

## HANDBOOK 44 SCALE METER



NTEP CERTIFICATION #92-152

Shown with LC101 Series  
Load Cell Sold Separately

The **INFW** scale meter is a microprocessor-based indicator/controller with enhanced features that allow you to easily configure the unit for virtually any application. It is compatible with most strain gage sensors such as load cells and pressure transducers.

### NEWPORT PRODUCT INFO

- [MANUAL](#)
- [QUICK START](#)
- [MECHANICAL](#)
- [PRICE](#)

 [REQUIRES ADOBE ACROBAT - HELP](#)



### INFW

- ✓ Selectable Scale Divisions, Selectable Classes I (III, IIII, or IV) and Handbook 44 Certification
- ✓ 6 Digits
- ✓ 2 or 5 Coordinate Linearization of Input Signals
- ✓ Four Isolated Open Collector Outputs
- ✓ Wide Selection of dc Voltage and Current Ranges
- ✓ Ratiometric Inputs
- ✓ Tare-Fixed, Auto or Sequential
- ✓ 1.5 to 11 and 24 Vdc Sensor Excitation
- ✓ Large Digital Offset Capabilities Enabling Easy Scaling in Engineering Units
- ✓ Smart Filtering Detects the Difference Between a Spike or Process Change (Patent Applied For)
- ✓ Selectable Decimal Point and Read Rates of up to 13 Readings/Sec
- ✓ Peak and Valley Detection and Memory
- ✓ Configurable Via Front Pushbuttons or Via RS-232 or RS-485

### OPTIONS

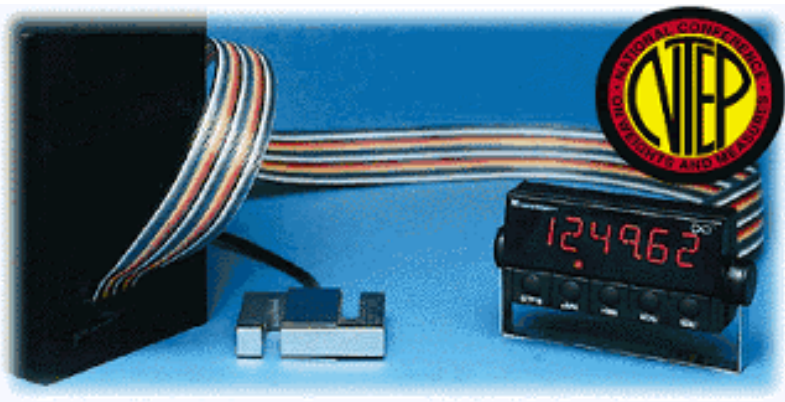
- ✓ Isolated Dual 7 Amp Form C (SPDT) Relays
- ✓ Isolated Parallel BCD Output
- ✓ Isolated Analog Output of 0-10 Vdc, 0-5 Vdc, 1-5 Vdc, 0-20 mA dc and 4-20 mA dc
- ✓ Isolated Serial RS-232
- ✓ Isolated RS-485, Addressable up to 199 Units

The **INFINITY**® scale meter can be configured, via the five front-panel pushbuttons and/or the optional serial communications boards, to accept any of a variety of dc voltage ranges (some ranges plus unipolar or bipolar are first selected via a jumper located at the top of the instrument housing) and display them in engineering units.

Standard features include normal or sequential tare, peak or valley recall, tare limit, and a high resolution A/D converter with digital scaling and offset. Other features include dual relay or BCD output, isolated analog output, RS-232 or RS-484 serial communications options, auto or sequential tare, class selection, and display of units of measure. Self-diagnostics are performed automatically on power-up.

These meters provide both software and hardware lockout configurations which let you define the parameters, from setpoint adjustment to total reprogramming. Users can scale and offset their input signal into any engineering units desired. This is accomplished by the use of an exclusive two or five data point method of scale and offset for linearization of input signals transmitted from a sensor. The meter provides a choice of sensor excitations of 1.5 to 11 Vdc or 24 Vdc for sensors such as load cells, strain gages, and pressure transducers.

### INFZW Split Meter



### MECHANICAL REFERENCE PRICE LIST

### Self-Adjusting Weight Assemblies TWA5 Load Cell Included SPECIFICATIONS



Available from  
**OMEGADYNE, INC.**

#### SPECIFICATIONS

**Accuracy:**  $\pm 0.005\%$  rdg

**Span Temperature Coefficient:**  $\pm 15$  ppm/ $^{\circ}$ C

**Step Response:** 1 sec to 99.9%

**Warmup to Rated Accuracy:** 55 min

**Operating Ambient:** 0 to 50 $^{\circ}$ C (32 to 122 $^{\circ}$ F), 95%RH, non-condensing

**Storage Ambient:** -40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F)

**Power:** 115 or 230 Vac, 49-400 Hz; 10 to 32 Vdc

**Power Consumption:** 6 W nominal, 10 W max.

**Normal Mode Rejection:** 60 dB

**Common Mode Rejection:** 120 dB

**Common Mode Voltage:** 1500 V peak per Hv test

**Conversion:** dual-slope technique

**Reading Rate:** 3/sec or 13/sec, 60 Hz; 3/sec or 12/sec, 50 Hz

**Display:** red or green 6-digit, 14-segment, 13.7 mm (0.54"); 4 alarm indicators

**Dimensions:** 48 H x 96 W x 165 D mm (1.89" x 3.78" x 6.5")

**Panel Cutout:** 45 H x 92 W mm (1.772" x 3.622"); 1/8 DIN

**Weight:** 574 g (1.27 lb)

**TTL Outputs:** four, isolated open collector; rated 150 mA at 1 V sink, 30 V open

**BCD Output:** isolated, tri-state, TTL/CMOS compatible; external 5 V supply for isolated; internal 5 V supply for non-isolated

**Dual Relays:** form C, 7 A at 30 Vdc or 230 Vac

**Four Relay Option:** dual 7A relays and dual 1 A relays

**Analog Output:** 0-5 V/1-5 V/0-10 V/0-20 mA/4-20 mA, user selectable; 354 Vp isolation; 15-bit resolution; 0.1% accuracy, 50 msec step response

**RS-232 Communications:** 300/600/1200/2400/4800/9600/19.2k baud; RJ11 4-wire connection; complete program setup and message display capability; programmable to transmit current display, alarm status, min/max, actual measured input value and status

**RS-485 Communications:** 300/600/1200/2400/4800/9600/19.2k baud; RJ12 6-wire connection; addressable from 0 to 199

**Voltage Input Ranges:** 0-100 mV, 0-1 V, 0-5 V, 1-5 V, 0-10 V, 0-100 V,  $\pm 50$  mV,  $\pm 500$  mV,  $\pm 5$  V,  $\pm 50$  V

**Current Input Ranges:** 0-20 mA, 4-20 mA

**Input Configuration:** single-ended

**Polarity:** unipolar/bipolar, programmable

**Span Adjustment:** +0.00001 to 500,000, programmable

**Offset Adjustment:** 0 to 999,999 or 0 to -99,999; programmable

**Sensor Excitation:** 10 V at 30 mA for bridge; 24 V at 25 mA for loop power

**To Order** (\*insert number code to complete model #) *Prices Shown in U.S. Dollars*

Basic Model	Power/Display	Control Output	Analog Output	Serial Output	Input Signal	Description	Price
INFW	(*)	(*)	(*)	(*)	(*)	Strain gage/load cell panel meter	\$545
INFZW	(*)	(*)	(*)	(*)	(*)	Strain meter with remote display	\$595
	0					115 Vac power, red LED display	N/C
	1					230 Vac power, red LED display	N/C
	2					115 Vac power, green LED display	N/C
	3					230 Vac power, green LED display	N/C
		0				Four NPN open collector transistors	N/C
		1				Isolated parallel BCD	\$110
		2				Two 7 A relays	\$75
		3				Two 7 A relays and two 1 A relays	\$175
			0			No analog output	N/C
			1			Isolated analog output	\$110
				0		No serial output	N/C
				1		Isolated RS-232	\$110
				2		Isolated RS-485	\$110
					(*)	Specify range signal from chart below.*	N/C

### INPUT SIGNAL

Range Code	Range	Range Code	Range	Range Code	Range
DC1	0-100 mV	DC5	0-10 Vdc	DC9	$\pm 5$ Vdc
DC2	0-1 Vdc	DC6	0-100 Vdc	DC10	$\pm 50$ Vdc
DC3	0-5 Vdc	DC7	$\pm 50$ mVdc	C1	0-20 mA
DC4	1-5 Vdc	DC8	$\pm 500$ mVdc	C2	4-20 mA

### OPTIONS

Model	Description	Price	Model	Description	Price
BL	Blank Lens	\$15	9SC4	9-pin RS-485 connector	\$30
FS	Special Calibration	\$25	25SC2	25-pin RS-232 connector	\$30
9SC2	9-pin RS-232 connector	\$30	25SC4	25-pin RS-485 connector	\$30

### Ordering Examples:

1.) **INFW-0200-DC7**, Standard Panel Meter with two relays,  $\pm 50$  mV input, 115 Vac power and red LED display, \$595 + \$75 = **\$670**.

2.) **INFZW-2210-DC1** Split Meter, two relays, analog output and 0-100 mVdc input, 115 Vac power and green LED

display,  $\$645 + 75 + 110 = \mathbf{\$830}$ .



