

# Programmable LCD bargraph meter with numeric display and Tri-Color backlight replaces older DB-40 instruments

HI-Q123



## Green

Backlight denotes value is within normal operating parameters. Notice the alarm marks at 15%, 25%, 75% and 85%. The backlight can be programmed to change color at the limit set points. Alternately, the alarm pointers can be disabled and the backlight will still change to the pre programmed colors. Flashing the bargraph display is easily configured and controlled with the alarm settings. Backlight color and Alarm color is user programmable Red, Orange or Green.

## FEATURES:

- ◆ 18 bit Delta -Sigma A/D converter
- ◆ 5VDC, 10-32VDC or 90-265VAC Power, 10 Watts maximum
- ◆ Optional Isolated 16 Bit analog output (4-20mA or 0-5VDC)
- ◆ Optional Four 10A Relays or 8- $\frac{1}{2}$ amp open collector transistor outputs
- ◆ Optional Isolated RS-232C/422/485 Serial communications
- ◆ Optional Isolated excitation to power your Sensors/Transducers
- ◆ 1, 2 or 3 analog input channels. Control the bargraph separately or perform complex math functions.
- ◆ Menu Driven Keypad programmable as soft keys for changes ON-THE-FLY
- ◆ Industrial NEMA 4X Rated Front Panel
- ◆ Math Functions: +, -, x,  $\div$ ,  $\sqrt{\quad}$  & More, user definable polynomials and 25 point linearization tables
- ◆ Custom face plate markings available
- ◆ Backlight is programmable to change color at the limits or as a continuous color display



## Orange

Backlight indicates value is just outside the normal operating parameters. Notice that the alarm marks are still visible at 15%, 25% and 85%. These give an indication of how far from the danger zone you actually are. If programmed, the bargraph display can flash at this alarm and relays can be triggered to turn equipment on or off.

## RED

Backlight shows value is outside the normal operating parameters. Notice that the alarm marks are still visible. These give an indication of how far from the intermediate zone you actually are. If programmed, the bargraph display can flash at this alarm and outputs can be triggered to turn equipment on or off. The HI-Q also has a feature known as the "PANIC" setting. When enabled, this will cause the relays to switch to a user programmed state (open or close) and the analog output to jump to the predetermined setting. This is extremely useful for taking control of a process in the event of a failure.



# Specifications

## A/D CONVERTER

- Bi-polar 18-Bit Delta-Sigma A/D converter
- Accuracy:  $\pm 0.01\%$  of Full Scale
- Linearity:  $\pm 0.01\%$  of Full Scale
- Zero offset: Automatic/Programmable
- SPAN: User Programmable for any reading
- F.S.Input Voltage Range: User selectable with internal jumpers
- Sampling Rate: 16 conversions per second (62.5mS), 100 per second available on request.
- Input Type: DC with internal signal conditioners for RMS, thermocouple, RTD, Strain-Gage or Watts available.
- Input Bias: 50pA
- C.M.V.:  $\pm 2\text{VDC}$  max (when powered by 5VDC)
- CMR:  $>90\text{dB}$
- Averaging (Weighted): None to 40. Adjustable band method for quick response
- Input Impedance: 

$>100\text{K}$ for voltage inputs
$<1\text{K}$ for current inputs.
See ordering information for details.

## ANALOG CONTROL OUTPUTS

- 16-BIT Digital to Analog converter, Isolated
- Accuracy & Linearity:  $\pm 0.03\%$
- Outputs: 0-5VDC ( 100K ohm minimum load)  
4-20mADC ( 1K ohm maximum load)  
Sourcing at 24VDC
- Isolation: 500VDC
- Response 70mS standard, 12mS available on request

## ON-OFF CONTROL OUTPUT RELAYS(4)

- Type: 4 each, S.P.D.T. Form "C"
- Max. Switching Current: 10A Res.
- Max. Switching Voltage: 30VDC/ 240VAC@Rated Current
- Contact Protection: Included
- Life Expectancy: 10,000,000 Cycles
- Activation: 30mS on / 50mS off
- Programmable Hysteresis eliminates chatter

