- To select gross/net vs. peak reading

4.4.1 Selecting Ratiometric/Non-Ratiometric Operation

1. Press the **MENU** button until Rd.CF displays.
2. Press the ▶**/TARE** button. The meter flashes one of the following:
   - R.1=R (***Ratiometric reading***) (Default – for strain meters)
   - R.1=N (Non-ratiometric reading – typically for voltage & current transducers)
3. Press the ▲**/NT/GRS** button to view the last stored selection and to toggle between selections.
4. Press the ▶**/TARE** button to select input resolution or press the **MENU** button to store your selection and shows COLR menu.

4.4.2 Setting Input Resolution

To set the input resolution of your meter, follow these steps:

1. Press the **MENU** button until Rd.CF displays, then press the ▶**/TARE** button twice.
   or
   Press the ▶**/TARE** button from R.1.
   One of the following displays (default is R.2=4):
   R.2=4 ***= 10µV Unipolar inputs. 25 µV for bipolar inputs.***
   R.2=0 = 1µv for Unipolar inputs. 5 µV for bipolar inputs.
   R.2=1 = 2µV for Unipolar inputs. 10 µV for bipolar inputs.
   R.2=2 = 3µV for Unipolar inputs. 15 µV for bipolar inputs.
   R.2=3 = 5µV for Unipolar inputs. 25µV for bipolar inputs.

Example: 3 µV resolution means that if you input 0-30 mV, at 30 mV the meter shows 9999.

2. Press the ▲**/NT/GRS** button to scroll through available selections.
3. Press the ▶**/TARE** button to display the filtered/unfiltered signal input or press the **MENU** button to store your selection and shows COLR menu.

4.4.3 Displaying the Filtered/Unfiltered Input Signal

To display the filtered/unfiltered signal input, follow these steps:

1. Press the **MENU** button until Rd.CF displays, then press the ▶**/TARE** button three times.
   or
   Press the ▶**/TARE** button from R.2.
   One of the following displays:
   - R.3=F = ***(Filtered value)*** (Default)
   - R.3=U = Unfiltered value
2. Press the ▲**/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selections. StRd momentarily displays, followed by COLR Menu.

4.4.4 Selecting Gross/Net or Peak Display

To select gross/net or peak display.

1. Press the **MENU** button until Rd.CF displays, then press the ▶**/TARE** button three times.
   or
   Press the ▶**/TARE** button from R.3.
   One of the following displays:
   - R.4=G = ***Gross/Net Display*** (Default)
   - R.4=P = Peak Display
2. Press the ▲**/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selections. StRd momentarily displays, followed by COLR Menu.

4.5 Selecting a Display Color COLR NEW

Note Refer to **Table 6-1** for a summary list of menu configuration.

Selecting Display Color is not active unless your meter is a Version "B".

To select a display color, follow these steps:
1. Press the **MENU** button until the meter shows COLR.
2. Press the ▶**/TARE** button. The meter shows one of the following:
   - GRN
   - REd
   - AMbR
3. Press the ▲**/NT/GRS** button to scroll between available choices.

Press the **MENU** button to store your choice. The meter momentarily shows StRd, followed by the next menu S1.CF (Setpoint 1 Configuration). Or you can press the **RESET** button to abort and go back to the Rd.CF menu.

4.6 Using Setpoint 1 Configuration S1.CF

Note Refer to **Table 6-1** for a summary list of menu configuration.

Setpoint 1 Configuration S1.CF is not active unless your meter has dual relay output capabilities. The LED's will display whether the S1.CF is active or not. You may use Setpoint 1 Configuration S1.CF for the following:
- To set the setpoint's active band above or below your chosen value
- To select whether the setpoint operation is latched or unlatched
- Assigning setpoint values to the net or gross reading

4.6.1 Setting Setpoint 1's Active Band

1. Press the **MENU** button until the meter shows S1.CF.
2. Press the ▶**/TARE** button. The meter shows one of the following:
   - S.1=A = ***(Active above the setpoint)*** (Default)
   - S.1=b = Active below the setpoint
3. Press the ▲**/NT/GRS** button to toggle between available choices.
4. Press the ▶**/TARE** button to select if Setpoint 1 is latched/unlatched **or** press the **MENU** button to store your selection. The unit shows S2.CF.

4.6.2 Selecting if Setpoint 1 is Latched of Unlatched

1. Press the **MENU** button until S1.CF displays, then press the ▶**/TARE** button twice.
   or
   Press the ▶**/TARE** button from S.1.
   The meter shows one of the following:
   - S.2=U = ***Setpoint 1 to be unlatched*** (Default)
   - S.2=L = Setpoint 1 to be latched
2. Press the ▲**/NT/GRS** button to toggle between available choices.
3. Press the ▶**/TARE** button to assign Setpoint 1 values to net or gross reading or press the **MENU** button to enter S2.CF (Setpoint 2 Configuration).

