

2000 Series Digital Panel Meters MODUTEC

**BEST OF
CLASS**



2100 Series with DIP switch selections and multiple power options.

Backlighting Options

- Positive Green Black on Green Background
- Negative Green Green on Black Background
- Positive Red Black on Red Background
- Negative Red Red on Black Background
- Non-Backlit LCD Black on Grey Background

Customize for features that are important to you and rely on industry standards for routine digital PM elements.

You need flexibility. We provide it. We customize our meters to meet your specifications.

- Scalable in engineering units
- Custom labels for special readouts
- User Selectable functions, decimal point, offset, span, process voltage or current, DC voltage
- Red or green backlit display

You need reliability. The MODUTEC 2000 Series operates in the harshest environments.

- Splash and hose proof meeting NEMA 4, NEMA 12, and IPC 55 standards
- Resistant to damage with a high impact polycarbonate case
- Wide operating temperature ranging from -4°F to +140°F (-20°C to +60°C)

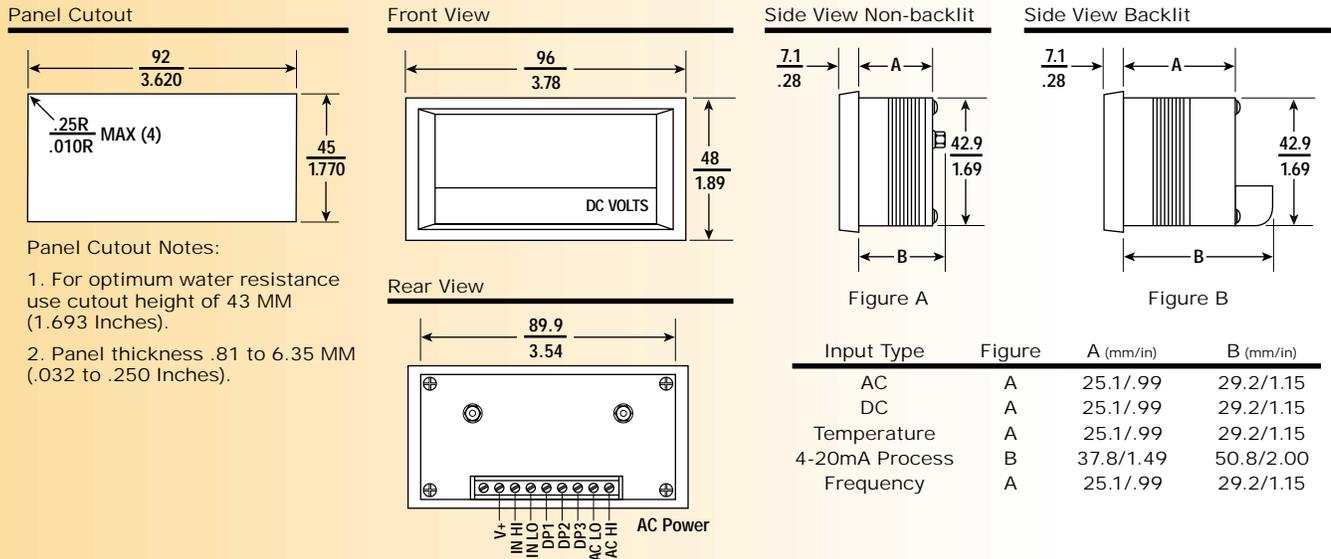
You need standards. The MODUTEC 2000 Series gives you industry standards designed in.

- 1/8 DIN industry standard cut-out and 1 inch depth
- Screw terminals
- Over range indication
- Low cost
- The MODUTEC 2100 includes user-friendly dipswitch selection features

Applications

- ▶ Telecommunications
- ▶ Water Purification
- ▶ Sewage Treatment
- ▶ Flow
- ▶ Process
- ▶ Desalinization
- ▶ Temperature
- ▶ AC & DC Amps
- ▶ AC & DC Volts

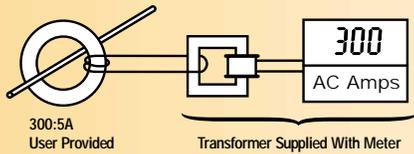
2000 & 2100 Series Dimensional Drawings (mm/in)



Panel Cutout Notes:

1. For optimum water resistance use cutout height of 43 MM (1.693 Inches).
2. Panel thickness .81 to 6.35 MM (.032 to .250 Inches).