## BiMOS OUTPUT (8) OPEN COLLECTOR

- Type: Sink Driver (Open collector Transistor)
- Isolation to 5V Power and analog inputs: None
- Isolation to 10-32VDC or 90-265VAC Power: 500V min
- Isolation to analog output: 500V minimum.
- Max. Current Sink: 250mA each
- $V_{\text{sat}}$  @250mA: 1.8V
- Standard Collector voltage: 5VDC
- External Collector voltage: Up to 35VDC
- Switching Speed: 100 $\mu\text{S}$

## POWER INPUTS

- 5VDC $\pm 5\%$  Non-Isolated from analog inputs
- 10-32VDC or 9-36VAC Isolated to 500V minimum
- 90-265VAC or 100-300VDC Isolated to 500V minimum
- Power Consumption 10Watts Maximum

## NEMA 4X

- NEMA 4x front panel when mounted in enclosure with the supplied gasket. Care must be taken during the installation process to not damage the gasket and to insure it is positioned properly

## ENVIRONMENTAL

- Operating Temperature..... -10 to 60 Degrees C
- Storage Temperature.....-40 to 70 Degrees C
- Humidity.....5% to 95% non-condensing
- Face Plate.....Lexan with epoxy ink printed on front

## DISPLAY

- High contrast liquid crystal type
- Backlight LED Programmable Tri-Color
- Viewing angle  $\pm 50$  degrees from center
- 101 segment bargraph provides 1% resolution
- 6 digit numeric 0.5" tall with alarm annunciators

## QUALIFICATIONS

**(N, M and S series only. Consult Factory)**

- Meets EPRI TR102323 rev B
- Radiated Emissions MIL-STD-461
- Radiated Susceptibility MIL-STD-462
- Conducted Emissions MIL-STD-461
- Conducted Susceptibility MIL-STD-462
- Fast Transient
- Seismic IEEE 323 / 344
- Software V&V per IEEE
- Shock & Vibration MIL-STD-901 & MIL-STD-167
- MTBF calculated at 100,000 hours per MIL-HDBK
- Optional EMI / RFI mesh and conductive gasket available with metal housing only.

**ORDERING INFORMATION 1/2003)**



**DISPLAY TYPE (1)**

- 0 ..... No Backlight
- 1 .... Tri-Color LED Backlight
- 9 ..... Custom (Factory #)

**SERIAL COMMUNICATIONS**

- 0 Non-Isolated RS-232 C Only (2)
- 1 ..... Isolated RS-232C&485
- 2 ..... Isolated RS-232C& 422
- 9 ..... Custom (Factory #)

**POWER INPUTS**

- 0 ..... 5VDC
- 1 ..... 10-32VDC
- 2 ..... 90-265VAC
- 9 ..... Custom (Factory#)

**CONTROL OUTPUTS**

- 0 ..... None
- 1 ..... 4 Relays
- 2 ..... 8 O.C.T.
- 9 ..... Custom (Factory#)

**ANALOG & POWER OUTPUTS**

- 0 ..... None
- 1 ..... 4-20mA, 1 Each
- 2 ..... 0-5VDC, 1 Each
- 6 ..... 4-20mA & 30VDC, 1 Each
- 7 ..... 0-5VDC & 30VDC, 1 Each
- 8 ..... 30VDC/30mA, 1 Each
- 9 ..... Custom (Factory#)

**HOUSING & MOUNTING**

- 0 ..... Plastic & 3.375"
- 1 ..... Plastic & 90mm
- 2 ..... Metal & 3.375"
- 9 ..... Custom (Factory #)

**DIGITAL INPUTS**

- 00 ..... None
- 01 ..... Multilevel
- 02 ..... TTL High Speed
- 09 ..... Custom (Factory #)

