BG Series Owners Manual

Addendum 1

for
Enhanced BarGraph

WESCHLER
INSTRUMENTS
DIVISION OF HUGHES CORPORATION

Contents

A1 INTRODUCTION

Scope

This addendum covers features specific to the *enhanced* versions of Weschler Instruments BarGraph instruments.

New Features

Enhanced BarGraph instruments provide all of the features described in section 2 of the manual *plus*:

· Full 5-digit decimal LED display.
· Simple 1-step dimming from the front panel control buttons.
· Alarms programmable to either high or low in the field.
· Programmable alarm hysteresis from 0 to 10% of Full Scale, or latching.
· Alphanumeric display in both programming modes for ease of use.
· Improved analog retransmit resolution to 64936 counts.
· Autoscaling for values less than -9999.

When to Use the Manual

Physical dimensions and electrical connections are identical to standard units. Refer to the manual for information on:

· Installation - Section 3
· Temperature Measurement - Section 6
· Retransmit - Section 7
· Peak/Valley Option - Section 8
· Manual Loading Station - Section 9
· Replacement Parts - Section 10
· Warranty - Section 11

When to Use the Addendum

Enhanced BarGraph instruments have an improved user interface for setup and calibration that differs radically from the standard BarGraph instruments. This addendum is intended to cover these areas specifically:

· Setup - Section A2 (Section 4 in the original manual)
· Calibration - Section A3 (Section 5 in the original manual)

A2 SETUP

Normal Display Operation

The bar and digital display provide visual analog indication of the process signal. When the incoming signal is below the bottom end of the bar display, the first LED and digital display flash at a 1 Hz rate, indicating an underrange condition. When the process signal exceeds the full scale value, the top LED and digital display flash at a 2 Hz rate, indicating an overrange condition.

The bar and digital display can be inhibited from flashing in the underrange/overrange condition by installing a permanent jumper. (See Appendix IV in the original manual for location).
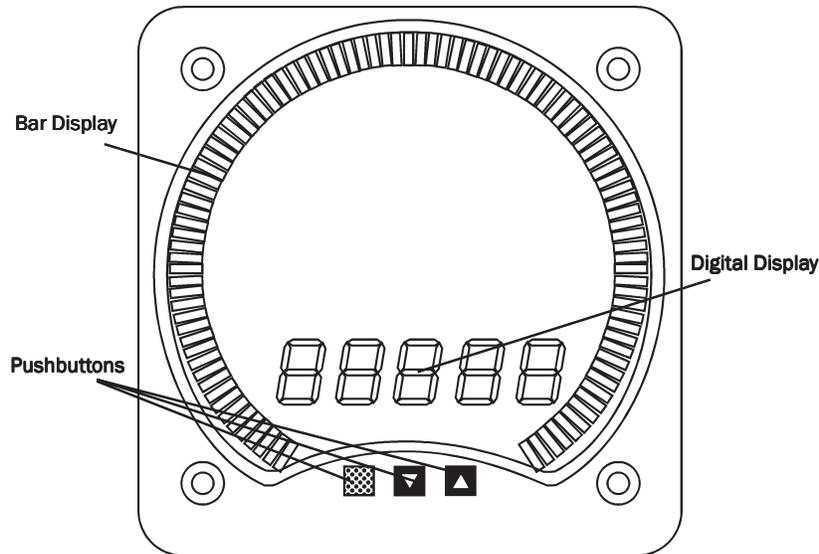
Display Operation During Setup

During setup programming the bar and digital display provide information to the user for programming. The digital display is used to show simple 3-letter abbreviations and numeric values for each of the setup functions and the bar display is used to provide an analog indication of functions and function values.

Information from the user is input through pushbuttons on the front panel. Three pushbutton switches are located on the front of the BarGraph™: two black pushbuttons with white triangular arrows and a red pushbutton with no markings. The pushbutton switch with the triangular arrow pointing up (▲)is the INCREASE pushbutton. The pushbutton with the triangular arrow pointing down (▼)is the DECREASE pushbutton. ENTER/SAVE is the red pushbutton (▨).

Operator and Supervisor Setup

Setup functions are divided into two separate classes: operator and supervisor.

Operator Setup functions are those that may need to be changed on a routine basis for normal operation of the instrument. These functions include the alarm setpoints and LED brightness control. Alarm setpoint programming may be disabled selectively under Supervisor Setup.

