Counters
Frequency Meters
PID Controllers
Clock/Timers
Printers
Process Meters
On/Off
Controllers
Recorders
Relative
Humidity
Transmitters
Thermocouples
Thermistors
Wire

Rate Meters
Timers
Totalizers
Strain Gauge
Meters
Voltmeters
Multimeters
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pH pens
pH Controllers
pH Electrodes
RTDs
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Flow Sensors

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info@newportUS.com

It is the policy of NEWPORT to comply with all worldwide safety and EMC/EMI regulations that apply. NEWPORT is constantly pursuing certification of its products to the European New Approach Directives. NEWPORT will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but NEWPORT Electronics, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

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PATENT NOTICE: This product is covered by one or more of the following patents: U.S. Pat. No. Des. 336,895; 5,274,577; 6,243,021 / Canada 2052599; 2052600 / Italy 1249456; 1250938 / France Brevet No. 91 12756 / Spain 2039150; 2048066 / UK Patent No. GB2 249 837; GB2 248 954 / Germany DE 41 34398 C2. Other US and International Patents Pending.

This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as it contains important information relating to safety and EMC.
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
* Enabling/disabling the front-panel tare
* 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
* Selecting analog output or proportional control
* Selecting proportional band
* Using manual reset (offsetting setpoint errors)
* Scaling analog output

For first-time users: Refer to the QuickStart Manual for basic operation and set-up instructions.
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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 effect the meter's functionality and must refer to accompanying documents.

**TIP:** Provides you helpful hints.
SECTION 1. INTRODUCTION

1.1 UNPACKING

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, use the phone numbers listed on the back cover to contact the Customer Service Department nearest you.

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:

<table>
<thead>
<tr>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Programmable Digital Meter indicator/controller with all applicable connectors attached.</td>
</tr>
<tr>
<td>1</td>
<td>Owner's Manual</td>
</tr>
<tr>
<td>1</td>
<td>Set Mounting brackets</td>
</tr>
</tbody>
</table>

If you ordered any of the available options (except the "BL" Blank Lens option), they will be shipped in a separate container to avoid any damage to your indicator/controller.
1 Introduction

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 the 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!
SECTION 2. ABOUT THE METER

2.1 DESCRIPTION

The Digital Programmable Process meter is a value packed indicator/controller. Four full digits and broad scaling capability allow for display in virtually all engineering units. A wide variety of DC current and voltage input ranges cover typical process 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 / Type 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 outputs
* Scalable analog output
* Proportional control
* Easy setup for proportional control

Note: Features with are for the “B” version which has three-color programmable “Big” LED display - All segment characters shown are for the “B” version.
About The Meter

2.3 AVAILABLE ACCESSORIES

Table 2-1. Accessories and Add-Ons

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<td>Special Calibration/Configuration</td>
</tr>
<tr>
<td>SPC4</td>
<td>NEMA-4 Splash Proof Cover</td>
</tr>
<tr>
<td>SPC18</td>
<td>NEMA-4 Splash Proof Cover, NEW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TP1A</td>
<td>Trimplate panel adaptor. Adapts DIN1A/DIN2A cases to larger panel cutouts</td>
</tr>
<tr>
<td>RP18</td>
<td>19-In. Rack Panel for one (1) 1/8 DIN instrument</td>
</tr>
<tr>
<td>RP28</td>
<td>19-In. Rack Panel for two (2) 1/8 DIN instruments</td>
</tr>
<tr>
<td>RP38</td>
<td>19-In. Rack Panel for three (3) 1/8 DIN instruments</td>
</tr>
</tbody>
</table>
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).

![Front-Panel with Big Display](image1)

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

![Front-Panel with Standard Display](image2)

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.

These meter display windows (both versions) light when appropriate:

1 - Setpoint 1 status
2 - Setpoint 2 status

5 Pushbuttons for programming the meter.
2. About The Meter

2.4 FRONT OF THE METER (Continued)

METER BUTTONS

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

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

\[\text{Note}\]
If the dual relay option is not installed or if the L.3=1 on the LK.CF menu, pressing the SETPTS button will display the meter's firmware version.

▲/MAX Button
In the Run Mode, this button will recall the PEAK reading since the last press of the RESET button.

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.1=t or R.1=n on Rd.CF menu. When configuring your setpoint values, press the ▲/MAX 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) if you configure the Reading Configuration bit R.1=t of the Rd.CF menu. If you configure R.1=n, the ▶/TARE button has no function.

In the Configuration Mode, press the this button to scroll to the next digit.
2.4 FRONT OF THE METER (Continued)

**MENU** Button

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

*Note*

> Only if you have not installed the lockout 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 PROC.

In the Run Mode, press the **RESET** button to reset tare, if any. The meter shows T.RST 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.

*Note*

> When in setpoint or Configuration Mode, if the meter shows 9999 or -1999 with all flashing digits, the value has overflowed. Press the ▲/MAX button to start a new value.
2.5 BACK OF THE METER

Figure 2-2 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.

![Diagram of connector label showing AC-Powered and DC-Powered detail](image_url)

**Figure 2-3. Connector Label (AC-Powered and DC-Powered Detail)**
### Table 2-2. Connector Description

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<th>Description</th>
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</tr>
<tr>
<td>TB1-2</td>
<td>Setpoint 1: Normally closed (N.C.1) connection</td>
</tr>
<tr>
<td>TB1-3</td>
<td>Setpoint 1: Common (COM1) connection</td>
</tr>
<tr>
<td>TB1-4</td>
<td>Setpoint 2: Normally open (N.O.2) connection</td>
</tr>
<tr>
<td>TB1-5</td>
<td>Setpoint 2: Normally closed (N.C.2) connection</td>
</tr>
<tr>
<td>TB1-6</td>
<td>Setpoint 2: Common (COM2) connection</td>
</tr>
<tr>
<td>TB1-7</td>
<td>AC line connection (no connections on DC-powered units)</td>
</tr>
<tr>
<td>TB1-8</td>
<td>AC neutral connection (+ Input on DC-powered units)</td>
</tr>
<tr>
<td>TB1-9</td>
<td>AC earth ground (DC-power return on DC-powered units)</td>
</tr>
<tr>
<td>TB1-10</td>
<td>Analog voltage output</td>
</tr>
<tr>
<td>TB1-11</td>
<td>Analog current output</td>
</tr>
<tr>
<td>TB1-12</td>
<td>Analog return</td>
</tr>
<tr>
<td>TB2-1</td>
<td>-E: Negative excitation connection from meter (5, 10, 12 V)</td>
</tr>
<tr>
<td>TB2-2</td>
<td>+E: Positive excitation connection from meter (5, 10, 12 V)</td>
</tr>
<tr>
<td>TB2-3</td>
<td>+20 mA connection for analog input</td>
</tr>
<tr>
<td>TB2-4</td>
<td>Not used.</td>
</tr>
<tr>
<td>TB2-5</td>
<td>+24 V output connection</td>
</tr>
<tr>
<td>TB2-6</td>
<td>+S: Positive signal input</td>
</tr>
<tr>
<td>TB2-7</td>
<td>-S: Negative signal input and return for +20 mA or +24 V</td>
</tr>
<tr>
<td>TB2-8</td>
<td>Not used</td>
</tr>
<tr>
<td>TB5-1</td>
<td>Isolated Analog Voltage Output</td>
</tr>
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<td>TB5-2</td>
<td>Isolated Analog Current Output</td>
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<td>TB5-3</td>
<td>Isolated Analog Output Return</td>
</tr>
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</tr>
</tbody>
</table>
About The Meter