4.6.3 Assigning Setpoint 1 Values to Net or Gross Readings

1. Press the **MENU** button until S1.CF displays, then press the ▶**/TARE** button twice.
   or
   Press the ▶**/TARE** button from S.2.
   The meter shows one of the following:

- S.3=W = ***Setpoint 1 assigned to net reading*** (Default)
- S.3=G = Setpoint 1 assigned to gross reading

2. Press the **▲/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selection(s). The meter momentarily shows StRd, followed by S2.CF (Setpoint 2 Configuration).

4.7 Using Setpoint 2 Configuration S2.CF

Note Refer to **Table 6-1** for a summary list of menu configuration.

Setpoint 2 Configuration S2.CF is not active unless your meter has dual relay output capabilities. The LED's will display whether the S2.CF is active or not. You may use Setpoint 2 Configuration S2.CF for the following:

- To set setpoint's active band above or below your chosen value
- To select whether the setpoint operation is latched or unlatched
- To assign setpoint values to the net or gross reading

4.7.1 Setting Setpoints 2's Active Band

1. Press the **MENU** button until the meter shows S2.CF.
   or
2. Press the **▶/TARE** button. The meter shows one of the following:
   - S.1=A = ***(Active above the setpoint)*** (Default)
   - S.1=b = (Active below the setpoint)

3. Press the **▲/NT/GRS** button to toggle between available choices.
4. Press the **▶/TARE** button to select if Setpoint 2 is latched/unlatched **or** press the **MENU** button to store your selection. The meter shows S 1.db.

4.7.2 Selecting if Setpoint 2 is Latched or Unlatched

1. Press the **MENU** button until S2.CF displays, then press the **▶/TARE** button twice.
   or
   Press the **▶/TARE** button from S.1.
   The meter shows one of the following:
   - S.2=U = ***Setpoint 2 to be unlatched*** (Default)
   - S.2=L = Setpoint 2 to be latched

2. Press the **▲/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selection(s). The meter momentarily shows StRd, followed by S 1.db (Setpoint 1 Deadband).

4.7.3 Assigning Setpoint 2 Values to Net or Gross Readings

1. Press the MENU button until S2.CF displays, then press the **▶/TARE** button twice.
   or
   Press the **▶/TARE** button from S.2.
   The meter will show one of the following:
   - S.3=W = ***Setpoint 2 assigned to net reading*** (Default)
   - S.3=G = Setpoint 2 assigned to gross reading

2. Press the **▲/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selection(s). The meter momentarily shows StRd, followed by S 1.db (Setpoint 1 Deadband).

4.8 Setting the Setpoint 1 Deadband S 1.db

Note Refer to **Table 6-1** for a summary list of menu configuration.

Setpoint 1 Deadband S 1.db is not active unless your meter has dual relay output capabilities. The LED's will display whether the S 1.db is active or not. The Setpoint 1 Default deadband is 0003. To change the deadband (hysteresis) of Setpoint 1, follow these steps:

1. Press the **MENU** button until the meter shows S1.db.
2. Press the ▶**/TARE** button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the ▲**/NT/GRS** button to change the value of the flashing digit. If you continue to press the ▲**/NT/GRS** button, the flashing digit's value continues to change.
4. Press the ▶**/TARE** button to scroll to the next digit.
5. Press the **MENU** button to store the selection. The meter momentarily shows StRd, followed by S2.db (Setpoint 2 Deadband).

4.9 Setting the Setpoint 2 Deadband S2.db

Note Refer to **Table 6-1** for a summary list of menu configuration.

Setpoint 2 Deadband S2.db is not active unless your meter has dual relay output capabilities. The LED's will display whether the S2.db is active or not. The Setpoint 2 default deadband is 0003. To change the deadband (hysteresis) of Setpoint 2, follow these steps:

1. Press the **MENU** button until the meter shows S2.db.
2. Press the ▶**/TARE** button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the ▲**/NT/GRS** button to change the value of the flashing digit. If you continue to press the ▲**/NT/GRS** button, the flashing digit's value continues to change.
4. Press the ▶**/TARE** button to scroll to the next digit.
5. Press the **MENU** button to store your selection. The meter momentarily shows StRd, followed by Ot.CF (Output Configuration) if you have analog output capabilities.