Supervisor functions are those that should be setup only once when the instrument is installed and may cause damage to equipment or faulty operation if changed inadvertently. These functions include calibration settings, retransmit ID settings and bar display modes. In addition, specific functions under the operator setup may be disabled.

Supervisor Setup functions may only be programmed by removing the front cover of the instrument and bridging jumper JA1 with the factory supplied jumper. Reference Appendix IV in the original manual for the location of JA1.

A2.1 OPERATOR SETUP PROGRAMMING

Activating Operator Setup

If Operator Setup was enabled under Supervisor Setup, pressing the red ENTER/SAVE pushbutton and holding it for more than 3 seconds activates Operator Setup without the installation of the internal jumper at JA1.

When operator setup is first enabled, CnF is displayed on the digital display. This is the point at which the user both enters and leaves Operator Setup.

Operator Setup Actions

Operator Setup allows the following functions. Note that the number of alarms available depends on the particular model of BarGraph™ display ordered.

Operator Setup functions are cycled through using the INCREASE and DECREASE keys. A particular function can be programmed by pressing the ENTER/SAVE key. Pressing the DECREASE key while LEd is displayed will go to CnF and pressing the INCREASE key while CnF is displayed will go to LEd.

Previous Function ▲	CnF	▨ Leave Operator Setup
	$AL1$	▨ Adjust Alarm 1 setpoint
	$AL2$	▨ Adjust Alarm 2 setpoint
	$AL3$	▨ Adjust Alarm 3 setpoint
Next Function ▼	$AL4$	▨ Adjust Alarm 4 setpoint
	LEd	▨ Set LED brightness
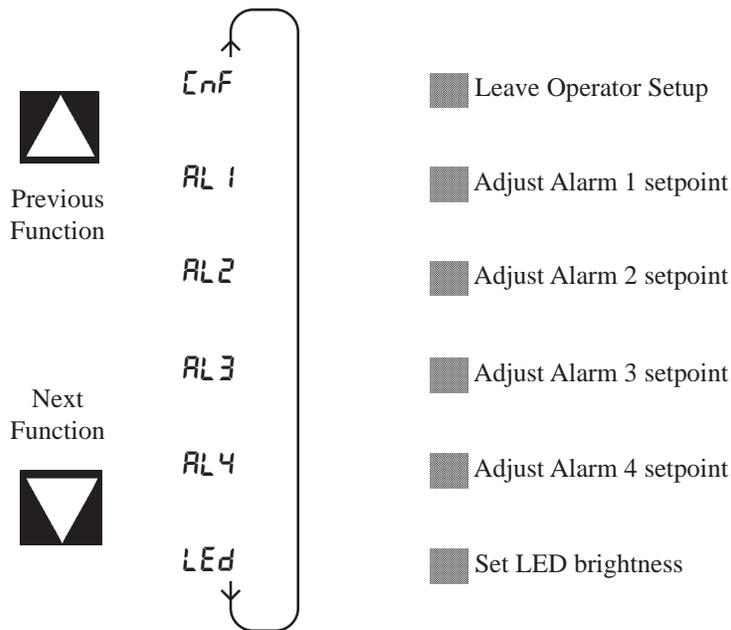
Pressing the ENTER/SAVE key while any of the above are displayed will display the current setting and allow it to be modified. Setting each of the above functions is described on the following pages.
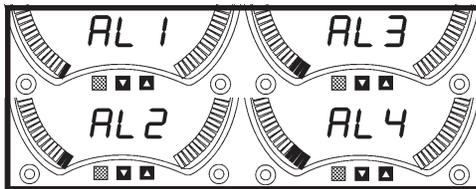
Up to four alarm setpoints are provided. Each of these setpoints may be programmed as a high or low setpoint in Supervisor Setup. In Operator Setup these setpoints may be examined, changed and, if latching is enabled under Supervisor Setup, a latched alarm may be cleared.

Press ENTER/SAVE

The display will show *HI* or *Lo* to indicate whether the alarm was configured as a high setpoint or low setpoint in Supervisor Setup.