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

**CALL 714-540-4914**

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

# 4-DIGIT STRAIN/MICROVOLTMETER, TRANSMITTER & CONTROLLER QUANTA Q9000S




## QUANTA STANDARD FEATURES

- ✓ Adjustable 1-10 Vdc bridge excitation supply
- ✓  $\pm 1,999$ -count display span
- ✓ Seven overlapping gain ranges
- ✓ Front-panel accessible zero and span adjustments
- ✓ Resolution down to 0.2  $\mu\text{V}/\text{count}$
- ✓ Strain-gauge sensitivity down to 0.20 mV/V
- ✓ Ratiometric measurement
- ✓ 0.2 mV/count analog output
- ✓ Bright, 0.56 in (14.2 mm) LED display
- ✓ Automatic polarity
- ✓ Display hold and test
- ✓ 120/240 Vac, 5 Vdc, 9-32 Vdc or 26-56 Vdc power
- ✓ Screw-terminal barrier strip
- ✓ 1/8 DIN case

## OPTIONS

- ✓ Analog output for user-selected span
- ✓ Single-setpoint 10 A relay control
- ✓ Dual-setpoint 10 A relay control
- ✓ Proportional 4-20 mA control
- ✓ Time-proportional 2 A SS relay control
- ✓ Parallel, isolated BCD output
- ✓ NEMA-4 splash-proof lens cover

NEWPORT PRODUCT INFO
• <a href="#">MANUAL</a>
• <a href="#">QUICK START</a>
• <a href="#">MECHANICAL</a> 1/8 DIN (1A) Case
• <a href="#">MECHANICAL</a> NEMA-SIZE
• <a href="#">MECHANICAL</a> Connections Diagram
• <a href="#">PRICE</a>
 REQUIRES ADOBE ACROBAT - <a href="#">HELP</a>

The **QUANTA 9000S** is a 4-digit meter/controller for use with pressure transducers and load cells which require bridge excitation and preamplification of microvolt signals. Deadload and tare adjustments make it ideal for weighing applications. Like process meters, it provides zero and span adjustments for direct readout in engineering units. It can also be used as a microvoltmeter with differential input.

## EXCITATION SUPPLY AND PREAMPLIFIER

The Q9000S provides a constant-voltage excitation supply, which is adjustable from 1 to 10 V and can drive up to 30 mA. It also provides a high-impedance preamplifier, which is continuously adjustable so that signal levels from  $\pm 2.0$  to  $\pm 500$  mV can produce the full-scale display of  $\pm 9,999$  counts. At 10 V excitation and maximum gain, full-scale readout can be obtained with strain-gauge sensitivity as low as 0.20 mV/V. An active filter is provided for noise reduction.

## BRIDGE CONNECTION

Bridges can be connected by 4 or 6 wires. In 6-wire connection, two lines sense the voltage applied to the bridge and compensate for lead resistance (these two sense lines require the optional PCB connector D1).

## RESOLUTION AND ACCURACY

Resolution is one part in  $\pm 9,999$  counts, or 0.01% of full scale. Accuracy is 99.9% of reading. The

measurement is ratiometric to reduce errors due to temperature and power-line variations. The same internal reference controls the meter gain and the excitation level.

## POWER OPTIONS

Six types of meter power are available: 120 Vac, 240 Vac, 24 Vac, 5 Vdc, isolated 9-32 Vdc, or isolated 26-56 Vdc.

## ANALOG OUTPUT OPTIONS

A 0.2 mV/count ( $\pm 2$  V full-scale) analog output is standard and is useful for driving a strip-chart recorder. An additional analog output can be provided by an optional vertical plug-in board. Available output signals are 0-5 Vdc, 0-10 Vdc, 0-1 mA (source or sink), and 4-20 mA (source or sink). The top and bottom of each output range can be scaled to fit a user-selected display span.

Additional outputs can be provided by a horizontal upper board. Available options include single-setpoint control with one 10 A relay, dual-setpoint control with two 10 A relays, 4-20 mA proportional control (source or sink), time-proportional 2 A solid-state relay control, and isolated, parallel BCD output. For additional information, please refer to the QUANTA, Options, and Mechanical sections.

## SPECIFICATIONS

ANALOG INPUT	Most-sensitive scaling	Least-sensitive scaling
Range	$\pm 2.0$ mV	$\pm 500$ mV
Resolution	0.2 $\mu$ V/count	50 $\mu$ V/count
Preamplifier gain	405	4.01
Post-amplifier gain	2.47	1.00

**Gain adjustment:** Seven overlapping ranges with fine adjustment

**Input configuration:** Differential, ratiometric

**Zero adjustment:**  $\pm 225$   $\mu$ V/volt of excitation

**Span adjustment:** 1 to 2.47 of preamp gain

**Bias current:** 11 nA typ, 22 nA max

## NOISE REJECTION

**NMR, SIG HI to SIG LO:** 150 dB, 50/60 Hz

**CMR, SIG GND to SIG LO:** 80 dB, DC to 60 Hz

**CMV, SIG GND to SIG LO:**  $\pm 1$  V, DC to 60 Hz

**CMR, SIG GND to PWR GND:** 120 dB

**CMV, SIG GND to PWR GND:** 1500 Vp per HV test, 354 Vp per IEC spacing

## ACCURACY AT 25°C

**Error, max:**  $\pm 0.05\%$  of reading  $\pm 2$  counts

**Span tempco:**  $\pm 0.01\%$  of reading/ $^{\circ}$ C

**Zero drift, max:**  $\pm 0.3$   $\mu$ V/ $^{\circ}$ C

**Offset drift, max:**  $\pm(0.01\%$  offset V  $\pm 0.01\%$  FS V)/ $^{\circ}$ C

**Step response:** 1 s to 99.9% of span

**Warmup to rated accuracy:** 60 min

## CONVERSION

**Technique:** Dual-slope, average-value

**Signal integration period:** 100 ms

**Read rate:** 2.5/s

## EXCITATION

**Configuration:** Constant-voltage

**Voltage sense:** Internal or remote

**Voltage range:** Adjustable from 1 to 10 V

**Load current, max:** 30 mA

## DISPLAY TYPE

**Type:** 7-segment, red

**Height:** 0.56 in (14.2 mm)

**Symbols:** -8.8.8.8

**Decimal point positions:** Three positions selectable by jumpers behind lens or at connector

**0 to ±9,999 counts:** Normal operation

**±10,000 to ±19,999 counts:** Four least-significant digits flash reading

**Beyond ±19,999 counts:** All four digits flash zeros

**Overrange indication:** Three least-significant digits blanked

## POWER

**AC voltages:** 120, 240 or 24 Vac +10%/-15%

**AC frequency:** 49-440 Hz

**DC voltages:** 9-32 Vdc, isolated to 300 Vp; 26-56 Vdc, isolated to 300 Vp; 5 Vdc ±5%, non-isolated

**Power consumption:** 5 W max

## ENVIRONMENTAL

**Operating temperature:** 0 to 60°C

**Storage temperature:** -40 to +85°C

**Relative humidity:** 95% at 40°C (non-condensing)

## MECHANICAL

**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 17 oz (480 g)

**Case material:** 94V-0 UL-rated polycarbonate



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

# 4 1/2 DIGIT STRAIN / MICROVOLTMETER MODEL 2002A-S / 2002B-S & 3002-S




## STANDARD FEATURES

- ✓ Programmable microvolt preamplifier
- ✓ Isolated 10-24 Vdc bridge excitation supply
- ✓ Independent bridge-balance, zero & span adjustments
- ✓  $\pm 1,999$ -count display span
- ✓ 120 dB CMR, 70 dB NMR
- ✓ Bright, 14.2 mm (0.56 in) LED display
- ✓ Automatic zero and polarity
- ✓ Display hold and test
- ✓ 115/230 Vac power
- ✓ EMI/RFI filter for AC power
- ✓ Screw-terminal barrier strip
- ✓ Short (4.1 in, 104 mm deep) 1/8 DIN case

## OPTIONS

- ✓ Isolated 9-32 Vdc power
- ✓ Isolated 26-56 Vdc power
- ✓ NEMA-4 splash-proof lens cover

NEWPORT PRODUCT INFO
• <a href="#">MANUAL</a>
• <a href="#">QUICK START</a>
• <a href="#">MECHANICAL</a> 1/8 DIN (2A) Case
• <a href="#">MECHANICAL</a> Connections Diagram
• <a href="#">PRICE</a>
 REQUIRES ADOBE ACROBAT - <a href="#">HELP</a>

**Model 2002A-S** is a low-cost 4 1/2 digit ( $\pm 19,999$  count) panel meter for indication-only applications that require bridge excitation and resolution down to  $1 \mu\text{V}$ . Zero, span and bridge-balance potentiometers are accessible behind the lens, so that the 2002A-S can be adjusted to read out directly in engineering units for a wide range of bridge inputs or other low-level signals. A ratiometric reference from the bridge excitation eliminates AC line and load regulation errors and reduces overall meter span tempco to 0.01% of reading/ $^{\circ}\text{C}$ . Overall meter accuracy is 99.98% at  $25^{\circ}\text{C}$ .

The 2002A-S is housed in a short 4.1 in (104 mm) 1/8 DIN case to fit where space is limited. Power options include isolated 9-32 Vdc and 26-56 Vdc. A splash-proof lens cover which meets NEMA-4 requirements allows the 2002A to be used in harsh industrial environments.

## APPLICATIONS

The 2002A-S is ideal as a digital indicator for pressure cells and metal-foil load cells. It can also be used as a low-level, high-impedance process meter with zero and span adjustments or as a DC voltmeter with resolution down to  $1 \mu\text{V}$ , as required by 50 mV current shunts.

## BRIDGE EXCITATION SUPPLY

The excitation supply is transformer-isolated to 500 V ac from the rest of the meter and provides up to 30 mA at 10 Vdc of output current. A multiturn potentiometer accessible behind the lens allows adjustment of output voltage from 10 to 24 Vdc.