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>
<thead>
<tr>
<th>Function</th>
<th>S1 DIP Switch Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>C= Closed</td>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td>O= Open</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Function</th>
<th>S1 DIP Switch Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8</td>
</tr>
<tr>
<td><strong>Settings for Excitation Voltage</strong></td>
<td></td>
</tr>
<tr>
<td>Internal 5/10/12 excitation</td>
<td>C - - - - - - -</td>
</tr>
<tr>
<td>External 5/10/12 excitation</td>
<td>O - - - - O O -</td>
</tr>
<tr>
<td>Internal 12 Vdc excitation</td>
<td>C - - - - O O -</td>
</tr>
<tr>
<td>Internal 10 Vdc excitation</td>
<td>C - - - - C O -</td>
</tr>
<tr>
<td>Internal 5 Vdc excitation</td>
<td>C - - - - C C -</td>
</tr>
</tbody>
</table>

### Settings for Input Ranges

<table>
<thead>
<tr>
<th>Input Ranges</th>
<th>S1 DIP Switch Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100 mV DC</td>
<td>O C O O - - O</td>
</tr>
<tr>
<td>±50 mV DC</td>
<td>O C O C - - O</td>
</tr>
<tr>
<td>±5 Vdc</td>
<td>C O O C - - O</td>
</tr>
<tr>
<td>0-10 Vdc</td>
<td>C O O O - - C</td>
</tr>
<tr>
<td>0-20 mA DC</td>
<td>O C C O - - O</td>
</tr>
</tbody>
</table>

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.

Disconnect the power supply before proceeding.

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

- Disconnect the 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.
SECTION 3. GETTING STARTED

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

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)

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 Vac, 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
3.2 MAIN BOARD POWER JUMPERS (Continued)

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

![Figure 3-2. Main Board Jumper Positions](image)

Figure 3-3. Upper Isolated Analog Output Option Board Installation
3.2 MAIN BOARD POWER JUMPERS (Continued)

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 for analog output
* To disable the **MENU** button
* To perform calibration procedure

Test pins TP1 - TP11 are for testing purposes. Do not use as reading errors may result.
S4-A Factory default jumper installed.

**Table 3-1. S3 Jumper Functions**

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3-A</td>
<td>Install to enable front panel push-buttons. Remove to disable all front panel push-buttons.</td>
</tr>
<tr>
<td>S3-B</td>
<td>Removed. Install for factory calibration only.</td>
</tr>
<tr>
<td>S3-C</td>
<td>Removed. Not used.</td>
</tr>
<tr>
<td>S3-D</td>
<td>Removed. Not used.</td>
</tr>
<tr>
<td>S3-E</td>
<td>If installed without S3-B, the <strong>MENU</strong> button locks out. If you press the <strong>MENU</strong> button, the meter shows <strong>LOCK</strong>.</td>
</tr>
</tbody>
</table>
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.
3.4 CONNECTING SENSOR INPUTS

Figures 3-6 through 3-12 describe how to connect your sensors.

**Figure 3-6. 3-Wire DC Input Connections with Internal Excitation**

![Diagram of 3-Wire DC Input Connections with Internal Excitation]

**Figure 3-7. 3-Wire DC Input Connections with External Excitation**

![Diagram of 3-Wire DC Input Connections with External Excitation]
3.4 CONNECTING SENSOR INPUTS (Continued)

Figure 3-8. 4-Wire DC Input Connections with Internal Excitation

Figure 3-9. Wire DC Input Connections with External Excitation
3.4 CONNECTING SENSOR INPUTS (Continued)

**Figure 3-10. DC Current Input Connections with Internal Excitation**

**Figure 3-11. DC Current Input Connections with External Excitation**
3.4 CONNECTING SENSOR INPUTS (Continued)

TB2

- E  +E  +20mA N/C

1  2  3  4

+24V  +S

5  6

-S  N/C

7  8

MAX. 20mA

Figure 3-12. DC Current Input Connections with Current Source

3.5 CONNECTING MAIN POWER

Connect the AC main power connections as shown in Figure 3-13.

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 3-13. Main Power Connections - AC Powered Unit
3.5 CONNECTING MAIN POWER (Continued)

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

Table 3-2. Main Power Connection - AC Powered Unit

<table>
<thead>
<tr>
<th>TB1</th>
<th>AC POWER</th>
<th>WIRE COLORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>~ AC Line</td>
<td>Brown</td>
</tr>
<tr>
<td>8</td>
<td>~ AC Neutral</td>
<td>Blue</td>
</tr>
<tr>
<td>9</td>
<td>~ AC Earth</td>
<td>Green/Yellow</td>
</tr>
</tbody>
</table>

Connect the DC main power connections as shown in Figure 3-14.

When using DC power, refer to the 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.
3.6 CONNECTING EXTERNAL TARE SWITCH

Connect external tare connections as shown in Figure 3-15.

![Figure 3-15. External Tare Connections](image)

3.7 CONNECTING ANALOG AND RELAY OUTPUTS

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

![Figure 3-16. Analog Output Connections](image)
3.7 CONNECTING ANALOG AND RELAY OUTPUTS (Continued)

Figure 3-17. Relay Output Connections.

Figure 3-18. Isolated Analog Output Connections.
SECTION 4. CONFIGURING THE METER

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

4.1 SELECTING THE INPUT TYPE

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 INPT.

2. Press the TARE button. The meter flashes one of the following:
   - 0-20 (for 4-20 mA dc) (Default)
   - 100M (for 0-100 mV dc)
   - ±50M (for ±50 mV dc)
   - 10V (for 0-10 Vdc)
   - ±5V (for ±5 Vdc)

3. Press the MAX button to scroll through available choices.

4. Press the MENU button to store your choice. The meter momentarily shows STRD, followed by DEC.P (Decimal Point).
4.2 SELECTING A DECIMAL POINT POSITION \textit{dEC.P}

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 \textbf{MENU} button until the meter shows \textit{dEC.P}.
2. Press the \textbf{TARE} button. The meter shows one of the following:
   - \textit{FFF.F}
   - \textit{FF.FF}
   - \textit{F.FFF}
   - \textit{FFFF} (Default)
3. Press the \textbf{MAX} button to scroll between available choices.
4. Press the \textbf{MENU} button to store your choice. The meter momentarily shows \textit{STRd}, followed by the next menu \textit{Rd.S.O} (Reading Scale and Offset). Or you can press the \textbf{RESET} button to abort and go back to the \textit{dEC.P} menu.