Connection for High Current Measurement



2000 and 2100 Series Specifications

Display

Digits: 3 1/2 digits, 7 segments Backlit LCD (1999)
Polarity: Automatic (-) displayed
Overload: Three lower digits blank for readings greater than 1999

Digit Height: 0.5" (12.7 mm)

Decimal Point: Three positions, external selection

Performance

Conversion Rate: 2.5 per second
Common Mode Rejection: ≥ 100 db 50 Hz-60 Hz¹
Tempco: ± 200 PPM/ $^{\circ}$ C typical²

Normal Mode Rejection: ≥ 40 db 50Hz-60Hz

Zero Adjust: Automatic

Warmup: 10 minutes

Environment

Operating Range: -4 $^{\circ}$ F to 140 $^{\circ}$ F (-20 $^{\circ}$ C to + 60 $^{\circ}$ C) **Storage Range:** -22 $^{\circ}$ F to 158 $^{\circ}$ F (-30 $^{\circ}$ C to + 70 $^{\circ}$ C)

Power Options

115V +10%, -15% 50Hz to 400Hz at 2VA
230V +10%, -15% 50Hz to 400Hz at 2VA
10 to 28VDC 150 mA (including backlighting)
10 to 15VDC or 20 to 32VDC 150mA (including backlighting)

Weight

2 oz.

FCC Compliance

Complies with the class B Limits of FCC rules and regulations, part 15, sub part J for conducted and radiated emissions.

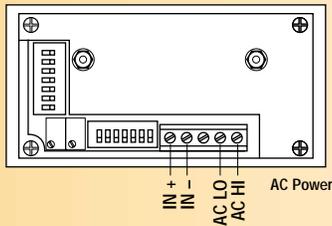
¹ except isolated DC powered which is ≥ 80 db 50 Hz-60Hz

² except thermocouple inputs which are .1 $^{\circ}$ / degree zero tempco for selectable process ranges is only ± 2 count/ $^{\circ}$ C

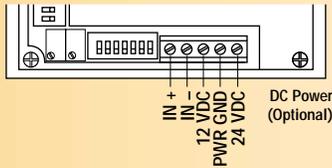
Specifications continued on back page.

2000 & 2100 Series Connection Drawings

Universal Switchable — Model 2100

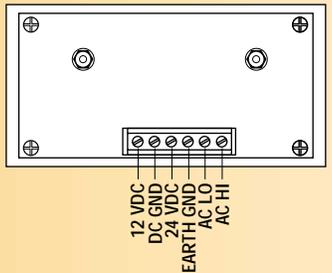


Terminal	Description
IN+ IN-	Signal Input
AC Power Low AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected



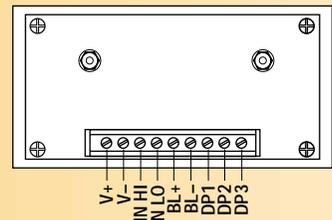
12VDC Power GND	12VDC power input } (optional)
24VDC Power GND	

Frequency Input



Terminal	Description
AC LO AC HI Earth GND	Signal input and power, 115VAC or 230VAC depending on model selected.
12VDC Power GND	12VDC power input } (optional)
24VDC Power GND	

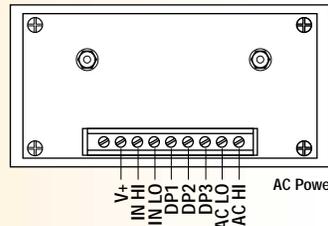
DC Inputs (Non-Isolated DC Power)