## MICROVOLT PREAMPLIFIER

The preamplifier provides an input resistance in excess of 1 G without bridge balance. Gains of 1, 10 and



100 are selectable by plug-in jumpers and provide meter resolutions of 100, 10 and 1  $\mu\text{V}/\text{count}$ , respectively. Typical offset drift is only 0.3  $\mu\text{V}/^\circ\text{C}$ .

## SPECIFICATIONS

### ANALOG INPUT

<b>Range</b>	$\pm 20$ mV	$\pm 200$ mV	$\pm 2$ V
<b>Resolution</b>	1 $\mu\text{V}/\text{count}$	10 $\mu\text{V}/\text{count}$	100 $\mu\text{V}/\text{count}$
<b>Preamplifier gain</b>	100	10	1

**Input resistance:** 1 Gohm without bridge balance

**Bias current:** 1 nA typ, 5 nA max

**Gain attenuator:** Adjustable from 0.001 to 1

**Bridge-balance range:**  $\pm 1.5$  mV with 350 bridge

**Zero-adjustment range:** -19,999 to +19,999 counts

**Span-adjustment range:** 0 to 19,999 counts

### REFERENCE

**Configuration:** Differential, ratiometric

**Internal from excitation supply:** 1.0 V with 9.5 kohm source resistance at 10 V excitation

**External, optional:** 1.0 V -50%/+100% with 680 kohm input resistance

### ACCURACY AT 25°C

**Maximum Error:**  $\pm 0.01\%$  of span  $\pm 2$  counts

Reference	Internal	External
<b>Bridge-balance tempco</b>	$\pm 0.5$ $\mu\text{V}/^\circ\text{C}$	$\pm 1.0$ $\mu\text{V}/^\circ\text{C}$
<b>Zero tempco</b>	$\pm 0.5$ counts/ $^\circ\text{C}$	$\pm 1.0$ counts/ $^\circ\text{C}$
<b>Span tempco</b>	$\pm 0.005\%$ of span/ $^\circ\text{C}$	$\pm 0.01\%$ of span/ $^\circ\text{C}$

**Full-scale step response:** 1 s

**Warmup to rated accuracy:** 10 min

### NOISE REJECTION

**NMR, SIG HI to SIG LO:** 80 dB at 50/60 Hz for 20 mV range, 66 dB at 50/60 Hz for 200 mV and 2 V ranges

**CMR, SIG GND to PWR GND:** 120 dB, DC to 60 Hz

**CMV, SIG GND to PWR GND:** 1500 Vp per HV test, 354 Vp per IEC spacing

### ANALOG-TO-DIGITAL CONVERSION

**Technique:** Dual-slope, average-value

**Signal integration period:** 100 ms

**Read rate:** 2.5/s

### BRIDGE EXCITATION SUPPLY

**Output voltage:** Adjustable from 10 to 24 Vdc

**Output current:** 30 mA max at 10 Vdc decreasing to 12 mA max at 24 Vdc

**Line regulation\*:** 0.01% typ,  $\pm 0.04\%$  max for 10% change of AC power voltage

**Load regulation\*:**  $\pm 0.15\%$  typ,  $\pm 0.5\%$  max from zero to max load

**Ripple at 50/60 Hz:**  $\pm 0.01\%$

**Tempco:**  $\pm 0.02\%/^\circ\text{C}$

\*The internal reference is derived from the excitation voltage for ratiometric operation. This eliminates load and line regulation errors and reduces other errors as indicated under accuracy at 25°C.

### DISPLAY

**Type:** 7-segment, red LED

**Height:** 0.56 in (14.2 mm)

**Symbols:** -1.8.8.8.8

**Decimal points:** Four positions programmable by jumpers behind lens or at connector, sink 10 mA to SIG GND

**Overrange indication:** Four least-significant digits flash

## DIGITAL SIGNALS

**Input signals:** Display hold, blanking, display test, decimal point select

**Level, Input signals:** TTL or 5 V CMOS compatible

## POWER

**AC voltages:** 115 or 230 Vac  $\pm 15\%$

**AC frequency:** 49-440 Hz

**DC voltages:** 9-32 Vdc, isolated to 300 Vp; 26-56 Vdc, isolated to 300 Vp

**Power consumption:** 4.0 W

**Output Voltages:** +4.7 Vdc and -4.7 Vdc  $\pm 5\%$ , 10 mA max

## ENVIRONMENTAL

**Operating temperature:** 0 to 60°C

**Storage temperature:** -40 to +85°C

**Relative humidity:** 95% at 40°C (non-condensing)

## MECHANICAL

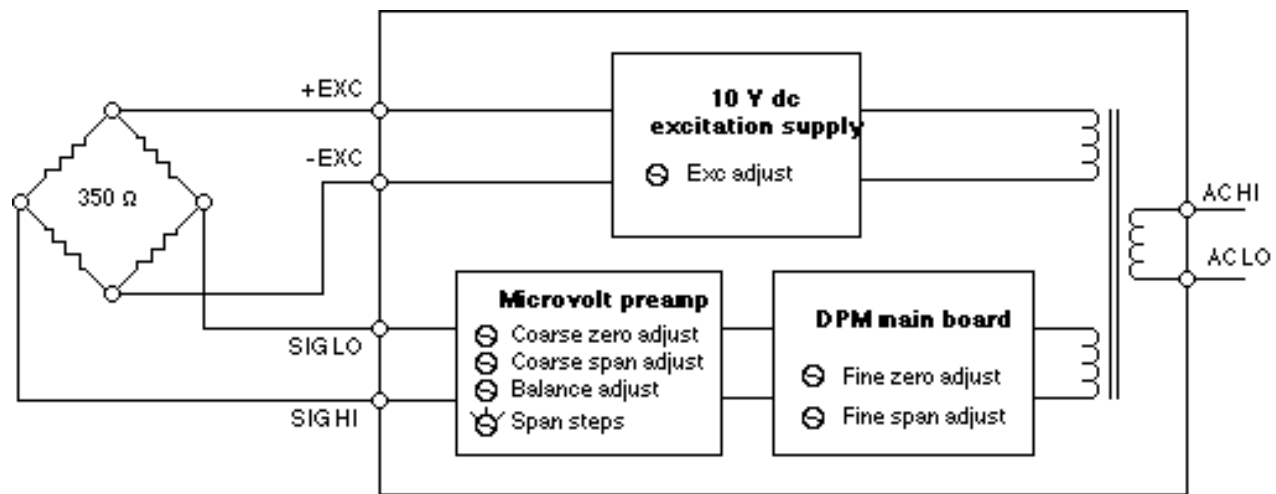
**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 15 oz (425 g)

**Case material:** 94V-0 UL-rated polycarbonate

**Connector for signal, power and excitation:** Screw-terminal barrier strip (standard)

**Connector for display control lines:** 36-pin PCB edge connector (optional)



newportUS.com

PRODUCTS | MANUALS | PRICELIST | QUOTES | SITEMAP | SEARCH | E-MAIL

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

4 1/2 DIGIT STRAIN METERS WITH BCD OUTPUT  
MODEL 2003B-LA1 & 2003B-LP1  
OPTION AVG/RMS



**STANDARD FEATURES**

- ✓ -5,000 to +19,999-count display span
- ✓ True-differential preamplifier
- ✓ Isolated 5, 10, 15 Vdc excitation supply
- ✓ 2 Hz low-pass active filter, LA1 version
- ✓ Peak-hold with external reset, LP1 version
- ✓ 1500 Vp CMV, 120 dB CMR
- ✓ Parallel BCD output
- ✓ 0.1 mV/count analog output
- ✓ Bright, 0.56 in (14.2 mm) LED display
- ✓ 115/230 V ac power
- ✓ 1/8 DIN case

**OPTIONS**

- ✓ NEMA-4 splash-proof lens cover

NEWPORT PRODUCT INFO
• <a href="#">MANUAL</a>
• <a href="#">QUICK START</a>
• <a href="#">MECHANICAL</a> 1/8 DIN (1A) Case
• <a href="#">MECHANICAL</a> NEMA-SIZE
• <a href="#">MECHANICAL</a> Connections Diagram
• <a href="#">PRICE</a>
<a href="#">REQUIRES ADOBE ACROBAT - HELP</a>

**Models 2003B-LA1 and 2003B-LP1** are high-resolution, high-accuracy 4 1/2 digit panel meters for use with pressure transducers, load cells and other bridge transducers which require excitation and preamplification of microvolt signals.

**Model 2003B-LA1** provides an extra 2 Hz two-pole active filter for exceptional normal mode noise rejection (NMR) of 110 dB.

**Model 2003B-LP1** provides an analog peak-hold circuit with external reset. It is ideal for destructive testing applications.

**EXCITATION SUPPLY AND PREAMPLIFIER**

The 2003B-LA1 and 2003B-LP1 provide an isolated, constant-voltage excitation supply which can be field-configured for 5, 10 or 15 V dc output. They also provide a high-impedance, true-differential preamplifier, which is continuously adjustable from 20 to 100 in 3% steps to accommodate load-cell sensitivities of 1 mV/V to 20 mV/V. Fine-gain and fine-deadload adjustments are easily accessible behind the lens. A push-to-cal switch is provided through the lens. The calibration shunt resistor is customer-supplied.

**BRIDGE CONNECTION**

Bridges can be connected by 4 or 6 wires. In 6-wire connection, two lines sense the voltage applied to the bridge and compensate for lead resistance.