4.3 SELECTING READING SCALE AND OFFSET \textit{Rd.S.O}

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 Configuring The Meter

4.3.1 Scaling with Known Loads (On-Line Calibration)

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

<table>
<thead>
<tr>
<th>12345678</th>
<th>12345678</th>
<th>RD.CF*</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCOOXXXXC</td>
<td>XCOOCXXC</td>
<td>R2=</td>
</tr>
<tr>
<td>0 - 10 V</td>
<td>±5 V</td>
<td>4</td>
</tr>
<tr>
<td>0 - 5 V</td>
<td>±5 V</td>
<td>3</td>
</tr>
<tr>
<td>0 - 3 V</td>
<td>±3 V</td>
<td>2</td>
</tr>
<tr>
<td>0 - 2 V</td>
<td>±2 V</td>
<td>1</td>
</tr>
<tr>
<td>0 - 1 V</td>
<td>±1 V</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 4-2. Range Selection Dip Switch Positions For Millivolt/ Milliamp Input

<table>
<thead>
<tr>
<th>12345678</th>
<th>12345678</th>
<th>12345678</th>
<th>RD.CF*</th>
</tr>
</thead>
<tbody>
<tr>
<td>XOCOOXX0</td>
<td>XOCOCXX0</td>
<td>XOCOXXX0</td>
<td>R2=</td>
</tr>
<tr>
<td>0 - 100 mV</td>
<td>±50 mV</td>
<td>0 - 20 mA</td>
<td>4</td>
</tr>
<tr>
<td>0 - 50 mV</td>
<td>±50 mV</td>
<td>0 - 10 mA</td>
<td>3</td>
</tr>
<tr>
<td>0 - 30 mV</td>
<td>±30 mV</td>
<td>0 - 6 mA</td>
<td>2</td>
</tr>
<tr>
<td>0 - 20 mV</td>
<td>±20 mV</td>
<td>0 - 4 mA</td>
<td>1</td>
</tr>
<tr>
<td>0 - 10 mV</td>
<td>±10 mV</td>
<td>0 - 2 mA</td>
<td>0</td>
</tr>
</tbody>
</table>

* Reading Configuration
4.3.1 Scaling with Known Loads (On-Line Calibration) (Continued)

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 \( R_d . S . 0 \).

3. Press the ▶/TARE button. The meter shows \( I_H \) (Input 1).
   
   **Note** \( I_H \) (Input 1) is the unscaled display reading at minimum input.

4. Press the ▶/TARE button again. The meter shows 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 \( I_H \) (Input 1). The meter shows \( R_d \) (Read 1).
   
   **Note** \( R_d \) (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 ▲/MAX 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 value as \( R_d \). The meter shows \( I_H \) (Input 2).
    
    **Note** \( I_H \) (Input 2) is the unscaled display reading at maximum input.
4.3.1 Scaling with Known Loads (On-Line Calibration) (Continued)

11. Apply a known load equal to approximately 100% of the transducer range.

12. Press the \( \text{TARE} \) button again. The meter shows the last stored value for Input 2.

13. Press the \( \text{TARE} \) button once more. The meter shows the actual signal being received.

14. Press the \( \text{MENU} \) button to store Input 2 value. The meter shows \( \text{RD} \)\( \_\_ \) (Read 2). \( \text{RD} \)\( \_\_ \) (Read 2) is the desired display reading at input 2.

15. Press the \( \text{TARE} \) button. The meter shows the last stored value for Read 2.

16. Press the \( \text{MAX} \) button to change the value of your digits.

17. Press the \( \text{TARE} \) button to scroll horizontally to the next digit.

18. Press the \( \text{MENU} \) button to store value as \( \text{RD} \)\( \_\_ \) (Read 2). The meter momentarily shows \( \text{STRD} \), followed by \( \text{RD.CF} \). Meter scaling is now complete.
4.3.2 Scaling Without Known Loads

To scale without known inputs, calculate input values based on the transducer specifications and manually enter them on the front-panel pushbuttons. The following example assumes a pressure transducer with these specifications:

**Pressure Range:** 0 to 2000 PSI  
**Output Span:** 1 to 5 Vdc

1. Determine the correct values for \( \text{IN}_1 \) and \( \text{IN}_2 \) based on the transducer specifications. In most cases, \( \text{RD}_1 \) & \( \text{RD}_2 \) are equal to the minimum and maximum of the transducer output span. The example assumes \( \text{RD}_1 \) & \( \text{RD}_2 \) are equal to the pressure range of the transducer (\( \text{RD}_1 = 0000 \) and \( \text{RD}_2 = 2000 \)). Calculate \( \text{IN}_1 \) and \( \text{IN}_2 \) using the transducer output span and the following equation:

\[
\text{IN} = (\text{Sensor Output}) \times (\text{Natural Gain}) \times (\text{Multiplier}).
\]

**Table 4-3. Natural Gain**

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Span Units</th>
<th>Natural Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 mV</td>
<td>Millivolts</td>
<td>100 cts/mV</td>
</tr>
<tr>
<td>±50 mV</td>
<td>Millivolts</td>
<td>40 cts/mV</td>
</tr>
<tr>
<td>0 to 10 V</td>
<td>Volts</td>
<td>1000 cts/V</td>
</tr>
<tr>
<td>±5 V</td>
<td>Volts</td>
<td>400 cts/V</td>
</tr>
<tr>
<td>0 to 20 mA</td>
<td>Milliamps</td>
<td>500 cts/mA</td>
</tr>
</tbody>
</table>

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

**Table 4-4. Input Resolution Multiplier**

<table>
<thead>
<tr>
<th>Input Range</th>
<th>( \text{R.2}=4 )</th>
<th>( \text{R.2}=3 )</th>
<th>( \text{R.2}=2 )</th>
<th>( \text{R.2}=1 )</th>
<th>( \text{R.2}=0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100 mV</td>
<td>1.000</td>
<td>2.000</td>
<td>3.333</td>
<td>5.000</td>
<td>10.00</td>
</tr>
<tr>
<td>0 to 10 V</td>
<td>1.000</td>
<td>2.000</td>
<td>3.333</td>
<td>5.000</td>
<td>10.00</td>
</tr>
<tr>
<td>0 to 20 mA</td>
<td>1.000</td>
<td>2.000</td>
<td>3.333</td>
<td>5.000</td>
<td>10.00</td>
</tr>
<tr>
<td>±50 mV</td>
<td>1.000</td>
<td>1.000</td>
<td>1.667</td>
<td>2.500</td>
<td>5.000</td>
</tr>
<tr>
<td>±5 V</td>
<td>1.000</td>
<td>1.000</td>
<td>1.667</td>
<td>2.500</td>
<td>5.000</td>
</tr>
</tbody>
</table>
4.3.2 Scaling Without Known Loads (Continued)

3. Determine \( \text{IN1} \) & \( \text{IN2} \) input range and resolution. The example selects the 0 to 10 V range and 10 uV resolution \((\text{R.2} = 4)\).

Example: 
\[
\begin{align*}
\text{IN1} &= (1 \text{ Volt}) \times (1000 \text{ cts/v}) \times (1.000) = 1000 \\
\text{IN2} &= (5 \text{ Volt}) \times (1000 \text{ cts/v}) \times (1.000) = 5000 \\
\text{RD1} &= 0000 \\
\text{RD2} &= 2000
\end{align*}
\]

4. Press \textbf{MENU} button until the meter shows \( \text{RD.S.O} \).

5. Press the \( \text{\textgreater\textless TARE} \) button. The meter shows \( \text{IN1} \).

6. Press the \( \text{\textgreater\textless TARE} \) button again, the meter shows the last Input 1 value, with the fourth digit flashing.

7. Press the \( \text{\text成为中国} / \text{MAX} \) button to change the value of your digits.

8. Press the \( \text{\textgreater\textless TARE} \) button to scroll horizontally to the next digit.

9. Press the \textbf{MENU} button to store this value. The meter shows \( \text{RD1} \).

10. Press the \( \text{\textgreater\textless TARE} \) button. The meter shows the last value for read 1.

Repeat steps 7, 8 and 9 until \( \text{RD1}, \text{IN2} \) and \( \text{RD2} \) have been displayed, verified, changed (if necessary) and stored.

4.4 USING READING CONFIGURATION \textbf{RD.CF}

\textbf{Note:} Refer to Table 6-1 for a summary list of menu configuration.