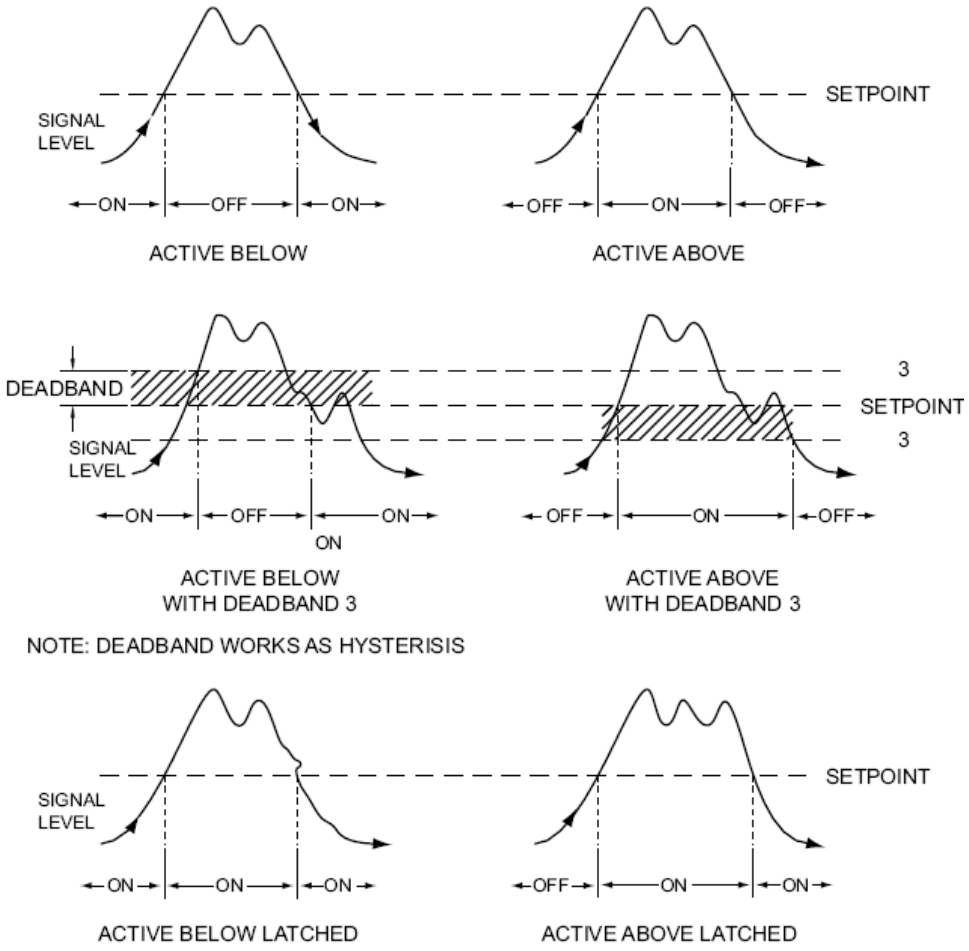


Figure 4-1 Alarm Example

Note

To reset latched alarms you must:
1. Input a signal **OUT** of the alarm zone
2. Then press **SETPTS** and then, **RESET** button

4.10 Using Output Configuration Ot.CF

Note Refer to **Table 6-1** for a summary list of menu configuration.

Output Configuration Ot.CF is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. Analog output must be ordered at time of purchase.

Use Output Configuration Ot.CF to select the following:
- To enable or disable the analog output
- To select if the analog output is current or voltage
- To assign the output to the net or gross reading

4.10.1 Enabling or Disabling the Analog Output

To enable or disable the analog output, follow these steps:
1. Press the **MENU** button until the meter shows Ot.CF.
2. Press the ▶**/TARE** button. The meter shows one of the following:
   - 0.1=E = ***(Analog output enabled)*** (Default))
   - 0.1=d = (Analog output disabled)
3. Press the ▲**/NT/GRS** button to toggle between available choices.
4. Press the ▶**/TARE** button to select analog output as current or voltage or press the **MENU** button to store your selection and enter Ot.S.O (Output Scale and Offset).

4.10.2 Selecting Analog Output as Current or Voltage

1. Press the **MENU** button until it shows Ot.CF, and then press the ▶**/TARE** button twice.
   or
   Press the ▶**/TARE** button from 0.1.
   The meter will show one of the following:
   - 0.2=C = ***(Analog output=current)*** (Default)
   - 0.2=V = (Analog output=voltage)
2. Press the ▲**/NT/GRS** button to toggle between available choices.
3. Press the ▶**/TARE** button to select analog output or proportional control or press the **MENU** button to store your selection and enter Ot.S.O (Output scale and Offset).

4.10.3 Selecting Analog Output or Proportional Control

1. Press the **MENU** button until it shows Ot.CF, and then press the ▶**/TARE** button twice.
   or
   Press the ▶**/TARE** button from 0.2.
   The meter shows one of the following:
   - 0.3=N = ***(Net Reading)*** (Default)
   - 0.3=G = (Gross Reading)
2. Press the ▲**/NT/GRS** button to toggle between available choices.
3. Press the **MENU** button to store your selection. The meter momentarily shows: StRd, followed by Ot.S.O (Output Scale and Offset).

4.11 Using Output Scale and Offset Ot.S.O

Note Refer to **Table 6-1** for a summary list of menu configuration.

Output Scale and Offset Ot.S.O is not active unless your meter has analog output capabilities. The menu will display whether analog output is present or not. Output Scale and Offset Ot.S.O scales your analog output to be

equal to the meter's display and/or any engineering units you require. You may scale the output for direct (4-20 mA, 0-10 V, etc) or reverse acting (20-4 mA, 10-0 V, etc).

1. Press the **MENU** button until OE.S.O displays.
2. Press the **▶/TARE** button. Rd 1 (Read 1) displays.

   Note: This is your first point of display reading.
3. Press the **▶/TARE** button again. The meter shows the last previously stored 4-digit number (-1999 through 9999) with flashing 4th digit.
4. Press the **▲/NT/GRS** button to change the digits.
5. Press the **▶/TARE** button to scroll to the next digit.
6. Press the **MENU** button to store your selection. OUt.1 (Output 1) displays.