**ANALOG INPUTS (1 Channel)**

- 10 ..... VDC (1MΩ)
- 11 ..... mADC
- 12 4-20mA Current Loop (25Ω)
- 14 ..... VRMS (1MΩ)
- 15 ..... mARMS
- 17 ..... Strain-Gage (>200<400Ω)
- 18 ..... Strain-Gage (>1K<5KΩ)
- 20 ..... Resistance (50KΩ)
- 21 ..... Temperature RTD
- 22 Temperature Thermocouple
- 25 ..... mVDC(1MΩ)
- 29 ..... Custom (Factory #)

**ANALOG INPUTS (2 Channels)**

- 30 ..... VDC (1MΩ)
- 31 ..... mADC
- 32 ..4-20mA Current Loop (25Ω)
- 33 ..... Watts DC (1M-0.1Ω)
- 34 ..... VRMS (1MΩ)
- 35 ..... mARMS
- 36 ..... Watts RMS (1M-0.1Ω)
- 41 ..... Temperature RTD
- 42 ..... Temperature TC
- 47 ..... mVDC (1MΩ)
- 49 ..... Custom (Factory #)

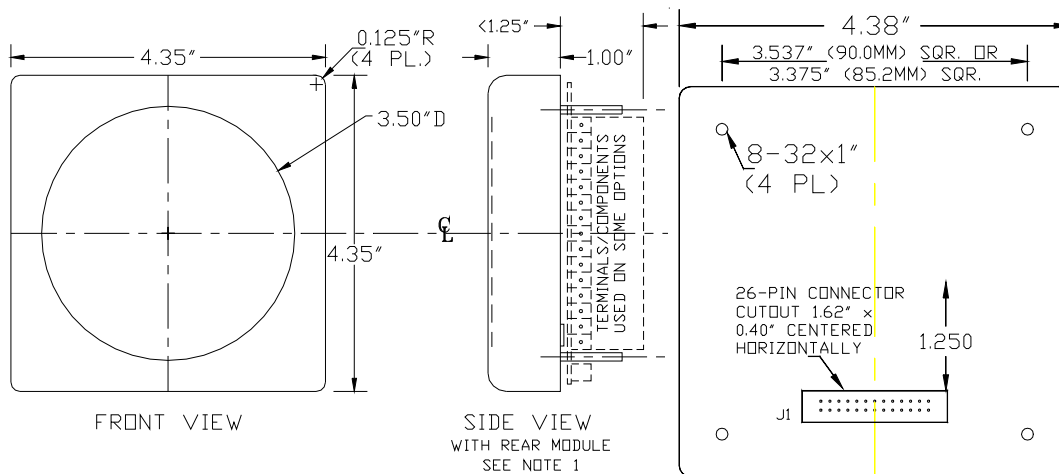
**ANALOG INPUTS (3 Channels)**

- 50 ..... VDC (1MΩ)
- 51 ..... mADC
- 52 ..4-20mA Current Loop (25Ω)
- 53 ..... VRMS(1MΩ)
- 54 ..... mARMS
- 59 ..... Custom (Factory#)

**Note:**

1. Contact the Factory with your requirement for custom display or scales.
2. RS-232C only (Option 0) is not isolated.
3. Volt & Amps Ranges are Internal Jumper Range Selectable .5, 5, 10 & 50VDC, 1, 5, 20mADC. Shipped with .5V or 1mA Unless Specified.
4. Mixed Inputs (V&A, Temp & 4-20mA, Etc.) Available.
5. Specify Voltage input. Range option 36 is for use with 5A CT and 120VAC.

**MECHANICAL FOR ALL "SWITCHBOARD" STYLE METERS**



**Note:**

1. J<sub>1</sub> connector and 3.375" studs spacing meet ANSI 39.1 standard for switch board meters. J1 falls within existing "Barrel" cutout.

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