## RESOLUTION AND ACCURACY

Resolution is one part in 19,999 counts, or 0.005% of full scale. Accuracy is up to 99.98% of reading. The measurement is ratiometric to reduce errors due to temperature and power-line variations. The same internal reference controls the meter gain and the excitation level.

## SIGNAL OUTPUTS

Standard outputs include non-isolated parallel BCD and a strip-chart recorder output of 1 mV/count (nominal).

## OPTIONS

Options include board-edge connectors and a splash-proof lens cover which meets NEMA-4 requirements. For additional information, please refer to the Options and Mechanical sections.

## SPECIFICATIONS

<b>ANALOG INPUT</b>	<b>Most-sensitive scaling</b>	<b>Least-sensitive scaling</b>
<b>Signal Range</b>	-0.5 to +2 mV	-2.5 to +10 mV
<b>Display Range</b>	-5000 to +19,999	-5000 to +19,999
<b>Resolution</b>	1 $\mu$ V/count	5 $\mu$ V/count
<b>Preamplifier Gain</b>	100	20

**Input configuration:** Differential, ratiometric

**Coarse-span adjustment:** 57 overlapping ranges with fine adjustment

**Fine-span adjustment:**  $\pm 3\%$  of span

**Zero adjustment:**  $\pm 3\%$  of bridge output

**Deadload adjustment, max:** Up to 60% of bridge output with external resistor

**Tare adjustment:**  $\pm 4$  counts nominal

**Bias current:** 11 nA typ, 22 nA max

## EXCITATION

**Configuration:** Constant-voltage

**Voltage sense:** Internal or remote

**Voltage settings:** Jumper-selectable 5, 10, 15 Vdc

**Load current, max:** 125 mA at 5 V, 115 mA at 10 V, 67 mA at 15 V

## NOISE REJECTION

**NMR, SIG HI to SIG LO, LA1 option:** 110 dB, 50/60 Hz

**NMR, SIG HI to SIG LO, LP1 option:** 80 dB, 50/60 Hz

**CMR, SIG GND to SIG LO:** 80 dB, DC to 60 Hz

**CMR, SIG GND to PWR GND:** 120 dB, 50/60 Hz

**CMV, SIG GND to PWR GND:** 1500 Vp test, 354 Vp per IEC spacing

## ACCURACY AT 25°C

**Error, max:**  $\pm 0.01\%$  of reading  $\pm 2$  counts

**Zero tempco:**  $\pm 0.3 \mu$ V/ $^{\circ}$ C

**Span tempco:**  $\pm 0.005\%$  of reading/ $^{\circ}$ C

**Step response:** 1 s to 99.9% of span

**Warmup to rated accuracy:** 60 min

## CONVERSION

**Technique:** Dual-slope, average-value

**Signal integration period:** 33 ms at 60 Hz, 40 ms at 50 Hz

**Read rate:** 4.3/s at 60 Hz, 3.6/s at 50 Hz

## DISPLAY

**Type:** 7-segment, red LED

**Height:** 0.56 in (14.2 mm)

**Symbols:** -1.8.8.8.8

**Decimal points:** Four positions programmable internally or at connector

**Overtime indication:** Display flashes

#### **DIGITAL SIGNALS**

**Output signals:** TTL-compatible

**HOLD input:** TTL or 5 V CMOS compatible

**BLANKING input:** Open-collector compatible

#### **POWER**

**AC voltages:** 115 Vac  $\pm$ 10% at 60 Hz; 230 Vac  $\pm$ 10% at 50 Hz

**Power consumption:** 8 W (nominal)

#### **ENVIRONMENTAL**

**Operating temperature:** 0 to 50°C

**Storage temperature:** -40 to +75°C

**Relative humidity:** 95% at 40°C (non-condensing)

#### **MECHANICAL**

**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 23 oz (650 g)

**Case material:** 94V-0 UL-rated polycarbonate



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

**CALL 714-540-4914**

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

# LOW-COST, 3 1/2 DIGIT STRAIN / MICROVOLTMETER MODEL 202A-S



## NEWPORT PRODUCT INFO

- [MANUAL](#)
- [QUICK START](#)
- [MECHANICAL](#) 1/8 DIN (2A) Case
- [MECHANICAL](#) Connections Diagram
- [PRICE](#)

 REQUIRES ADOBE ACROBAT - [HELP](#)

## STANDARD FEATURES

- ✓ Programmable preamplifier
- ✓ Isolated 10-24 Vdc bridge excitation supply
- ✓ Independent bridge-balance, zero & span adjustments
- ✓  $\pm 1,999$ -count display span
- ✓ 120 dB CMR, 70 dB NMR
- ✓ Bright, 14.2 mm (0.56 in) LED display
- ✓ Automatic zero and polarity
- ✓ Display hold and test
- ✓ 115/230 Vac power
- ✓ EMI/RFI filter for AC power
- ✓ Screw-terminal barrier strip
- ✓ Short (4.1 in, 104 mm deep) 1/8 DIN case

## OPTIONS

- ✓ Isolated 9-32 Vdc power
- ✓ Isolated 26-56 Vdc power
- ✓ NEMA-4 splash-proof lens cover

**Model 202A-S** is a low-cost 3 1/2 digit panel meter in a short 4.1 in (104 mm deep) 1/8 DIN case for applications that require bridge excitation and resolution down to 10 microvolts. Zero, span and bridge-balance adjustments are accessible behind the lens, so that the 202A-S can read out directly in engineering units for a wide range of bridge inputs or other low-level signals.

## APPLICATIONS

Model 202A-S is primarily intended as a digital indicator for pressure cells and metal-foil load cells. It can also be used as a low-level, high-impedance process meter with zero and span adjustments, or as a DC voltmeter with resolution down to 10 microvolts, required by 50 mV current shunts.

## RESOLUTION AND ACCURACY

Resolution is 1 part in  $\pm 1,999$  counts, or 0.05% of full scale. Accuracy is 99.9%. A ratiometric reference input eliminates AC line and load regulation errors and reduces overall meter span tempco to 0.01% of reading/ $^{\circ}$ C.

## BRIDGE EXCITATION SUPPLY

The built-in excitation supply of the 202A-S is transformer-isolated to 500 Vac from the rest of the meter. A multiturn potentiometer accessible behind the lens allows adjustment of the output voltage from 10 to 24 Vdc. Maximum output current is 30 mA.

## MICROVOLT PREAMPLIFIER

The preamplifier of the 202A-S provides an input impedance in excess of 1 G to ensure that the signal

source is not overloaded. Gains of 1, 10 and 100 are selectable by solder bridges and provide resolutions of 1000, 100, and 10  $\mu\text{V}/\text{count}$ , respectively. Typical offset drift is only 0.3  $\mu\text{V}/^\circ\text{C}$ .

## OPTIONS

Mechanical options are a PCB edge connector for hand-shake signals and a splash-proof lens cover which meets NEMA-4 requirements. Power options are isolated 9-32 Vdc and 26-56 Vdc.

## SPECIFICATIONS

ANALOG INPUT	Most-sensitive scaling	Least-sensitive scaling
Range	$\pm 19.99 \text{ Mv}$	2.5 V (limited by CMV)
Resolution	10 $\mu\text{V}/\text{count}$	1 mV/count
Preamplifier gain	100	1
Gain attenuator	1	0.001

**Configuration:** Differential, ratiometric

**Polarity:** Bipolar

**Input resistance:** 1 G

**Bias current:** 1 nA typ, 5.5 nA max

**Maximum voltage:** 50 V

**Coarse preamplifier gains:** 1, 10, 100

**Gain attenuator:** Adjustable from 0.001 to 1

**Bridge-balance range:**  $\pm 50\%$  of bridge span

**Zero-adjustment range:** -1,000 to +1,000 counts

**Span-adjustment range:** 0 to 2,000 counts

## NOISE REJECTION

**NMR, SIG HI to SIG LO:** 70 dB, 50/60 Hz

**CMR, SIG GND to SIG HI:** 120 dB at gain 100, DC to 60 Hz

**CMV, SIG GND to SIG HI or LO:** +2.5 Vdc

**CMR, SIG GND to PWR GND:** 120 dB, DC to 60 Hz

**CMV, SIG GND to PWR GND:** 1500 Vp test, 354 Vp per IEC spacing

## ACCURACY AT 25°C

**Error, max:**  $\pm 0.05\%$  of reading  $\pm 1$  count

**Balance tempco:**  $\pm 0.3 \mu\text{V}/^\circ\text{C}$  typ,  $\pm 1.0 \mu\text{V}/^\circ\text{C}$  max

**Zero tempco:**  $\pm 0.01\%$  of zero/ $^\circ\text{C}$

**Span tempco, ratiometric:**  $\pm 0.03\%$  of reading/ $^\circ\text{C}$

**Span tempco, non-ratiometric:**  $\pm 0.3 \mu\text{V}/^\circ\text{C}$

**Full-scale step response:** 1.0 s

**Warmup to rated accuracy:** 10 min

## ANALOG-TO-DIGITAL CONVERSION

**Technique:** Dual-slope, average-value

**Signal integration period:** 100 ms

**Read rate:** 2.5/s

## BRIDGE EXCITATION SUPPLY

**Output voltage:** Adjustable 10 to 24 Vdc

**Output current:** 30 mA at 10 Vdc decreasing to 12 mA at 24 Vdc

**Line regulation:**  $\pm 0.01\%/V$  of AC power

**Load regulation:**  $\pm 0.5\%$

**Ripple at 50/60 Hz:**  $\pm 0.01\%$

**Tempco:**  $\pm 0.02\%/^\circ\text{C}$

**Reference signal:** 1.0 V typ at 10 V output (Eliminates line and load regulation errors and reduces overall meter span tempco to  $\pm 0.01\%/^\circ\text{C}$ )

## DISPLAY

**Display Type:** 7-segment, red LED

**Display Height:** 0.56 in (14.2 mm)

**Symbols:** -1.8.8.8

**Decimal points:** Three positions, programmable by jumpers behind lens or at connector, 10 mA sink

**Overrange indication:** Three least-significant digits blanked

### DIGITAL INPUTS

**Level:** TTL or 5 V CMOS compatible

### POWER

**AC voltages:** 115 or 230 Vac  $\pm 15\%$

**AC frequency:** 49-440 Hz

**DC voltages:** 9-32 Vdc, isolated to 300 Vp; 26-56 Vdc, isolated to 300 Vp

**Power consumption:** 3.7 W max

**Output Voltages:** +4.7 Vdc and -4.7 Vdc  $\pm 5\%$ , 10 mA max

### ENVIRONMENTAL

**Operating temperature:** 0 to 60°C

**Storage temperature:** -40 to +85°C

**Relative humidity:** 95% at 40°C (non-condensing)

### MECHANICAL

**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 15 oz (425 g)

**Case material:** 94V-0 UL-rated polycarbonate

**Connector for signal and power:** D4 screw-terminal barrier strip (standard)

**Connector for control lines:** D1 36-pin PCB edge connector (optional)



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.