   Note: This starting analog signal corresponds to your Read 1 display.
7. Press the **▶/TARE** button. Selected output displays.

   Note: If you select 0.2.4 for voltage, the maximum signal you may select is 10.00 for a 0-10 Vdc signal output. If you select 0.2.C for current, the maximum signal you may select is 20.00.
8. Press the **▲/NT/GRS** button to enter the Output 1 signal selection. If you continue to press the **▲/NT/GRS** button, the flashing digit's value continues to change.
9. Press the **▶/TARE** button to scroll horizontally to the next digit.
10. Press the **MENU** button to store your selection. Rd 2 (Read 2) displays.

    Note: This is your second point of display reading.
11. Press the **▶/TARE** button. The meter shows the last previously stored 4-digit number (-1999 from 9999) with flashing 4th digit.
12. Press the **▲/NT/GRS** button to change the value of the flashing digit. If you continue to press the **▲/NT/GRS** button, the flashing digit's value continues to change.
13. Press the **▶/TARE** button to scroll horizontally to the next digit.
14. Press the **MENU** button to store your selection. The meter shows OUt.2 (Output 2).

    Note: This analog signal should correspond to your Read 2 display.
15. Press the **▶/TARE** button. The meter shows the selected output.

    Note: If you select 0.2.4 for voltage, the maximum signal you may select is 10.00 for a 0-10 V signal output. If you select 0.2.C for current, the maximum signal you may select is 20.00 for a 0-20 or 4-20 mA DC signal output.
16. Press the **▲/NT/GRS** button to change the value of the flashing digit. If you continue to press the **▲/NT/GRS** button, the flashing digit's value continues to change.
17. Press the **▶/TARE** button to scroll horizontally to the next digit.
18. Press the **MENU** button to store your selection. The meter momentarily shows StRd, followed by LK.CF (Lock Out configuration).

WARNING: If the meter shows flashing values on any time, the value has overflowed. Press the **▲/NT/GRS** button to start new values.

4.11.1 Examples for Output Scale and Offset

Example: You want to spend 4-20 mA output for 0 to 100.0. The meter has 0.1 degrees resolution. Complete the following steps:

1. Press the **MENU** button until the meter shows OE.S.O.
2. Press the **▶/TARE** button. The meter shows Rd 1 (Read 1).
3. Press the **▶/TARE** button to show the existing value.
4. Change the value of Read 1 to 000.0 by pressing the **▲/NT/GRS** and **▶/TARE** buttons.
5. Press the **MENU** button to store your selection. The meter shows OUt.1 (Output 1).
6. Press the **▶/TARE** button to show the existing value.
7. Change the value of Output 1 to 04.00 by pressing the **▲/NT/GRS** and **▶/TARE** buttons.
8. Press the **MENU** button to store your selection. The meter shows Rd.2 (Read 2).

9. Press the ▶**/TARE** button to show the existing value.
10. Change the value of Read 2 to 100.0 by pressing the ▲**/NT/GRS** and ▶**/TARE** buttons.
11. Press the **MENU** button to store your selection. The meter shows OUt.2 (Output 2).
12. Press the ▶**/TARE** button to show the existing value.
13. Change the value of Output 2 to 20.0 by pressing the ▲**/NT/GRS** and ▶**/TARE** buttons.
14. Press the **MENU** button to store your selection. The meter shows LK.CF (Lock Out Configuration).

4.12 Using Lock Out Configuration LK.CF

Note Refer to **Table 6-1** for a summary list of menu configuration.

Use Lock Out Configuration LK.CF for the following:

- To enable or disable setpoint changes
- To enable or disable the **RESET** button in the Run Mode
- To enable or disable displaying meter firmware version

4.12.1 Enabling or Disabling the RESET button in the Run Mode

1. Press the **MENU** button until the meter shows LK.CF (after Ot.S.0.)
2. Press the ▶**/TARE** button. The meter shows one of the following:
   - RS.tE = ***To enable the RESET button in the Run mode*** (Default)
   - RS.td = To disable the **RESET** button in the Run mode
3. Press the ▲**/NT/GRS** button to toggle between available choices.
4. Press the **MENU** button to store the changes. The meter shows StRd if the new value is different otherwise the meter shows bR.tE and returns to the Run mode.

4.12.2 Enabling or Disabling the SETPOINT Changes

1. Press the **MENU** button until the meter shows LK.CF (after Ot.S.0)
2. Press the ▶**/TARE** button twice. The meter shows one of the following:
   - SP.tE = ***To enable the setpoint changes*** (Default)
   - SP.td = To disable the setpoint changes
3. Press the ▲**/NT/GRS** button to toggle between available choices.
4. Press the **MENU** button to store the changes. The meter shows StRd if the new value is different otherwise the meter shows bR.tE and returns to the Run Mode.

4.12.3 SETPOINT Display Function: Firmware version or Setpoint value

1. Press the **MENU** button until the meter shows LK.CF (after Ot.S.0)
2. Press the ▶**/TARE** button three times. The meter shows one of the following:
   - L.3=0 **= SETPTS** button will display setpoint values.
   - L.3= 1 = **SETPTS** button will display the meter's firmware version.
3. Press the ▲**/NT/GRS** button to toggle between the choices above.
4. Press the **MENU** button to store the changes. The meter shows StRd if the new value is different otherwise the meter shows bR.tE and returns to the Run Mode.