You may use Reading Configuration \textbf{RD.CF} to configure your meter for the following:

- To enable or disable the front panel tare
- To set the input resolution of your meter
- To display the filtered/unfiltered signal input value
4.4.1 Enabling or Disabling the Front-Panel Tare

To enable or disable the front-panel tare, follow these steps:

1. Press the **MENU** button until \( \text{RD.CF} \) displays.

2. Press the \( \uparrow/\text{TARE} \) button. The meter shows one of the following:
   - \( \text{R.1=L} \) (Tare enabled) (Default)
   - \( \text{R.1=H} \) (Tare disabled)

3. Press the \( \uparrow/\text{MAX} \) button to view last stored selection. Press the \( \uparrow/\text{MAX} \) button to toggle between selections.

4. Press the \( \uparrow/\text{TARE} \) button to select input resolution or press the **MENU** button to store your selections.

4.4.2 Setting Input Resolution

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

1. Press the **MENU** button until \( \text{RD.CF} \) displays, then press the \( \uparrow/\text{TARE} \) button twice.

   or

   Press the \( \uparrow/\text{TARE} \) button from \( \text{R.1} \).

   One of the following displays (default is \( \text{R.2=4} \)):

   - \( \text{R.2=4} \) = 10 \( \mu \text{V} \) for Unipolar inputs. 25 \( \mu \text{V} \) for Bipolar inputs
   - \( \text{R.2=0} \) = 1 \( \mu \text{V} \) for Unipolar inputs. 5 \( \mu \text{V} \) for Bipolar inputs
   - \( \text{R.2=1} \) = 2 \( \mu \text{V} \) for Unipolar inputs. 10 \( \mu \text{V} \) for Bipolar inputs
   - \( \text{R.2=2} \) = 3 \( \mu \text{V} \) for Unipolar inputs. 15 \( \mu \text{V} \) for Bipolar inputs
   - \( \text{R.2=3} \) = 5 \( \mu \text{V} \) for Unipolar inputs. 25 \( \mu \text{V} \) for Bipolar inputs

   **Example:** 3 \( \mu \text{V} \) resolution means that if you input 0-30 mV, at 30 mV the display shows 9999.

2. Press the \( \uparrow/\text{MAX} \) button to scroll through available selections.

3. Press the \( \uparrow/\text{TARE} \) button to display the filtered/unfiltered signal input or press the **MENU** button to store your selections. \( \text{STRd} \) momentarily displays, followed by \( \text{COLR} \) menu.
4 Configuring The Meter

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 R.3.F 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 ▲ MAX 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

**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 ▲ MAX button to scroll between available choices.

4. Press the MENU button to store your choice. The meter momentarily shows SERD, followed by the next menu SCI.CF (Setpoint 1 Configuration). Or you can press the RESET button to abort and go back to the R.3.CF menu.
4.6 USING SETPOINT 1 CONFIGURATION \texttt{S1.CF}

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

Setpoint 1 Configuration \texttt{S1.CF} is not active unless your meter has dual relay output capabilities. The LED's will display whether the \texttt{S1.CF} is active or not. You may use Setpoint 1 Configuration \texttt{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

### 4.6.1 Setting Setpoint 1's Active Band

1. Press the \texttt{MENU} button until the meter shows \texttt{S1.CF}.
2. Press the \texttt{∂/TARE} button. The meter shows one of the following:
   - \texttt{S.1=A} (Active above the setpoint) (Default)
   - \texttt{S.1=B} (Active below the setpoint)
3. Press the \texttt{ß/MAX} button to toggle between available choices.
4. Press the \texttt{∂/TARE} button to select if Setpoint 1 is latched or unlatched or press the \texttt{MENU} button to store your selection.

### 4.6.2 Selecting if Setpoint 1 is Latched or Unlatched

1. Press the \texttt{MENU} button until \texttt{S1.CF} displays, then press the \texttt{∂/TARE} button twice. or Press the \texttt{∂/TARE} button from \texttt{S.1}.

   The meter shows one of the following:
   - \texttt{S.2=U} Setpoint 1 to be unlatched (Default)
   - \texttt{S.2=L} Setpoint 1 to be latched
2. Press the \texttt{∂/MAX} button to toggle between available choices.
3. Press the \texttt{MENU} button to store your selection(s). The meter momentarily shows \texttt{STRd}, followed by \texttt{S2.CF} (Setpoint 2 Configuration).
4 Configuring The Meter

4.7 USING SETPOINT 2 CONFIGURATION \texttt{S2.CF}

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

Setpoint 2 Configuration \texttt{S2.CF} is not active unless your meter has dual relay output capabilities. The LED’s will display whether the \texttt{S2.CF} is active or not. You may use Setpoint 2 Configuration \texttt{S2.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

4.7.1 Setting Setpoint 2's Active Band

1. Press the \texttt{MENU} button until the meter shows \texttt{S2.CF}.
2. Press the \texttt{\textgreater TARE} button. The meter shows one of the following:
   - \texttt{S.1=A} (Active above the setpoint) (Default)
   - \texttt{S.1=b} (Active below the setpoint)
3. Press the \texttt{\textgreater MAX} button to toggle between available choices.
4. Press the \texttt{\textgreater TARE} button to select if Setpoint 2 is latched or unlatched or press the \texttt{MENU} button to store your selection and enter \texttt{S1.DB} (Setpoint 1 Deadband)

4.7.2 Selecting if Setpoint 2 is Latched or Unlatched

1. Press the \texttt{MENU} button until \texttt{S2.CF} displays, then press the \texttt{\textgreater TARE} button twice. or
   Press the \texttt{\textgreater TARE} button from \texttt{S.1}.
   The meter shows one of the following:
   - \texttt{S.2=U} Setpoint 2 to be unlatched (Default)
   - \texttt{S.2=L} Setpoint 2 to be latched
2. Press the \texttt{\textgreater MAX} button to toggle between available choices.
3. Press the \texttt{MENU} button to store your selection(s). The meter momentarily shows \texttt{STRD}, followed by \texttt{S1.DB} (Setpoint 1 Deadband).
4.8 SETTING THE SETPOINT 1 DEADBAND \textit{S1.db}

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

Setpoint 1 Deadband \textit{S1.db} is not active unless your meter has dual relay output capabilities. The LED's will display whether the \textit{S1.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 \textbf{MENU} button until the meter shows \textit{S1.db}.
2. Press the \textbf{\normalfont{\boldmath $\partial_TARE$}} button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the \textbf{\normalfont{\boldmath $\beta_MAX$}} button to change the value of the flashing digit. If you continue to press the \textbf{\normalfont{\boldmath $\beta_MAX$}} button, the flashing digit's value continues to change.
4. Press the \textbf{\normalfont{\boldmath $\partial_TARE$}} button to scroll to the next digit.
5. Press the \textbf{MENU} button to store your selection. The meter momentarily shows \textit{STRd}, followed by \textit{S2.db} (Setpoint 2 Deadband).