# 3 3/4 DIGIT STRAIN METERS WITH BCD OUTPUT

## MODEL 204B-LA2 & 204B-LP2

### OPTION AVG/RMS



#### NEWPORT PRODUCT INFO

- [MANUAL](#)
- [QUICK START](#)
- [MECHANICAL](#) 1/8 DIN (2A) Case
- [MECHANICAL](#) NEMA-SIZE
- [MECHANICAL](#) Connections Diagram
- [PRICE](#)

 [REQUIRES ADOBE ACROBAT - HELP](#)

#### STANDARD FEATURES

- ✓ -480 to +3,999-count display span
- ✓ True-differential preamplifier
- ✓ Isolated 5, 10, 15 Vdc excitation supply
- ✓ 2 Hz low-pass active filter, LA2 version
- ✓ Peak-hold with external reset, LP2 version
- ✓ 1500 Vp CMV, 120 dB CMR
- ✓ Parallel BCD output
- ✓ 1 mV/count analog output
- ✓ Bright, 0.56 in (14.2 mm) LED display
- ✓ 115/230 Vac power
- ✓ 1/8 DIN case

#### OPTIONS

- ✓ [Dummy right-hand zero](#)
- ✓ [NEMA-4 splash-proof lens cover](#)

**Models 204B-LA2 and 204B-LP2** are high-quality 3 3/4 digit panel meters for use with pressure transducers, load cells and other bridge transducers which require excitation and preamplification of microvolt signals.

**Model 204B-LA2** provides a 2 Hz two-pole active filter for superior normal mode noise rejection (NMR) of 90 dB.

**Model 204B-LP2** provides an analog peak-hold circuit with external reset. It is useful for destructive testing applications.

#### BUILT-IN EXCITATION SUPPLY AND PREAMP

The 204B-LA2 and 204-LP2 provide an isolated, constant-voltage excitation supply, which can be field-configured for 5, 10 or 15 V dc output. They also provide a high-impedance, true-differential preamplifier, which is continuously adjustable from 20 to 800 in 3% steps to accommodate load-cell sensitivities of 1 mV/V to 20 mV/V. Fine-gain and fine-deadload adjustments are easily accessible behind the lens. A push-to-cal switch is provided through the lens. The calibration shunt resistor is customer supplied.

#### BRIDGE CONNECTION

Bridges can be connected by 4 or 6 wires. In 6-wire connection, two lines sense the voltage applied to the bridge and compensate for lead resistance.

**DISPLAY RESOLUTION AND ACCURACY**

Display resolution is one part in 3999 counts, or 0.025% of full scale. Accuracy is up to 99.95% of reading. The measurement is ratiometric to reduce errors due to temperature and power-line variations. The same internal reference controls the meter gain and the excitation level.

**SIGNAL OUTPUTS**

Standard outputs include non-isolated parallel BCD and a strip-chart recorder output of 1 mV/count (nominal).

**OPTIONS**

Options are an extra fixed right-hand zero for more flexibility in scaling to engineering units; a splash-proof lens cover, which meets NEMA-4 requirements; and board-edge connectors for the DPM lower board and the LA2 or LP2 signal conditioner upper board. For additional information, please refer to the Options and Mechanical sections.

**SPECIFICATIONS**

<b>ANALOG INPUT</b>	<b>Most-sensitive scaling</b>	<b>Least-sensitive scaling</b>
<b>Signal Range</b>	-0.6 to +5 mV	-20 to +200 mV
<b>Display Range</b>	-480 to +3999	-480 to +3999
<b>Resolution</b>	1.25 $\mu$ V/count	50 $\mu$ V/count
<b>Preamplifier Gain</b>	800	20

**Input configuration:** Differential, ratiometric

**Coarse-span adjustment:** 125 overlapping ranges with fine adjustment

**Fine-span adjustment:**  $\pm 3\%$  of span

**Zero adjustment:**  $\pm 3\%$  of bridge output

**Deadload adjustment, max:** Up to 60% of bridge output with external resistor

**Tare adjustment:**  $\pm 12$  counts nominal

**Bias current:** 11 nA typ, 22 nA max

**NOISE REJECTION**

**NMR, SIG HI to SIG LO, LA2 option:** 90 dB, 50/60 Hz

**NMR, SIG HI to SIG LO, LP2 option:** 60 dB, 50/60 Hz

**CMR, SIG GND to SIG LO:** 80 dB, DC to 60 Hz

**CMR, SIG GND to PWR GND:** 120 dB, 50/60 Hz

**CMV, SIG GND to PWR GND:** 1500 Vp test, 354 Vp per IEC spacing

**ACCURACY AT 25°C**

**Error, max:**  $\pm 0.02\%$  of reading  $\pm 1$  count

**Zero tempco, max:**  $\pm 0.3$   $\mu$ V/ $^{\circ}$ C

**Span tempco:**  $\pm 0.005\%$  of reading/ $^{\circ}$ C

**Step response:** 1 s to 99.9% of span

**Warmup to rated accuracy:** 60 min

**CONVERSION**

**Technique:** Dual-slope, average-value

**Signal integration period:** 50 ms at 60 Hz, 40 ms at 50 Hz

**Read rate:** 2.5/s

**EXCITATION**

**Configuration:** Constant-voltage

**Voltage sense:** Internal or remote

**Voltage settings:** Jumper-selectable 5, 10, 15 Vdc

**Load current, max:** 125 mA at 5 V, 115 mA at 10 V, 67 mA at 15 V

**DISPLAY**

**Type:** 7-segment, red LED

**Height:** 0.56 in (14.2 mm)

**Symbols:** -8.8.8.8

**Decimal points:** Three positions programmable internally or at connector

**Overtime indication:** Display flashes

### DIGITAL SIGNALS

**Output signals:** TTL-compatible

**HOLD input:** TTL or 5 V CMOS compatible

**BLANKING input:** Open-collector compatible

### POWER

**AC voltages:** 115 Vac  $\pm$ 10% at 60 Hz; 230 Vac  $\pm$ 10% at 50 Hz

**Power consumption:** 8 W (nominal)

### ENVIRONMENTAL

**Operating temperature:** 0 to 50°C

**Storage temperature:** -40 to +75°C

**Relative humidity:** 95% at 40°C (non-condensing)

### MECHANICAL

**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 23 oz (650 g)

**Case material:** 94V-0 UL-rated polycarbonate



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

CALL 714-540-4914



Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

## 2520-PA

- ✓ ±19,999-Count Display Span
- ✓ True-Differential Input
- ✓ 3-Wire Ratio Measurement
- ✓ Serial BCD Output
- ✓ Bright, 0.56" (14.2 mm) LED Display
- ✓ Automatic Zero and Polarity
- ✓ Display Hold and Test
- ✓ 5 Vdc Power
- ✓ 1 Watt Power Consumption
- ✓ Low-Profile 1/16 DIN Case



### NEWPORT PRODUCT INFO

- [MANUAL \(HTML\)](#)
  - [QUICK START](#) 
  - [MECHANICAL](#)
  - [PRICE](#)
-  [REQUIRES ADOBE ACROBAT - HELP](#)



Model **2520-PA** is an economical 5-volt powered, high-resolution, high-accuracy 4 1/2 digit dc microvoltmeter in a compact 1/16 DIN case. The height of the panel cutout is 0.88" (22.2 mm), and the depth required behind the panel is only 2.83" (72 mm). Power consumption is 1 watt.

Low cost, small size, low power consumption at 5 Vdc and exceptional power-supply noise rejection make the **2520-PA** ideal for demanding OEM and portable-instrument applications.

## MICROVOLT PREAMPLIFIER

The **2520-PA** incorporates a preamplifier, which can be programmed for resolution from 1 to 25  $\mu\text{V}/\text{count}$  and for zero offset up to  $\pm 0.6 \text{ mV}$  (RTI)  $\pm 21\%$  of full-scale readout (RTO). The 2520-PA can be configured for use with load cells and pressure gauges, which require zero and span adjustment for readout in engineering units. Bridge excitation may be provided by the same 5 Vdc supply that powers the meter, or by an external, isolated 10 or 15 Vdc power supply. The 2520-PA can also be configured as a microvoltmeter using an internal reference, or in a ratiometric mode using an external reference.

## SERIAL BCD

Non-isolated, character-serial BCD output is standard to allow the 2520-PA to be interfaced to other instrumentation.