Note If your meter does not have the relay option, setpoint menu items above will not be available and **SETPTS** button will always display the meter's firmware version. These units will have FOL (overload) or FOPN memory indicated by Alarm 1 & 2 LED displays. LEDs can be reset by pressing **MENU** then **RESET** button or by Power **OFF** then **ON**.

4.13 Using Display Brightness Configuration NEW

4.13.1 Changing Brightness Level

Changing Display Brightness is not active unless your meter is a **Version "B"**.

1. Press the **MENU** button the meter shows bR.tE (after LKCF).
2. Press the ▶**/TARE** button from bR.tE. The meter shows one of the following:

- M.brt = Medium Brightness
- L.brt = Low Brightness
- H.brt = ***High Brightness***(Default)

3. Press the **▲/NT/GRS** button to toggle between available choices.
4. Press the **MENU** button to store your selection. The meter momentarily shows StRd followed by StRd, RSt, StRN, and then measured value.

5.0 DISPLAY MESSAGES

Table 5-1 Display Messages

MESSAGE	DESCRIPTION
StRN	Strain Meter
RSt	Hard (Power On) Reset
INPt	Input Type
dEC.P	Decimal Point Position
Rd.S.O	Reading Scale and Offset
Rd.CF	Reading Configuration
COLR	Display Color NEW
S1.CF	Setpoint 1 Configuration
S2.CF	Setpoint 2 Configuration
S1.db	Setpoint 1 Deadband
S2.db	Setpoint 2 Deadband
Ot.CF	Output configuration
Ot.S.O	Output Scale and Offset
LK.CF	Lock Out configuration
bR.t	Display Brightness NEW
+OL	+Overload Signal
-OL	- Overload Signal
RS.OF	Resolution Overflow
+999	Value Overflow in Setpoint/Menu Routines
-999	Value Overflow in Setpoint/Menu Routines
Nt.OF	Net Value Overflow
Gt.OF	Gross Value Overflow
ER1	2 Coordinate Format Programming Error
PEAK	Peak Value
PK.RS	Peak Reset
t.RS	Tare Reset
SP.RS	Setpoint Reset
NEt	Net Value
GROS	Gross Value
SP1	Setpoint 1 Value
SP2	Setpoint 2 Value
R.OV.S	Resolution Over Scale
V.-8.8	Firmware Version (where 8 is 0 ~ 9)
RUN	Operating Mode

6.0 MENU CONFIGURATION DISPLAYS

Not all items display on standard meters.

Table 6-1 Menu Configuration Displays

(Defaults in Bold and Italics)

MENU	▶/TARE	▲/NT/GRS
INPt	Show input choices:	100M (***Default***) ±50M 10V ±5V 0-20
dEC.P	Show current decimal point position	FFFF ***(Default)*** F.FFF FF.FF FFF.F
(Reading Scale & Offset) Rd.S.0	**1** Show IN 1 Shows prior value entered and flashing digit. Scrolls to the next digit • If **▶/TARE** is pressed, actual input is shown and cannot be changed with **▲/NT/GRS**. • If **▲/NT/GRS** is pressed, unit can scroll through digits with **▶/TARE**.	Changes the value of the flashing digit.
2 Enter new value and show Rd 1	**3** Shows prior value entered and flashing digit. Scrolls to the next digit.	Changes the value of the flashing digit.
4 Enter new value and show IN 2	**5** Shows prior value entered and flashing digit. Scrolls to the next digit. • If **▶/TARE** is pressed, actual input is shown and cannot be changed with **▲/NT/GRS**. • If **▲/NT/GRS** is pressed, unit can scroll through digits with **▶/TARE**.	Changes the value of the flashing digit.
6 Enter new value and show Rd 2	**7** Shows prior value entered and flashing digit. Scrolls to the next digit.	Changes the value of the flashing digit.

MENU	▶/TARE	▲/INT/GRS
Reading Configuration Rd.CF	**R.1=**	R.1=R ***(Ratiometric Reading)*** R.1=H (Non-ratiometric reading)
	R.2=	R.2=0 (1µV resolution for unipolar & 5µV resolution for bipolar) R.2=1 (2µ V resolution for unipolar & 10µV resolution for bipolar) R.2=2 (3µ V resolution for unipolar & 15µV resolution for bipolar) R.2=3 (5µ V resolution for unipolar & 25µV resolution for bipolar) R.2=4 ***(10µ V resolution for unipolar & 25µV resolution for bipolar)*** ***Note**: 3 µV resolution means if your input is 0-30mV, at 30mV the display shows 9999.*
	R.3=	R.3=F ***(Filtered value)*** R.3=U (Unfiltered value)
	R.4=	R.4=G ***(Gross/Net Display)*** R.4=P (Peak Display)
Display Color Selection COLR NEW	Show input choices:	GRN Green REd Red AMbR Amber
Setpoint 1 Configuration S1.CF	S.1=	S.1=A ***(Active above)*** S.1=b (Active below)
	S.2=	S.2=U ***(Unlatched)*** S.2=L (Latched)
	S.3=	S.3=N ***(Net Reading)*** S.3=G (Gross Reading)
Setpoint 2 Configuration S2.CF	S.1=	S.1=A ***(Active above)*** S.1=b (Active below)
	S.2=	S.2=U ***(Unlatched)*** S.2=L (Latched)
	S.3=	S.3=N ***(Net Reading)*** S.3=G (Gross Reading)
Setpoint 1 Deadband S1.db	Press to scroll to the next digit to the right.	Press to change the value of the flashing digit.
Setpoint 2 Deadband S2.db	Press to scroll to the next digit to the right	Press to change the value of the flashing digit