4.9 SETTING THE SETPOINT 2 DEADBAND \textit{S2.db}

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

Setpoint 2 Deadband \textit{S2.db} is not active unless your meter has dual relay output capabilities. The LED's will display whether the \textit{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 \textbf{MENU} button until the meter shows \textit{S2.db}.
2. Press the \textbf{\normalfont{\boldmath $\partial_TARE$}} button. The meter shows the last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.
3. Press the \textbf{\normalfont{\boldmath $\beta_MAX$}} button to change the value of the flashing digit. If you continue to press the \textbf{\normalfont{\boldmath $\beta_MAX$}} button, the flashing digit's value continues to change.
4. Press the \textbf{\normalfont{\boldmath $\partial_TARE$}} button to scroll to the next digit.
5. Press the \textbf{MENU} button to store your selection. The meter momentarily shows \textit{STRd}, followed by \textit{Ot.CF} (Output Configuration) if you have analog output capabilities.
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

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 the 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 select if the analog output is regular or proportional

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:

   - O.1=E (Analog output enabled) (Default)
   - O.1=d (Analog output disabled)

3. Press the ▲/MAX 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 Configuring The Meter

4.10.2 Selecting Analog Output as Current or Voltage

1. Press the **MENU** button until it shows **0E.CF**, then press the **✓/TARE** button twice.
   or
   Press the **✓/TARE** button from **0.1**.
   The meter shows one of the following:
   
   • **0.2=C** *(Analog output = current)* (Default)
   • **0.2=V** *(Analog output = voltage)*

2. Press the **▲/MAX** 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 **0E.S.O** *(Output Scale and Offset)*.

4.10.3 Selecting Analog Output or Proportional Control

![Note](image)

Use this section to select if the meter will transmit an analog signal proportional to the display readings, or proportional to the error signal between the display reading and Setpoint 1.

Proportional Control Analog Option is not available for models without Relay Option.

1. Press the **MENU** button until it shows **0E.CF**, then press the **✓/TARE** button twice.
   or
   Press the **✓/TARE** button from **0.2**.
   The meter shows one of the following:
   
   • **0.3=A** *(Analog output is regular)* (Default)
   • **0.3=P** *(Analog output is proportional)*

2. Press the **▲/MAX** button to toggle between available choices.
4.10.3 Selecting Analog Output or Proportional Control (Continued)

3a. If you select \( \text{O.3} = \text{A} \), press the \textbf{MENU} button to store your selection. The meter momentarily shows \( \text{STRd} \), followed by \( \text{OT.5.0} \) (Output Scale and Offset).

3b. If you select \( \text{O.3} = \text{P} \), press the \( \text{TARE} \) button. The meter shows one of the following:

- \( \text{O.4} = \text{d} \) (Proportional analog output is DIRECT ACTING)
- \( \text{O.4} = \text{r} \) (Proportional analog output is REVERSE ACTING).

4. Press the \( \text{MAX} \) button to toggle between available choices.

5. Press the \textbf{MENU} button to store your selections. The meter momentarily shows \( \text{STRd} \), followed by \( \text{P.bNd} \) (Proportional Band).

Additionally, if you select \( \text{O.2} = \text{V} \) (Analog output to be voltage), press the \( \text{TARE} \) button. One of the following displays:

- \( \text{O.5} = \text{F} \) (Proportional 0-10 V analog output)
- \( \text{O.5} = \text{H} \) (Proportional 0-5 V analog output).

6. Press the \( \text{MAX} \) button to toggle between available choices.

7. Press the \textbf{MENU} button to store your selections. The meter momentarily shows \( \text{STRd} \), followed by \( \text{P.bNd} \) (Proportional Band).
4 Configuring The Meter

4.11 SELECTING PROPORTIONAL BAND $P_{bnd}$

Proportional Band $P_{bnd}$ is not active unless your meter has analog output and relay capabilities. The menu will display whether analog output is present or not.

- A proportional controller's output is linearly proportional to the change of the error signal, whenever the signal is within 2 prescribed values (Proportional Band).
- There are three (3) points of interest on the proportional controller transfer curve.
- The first is the magnitude of the error signal that drives the controller to “full on” (e.g. 20 mA out for 4-20 mA).

![Figure 4-2. Controller Output]

- The second point of interest is the magnitude of the error signal that drives the controller output to “full off” (e.g. 4 mA out on 4-20 mA). These two (2) points need not be equally spaced on either side of the zero error point.
- The third is the factor "Offset" and it is the output value of the controller which causes zero error.

The above example illustrates the parameters for the 4-20 mA analog out, likewise, analog voltage output will have these (3) points of interest.
4.11 SELECTING PROPORTIONAL BAND \( P_{bnd} \) (Continued)

If \( A \) is the controller gain then,

\[
\text{Proportional Band} = \frac{\text{Max. out} - \text{Min. out}}{A} \\
\text{CONTROLLER OUT} = A \times \text{ERROR} + \text{OFFSET}
\]

To select the proportional band for your proportional controller, follow these steps:

1. Press the \textbf{MENU} button until the meter shows \( P_{bnd} \).

If \( P_{bnd} \) menu doesn’t show, set \( 0.3=P \) on Menu \( \text{OT.CF} \).

\[\text{Note:}\] Remember to press \( \uparrow/TARE \) when \( \text{OT.CF} \) is displayed until \( 0.3=\color{red}P \), then press \( \Delta/\text{MAX} \), unit will show \( 0.3=\color{red}P \). Pressing the \textbf{MENU} button will store the selection.

2. Press the \( \uparrow/TARE \) button. The meter shows last previously stored 4-digit number (0000 through 9999) with flashing 4th digit.

3. Press the \( \uparrow/\text{MAX} \) button to change the value of the flashing digit. If you continue to press the \( \uparrow/\text{MAX} \) button, the flashing digit's value continues to change.

4. Press the \( \uparrow/TARE \) button to scroll to the next digit.

5. Press the \textbf{MENU} button to store your selection. The meter shows \textit{STRD}, followed by \textit{M.RST} (Manual Reset).
4 Configuring The Meter

4.12 USING MANUAL RESET M.RST

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

Manual Reset M.RST is not active unless your meter has analog output and relay capabilities. The menu will display whether analog output is present or not. This feature allows you to offset the error that may occur with your setpoint. In order to determine the amount of error, you must compare your display value to the Setpoint 1 value. The difference between these two values (display - Setpoint 1) is the amount of error that you may want to enter into Manual Reset M.RST. The value of M.RST must be less than P.bnd/2. Larger values will not be accepted and the meter will display ER4 (flashing).

1. Press the MENU button until M.RST displays.

   This menu M.RST and P.bnd will show up if 0.3=P on OT.CF.

2. Press the ▶ TARE button. The meter shows the last previously stored 4-digit number (-1999 through 9999) with flashing 4th digit.

3. Press the ▲ MAX button to change the value of the flashing digit. If you continue to press the ▲ MAX 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. STRd momentarily displays, followed by RSE (Reset).
4.13 USING OUTPUT SCALE AND OFFSET

Output Scale and Offset 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 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 displays.
2. Press the TARE button. (Read 1) displays.

   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 MAX 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. (Output 1) displays.

   This starting analog signal corresponds to your Read 1 display.
7. Press the TARE button. Selected output displays.

   If you select for voltage, the maximum signal you may select is 10.00 for an 0-10 Vdc signal output. If you select for current, the maximum signal you may select is 20.00.
8. Press the MAX button to enter the Output 1 signal selection. If you continue to press the MAX button, the flashing digit's value continues to change.
9. Press the TARE button to scroll to the next digit.
10. Press the MENU button to store your selection. (Read 2) displays.

   This is your second point of display reading.
11. Press the ➤/TARE button. The meter shows last previously stored 4-digit number (-1999 through 9999) displays with flashing 4th digit.

12. Press the ▲/MAX button to change the value of the flashing digit. If you continue to press the ▲/MAX button, the flashing digit’s value continues to change.

13. Press the ➤/TARE button to scroll to the next digit.

14. Press the MENU button to store your selection. The meter shows Out.2 (Output 2).

This analog signal should correspond to your Read 2 display.