Model **2520-PA** provides a differential programmable preamplifier for use with low-level bridge circuits. Bridge excitation can be provided by the same 5 Vdc power supply that powers the meter.



**SPECIFICATIONS****ANALOG INPUT**

**Signal range:**  $\pm 20$  mV (Most Sens. Scaling) /  $\pm 500$  mV (Least Sens. Scaling)  
**Display range:**  $\pm 19,999$  (Most Sens. Scaling) /  $\pm 19,999$  (Least Sens. Scaling)  
**Resolution ( $\mu\text{V}/\text{count}$ ):** 1 (Most Sens. Scaling) / 25 (Least Sens. Scaling)  
**Preamplifier gain:** 100 (Most Sens. Scaling) / 4 (Least Sens. Scaling)  
**Input Configuration:** Differential, ratiometric  
**Coarse-Span Adjustment:** Jumper-selectable gain ranges  
**Fine-Span Adjustment:** Front-panel accessible precision potentiometer  
**Zero Adjustment (RTI or Deadload):**  $\pm 0.6$  mV  
**Zero Adjustment (RTO or Tare):**  $\pm 20.9\%$  of full-scale display  
**Bias Current:** 10 nA typ, 20 nA max

**NOISE REJECTION**

**NMR, SIG HI to SIG LO:** 60 dB, 50/60 Hz  
**CMR, SIG GND to SIG LO:** 86 dB, dc to 60 Hz  
**CMV, SIG GND to SIG LO:**  $-1$  to  $+2.5$  Vdc  
**Power Supply Rejection:** 86 dB at 50/60 Hz

**ACCURACY AT 25°C Error**

**Max:**  $\pm 0.01\%$  of reading  $\pm 2$  counts  
**Span Tempco, Typ:**  $\pm 0.003\%$  of reading/ $^{\circ}\text{C}$   
**Zero Tempco, Typ:**  $\pm 0.3$   $\mu\text{V}/^{\circ}\text{C}$   
**Step Response:** 2 sec to 99.9% of span  
**Warmup to Rated Accuracy:** 30 min

**CONVERSION**

**Technique:** Dual-slope, average-value  
**Signal Integration Period:** 100 msec  
**Read Rate:** 2.5/sec

**DIGITAL SIGNALS**

**Output Signals:** TTL-compatible  
**HOLD Input:** TTL or 5 V CMOS compatible  
**BLANKING Input:** Open-collector compatible

**POWER**

**Voltage:** +5 to +5.25 Vdc  
**Current:** 170 to 230 mA  
**Power Consumption:** 1 W (nominal)

**ENVIRONMENTAL**

**Operating Temperature:** 0 to  $55^{\circ}\text{C}$  (32 to  $122^{\circ}\text{F}$ )  
**Storage Temperature:**  $-40$  to  $+85^{\circ}\text{C}$  ( $-40$  to  $184^{\circ}\text{F}$ )  
**Relative Humidity:** 95% at  $40^{\circ}\text{C}$  ( $104^{\circ}\text{F}$ ) (non-condensing)

**MECHANICAL**

**Dimensions:** 24 H x 96 W x 72 mm D (0.94" x 3.77" x 2.82")  
**Panel Cutout:** 22.2 x 92 mm  
**Weight:** 145 g (5 oz)  
**Case Material:** 94 V-0 UL-rated polycarbonate

**To Order** (Specify Model No.) *Prices Shown in U.S. Dollars*

Model No.	Description	Price
2520-PA	DC powered strain/microvolt	\$360
2520-PA, UC	Strain/Microvoltmeter with heavy duty U-clamp mount	\$364


# INFINITY<sup>®</sup> STRAIN METER / CONTROLLER



## INFCS

- ✓ Wide Range of Scaling in Engineering Units
- ✓ Built-In Excitation
- ✓ Analog Output Optional
- ✓ Dual Relays Optional
- ✓ Tare Button
- ✓ Peak Memory

### NEWPORT PRODUCT INFO

- [MANUAL \(HTML\)](#)
- [QUICKSTART](#) 
- [MECHANICAL](#)
- [PRICE](#)

 REQUIRES ADOBE ACROBAT - [HELP](#)

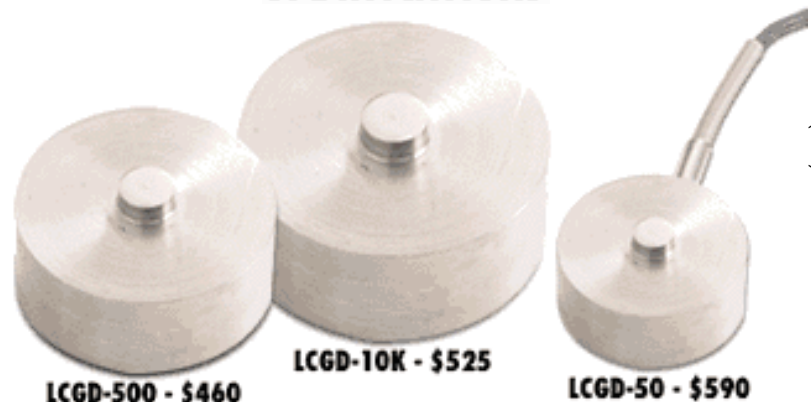
The **INFINITY<sup>®</sup> C** strain meter/controller accepts a wide variety of DC voltage and current inputs to cover any typical process application. Standard features include a full 14-segment 4-digit display, easy front panel scaling to virtually any engineering units, selectable excitation of four voltages to work with most transducers and transmitters, front panel and remote tare function for weighing applications, and a hardware lockout to prevent unauthorized changes in setup.

The **INFINITY<sup>®</sup> C** strain meter is ideal for use with pressure transducers, load cells, or any strain gage type transducers. Four full digits and simplified scaling via the front-panel pushbuttons make it easy to set the display to read in any engineering units. All these standard features add up to an instrument with powerful capabilities at an extremely affordable price.

## SPECIFICATIONS

**Input Ranges:** 0-100 mV,  $\pm 50$  mV, 0-10 V,  $\pm 5$  V, 0-20 mA, 4-20 mA  
**Isolation:** 354 V peak per IEC spacing  
**NMR:** 60 dB  
**CMR:** 120 dB  
**Protection:** 240 V rms max for voltage input ranges; 200 mA for current ranges  
**Input Impedance:** 100 Meg ohms for 100 mV or  $\pm 50$  mV range; 1 Meg ohm for 10 V or  $\pm 5$  V range; 5 ohms for 20 mA current input  
**Display:** 4-digit, 14 segment, 13.8 mm (0.54") Height  
**Analog-to-digital technique:** Dual slope  
**Internal resolution:** 15 bits  
**Read rate:** 3/sec  
**Polarity:** Automatic  
**Max error strain/process:**  $\pm 0.03\%$  rdg  
**Span tempco:**  $\pm 50$  ppm/ $^{\circ}$ C  
**Step response:** 1-2 sec

## LCGD Series Load Cells SPECIFICATIONS



Available from  
[OMEGADYNE, INC.](#)

**Warmup to rated accuracy:** 30 min**Analog output (optional):** 0-10 V, 4-20 mA or 0-20 mA; may be assigned to a display range or used as a proportional control output with setpoint #1, order INFCS-011A.**Excitation voltage:** 24 V @ 25 mA or 12 V @ 50 mA; 10 V @ 120 mA or 5 V @ 60 mA**Power:** 115 V or 230 V rms  $\pm 15\%$ , 50-60 Hz; 6 watts**Operating temperature:** 0 to 50° C (32 to 122°F)**Storage temperature:** -40 to 85°C (-40 to 184° F)**Relative humidity:** 90% at 40°C (104°F) (non-condensing)**Panel cutout:** 1/8 DIN, 45 x 92 mm (1.78" x 3.62")**Weight:** 574 g (1.27 lb)**To Order** (Specify Model No.) *Prices Shown in U.S. Dollars*

Model No.	Description	Price
INFCS-( * )00 A	Digital Strain Meter with excitation, basic unit	\$245
INFCS-( * )01 A	Digital Strain Meter with non-isolated Analog output	\$325
INFCS-( * )10 A	Digital Strain Meter with dual ( 6-Amp from "C" relays )	\$315
INFCS-( * )11 A	Digital Strain Meter setpoint and non-isolated Analog output	\$395
INFCS-( * )12 A	Digital Strain Meter setpoint and isolated Analog output	\$405

**Ordering Example:** INFCS-010, INFINITY® C strain meter with dual relays, red LED display, 115 Vac power, **\$315.****Power and Display Selection**

Order Code	Power	Display	Add'l Price	Order Code	Power	Display	Add'l Price
0	115 Vac	red	N/C	4	10-32 Vdc	red	\$95
1	230 Vac	red	N/C	5	10-32 Vdc	green	\$95
2	115 Vac	green	N/C	6	26-56 Vdc	red	\$120
3	230 Vac	green	N/C	7	26-56 Vdc	green	\$120

**Ordering Example:** INFCS-011, strain meter with 115 Vac power red LED display, analog output, dual relays, **\$395.**

[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.

# INFINITY® SERIES INFPS

Courtesy of Steven Engineering, Inc. • 230 Ryan Way, South San Francisco, CA 94080-6370 • Main Office: (650) 588-9200 • Outside Local Area: (800) 258-9200 • www.stevenengineering.com

## PRESSURE STANDARD

The **INFINITY®** series pressure standard gives you the features of an expensive laboratory standard in a portable bench top unit. The convenient front-panel tare allows zeroing at the touch of a button. All units are NIST traceable. The handle doubles as a bench stand affording the user both convenience and easy reading. The optional serial communications capability permits easy transfer of test data to a computer for documentation purposes. The outputs can easily be configured as go/no-go alarms for error-free operation.