MENU	▶/TARE	▲/NT/GRS
Output Configuration Ot.CF	**0.1 =**	0.1=E ***(Analog output is enabled)*** 0.1=d (Analog output is disabled)
	0.2 =	0.2=C ***(Analog output is current)*** 0.2=V (Analog output is voltage)
	0.3 =	0.3=N ***(Net Reading)*** 0.3=G (Gross Reading)
Output Scale & Offset Ot.S.0 (Shown if 0.3=A in Output Configuration Menu Ot.CF)	**1** Show Rd 1 Shows prior value entered and flashing digit. Scrolls to the next digit	Changes the value of the flashing digit.
2 Enter new value and show Out 1.	**3** Shows prior value entered and flashing digit. Scrolls to the next digit.	Changes the value of the flashing digit.
4 Enter new value and show Rd 2.	**5** Shows prior value entered and flashing digit. Scrolls to the next digit.	Changes the value of the flashing digit.
6 Enter new value and show Out2.	**7** Shows prior value entered and flashing digit. Scrolls to the next digit.	Changes the value of the flashing digit.
Lock Out Configuration LK.CF	RS =	RS=E ***(Enable RESET button in the Run Mode)*** RS=d (Disable **RESET** button in the Run Mode)
	SP =	SP=E ***(Enable setpoint changes)*** SP=d (Disable setpoint changes)
	L3 =	L3=0 ***(SETPTS button display setpoint values)*** L3=1 (SETPTS button display firmware version V.-8.8 where 8 is 0 ~ 9)
Brightness Configuration bR it NEW	Shows input choices:	M.brt (Medium Brightness) L.brt (Low Brightness) H.brt ***(High Brightness)***

Table 6-2 Run Mode Displays

Display	▶/TARE	▲/NT/GRS	RESET	Description
NEt / GROS		Displays NET or GROSS reading. Once reading shows, respective value shows.		**Peak Reading** Toggle between Net and Gross values.
t.RSt	Press to activate		Will reset your tare when viewing this function	**Tare Reset**
SP.RS				**Reset Latched Alarms** Pressing the **RESET** button resets your latched alarm

7.0 SETPOINT CONFIGURATION DISPLAYS

Table 7-1 Setpoint Configuration Displays

MENU	▶/TARE	▲/NT/GRS	Description
SP 1	Press to scroll to the next digit to the right	Press to change the value of the flashing digit	SETPOINT 1 Select from –1999 through 9999
SP2	Press to scroll to the next digit to the right	Press to change the value of the flashing digit	SETPOINT 2 Select from –1999 through 9999

8.0 SPECIFICATIONS

SIGNAL INPUT

Input Ranges: 0-100mV, ± 50 mV, 0-10 V, ± 5 V, 0-20 mA, 4-20 mA

Isolation: Dielectric strength to 2500V transient per 3mm spacing based on EN 61010 for 260Vrms of DC working Voltage

Noise Rejection: Normal Mode Rejection (NMR) = 60dB
Common Mode Rejection (CMR) = 120dB

Resistance: 100 Meg ohms for 100 mV or ±50 mV input range
1 Meg ohm for 10 or +5 V input range
5 ohms for 20 mA current input range

Big Display NEW: 4-digit, three color programmable 9-segment, LED 21 mm (0.83")

Symbol: 8.8.8.8 (-1.9.9.9 ~ 9.9.9.9)

Standard Display: 4-digit, 14-segment LED, 13.8 mm (0.54")

Symbol: 8888 (-1.9.9.9 ~ 9.9.9.9.)

ANALOG TO DIGITAL

Technique: Dual slope

Internal resolution: 15 bits

Read Rate: 3/sec Polarity Automatic

ACCURACY AT 25°C

Max Error Strain:	±0.03% of reading, ± 1 count	
Span Tempco:	50 ppm/°C	
Step Response:	1 sec	
Warm Up to Rated Accuracy:	30 min	
Excitation Voltage:	AC power units	DC power units
	24 V @ 25 mA,	**Refer to Table 8-1**
	12 V @ 50 mA,	Color chart for DC Output
	10 V @ 120 mA,	Excitation
	5 V @ 60 mA	
Load Regulation:	1.1%	
Line Regulation:	0.02% per Vac	

ALARM OUTPUTS (if applicable)

2 Form "C" on/off relays. Configurable for latched and unlatched by software.
Max current: 5 AMPS, resistive load
Max voltage: 250 Vac or 30 Vdc

ANALOG OUTPUT (if applicable)

Signal Type:	Current or voltage
Signal Level:	Current: 10 V max compliance at 20 mA output Voltage: 20 mA max for 0-10 V output
Function:	May be assigned to a display range or proportional control output with setpoint #1 when used as a control output.
Linearity:	0.2%
Step Response Time:	2 – 3 seconds to 99% of the final value

ISOLATED ANALOG OUTPUT (TB5, if applicable)

Same as non-isolated analog output except isolated.