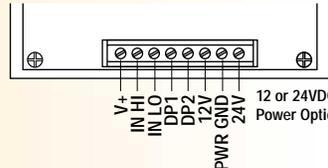
Terminal	Description
V+ V-	10-28VDC power input
IN HI IN LO	Signal Input
BL+ BL-	Backlight power input

DP1, DP2, DP3 — Decimal point selection, connect to V+ as follows: DP1=XXX.X, DP2=XX.XX, DP3=X.XXX

AC and DC Inputs (AC and Isolated DC power)

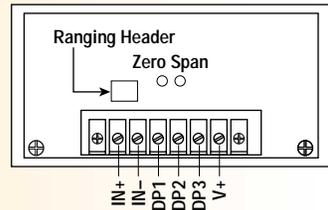


Terminal	Description
V+	10-28VDC power input
IN HI IN LO	Signal Input
DP1, DP2, DP3	Decimal point selection, connect to V+ as follows: DP1=XXX.X, DP2=XX.XX, DP3=X.XXX
AC Power LO AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected



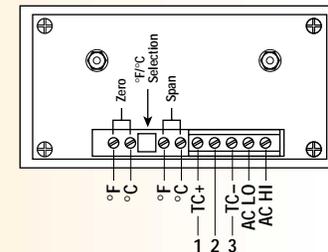
12V Power GND	12VDC power input } (optional)
24V Power GND	

4-20mA Process & Flow Inputs



Terminal	Description
IN+ IN-	Signal Input
DP1, DP2, DP3	Decimal point selection, connect to V+ as follows: DP1= XXX.X, DP2= XX.XX, DP3= X.XXX
V+	DC voltage output to select decimal points

Temperature Inputs



Terminal	Description
TC+ TC-	Thermocouple Inputs
AC Power Low AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected
1 2 3	RTD inputs

2000 Series Scaling Chart

Model 2100, of the 2000 Series, provide the unique ability to switch-select a range and then scale and offset that range. Input will be displayed in engineering units. For example, by changing switch positions and recalibrating, a 2133-3419-04 may be set-up for any of the following displays:

- 4 to 20mA input display -148°F to 932°F (-100°C to +500°C) temperature
- 1 to 5V input displaying - 60kPa to 300kPa differential pressure
- 0 to 10V input displaying +700°F to +950°F (+682°C to +932°C) temperature
- 0 to 50mV input displaying 0 to 300 amperes

Scaling Capability

Zero Range Adjustment

4mA to 20mA, 1V to 5V

0 to 200mV, 0 to 2V, 0 to 10V

Full Scale Span Adjustment

All ranges

Other ranges and scaling available.

-1000 counts to +1500 counts. Switch selectable in four ranges: a 25-turn potentiometer enables continuous adjustment.

-1500 counts to +1500 counts. Switch selectable in six ranges: a 25-turn potentiometer enables continuous adjustment.

0 to 2000 counts. Switch selectable in four ranges: a 25-turn potentiometer enables continuous adjustment.

How to Order

2

a	b
0	3

 3¹ - 3

c	d
4	6 1

 -

e	f
0 4	2

Configuration	
0 = 1/8 DIN	1 = UPM
2 = TRMS (Inst)	3 = TRMS (Power)

Display	
1 = Non Bklit	3 = Pos Grn Bklit
4 = Neg Grn Bklit	5 = Neg Red Bklit
6 = Pos Red Bklit	

DPM Power²	
0 = loop power	1 = 9 VDC
2 = ±5VDC	3 = +5 volts
4 = 115VAC	5 = 230VAC
6 = 10 to 28VDC	7 = 12 or 24VDC (Iso)
8 = 12 VDC	9 = 24VDC