<b>INFPS</b>	PRESSURE STANDARD	<b>\$795.00</b>
--------------	-------------------	-----------------

MOST POPULAR MODELS			
INFPS-0210-P15	\$980.00	INFPS-0001-P1K	\$905.00
INFPS-0000-P100	\$795.00		

POWER AND LED COLOR		
<b>0</b>	Designates 115 Vac power and red LED display	<b>N/C</b>
<b>1</b>	Designates 230 Vac power and red LED display	<b>N/C</b>

BCD AND CONTROL OUTPUT(S)		
<b>0</b>	Four optically isolated open-collector outputs	<b>N/C</b>
<b>2</b>	Isolated dual 7 A relays (REL1)	<b>\$75.00</b>
<b>3</b>	Isolated dual 7 amp and dual 1 amp relays (REL4)	<b>\$175.00</b>

ANALOG OUTPUT		
<b>0</b>	No analog output	<b>N/C</b>
<b>1</b>	Isolated analog output (0-20 mA, 4-20 mA, 0-5 V, 1-5 V, 0-10 V) (AN02)	<b>\$110.00</b>

SERIAL OUTPUTS		
<b>0</b>	No serial output	<b>N/C</b>
<b>1</b>	Isolated RS-232 serial output* (RS20)	<b>\$110.00</b>
<b>2</b>	Isolated RS-485 serial addressable output* (RS40)	<b>\$110.00</b>

**\*Includes 6' of interconnecting cable with telephone plug connectors. See serial connector accessories below for conversion to "D" type connectors.**



INPUT RANGE					
<b>P15</b>	0-15.000 PSIG	<b>N/C</b>	<b>P600</b>	0-600.00 PSIG	<b>N/C</b>
<b>P30</b>	0-30.000 PSIG	<b>N/C</b>	<b>P1K</b>	0-1000.0 PSIG	<b>N/C</b>
<b>P60</b>	0-60.000 PSIG	<b>N/C</b>	<b>P3K</b>	0-3000.0 PSIG	<b>N/C</b>
<b>P100</b>	0-100.00 PSIG	<b>N/C</b>	<b>P6K</b>	0-6000.0 PSIG	<b>N/C</b>
<b>P300</b>	0-300.00 PSIG	<b>N/C</b>			

**ACCESSORIES**

<b>PS4D</b>	Snubber for motor oil	<b>\$10.00</b>
<b>PS4E</b>	Snubber for water and light oils	<b>\$10.00</b>
<b>PS4G</b>	Snubber for gases.	<b>\$10.00</b>
<b>9SC2</b>	9-pin serial connector with RJ-11 jack for RS-232	<b>\$30.00</b>
<b>9SC4</b>	9-pin serial connector with RJ-12 jack for RS-485	<b>\$30.00</b>
<b>25SC2</b>	25-pin serial connector with RJ-11 jack for RS-232	<b>\$30.00</b>
<b>25SC4</b>	25-pin serial connector with RJ-12 jack for RS-485	<b>\$30.00</b>
<b>SP1</b>	Split connector for RS-485 network	<b>\$15.00</b>
<b>SB03</b>	Setup & configuration, and communications diskettes included with serial communication options	<b>\$10.00</b>



PRODUCTS | MANUALS | PRICELIST | QUOTES | SITEMAP | SEARCH | E-MAIL

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.




# STRAIN METER

The **INFS** strain gage meter is a microprocessor-based indicator/controller with enhanced features that allow you to easily configure the unit for virtually any application. It is compatible with most strain gage sensors such as load cells and pressure transducers.

Shown with LC101 Series Load Cell Sold Separately



## NEWPORT PRODUCT INFO

- [MANUAL \(HTML\)](#) - PDF Version 
  - [QUICKSTART](#) 
  - [MECHANICAL](#)
  - [PRICE](#)
-  REQUIRES ADOBE ACROBAT - [HELP](#)

## INFS

- ✓ 6 Digits
- ✓ Optional Split Meter System
- ✓ Four Isolated Open Collector Outputs
- ✓ Wide Selection of dc Voltage and Current Ranges
- ✓ Ratiometric Inputs
- ✓ Tare
- ✓ 1.5 to 11 and 24 Vdc Sensor Excitation
- ✓ Peak and Valley Detection and Memory
- ✓ Large Digital Offset Capabilities Enabling Easy Scaling in Engineering Units
- ✓ Smart Filtering Detects the Difference Between a Spike or Process Change (Patent Applied For)
- ✓ Selectable Decimal Point and Read Rates of up to 13 Readings/Sec
- ✓ Configurable Via Front Pushbuttons or Via RS-232 or RS-485

## OPTIONS

- ✓ Isolated Dual 7 Amp Form C Relays
- ✓ Isolated Parallel BCD Output
- ✓ Isolated Analog Output of 0-10 Vdc, 0-5 Vdc, 1-5 Vdc, 0-20 mA dc and 4-20 mA dc
- ✓ Isolated Serial RS-232
- ✓ Isolated RS-485, Addressable up to 199 Units

The **INFINITY**® strain gage meter can be configured, via the five front-panel pushbuttons and/or the optional serial communications boards, to accept any of a variety of dc voltage ranges (some ranges plus unipolar or bipolar are first selected via a jumper located at the top of the instrument housing) and display them in engineering units.

The **INFW** scale meter offers the same features as the INFS strain meter, plus it is easily integrated into your data acquisition systems, PLCs or other computer-controlled systems with the optional inputs. Other features include dual relay of BCD output, isolated analog output, RS-232 or RS-484 serial communications options, auto or sequential tare, class selection, and display of units of measure. Self-diagnostics are performed automatically on power-up.

These meters provide both software and hardware lockout configurations which let you define the parameters, from

setpoint adjustment to total reprogramming. Users can scale and offset their input signal into any engineering units desired. This is accomplished by the use of an exclusive two-data point method of scale and offset that eliminates the signal errors transmitted from a sensor. The meter provides a choice of sensor excitations of 1.5 to 11 Vdc or 24 Vdc for sensors such as load cells, strain gages, and pressure transducers.

### INFZS Split Meter with remote display



### MECHANICAL REFERENCE PRICE LIST

### Low Range Constant Moment Beam Load Cell with 4-Direction Overload Stops



Available from  
[OMEGADYNE, INC.](http://www.omegadyne.com)

### SPECIFICATIONS

**Accuracy:**  $\pm 0.005\%$  rdg

**Span Temperature Coefficient:**  $\pm 15$  ppm/ $^{\circ}$ C

**Step Response:** 1 sec to 9.9%

**Warm-up to Rated Accuracy:** 50 min

**Operating Ambient:** 0 to 50 $^{\circ}$ C (32 to 122 $^{\circ}$ F), 95%RH, non-condensing

**Storage Ambient:** -40 to 85 $^{\circ}$ C (-40 to 185 $^{\circ}$ F)

**Power:** 115 or 230 Vac, 49-400 Hz; 10 to 32 Vdc

**Power Consumption:** 6 W nominal, 10 W max.

**Normal Mode Rejection:** 60 dB

**Common Mode Rejection:** 120 dB

**Common Mode Voltage:** 1500 V peak per Hv test

**Conversion:** dual-slope technique

**Resolution:** 15-bit

**Reading Rate:** 3/sec or 13/sec, 60 Hz; 3/sec or 12/sec, 50 Hz

**Display:** red or green 6-digit, 14-segment, 13.7 mm (0.54"); 4 alarm indicators

**Dimensions:** 48 H x 96 W x 165 D mm (1.89" x 3.78" x 6.5")

**Panel Cutout:** 45 H x 92 W mm (1.772" x 3.622"); 1/8 DIN

**Weight:** 574 g (1.27 lb)

**TTL Outputs:** four, isolated open collector; rated 150 mA at 1 V sink, 30 V open

**BCD Output:** isolated, tri-state, TTL/CMOS compatible; external 5 V supply for isolated; internal 5 V supply for non-isolated

**Dual Relays:** form C, 7 A at 30 Vdc or 230 Vac

**Four Relay Option:** dual 7A relays and dual 1 A relays

**Analog Output:** 0-5 V/1-5 V/0-10 V/0-20 mA/4-20 mA, user selectable; 354 Vp isolation; 15-bit resolution; 0.1% accuracy, 50 msec step response

**RS-232 Communications:** 300/600/1200/2400/4800/9600/19.2k baud; RJ11 4-wire connection; complete program setup and message display capability; programmable to transmit current display, alarm status, min/max, actual measured input value and status

**RS-485 Communications:** 300/600/1200/2400/4800/9600/19.2k baud; RJ12 6-wire connection; addressable from 0 to 199

**Voltage Input Ranges:** 0-100 mV, 0-1 V, 0-5 V, 1-5 V, 0-10 V, 0-100 V,  $\pm 50$  mV,  $\pm 500$  mV,  $\pm 5$  V,  $\pm 50$