15. Press the ➤/TARE button. The meter shows selected output.

If you select $0.2\text{±}4$ for voltage, the maximum signal you may select is 10.00 for an 0-10 Vdc signal output. If you select $0.2\text{±}C$ 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 ▲/MAX button to change the value of the flashing digit. If you continue to press the ▲/MAX button, the flashing digit’s value continues to change.

17. Press the ➤/TARE button to scroll to the next digit.

18. Press the MENU button to store your selection. The meter momentarily shows Strd, followed by Lk.Cf (Lockout Configuration).

---

**WARNING:** If the meter displays all flashing values on any item, the value has overflowed. Press the ▲/MAX button to start new values.
4.14 USING LOCK OUT CONFIGURATION LK.CF

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 the meter’s firmware version.

4.14.1 Enabling or Disabling the RESET button in the Run Mode

1. Press the MENU button until the meter shows LK.CF (after OT.S.O).
2. Press the △/TARE button. The meter shows one of the following:
   - RS.=E To enable the RESET button in the Run Mode (Default)
   - RS.=D To disable the RESET button in the Run Mode
3. Press the ▲/MAX 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 BRIT and returns to the Run Mode.

4.14.2 Enabling or Disabling SETPOINT Changes

1. Press the MENU button until the meter shows LK.CF (after OT.S.O).
2. Press the △/TARE button twice. The meter shows one of the following:
   - SP.=E To enable setpoint changes (Default)
   - SP.=D To disable setpoint changes
3. Press the ▲/MAX 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 BRIT and returns to the Run Mode.
4 Configuring The Meter

4.14.3 SETPOINT Display Function: Firmware version or Setpoint value

1. Press the MENU button until the meter shows \texttt{LK.CF} (after \texttt{0E.S.O}).
2. Press the \texttt{\textgreater \textless \ TARE} button three times. The meter shows one of the following:
   - \texttt{L.3=0} SETPTS button will display setpoint values.
   - \texttt{L.3=1} SETPTS button will display the meter's firmware version.
3. Press the \texttt{\textuparrow \textdownarrow \ MAX} button to toggle between the choices above.
4. Press the MENU button to store the changes. The meter shows \texttt{STRD} if the new value is different otherwise the meter shows \texttt{BRIT} and returns to the Run Mode.

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 \texttt{FOL} (overload) or \texttt{POP} memory indicated by Alarm 1 & 2 LED displays. LEDs can be reset by pressing MENU then RESET button or by Power OFF then ON.

4.15 USING DISPLAY BRIGHTNESS CONFIGURATION

Changing “Display Brightness” is not active unless your meter is a Version “B”.

1. Press the MENU button until the meter shows \texttt{bR.iC} (after \texttt{LKCF}).
2. Press the \texttt{\textgreater \textless \ TARE} button from \texttt{bR.iC}. The meter shows one of the following:
   - \texttt{M.b.r.t} Medium Brightness
   - \texttt{L.b.r.t} Low Brightness
   - \texttt{H.b.r.t} \textit{High Brightness} (Default)
3. Press the \texttt{\textuparrow \textdownarrow \ MAX} button to toggle between available choices.
4. Press the MENU button to store your selection. The meter momentarily shows \texttt{STRD} followed by \texttt{STRD}, \texttt{RST}, \texttt{PROC}, then measured value.
## SECTION 5. DISPLAY MESSAGES

### Table 5-1. Display Messages

<table>
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<th>MESSAGE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
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<td>PROC</td>
<td>Process Meter</td>
</tr>
<tr>
<td>RST</td>
<td>Hard (Power On) Reset</td>
</tr>
<tr>
<td>INPT</td>
<td>Input Type</td>
</tr>
<tr>
<td>dEC.P</td>
<td>Decimal Point</td>
</tr>
<tr>
<td>Rd.5.0</td>
<td>Reading Scale and Offset</td>
</tr>
<tr>
<td>Rd.CE</td>
<td>Reading Configuration</td>
</tr>
<tr>
<td>COLR</td>
<td>Display Color</td>
</tr>
<tr>
<td>S1.CF</td>
<td>Setpoint 1 Configuration</td>
</tr>
<tr>
<td>S2.CF</td>
<td>Setpoint 2 Configuration</td>
</tr>
<tr>
<td>S1.db</td>
<td>Setpoint 1 Deadband</td>
</tr>
<tr>
<td>S2.db</td>
<td>Setpoint 2 Deadband</td>
</tr>
<tr>
<td>P.bWd</td>
<td>Proportional Band</td>
</tr>
<tr>
<td>M.RSE</td>
<td>Manual Reset</td>
</tr>
<tr>
<td>ER4</td>
<td>Manual Reset Error</td>
</tr>
<tr>
<td>Ot.CF</td>
<td>Output Configuration</td>
</tr>
<tr>
<td>Ot.5.0</td>
<td>Output Scale and Offset</td>
</tr>
<tr>
<td>Lk.CF</td>
<td>Lock Out Configuration</td>
</tr>
<tr>
<td>br.it</td>
<td>Display Brightness</td>
</tr>
<tr>
<td>hOL</td>
<td>+ Overload Signal</td>
</tr>
<tr>
<td>-OL</td>
<td>- Overload Signal</td>
</tr>
<tr>
<td>RS.OF</td>
<td>Resolution Overflow</td>
</tr>
<tr>
<td>+999</td>
<td>Value Overflow in Setpoint/Menu &amp; Peak Routines</td>
</tr>
<tr>
<td>-1999</td>
<td>Value Overflow in Setpoint/Menu &amp; Peak Routines</td>
</tr>
<tr>
<td>ER1</td>
<td>2 Coordinate Format Programming Error</td>
</tr>
<tr>
<td>PEAK</td>
<td>Peak Value</td>
</tr>
<tr>
<td>PR.RS</td>
<td>Peak Reset</td>
</tr>
<tr>
<td>T.RS</td>
<td>Tare Reset</td>
</tr>
<tr>
<td>SP.RS</td>
<td>Reset Latched Alarms</td>
</tr>
<tr>
<td>SP1</td>
<td>Setpoint 1 Value</td>
</tr>
<tr>
<td>SP2</td>
<td>Setpoint 2 Value</td>
</tr>
<tr>
<td>R.04.S</td>
<td>Resolution Over Scale</td>
</tr>
<tr>
<td>v.-8.8</td>
<td>Firmware Version (where 8 is 0 ~ 9)</td>
</tr>
<tr>
<td>R.WH</td>
<td>Operating Mode</td>
</tr>
</tbody>
</table>
### SECTION 6. MENU CONFIGURATION DISPLAYS

Not all menu items display on standard meters.