Signal Type:	Current or voltage
Signal Level:	Current: 10 V max compliance at 20 mA output Voltage: 20 mA max for 0-10 V output
Function:	May be assigned to a display range or proportional control output with Setpoint #1 when used as a control output.
Linearity:	0.2%
Step Response Time:	2 – 3 seconds to 99% of the final value
Isolation:	130 Vrms working voltage, 1000 V/60sec Dielectric test

Note Only one analog output is available on each unit and it must be factory installed.

INPUT POWER INFORMATION

AC units	115/230 V~(AC) ±10%, 50/60 Hz 9.5 W max, power consumption (Non-Isolated Analog Out) 11.0 W max, power consumption (Isolated Analog Out)
DC Units	10-32 Vdc or 26-56 Vdc, 8 W Do not use a combination of dc power and internal excitation or Isolated Analog Out, unless using dc power of 20-32 Vdc. Refer to Table 8-1 below

External Fuse Required:

IEC 127-2/111	
Power	Fuse
115V	125 mA @ 250 (T)
230V	63 mA @ 260 (T)
UL 248-14 (Listed Fuse)	
Power	Fuse
115V	175 mA @ 250 V Slow-Blow
230V	80 mA @ 250 Slow-Blow

ENVIRONMENT

Operating Temperature: 0° to 50°C (32° to 122°F)
Storage Temperature: -40° to 85°C (-40° to 185° F)
Relative humidity: 90% at 40°C (non-condensing)

MECHANICAL

Panel cutout: 1/8" DIN 3.62 x 1.78" (45 x 92mm)
Weight: 1.27 lb (575 g)
Case material: Polycarbonate, 94 V-O UL rated
Protection: NEMA-4/Type 4 Front Bezel

Table 8-1 Color Chart for DC Power

COLOR	HIGH BRIGHTNESS	MEDIUM & LOW BRIGHTNESS
RED	Sensor Excitation: 24 V @ 25 mA, 12 V, 10 V, 5 V @ 35 mA Max Analog Output: Non-Isolated option only	Any combination of Sensor Excitation and Analog Output 24 V @ 25 mA, 12 V @ 35 mA Max 10 V @ 35 mA Max 5 V @ 35 mA Max Analog Output: Non-Isolated options or Isolated Analog option
GREEN	Warning: • Do not use Internal Excitation. Use External Excitation. • Do not use Isolated Analog Output. Use Non-Isolated Analog Output.	
AMBER		

HIGH/LOW Brightness and AMBER are only available on Version "B" meters. Standard display meters are MEDIUM Brightness.