**Current Input Ranges:** 0-20 mA, 4-20 mA

**Input Configuration:** single-ended

**Polarity:** unipolar/bipolar, programmable

**Span Adjustment:** +0.00001 to 500,000, programmable

**Offset Adjustment:** 0 to 999,999 or 0 to -99,999; programmable

**Sensor Excitation:** 10 V at 30 mA for bridge; 24 V at 25 mA for loop power

**To Order** (\* insert number code to complete model number) *Prices Shown in U.S. Dollars*

Basic Model	Power/Display	Control Output	Analog Output	Serial Output	Input Signal	Description	Price
INFS	(*)	(*)	(*)	(*)	(*)	Strain gage/load cell panel meter	\$545
INFZS	(*)	(*)	(*)	(*)	(*)	Strain meter with remote display	\$595
	0					115 Vac power, red LED display	N/C
	1					230 Vac power, red LED display	N/C
	2					115 Vac power, green LED display	N/C
	3					230 Vac power, green LED display	N/C
	4					10-32 Vdc power, red LED display	\$110
	5					10-32 Vdc power, green LED display	\$110
		0				Four NPN open collector transistors	N/C
		1				Isolated parallel BCD	\$110
		2				Two 7 A relays	\$75
		3				Two 7 A relays and two 1 A relays	\$175
			0			No analog output	N/C
			1			Isolated analog output	\$110
				0		No serial output	N/C
				1		Isolated RS-232	\$110
				2		Isolated RS-485	\$110
					(*)	Specify range signal from chart below.*	N/C

### INPUT SIGNAL

Range Code	Range	Range Code	Range	Range Code	Range
DC1	0-100 mV	DC5	0-10 Vdc	DC9	±5 Vdc
DC2	0-1 Vdc	DC6	0-100 Vdc	DC10	±50 Vdc
DC3	0-5 Vdc	DC7	±50 mVdc	C1	0-20 mA
DC4	1-5 Vdc	DC8	±500 mVdc	C2	4-20 mA

### ADD-ON-OPTIONS

Model	Description	Price	Model	Description	Price
BL	Blank Lens	\$15	9SC4	9-pin RS-485 connector	\$30
FS	Special Calibration	\$25	25SC2	25-pin RS-232 connector	\$30
9SC2	9-pin RS-232 connector	\$30	25SC4	25-pin RS-485 connector	\$30

### Ordering Examples:

1.) **INFS-0200-DC7**, Standard Panel Meter with two relays, ±50 mV input, 115 Vac power and red LED display, \$545 + 75 = **\$620**.

2.) **INFZS-2210-DC1** Split Meter System, two relays, analog output and 0-100 mVdc input, 115 Vac power and green LED display, \$595 + 75 + 110 = **\$780**.


# 3 1/2 STRAIN/MICROVOLTMETER, TRANSMITTER & CONTROLLER QUANTA Q2000S



## QUANTA STANDARD FEATURES

- ✓ Adjustable 1-10 Vdc bridge excitation supply
- ✓  $\pm 1,999$ -count display span
- ✓ Seven overlapping gain ranges
- ✓ Front-panel accessible zero and span adjustments
- ✓ Resolution down to 1  $\mu\text{V}/\text{count}$
- ✓ Strain-gauge sensitivity down to 0.20 mV/V
- ✓ Ratiometric measurement
- ✓ 1 mV/count analog output
- ✓ LED or LCD display
- ✓ Automatic polarity
- ✓ Display hold and test
- ✓ 120/240 Vac, 5 Vdc, 9-32 Vdc or 26-56 Vdc power
- ✓ Screw-terminal barrier strip
- ✓ 1/8 DIN case

## NEWPORT PRODUCT INFO

- [MANUAL](#)
  - [QUICK START](#)
  - [MECHANICAL](#) 1/8 DIN (1A) Case
  - [MECHANICAL](#) Connections Diagram
  - [PRICE](#)
-  [REQUIRES ADOBE ACROBAT - HELP](#)

## OPTIONS

- ✓ [Analog output for user-selected span](#)
- ✓ [Single-setpoint 10 A relay control](#)
- ✓ [Dual-setpoint 10 A relay control](#)
- ✓ [Proportional 4-20 mA control](#)
- ✓ [Time-proportional 2 A SS relay control](#)
- ✓ [Parallel, isolated BCD output](#)
- ✓ [NEMA-4 splash-proof lens cover](#)

The **QUANTA 2000S** is a 3 1/2 digit meter/controller for use with pressure transducers and load cells which require bridge excitation and preamplification of microvolt signals. Deadload and tare adjustments make it suitable for weighing applications. Like process meters, it provides zero and span adjustments for direct readout in engineering units. It can also be used as a microvoltmeter with differential input.

## EXCITATION SUPPLY AND PREAMPLIFIER

The Q2000S provides a constant-voltage excitation supply, which is adjustable from 1 to 10 V and can drive up to 30 mA. It also provides a high-impedance preamplifier, which is continuously adjustable so that signal levels from  $\pm 2.0$  to  $\pm 500$  mV can produce the full-scale display of  $\pm 1,999$  counts. At 10 V excitation and maximum gain, full-scale readout can be obtained with strain-gauge sensitivity as low as 0.20 mV/V. An active filter is provided for noise reduction.

## BRIDGE CONNECTION

Bridges can be connected by 4 or 6 wires. In 6-wire connection, two lines sense the voltage applied to the bridge and compensate for lead resistance (these two sense lines require the optional PCB connector D1).

## RESOLUTION AND ACCURACY

Resolution is one part in  $\pm 1,999$  counts, or 0.05% of full scale. Accuracy is 99.9% of reading. The

measurement is ratiometric to reduce errors due to temperature and power-line variations. The same internal reference controls the meter gain and the excitation level.

### INPUT POWER AND DISPLAY OPTIONS

Six types of meter power are available: 120 Vac, 240 Vac, 24 Vac, 5 Vdc, isolated 9-32 Vdc, and isolated 26-56 Vdc. An LED display is standard. An LCD display is available in the Q2000 and is ideal for viewing in bright ambient light.

### ANALOG OUTPUT OPTIONS

A 1 mV/count ( $\pm 2$  V full-scale) analog output is standard and is ideal for driving a strip-chart recorder. An additional analog output can be provided by an optional vertical plug-in board. Available output signals are 0-5 Vdc, 0-10 Vdc, 0-1 mA (source or sink), and 4-20 mA (source or sink). The top and bottom of each output range can be scaled to fit a user-selected display span.

### CONTROL OUTPUT OPTIONS

Additional outputs can be provided by a horizontal upper board. Available options include single-setpoint control with one 10 A relay, dual-setpoint control with two 10 A relays, 4-20 mA proportional control (source or sink), time-proportional 2 A solid-state relay control, and isolated, parallel BCD output. For additional information, please refer to the QUANTA, Options, and Mechanical sections.

### SPECIFICATIONS

ANALOG INPUT	Most-sensitive scaling	Least-sensitive scaling
Range	$\pm 2.0$ mV	$\pm 500$ mV
Resolution	1.0 $\mu$ V/count	250 $\mu$ V/count
Preamplifier gain	405	4.01
Post-amplifier gain	2.47	1.00
Maximum voltage	250 Vp	250 Vp

**Gain adjustment:** Seven overlapping ranges with fine adjustment

**Input configuration:** Differential, ratiometric

**Zero adjustment:**  $\pm 225$   $\mu$ V/volt of excitation

**Span adjustment:** 1 to 2.47 of preamp gain

**Bias current:** 11 nA typ, 22 nA max

### NOISE REJECTION

**NMR, SIG HI to SIG LO:** 95 dB, 50/60 Hz

**CMR, SIG GND to SIG LO:** 80 dB, DC to 60 Hz

**CMV, SIG GND to SIG LO:**  $\pm 1$  V, DC to 60 Hz

**CMR, SIG GND to PWR GND:** 120 dB

**CMV, SIG GND to PWR GND:** 1500 Vp per HV test, 354 Vp per IEC spacing

### ACCURACY AT 25°C

**Error, max:**  $\pm 0.05\%$  of reading  $\pm 1$  count

**Span tempco:**  $\pm 0.01\%$  of reading/ $^{\circ}$ C

**Zero drift, max:**  $\pm 0.3$   $\mu$ V/ $^{\circ}$ C

**Offset drift, max:**  $\pm(0.01\%$  offset V  $\pm 0.01\%$  FS V)/ $^{\circ}$ C

**Step response:** 1 s to 99.9% of span

**Warmup to rated accuracy:** 30 min

### CONVERSION

**Technique:** Dual-slope, average-value

**Signal integration period:** 100 ms

**Read rate:** 2.5/s

### EXCITATION

**Configuration:** Constant-voltage

**Voltage sense:** Internal or remote

**Voltage range:** Adjustable from 1 to 10 V

**Load current, max:** 30 mA

### DISPLAY

**LED:** 0.56 in (14.2 mm) 7-segment, red

**LCD:** 0.50 in (12.7 mm) 7-segment liquid crystal

**Symbols:** -1.8.8.8

**Decimal point positions:** Three positions selectable by jumpers behind lens or at connector

**Overrange indication:** Three least-significant digits blanked

### POWER

**AC voltages:** 120, 240 or 24 Vac +10%/-15%

**AC frequency:** 49-440 Hz

**DC voltages:** 9-32 Vdc, isolated to 300 Vp; 26-56 Vdc, isolated to 300 Vp; 5 Vdc  $\pm$ 5%, non-isolated

**Power consumption:** 5 W max

### ENVIRONMENTAL

**Operating temperature:** 0 to 60°C

**Storage temperature:** -40 to +85°C

**Relative humidity:** 95% at 40°C (non-condensing)

### MECHANICAL

**Dimensions:** Newport DIN1A (1/8 DIN) case (see Mechanical section for drawings)

**Weight:** 17 oz (480 g)

**Case material:** 94V-0 UL-rated polycarbonate



[PRODUCTS](#) | [MANUALS](#) | [PRICELIST](#) | [QUOTES](#) | [SITEMAP](#) | [SEARCH](#) | [E-MAIL](#)

CALL 714-540-4914

Copyright 2000, NEWPORT Electronics, Inc. All rights reserved.