#### Table 6-1. Menu Configuration Displays

(Defaults in Bold and Italics)

<table>
<thead>
<tr>
<th>MENU</th>
<th>▶/TARE</th>
<th>▲/MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN PT</td>
<td>Show input choices:</td>
<td>100M</td>
</tr>
<tr>
<td></td>
<td>▶/TARE is pressed, actual input is shown and can not be changed with ▲/MAX.</td>
<td>▲/MAX is pressed, unit can scroll through digits with ▶/TARE.</td>
</tr>
<tr>
<td></td>
<td>▲/MAX is pressed, unit can scroll through digits with ▶/TARE.</td>
<td></td>
</tr>
<tr>
<td>DEC.P</td>
<td>Show current decimal point position</td>
<td>F.FFF (Default)</td>
</tr>
<tr>
<td>Rd.S.O</td>
<td>Reading Scale &amp; Offset</td>
<td>F.FFP</td>
</tr>
<tr>
<td></td>
<td>Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td>F.FFP</td>
</tr>
<tr>
<td>1</td>
<td>Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Enter new value and show Rd.1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Enter new value and show Rd.2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Enter new value and show Rd.2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Enter new value and show Rd.2</td>
<td></td>
</tr>
</tbody>
</table>

Changes the value of the flashing digit

Changes the value of the flashing digit

Changes the value of the flashing digit
## Menu Configuration Displays

### SECTION 6. MENU CONFIGURATION DISPLAYS (Continued)

<table>
<thead>
<tr>
<th>MENU</th>
<th>➞/TARE</th>
<th>➞/MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Configuration</td>
<td>R.1=</td>
<td>R.1=₁ᵇ&lt;br&gt;<em>(Tare enabled)</em>&lt;br&gt;R.1=₁ᵈ&lt;br&gt;<em>(Tare disabled)</em>&lt;br&gt;R.2=₀&lt;br&gt;<em>(1 µV resolution for unipolar &amp; 5 µV resolution for bipolar)</em>&lt;br&gt;R.2=₁&lt;br&gt;<em>(2 µV resolution for unipolar &amp; 10 µV resolution for bipolar)</em>&lt;br&gt;R.2=₂&lt;br&gt;<em>(3 µV resolution for unipolar &amp; 15 µV resolution for bipolar)</em>&lt;br&gt;R.2=₃&lt;br&gt;<em>(5 µV resolution for unipolar &amp; 25 µV resolution for bipolar)</em>&lt;br&gt;R.2=₄&lt;br&gt;<em>(10 µV resolution for unipolar &amp; 25 µV resolution for bipolar)</em>&lt;br&gt;Note: 3 µV resolution means if your input is 0-30 mV, at 30 mV the display shows 9999.</td>
</tr>
<tr>
<td></td>
<td>R.2=</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R.3=</td>
<td>R.3=₁ᶠ&lt;br&gt;<em>(Filtered value)</em>&lt;br&gt;R.3=₁ᵐ&lt;br&gt;<em>(Unfiltered value)</em></td>
</tr>
<tr>
<td>Display Color Selection</td>
<td>Show input choices:</td>
<td>G=₁ᵐ&lt;br&gt;<em>(Green)</em>&lt;br&gt;R=₁ᵐ&lt;br&gt;<em>(Red)</em>&lt;br&gt;A=₁ᵐ&lt;br&gt;<em>(Amber)</em></td>
</tr>
<tr>
<td>Setpoint 1 Configuration</td>
<td>S.1=</td>
<td>S.1=₁ᵃ&lt;br&gt;<em>(Active above)</em>&lt;br&gt;S.1=₁ᵇ&lt;br&gt;<em>(Active below)</em>&lt;br&gt;S.2=₀&lt;br&gt;<em>(Unlatched)</em>&lt;br&gt;S.2=₁&lt;br&gt;<em>(Latched)</em></td>
</tr>
<tr>
<td>Setpoint 2 Configuration</td>
<td>S.1=</td>
<td>S.1=₁ᵃ&lt;br&gt;<em>(Active above)</em>&lt;br&gt;S.1=₁ᵇ&lt;br&gt;<em>(Active below)</em>&lt;br&gt;S.2=₀&lt;br&gt;<em>(Unlatched)</em>&lt;br&gt;S.2=₁&lt;br&gt;<em>(Latched)</em></td>
</tr>
</tbody>
</table>
### Table 6-1. Menu Configuration Displays (Continued)

<table>
<thead>
<tr>
<th>MENU</th>
<th>▶/TARE</th>
<th>△/MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setpoint 1 Deadband</td>
<td>Press to scroll to the next digit to the right</td>
<td>Press to change the value of the flashing digit</td>
</tr>
<tr>
<td><strong>S1.db</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setpoint 2 Deadband</td>
<td>Press to scroll to the next digit to the right</td>
<td>Press to change the value of the flashing digit</td>
</tr>
<tr>
<td><strong>S2 db</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OT.CF</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1 =</td>
<td>0.1=E</td>
<td>(Analog output is enabled)</td>
</tr>
<tr>
<td>0.2 =</td>
<td>0.2=C</td>
<td>(Analog output is current)</td>
</tr>
<tr>
<td>0.3 =</td>
<td>0.3=A</td>
<td>(Regular analog output)</td>
</tr>
<tr>
<td>0.4 =</td>
<td>0.4=P</td>
<td>(Proportional analog output)*</td>
</tr>
<tr>
<td>shown if menu 0.3=P</td>
<td>0.4=R</td>
<td>(Proportional analog is direct acting)</td>
</tr>
<tr>
<td>0.5 =</td>
<td>0.5=F</td>
<td>(Analog output is 0-10 Vdc)</td>
</tr>
<tr>
<td>shown if menu 0.2=V</td>
<td>0.5=H</td>
<td>(Analog output is 0-5 Vdc)</td>
</tr>
</tbody>
</table>

* If you select 0.2=V and 0.3=P, you may select your analog output to be 0-10 V or 0-5 V by accessing submenu 0.5=F or 0.5=H.

* If 0.3=P, you may select your proportional output analog to be:
  - Direct Acting 0.4=D: 4-20 mA, 0-5 V, 0-10 V
  - Reverse Acting 0.4=R: 20-4 mA, 5 V-0 V, 10 V-0 V

Note: **Defaults in Bold and Italics**
### Menu Configuration Displays

#### SECTION 6. MENU CONFIGURATION DISPLAYS (Continued)

#### Table 6-1. Menu Configuration Displays (Continued)

(Defaults in Bold and Italics)

<table>
<thead>
<tr>
<th>MENU</th>
<th>▶/TARE</th>
<th>▲/MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.bWd</td>
<td>Shows prior value entered. Scrolls to the next digit to the right.</td>
<td>Changes the value of the flashing digit</td>
</tr>
<tr>
<td>Proportional Band shown menu if 0.3 ≤ P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m.RST</td>
<td>Shows prior value entered. Scrolls to the next digit to the right.</td>
<td>Changes the value of the flashing digit</td>
</tr>
<tr>
<td>Manual Reset shown menu if 0.3 ≤ P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output Scale &amp; Offset</td>
<td>1 Shows Rd 1 Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td>Changes the value of the flashing digit</td>
</tr>
<tr>
<td>(Shown if 0.3 ≤ A in Output Configuration Menu Ot.CF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Enter new value and show OUT1</td>
<td>3 Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td>Changes the value of the flashing digit</td>
</tr>
<tr>
<td>4 Enter new value and show Rd2</td>
<td>5 Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td>Changes the value of the flashing digit</td>
</tr>
<tr>
<td>6 Enter new value and show OUT2</td>
<td>7 Shows prior value entered and flashing digit. Scrolls to the next digit.</td>
<td>Changes the value of the flashing digit</td>
</tr>
</tbody>
</table>
### Table 6-1. Menu Configuration Displays (Continued)

(Default in Bold and Italics)

<table>
<thead>
<tr>
<th>MENU</th>
<th>▶/TARE</th>
<th>▲/MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lock Out Configuration</td>
<td>RS=</td>
<td>RS=E (Enable RESET button in the Run Mode) RS=d (Disable RESET button in the Run Mode)</td>
</tr>
<tr>
<td></td>
<td>SP=</td>
<td>SP=E (Enable setpoint changes) SP=d (Disable setpoint changes)</td>
</tr>
<tr>
<td></td>
<td>L3=</td>
<td>L3=0 (SETPTS button display setpoint values) L3=1 (SETPTS button display firmware version V.8.8 where 8 is 0~9)</td>
</tr>
<tr>
<td>Brightness Configuration</td>
<td></td>
<td>▲/MAX</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M.BrT (Medium Brightness)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L.BrT (Low Brightness)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H.BrT (High Brightness)</td>
</tr>
</tbody>
</table>