Press ENTER/SAVE

If latching was enabled for this setpoint in Supervisor Setup, the display will show *LCH* or *rEL* to indicate a latched or released state for this alarm. The bar display will show a graphical representation of the alarm state. One bar at the lower end of the scale will be lit for a released (*rEL*) state and all 101 bars will be lit for a latched (*LCH*) state.

Press INCREASE DECREASE

If latching was enabled for this setpoint in Supervisor Setup and the alarm is latched (*LCH*), pressing either the INCREASE or DECREASE key will release the alarm. Pressing ENTER/SAVE without pressing INCREASE or DECREASE will leave the alarm in a latched state and display the setpoint value.

Press ENTER/SAVE

Setpoint for this alarm is displayed. The bar and digital displays both indicate value of the setpoint.

Press INCREASE DECREASE

INCREASE and DECREASE keys can be used to change the setpoint value. Hold it until the new setpoint value is reached.

The longer the key is held, the faster the display moves to the required location.

Press ENTER/SAVE

To save the new setpoint value, press the ENTER/SAVE key.

Do not assume that the new value is saved once you have arrived at the new setpoint value and the BarGraph defaults to normal display mode. You must press ENTER/SAVE to store the new setpoint value and make it effective.

NOTES

If the BarGraph is in AL1 through AL4 and no keys are pressed for 45 seconds, the BarGraph reverts to the normal display.

In Operator Setup mode, only the bar and digital displays are affected. All signal processing functions continue to operate at the current setup values. Thus, if you are using the setpoint form "C" relays or retransmit capabilities, they continue to function as if the BarGraph was in the normal display mode.

LEd

LED brightness can be controlled from Operator Setup. Two settings are available: *LO* and *HI*.

Press
ENTER/SAVE

The display will show *HI* or *LO* to indicate the current LED brightness setting.

Press
INCREASE
DECREASE

Pressing INCREASE or DECREASE will toggle the current setting of LED brightness.

Press
ENTER/SAVE

To save the new LED brightness, press the ENTER/SAVE key.

Do not assume that the new setting is saved once you have chosen it and the BarGraph™ defaults to normal display mode. You must press ENTER/SAVE to store the new LED brightness setting and make it effective.

One-Step LED Brightness Control

During normal display operation, the LED brightness may be toggled between *LO* and *HI* by pressing the INCREASE or DECREASE keys.

A2.2 SUPERVISOR SETUP PROGRAMMING

Activating Supervisor Setup

Supervisor Setup can only be activated by removing the front cover of the BarGraph™ display and installing jumper JA1. Refer to Appendix IV of the original manual for location of JA1.

When Supervisor Setup is first enabled, CnF is displayed on the digital display. This is the point at which the user both enters and leaves Supervisor Setup.

Supervisor Setup Functions

Operator Setup allows the following functions. Note that the number of alarms available depends on the particular model of BarGraph display ordered.

Operator Setup functions are cycled through using the INCREASE and DECREASE keys. A particular function can be set by pressing the ENTER/SAVE key. Pressing the DECREASE key while LEd is displayed will go to CnF and pressing the INCREASE key while CnF is displayed will go to LEd.