Input	
00 = 100mVDC (1999 counts)	
01 = 200mVDC scaled 0 to 199.9	
02 = 2VDC scaled 0 to 1.999	
03 = 20VDC	
04 = 200VDC	
05 = 1V to 5 VDC scaled 0 to 100.0	
06 = 10VDC scaled 0 to 10.00	
07 = 500VDC	
10 = 200uADC	
11 = 2mADC	
12 = 20mADC	
13 = 200mADC	
18 = 4 to 20mADC Sq Rt ³	
19 = 4 to 20mADC scaled 0 to 100.0 ³	
21 = 200.0mVAC RMS	
22 = 2.000VAC RMS	
23 = 20.00VAC RMS	
24 = 200.0VAC RMS	
25 = 500VAC RMS	
27 = 500VAC Avg	
28 = 80.0 - 130.0VAC Avg	
29 = 80 - 260VAC Avg	
30 = 250VAC RMS	
31 = 2.000mAAC RMS	
32 = 20.00mAAC RMS	
33 = 200.0mAAC RMS	
34 = 2.000AAC RMS	
36 = 5.00AAC ⁴ RMS	
37 = 50.0AAC ⁴ RMS	
38 = 0 - 5AAC ⁴ AVG	
39 = 0 - 50AAC ⁴ AVG	
60 = 40 to 440Hz	
61 = 40.0 to 199.9Hz	
70 = 100 Ohms Pt 1 [°] Resolution	
71 = 100 Ohms Pt .1 [°] Resolution	
80 = Type J Thermocouple	
81 = Type K Thermocouple	
82 = Type T Thermocouple	

Backlit Power²	
00 = No Backlight	01 = 5VDC
02 = 12VDC	03 = 24VDC
04 = 115VAC	05 = 230VAC
06 = 10 to 28VDC	07 = 12 or 24VDC

Display⁵		
1 = 2000	2 = 1500	3 = 1000
4 = 600	5 = 500	6 = 300
7 = 200	8 = 100	

2000 and 2100 Series Specifications (continued)

DC Inputs	Accuracy	Input Resistance	Overload Protection
200mVDC & 2VDC	±(.1% +1 count) typical ±(.2% +1 count) max.	≥ 100 Meg Ohms	200V continuous 300V intermittent
20VDC & 200VDC	±(.1% +1 count) typical ±(.2% +1 count) max.	1 Meg Ohm	350V continuous 500V intermittent
DC Current	±(.1% +1 count) typical ±(.2% +1 count) max.	200mV drop full scale	3 times f.s. current
Universal Selectable Process	±(.1% +2 counts)	4 to 20mA, 10 Ohms ≥ 200mV, ≥ 200K Ohms 2V and up, ≥ 1Meg Ohm	4 to 20 mA, ±100mA Voltage Inputs, 200V continuous 300V intermittent
AC Inputs	Accuracy	Input Resistance	Overload Protection
AC Voltage	±(.5% + 1 count)	1 Meg Ohm	350V continuous 500V intermittent
5A AC Current	±(.5% +1 count)	Current transformer	3 times f.s. current
50A AC Current	±(.5% +5 counts)	Current transformer	3 times f.s. current
Frequency Inputs	Accuracy	Distortion	
40.0 to 199.9Hz	±.2Hz (40 to 70Hz) ±.5Hz (above 70Hz)	≤ .1 Hz for up to 20% third harmonic distortion	
40 to 440Hz	±1Hz	≤ .1 Hz for up to 20% third harmonic distortion	
Temperature Inputs	Accuracy	Input Characteristic	Overload Protection
Type J thermocouple			
-10°F to +1200°F (-23°C to +649°C)	±(.1% +1 count) accuracy ±1.3°C (2.8°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
Type K thermocouple			
-40°F to +1500°F (-40°C to +815°C)	±(.1% +1 count) accuracy ±1.2°C (2.5°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
Type T thermocouple			
-100°F to +600°F (-73°C to +315°C)	±(.1% +1 count) accuracy ±1.5°C (3.5°F) conformity error	45 uV max per 100 Ohms thermocouple lead resistance	200V continuous
100 Ω Pt. α =.00385			
-200°F to +600°F (-129°C to +315°C)	±(.2% + 1 count) max	1mA RTD current	±5V
100 Ω Pt. α =.00385			
-100.0°F to +199.9°F (-73°C to +98°C)	±(.2% + 1 count) max	1mA RTD current	±5V

¹ Change Order Number to "4" for 200 VDC Input

² Backlit power must be the same as the selected DPM power.