### Table 6-2. Run Mode Displays

<table>
<thead>
<tr>
<th>Display</th>
<th>▶/TARE</th>
<th>▲/MAX</th>
<th>RESET</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEAK</td>
<td></td>
<td>Displays the peak reading and must be pressed again to return to the normal operating mode without resetting.</td>
<td>Reset the peak reading when in this mode.</td>
<td>Peak Reading Displays the highest reading since last reset.</td>
</tr>
<tr>
<td>T.RST</td>
<td>Press to activate.</td>
<td></td>
<td>Will reset your tare when viewing this function.</td>
<td>Tare Reset</td>
</tr>
<tr>
<td>SP.RS</td>
<td></td>
<td></td>
<td></td>
<td>Reset Latched Alarms Pressing the RESET button resets your latched alarms.</td>
</tr>
</tbody>
</table>
# Table 7-1. Setpoint Configuration Displays

<table>
<thead>
<tr>
<th>MENU</th>
<th>TARE</th>
<th>MAX</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1</td>
<td>Press to scroll to the next digit to the right</td>
<td>Press to change the value of the flashing digit</td>
<td>SETPOINT 1 Select from -1999 through 9999</td>
</tr>
<tr>
<td>SP2</td>
<td>Press to scroll to the next digit to the right</td>
<td>Press to change the value of the flashing digit</td>
<td>SETPOINT 2 Select from -1999 through 9999</td>
</tr>
</tbody>
</table>
# SECTION 8. SPECIFICATIONS

## SIGNAL INPUT

<table>
<thead>
<tr>
<th>Input Ranges:</th>
<th>0-100 mV, ± 50 mV, 0-10 V, ± 5 V, 0-20 mA, 4-20 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation:</td>
<td>Dielectric strength to 2500V transient per 3mm spacing based on EN 61010 for 260Vrms or DC working voltage</td>
</tr>
<tr>
<td>Noise Rejection:</td>
<td>Normal Mode Rejection (NMR) = 60 dB</td>
</tr>
<tr>
<td></td>
<td>Common Mode Rejection (CMR) = 120 dB</td>
</tr>
<tr>
<td>Resistance:</td>
<td>100 Meg ohms for 100 mV or ±50 mV input range</td>
</tr>
<tr>
<td></td>
<td>1 Meg ohm for 10 V or +5 V input range</td>
</tr>
<tr>
<td></td>
<td>5 ohms for 20 mA current input range</td>
</tr>
</tbody>
</table>

### “Big” Display:

- **Symbol:** 8888 (-1.999.9 ~ 9.999.9)
- **Standard Display:** 4-digit, 14-segment LED, 13.8 mm (0.54”)
  
### Standard Display:

- **Symbol:** 8888 (-1.999.9 ~ 9.999.9)

## ANALOG TO DIGITAL

- **Technique:** Dual slope
- **Internal resolution:** 15 bits
- **Read Rate:** 3/sec Polarity Automatic

## ACCURACY AT 25°C

- **Max Error Strain/Process:** ±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**
    - 24 V @ 25 mA,
    - 12 V @ 50 mA,
    - 10 V @ 120 mA,
    - 5 V @ 60 mA
  - **Refer to Table 8-1**
  - **Color chart for DC Output**
  - **Excitation**
- **Load Regulation:** 1.1%
- **Line Regulation:** 0.02% per Vac
SECTION 8. SPECIFICATIONS (Continued)

**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

- Only one analog output is available on each unit and it must be factory installed.
SECTION 8. SPECIFICATIONS (Continued)

INPUT POWER INFORMATION

\[\sim\] AC units  
115/230 V~(AC) \pm 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, 8W  
(Refer to Table 8-1 below)

External Fuse Required:

<table>
<thead>
<tr>
<th>IEC 127-2/III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Fuse</td>
</tr>
<tr>
<td>115 V</td>
<td>125 mA @ 250 (T)</td>
</tr>
<tr>
<td>230 V</td>
<td>63 mA @ 250 (T)</td>
</tr>
</tbody>
</table>

UL 248-14 (Listed Fuse)

<table>
<thead>
<tr>
<th>Power</th>
<th>Fuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 V</td>
<td>175 mA @ 250 V Slow-Blow</td>
</tr>
<tr>
<td>230 V</td>
<td>80 mA @ 250 V Slow-Blow</td>
</tr>
</tbody>
</table>

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

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

**Warning**: Do not use Internal Excitation. Use External Excitation. Do not use Isolated Analog Output. Use Non-Isolated Analog Output.

**Note**: 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

NOTE: Dimensions in Millimeters (Inches)
## SECTION 9. FACTORY PRESET VALUES

### Table 9-1. Factory Preset Values

<table>
<thead>
<tr>
<th>MENU ITEM</th>
<th>FACTORY PRESET VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPT</strong></td>
<td>Input Type: 0-20 (0-20 mA dc input)</td>
</tr>
<tr>
<td><strong>dEC.P</strong></td>
<td>Decimal Point Position: FFFFF</td>
</tr>
<tr>
<td><strong>Rd.S.O</strong></td>
<td>Reading Scale and Offset: 4-20 mA dc = 0-1000</td>
</tr>
</tbody>
</table>
| **Rd.CE** | Reading Configuration:  
  R.1=E (Tare enabled)  
  R.2=C (10 µV resolution for unipolar & 25 µV resolution for bipolar)  
  R.3=F (Filtered value) |
| **COLOR** | 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) |
| **S2.CF** | Setpoint 2 Configuration:  
  S.1=A (Setpoint is active above)  
  S.2=U (Setpoint is unlatched) |
| **S1.db** | Setpoint 1 Deadband: 0003 |
| **S2.db** | Setpoint 2 Deadband: 0003 |
| **04.CF** | Output Configuration:  
  O.1=E (Analog output is enabled)  
  O.2=C (Analog output is current)  
  O.3=A (Analog output follows the display value) |
| **04.S.O** | Output Scale and Offset: 0-1000 = 4-20 mA dc |
| **LM.CE** | Lock Out Configuration  
  L5=E (Enable the RESET button in the Run Mode)  
  SP=E (Enable setpoint changes)  
  L3=O (Display setpoint values) |
| **bR 16** | (Brightness Level) |
| **SP1** | Setpoint 1 Value: 0000 |
| **SP2** | Setpoint 2 Value: 0000 |

Sensor Excitation Output: 12 Vdc
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)

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.
NEWPORT Electronics, Inc. warrants this unit to be free of defects in materials and workmanship for a period of one (1) year from the date of purchase. In addition to NEWPORT’s standard warranty period, NEWPORT Electronics will extend the warranty period for four (4) additional years if the warranty card enclosed with each instrument is returned to NEWPORT.

If the unit should malfunction, it must be returned to the factory for evaluation. NEWPORT’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by NEWPORT, if the unit is found to be defective it will be repaired or replaced at no charge. NEWPORT’s WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of NEWPORT’s control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the NEWPORT Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO NEWPORT, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM NEWPORT’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting NEWPORT:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult NEWPORT for current repair charges. Have the following information available BEFORE contacting NEWPORT:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

NEWPORT’s policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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