to LEd

↑

CnF Install/Remove jumper JA1

▲
Previous
Function

$AL1$ Configure Alarm 1

$AL2$ Configure Alarm 2

$AL3$ Configure Alarm 3

Next
Function $AL4$ Configure Alarm 4

▼

PEA Enable/Disable Peak

HYS Configure Hysteresis

$ZErO$ Calibrate Zero

$FULL$ Calibrate Full-scale

↓
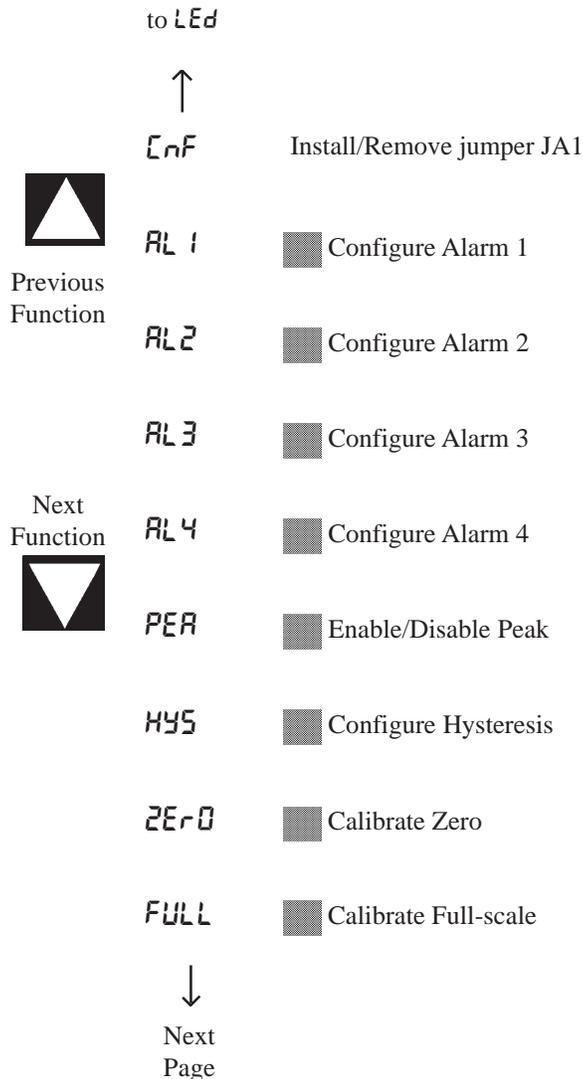
Next
Page

bAr   ▨ Configure Barform

▲

Previous
Function

OPr   ▨ Enable/disable Operator Setup

dEC   ▨ Configure Decimal Point Scaling

b2r   ▨ Configure BarGraph™ Zero

Next
Function

bFL   ▨ Configure BarGraph™ Full-scale

Id   ▨ Set Communication ID

▼

LEd   ▨ Set LED brightness

```
 ╔═══════╗ ╔═══════╗
 ║ AL 1  ║ ║ AL 3  ║
 ╠═══════╣ ╠═══════╣
 ║ AL 2  ║ ║ AL 4  ║
 ╚═══════╝ ╚═══════╝
```
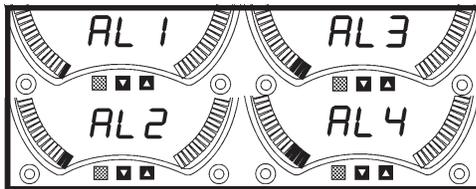
Alarm Setpoints

Up to four alarm setpoints are provided. Each of these setpoints may be programmed as a high or low setpoint, latching may be enabled or disabled and the alarm setpoint programmed.

Press ENTER/SAVE

The display will show *Hi* or *Lo* to indicate whether the alarm is currently programmed as a high or low alarm. A high alarm will trip when the measured value is greater than the programmed setpoint. A low alarm will trip when the measured value is less than the programmed setpoint.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE keys will toggle between *Hi* and *Lo*.

Press ENTER/SAVE

The display will show *LCH* or *rEL* to indicate whether this alarm is configured as latching or not. The bar display will show a graphical representation of the alarm state. One bar at the lower end of the scale will be lit for a released (*rEL*) state and all 101 bars will be lit for a latched (*LCH*) state.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE keys will toggle between *LCH* and *rEL*.

Press ENTER/SAVE

Setpoint for this alarm is displayed. The bar and digital displays both indicate value of the setpoint.

Press INCREASE DECREASE

INCREASE and DECREASE keys can be used to change the setpoint value. Hold it until the new setpoint value is reached.

The longer the key is held, the faster the display moves to the required location.

Press ENTER/SAVE

To save the new setpoint value, press the ENTER/SAVE key.

Peak/Valley allows the BarGraph to display the highest (Peak) and lowest (Valley) level during the reading cycle, as determined by the reset.

The display will show OFF or on to indicate the current state of Peak/Valley function.

Press
ENTER/SAVE

Pressing the INCREASE or DECREASE key will toggle between OFF and on.

Press
INCREASE
DECREASE

Press ENTER/SAVE to store the new setting.

Press
ENTER/SAVE

HYS

Set Hysteresis

Hysteresis may be set in 0.1% increments from 0 to 10% of Full Scale. Attempting to increment past 10% will enable latching for all alarms (infinite hysteresis).

The display will show the current hysteresis setting.

Press
ENTER/SAVE

Pressing the INCREASE or DECREASE key will increase or decrease the hysteresis setting. Incrementing past 10% will enable latching on the alarms and display LCH.