³ Available on Non-Backlit meters only.

⁴ Rated for use with 5A or 50A external current transformer supplied with DPM. See high current connection on inside page.

⁵ For 5A current transformer inputs only.

For over 60 years, Jewell Instruments and our predecessor companies have provided high quality panel meter solutions for a wide range of aerospace, industrial and commercial applications. JEWELL and MODUTEC are some of the most trusted brands in the industry. They are known for:

- reliable, high quality, products
- superb applications knowledge
- custom designs for unique requirements
- “extended staff” relationships with customers
- creative engineering expertise

Jewell Instruments

The only panel meter manufacturer that offers a full spectrum of panel meters. Analog, digital. Any size, and shape. Surface mount, window mount, bezel mount. We have decades of broad-based experience resulting in our superior breadth of product — and our ability to meet your custom needs. Jewell Instruments can provide a proven, quick and cost-effective solution to your panel meter needs.

Analog panel meters can be either electrical or electronic. Application areas include:

Electrical

- Field Strength Meters
- Power Generation
- Power Distribution Panel
- Control Panels
- Switchgear Panels
- Power Supplies
- Power Conditioners
- Voltage Regulators
- UPS Systems
- Automatic Transfer Switches
- Generator Paralleling Switchgear

Electronic

- Liquid Level
- Flow
- Pressure Monitors
- Volume Units
- Laboratory Equipment
- Test Equipment
- Broadcast Equipment
- Stereo Equipment
- Medical
- Temperature
- Battery Level
- Speed
- Tension Control
- Kilns
- Marine
- Chart Recorders
- Field Strength

Digital panel meter applications include:

Digital

- Telecommunications
- Welders
- Agricultural
- Water Purification
- Desalinization

Digital Panel Meters

Digital Panel Meters

	Categories							
	BL Series	1000 Series	BGE Series	PMC Series	2000 Series	2100 Series	DW Series	1800 Series
Display								
LCD	•	•	•	•	•	•	•	•
Backlit LCD	•	•	•	•	•	•		
LED						•		•
Mounting								
Surface	•	•					•	
Window	•		•	•			•	
Bezel	•	•	•		•	•	•	•
Connections								
Pins	•	•	•					
Solder Pads	•							
Screw Terminal Connector	•			•	•	•		•
Banana Plugs				•				
Inputs								
DC Volt	•	•	•		•	•	•	•
DC AMP	•	•		•	•	•	•	•
AC Volt	•				•	•	•	
AC AMP	•				•	•	•	
Frequency	•				•	•		
RTD	•				•	•		•
Thermocouple	•				•	•		
DPM Power								
5 Volt DC	•	•	•				•	•
+/- 5 Volt DC	•	•						
9 Volt DC	•	•	•				•	
Loop Powered	•	•		•	•	•	•	
115 VAC	•				•	•	•	
230 VAC	•				•	•	•	
12 or 24 VDC (Isolated)	•				•	•		
10 to 28 VDC (Isolated)	•	•					•	
10 to 30 VDC (Isolated)	•							
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PMC Series — MODUTEC

The *PMC Series* is designed to meet the unique needs of process instrumentation applications. It is self-powered from a 4-20mA control loop. It includes our standard features, such as selectable decimal points and large digits.



2000 Series — MODUTEC

The *Series 2000* is the ideal industrial application panel meter. This 1/8" DIN meter is splash and hose proof, with a wide temperature range. The polycarbonate case makes it resistant to knocks. With all of these rugged features, the *Series 2000* remains a slim meter, easy to fit in the design of your industrial application.



2100 Series — MODUTEC

The *Series 2100* is the next generation *2000* with all the features of the *2000*, but now with DIP switch selections for decimal points and inputs. We've also added multiple power options.