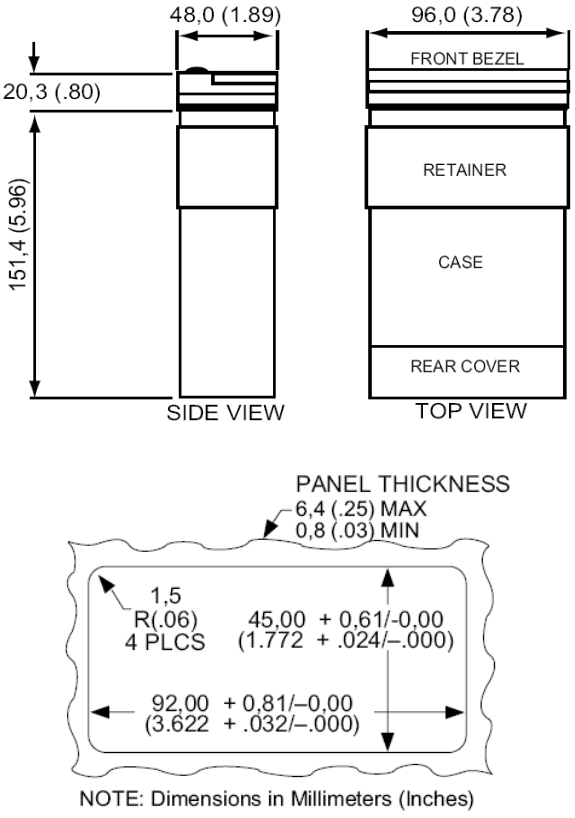


Figure 8-1 Meter Dimensions/Panel Cutout

9.0 FACTORY PRESET VALUES

Table 9-1 Factory Preset Values

MENU ITEM	FACTORY PRESET VALUES
INPt	Input Type: 0-100 (0-100 mV input)
dEC.P	Decimal Point Position: FFFF
Rd.S.O	Reading Scale and Offset: 0-100 mV = 0-1000
Rd.CF	Reading Configuration: R.1=R (Ratiometric) R.2=4 (10µV resolution for unipolar & 25 µV resolution for bipolar) R.3=F (Filtered value) R.4=G (Gross/net reading)
COLR NEW	Normal Color Display: RED or GRN (Note: depending how unit was ordered)
S1.CF	Setpoint 1 Configuration: S.1=A (Setpoint is active above) S.2=U (Setpoint is unlatched) S.3=N (Net Reading)
S2.CF	Setpoint 2 Configuration: S.1=A (Setpoint is active above) S.2=U (Setpoint is unlatched) S.3=N (Net Reading)
S1.db	Setpoint 1 Deadband: 0003
S2.db	Setpoint 2 Deadband: 0003
Ot.CF	Output Configuration: O.1=E (Analog output is enabled) O.2=C (Analog output is current) O.3=N (Analog output follows the Net value)
Ot.S.O	Output Scale and Offset: 0-1000 = 4-20 mA DC
LK.CF	Lock Out Configuration RS=E (Enable the **RESET** button in the Run Mode) SP=E (Enable setpoint changes) L3=O (Display setpoint values)
bR.t NEW	H.brt (Brightness Level)
SP1	Setpoint 1 Value: 0000
SP2	Setpoint 2 Value: 0000
Sensor Excitation:	10Vdc

10.0 CE APPROVALS INFORMATION

This product conforms to the EMC directive 89/336/EEC amended by 93/68/EEC, and with the European Low Voltage Directive 72/23/EEC.

Electrical Safety EN61010-1:2001
Safety requirements for electrical equipment for measurement, control and laboratory.
Double Insulation
Pollution Degree 2
Dielectric withstand Test per 1 min

- Power to Input/Output: 2300 Vac (3250 Vdc)
- Power to Input/Output: 500 Vac (720 Vdc)
  (Low Voltage dc Power Option*)
- Power to Relays Output: 2300 Vac (3250 Vdc)
- Relay 1 to Relay 2: 2300 Vac (3250 Vdc)
- Isolated Analog to Inputs: 1000 Vac (1420 Vdc)
- Analog to Inputs: No Isolation

Measurement Category I
Category I are measurements performed on circuits not directly connected to the Mains Supply (power). Maximum Line-to-Neutral working voltage is 50 Vac/dc. This unit should not be used in Measurement Categories II, III, IV.

Transients Overvoltage Surge (1.2 / 50uS pulse)
- Input Power: 2500 V
- Input Power: 500 V
  (Low Voltage dc Power Option*)
- Isolated Analog: 500 V
- Input/Output Signals: 500 V

Note: **Units configured for external low power dc voltage, 10-32 Vdc (Basic Insulation)*

EMC EN61326:1997 + and A1:1998 + A2:2001
Immunity and Emissions requirements for electrical equipment for measurement, control and laboratory.
- EMC Emissions Table 4, Class B of EN61326
- EMC Immunity** Table 1 of EN61326

Note: ***I/O signal and control lines require shielded cables and these cables must be located on conductive cable trays or in conduits. Furthermore, the length of these cables should not exceed 30 meters*

Refer to the EMC and Safety installation considerations (Guidelines) of this manual for additional information.

WARRANTY REPAIR POLICY

Limited Warranty On Products

Any Cooper Instruments product which, under normal operating conditions, proves defective in material or in workmanship within one year of the date of shipment by Cooper will be repaired or replaced free of charge provided that a return material authorization is obtained from Cooper and the defective product is sent, transportation charges prepaid, with notice of the defect, and it is established that the product has been properly installed, maintained, and operated within the limits of rated and normal usage. Replacement or repaired product will be shipped F.O.B. from our plant. The terms of this warranty do not extend to any product or part thereof which, under normal usage, has an inherently shorter useful life than one year. The replacement warranty detailed here is the buyer's exclusive remedy, and will satisfy all obligations of Cooper whether based on contract, negligence, or otherwise. Cooper is not responsible for any incidental or consequential loss or damage which might result from a failure of any and all other warranties, express or implied, including implied warranty of merchantability or fitness for particular purpose. Any unauthorized disassembly or attempt to repair voids this warranty.

Obtaining Service Under Warranty

Advance authorization is *required* prior to the return to Cooper Instruments. Before returning the item, contact the Repair Department c/o Cooper Instruments at (540) 349-4746 for a Return Material Authorization number. Shipment to Cooper shall be at buyer's expense and repaired or replacement items will be shipped F.O.B. from our plant in Warrenton, Virginia. Non-verified problems or defects may be subject to a $150 evaluation charge. Please return the original calibration data with the unit.

Repair Warranty

All repairs of Cooper products are warranted for a period of 90 days from date of shipment. This warranty applies only to those items that were found defective and repaired; it does not apply to products in which no defect was found and returned as is or merely recalibrated. It may be possible for out-of-warranty products to be returned to the exact original specifications or dimensions.

* Technical description of the defect: In order to properly repair a product, it is *absolutely necessary* for Cooper to receive information specifying the reason the product is being returned. Specific test data, written observations on the failure and the specific corrective action you require are needed.