Press
INCREASE
DECREASE

Press ENTER/SAVE to store the new setting.

Press
ENTER/SAVE

BarGraph Zero

This is a calibration function. The following steps show how to check the current calibration settings. For a description of how to change the calibration, see section A.3 for complete calibration procedure.

Press ENTER/SAVE

The display will show the current BarGraph zero setting as a percentage of Full Scale.

Press INCREASE DECREASE

If the INCREASE or DECREASE keys are not pressed, the BarGraph will not change the calibration settings. See section A.3 for a complete description of calibration.

Press ENTER/SAVE

Press ENTER/SAVE to advance to the next function (BarGraph Full Scale).

BarGraph Full Scale

This is a calibration function. The following steps show how to check the current calibration settings. For a description of how to change the calibration, see section A.3 for complete calibration procedure.

Press ENTER/SAVE

The display will show the current BarGraph Full Scale display setting as a percentage of Full Scale.

Press INCREASE DECREASE

If the INCREASE or DECREASE keys are not pressed, the BarGraph will not change the calibration settings. See section A.3 for a complete description of calibration.

Press ENTER/SAVE

Press ENTER/SAVE to advance to the next function (Set Barform).

11

This function allows the user to set the display format. The most common display format is bottom zero, ie; starts at the bottom (or most left for circular or horizontal displays) and increasing up (towards the right for circular or horizontal displays). The BarGraph zero point can be located or referenced anywhere on or off the scale in this setup.

Press ENTER/SAVE

The display will show the current barform. Options for barform and the order they appear in are shown below.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE key will cycle through the barform options shown below.

0 — Bottom 0. BarGraph reads 0% of Full Scale at the bottom and increasing up to 100% of Full Scale at the top.

Previous Barform

25 — Zero point at 25% of bar display. BarGraph reads -25% of Full Scale at the bottom and increases up to +75% at the top.

33 — Zero point at 33% of bar display. BarGraph reads -33% of Full Scale at the bottom and increases up to +66% at the top.

50 — Zero point at 50% of bar display. BarGraph reads -50% of Full Scale at the bottom and increases up to +50% at the top.

Next Barform

100 — Zero point at 100% of bar display. This effectively reverses the bar display, with 100% of Full Scale at the bottom of bar display and 0% of Full Scale at the top.

b IP — Bipolar - Zero point at 50% of bar display. BarGraph reads -100% at the bottom of display and +100% at the top of bar display.

uAr — Variable allows the user to set any arbitrary values for the bottom and top of bar display (see Set Bar Zero and Set Bar Full Scale).

dEu — Deviation allows the user to set a bar display center point at any arbitrary value and display + or - variations around that center point. The Bar Zero point is displayed at 50 % of bar display, with - Bar Full Scale at the bottom of display and + Bar Full Scale at the top of bar display. (see Set Bar Zero and Set Bar Full Scale)

Press ENTER/SAVE

Press ENTER/SAVE to store the new barform setting.
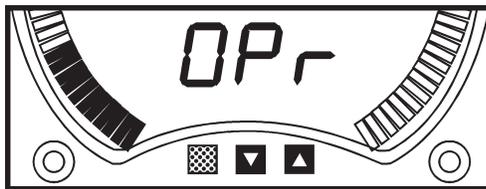
Enable/Disable Operator Setup

Operator Setup can be enabled or disabled through this function. If Operator Setup is disabled, the simple one-step LED dimming is still available.

Press ENTER/SAVE

The display will show `OFF` or `on` to indicate whether Operator Setup is currently disabled or enabled.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE key will toggle between `OFF` and `on`.

Press ENTER/SAVE

Press ENTER/SAVE to store the new setting.
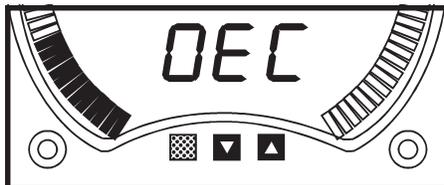
Set Decimal Point

This function is used to set the position of the decimal point on the digital display.

Press ENTER/SAVE

The display will show the current display decimal point setting. Options for display decimal settings and the order they appear are shown below.


Press INCREASE DECREASE

Pressing the INCREASE or DECREASE key will cycle through the display decimal point setting options shown below.

▲ Previous Position	xxx0x	No decimal point.

xxx1x. — Decimal point after least significant digit on display.

xxx2.x — Decimal point after 2nd least significant digit on display.

xxx.3x — Decimal point after 3rd least significant digit on display.

▼ Next Position	xx.x4x	Decimal point after 4th least significant digit on display.

x.xx5x — Decimal point after most significant digit on display.

Press ENTER/SAVE to store the new setting.

Press ENTER/SAVE

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b2r — Set Bar Zero
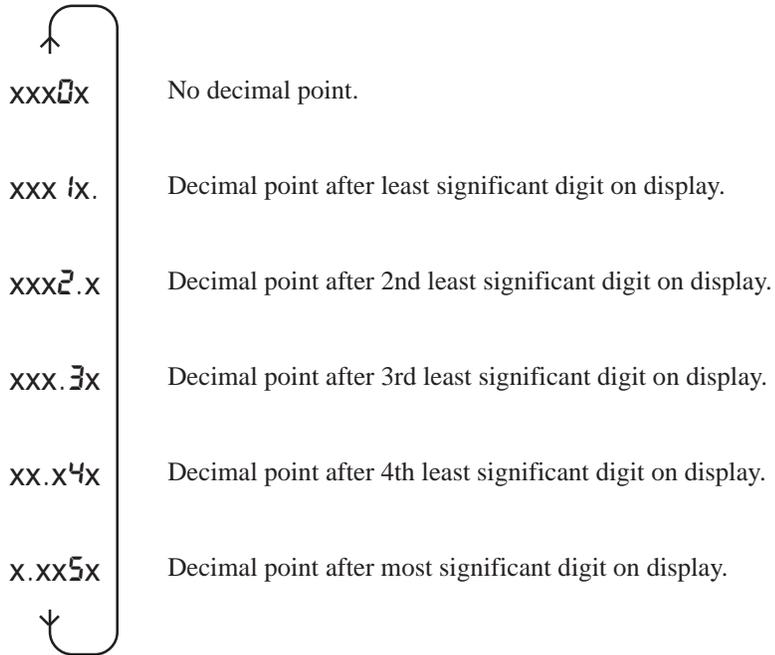
The BarGraph zero display point may be set to a percentage of Full Scale. This is not a calibration function. It only affects the value the BarGraph will display at the lowest end of the bar display. This setting can be used to limit the lowest value that the BarGraph will display. This function will not be enabled or displayed unless barform has been set to Deviation or Variable barform (see barform function).

The display will show the current BarGraph zero setting as a percentage of Full Scale.

Press ENTER/SAVE

Pressing the INCREASE or DECREASE key will increase or decrease the zero display point.

Press INCREASE DECREASE

Press ENTER/SAVE to store the new setting.

Press ENTER/SAVE

14

Set Bar Full Scale

The BarGraph Full Scale display point may be set to a percentage of Full Scale for measurement. This is not a calibration command. It only affects the BarGraph display. This command and the Set Bar Zero function may be used to limit the values shown on the bar display to a specific region of interest. This function will not be enabled or displayed unless barform has been set to Deviation or Variable barform (see Set Barform function).

Press ENTER/SAVE

The display will show the current BarGraph Full Scale display setting as a percentage of Full Scale.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE key will increase or decrease the Full Scale display point.

Press ENTER/SAVE

Press ENTER/SAVE to store the new setting.

Set ID

This function is used to set BarGraph communication ID. Each BarGraph hooked to the communication lines must have its own unique ID to distinguish it from other units.

Press ENTER/SAVE

The display will show the current communication ID.

Press INCREASE DECREASE

Pressing the INCREASE or DECREASE key will increase or decrease the communication ID.

Press ENTER/SAVE

Press ENTER/SAVE to store the new setting.

Use this function to set LED brightness. Two settings are available: LO and HI.

The display will show HI or LO to indicate the current LED brightness setting.

Press
ENTER/SAVE

Pressing INCREASE or DECREASE will toggle the current setting of LED brightness.

Press
INCREASE
DECREASE

To save the new LED brightness, press the ENTER/SAVE key.

Press
ENTER/SAVE

One-Step LED Brightness Control

During normal display operation the LED brightness may be toggled between LO and HI by pressing the INCREASE or DECREASE keys.

A3 CALIBRATION

<table>
<tr>
<td>⚠</td>
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**WARNING: PREVENT DAMAGE TO YOUR BARGRAPH!**

The BarGraph was configured at the factory for certain Zero and Full Scale values. These values should not vary much or damage will occur to your BarGraph. Identify the Zero and Full Scale values from the INPUT data on the BarGraph label. If you need significant changes to your configuration, the input circuitry might require modification. Consult the factory for assistance.

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</table>

Calibration Procedure

1. Install jumper at JA1 (see circuit board layout drawing in Appendix IV in the original manual for location). The display changes to:
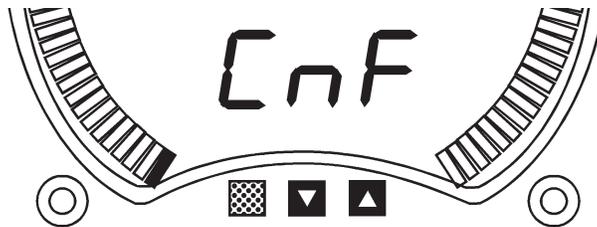

2. To change the BarGraph Zero, press the INCREASE (▲) or DECREASE (▼) pushbuttons until the Zero display appears (if option was ordered) and eight segments of the bar display are lit, as shown below:
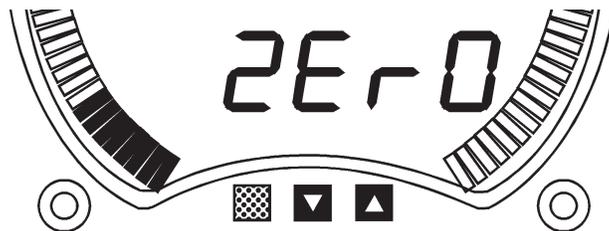

3. Press the red ENTER/SAVE pushbutton. The display will change to show `0000` on the digital display and the bar display will show one segment lit.

4. Check your BarGraph's zero value. Enter the desired zero input value into the BarGraph signal input terminals. Use a calibrated lab-standard.

5. Press INCREASE (▲) or DECREASE (▼) to load the new Zero value into the meter. This tells the unit that you are changing the Zero value, not simply scrolling through setup.

CAUTION: If this step is not performed, the new calibration point will not be saved.

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6. Make sure the desired bar segment and digital display value are correct. Press the red ENTER/SAVE pushbutton The desired Zero value is stored in memory and the displays change from the Zero value to:
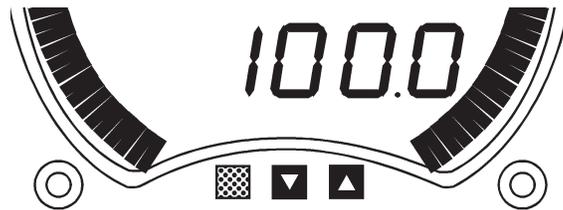
7. When ENTER/SAVE is released, the displays change to allow setting BarGraph Full Scale:
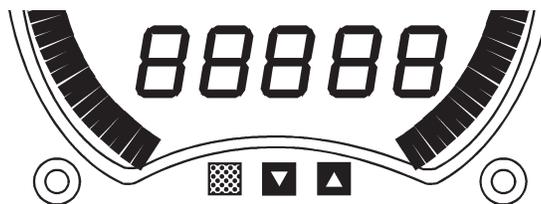
8. Press ENTER/SAVE to allow setting Full Scale value. The display will change to show the previously stored Full Scale value.

9. Enter the desired Full Scale input value into the BarGraph signal input terminals. Use a calibrated lab-standard.

10. Press INCREASE (▲) or DECREASE (▼) to load the new Full Scale value into the meter. This tells the unit that you are changing the Full Scale value, not simply scrolling through setup.

> **CAUTION: If this step is not performed, the new calibration point will not be saved.**

11. Make sure the desired bar segment and digital display value are correct. Press the red ENTER/SAVE pushbutton. The desired Full Scale value is stored in memory and the displays change from the Full Scale value to the next setup mode.

12. Press INCREASE (▲) or DECREASE (▼) to return to the CnF setup mode.

13. Remove the jumper at JA1.

14. Recheck your BarGraph's Zero and Full Scale values with the lab-standard input signal source and verify that you have accomplished the desired results.