

## 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)

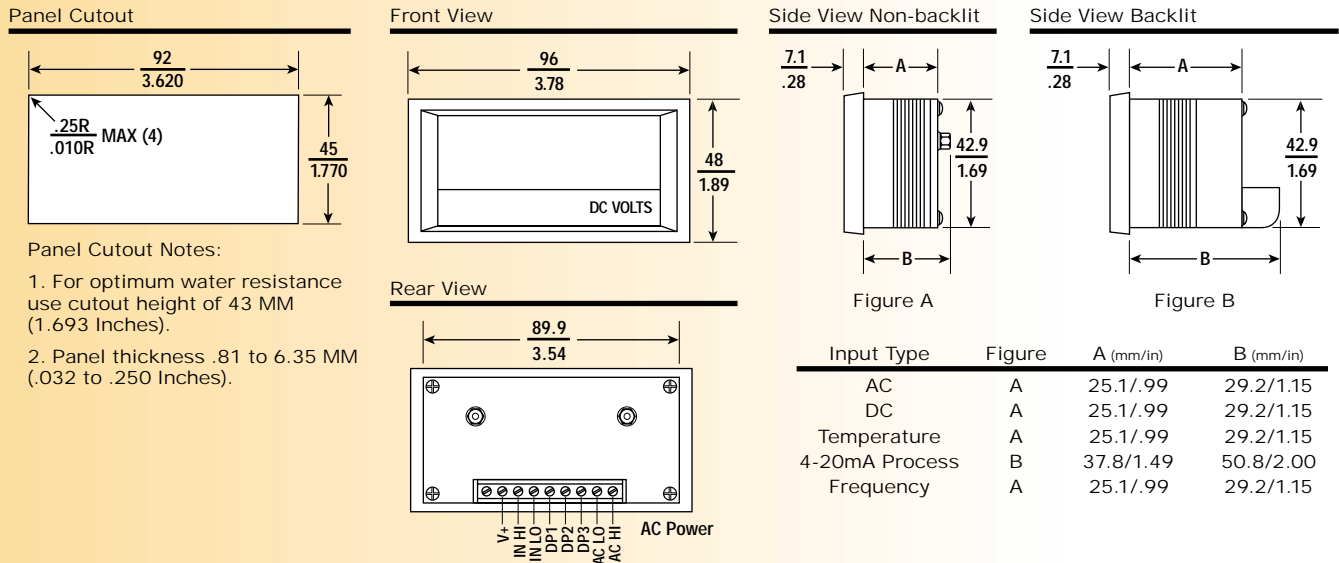
*You need standards. The MODUTEC 2000 Series gives you industry standards designed in.*

- 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

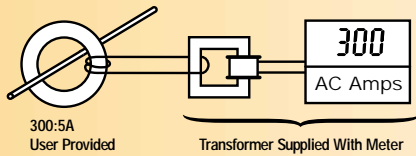
## 2000 & 2100 Series Dimensional Drawings (mm/in)



### 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:** ≥ 100db 50 Hz-60 Hz<sup>1</sup>  
**Tempco:** ±200 PPM/°C typical<sup>2</sup>

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

**Zero Adjust:** Automatic

**Warmup:** 10 minutes

### Environment

**Operating Range:** -4°F to 140°F (-20°C to + 60°C) **Storage Range:** -22°F to 158°F (-30°C to + 70°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.

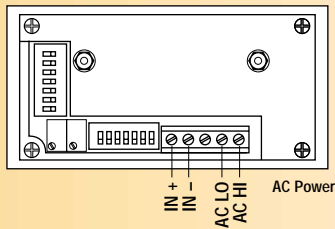
<sup>1</sup> except isolated DC powered which is ≥ 80 db 50 Hz-60Hz

<sup>2</sup> except thermocouple inputs which are .1°/ degree zero tempco for selectable process ranges is only ±.2 count/°C

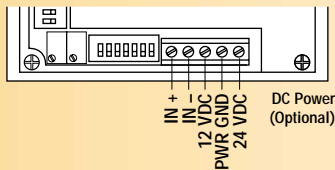
Specifications continued on back page.

## 2000 & 2100 Series Connection Drawings

### Universal Switchable — Model 2100

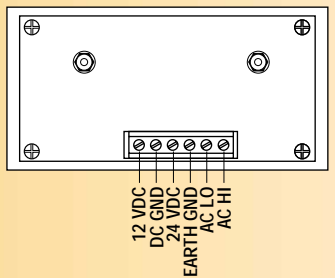


Terminal	Description
IN+ IN-	Signal Input
AC Power Low AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected



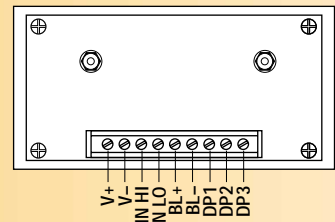
12VDC Power GND	12VDC power input } (optional)
24VDC Power GND	

### 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	

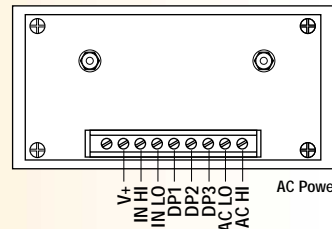
### DC Inputs (Non-Isolated DC Power)



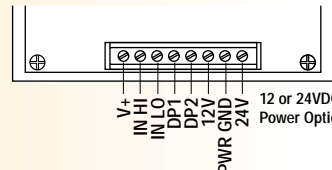
Terminal	Description
V+ V-	10-28VDC power input
IN HI IN LO	Signal Input
BL+ BL-	Backlight power input

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)

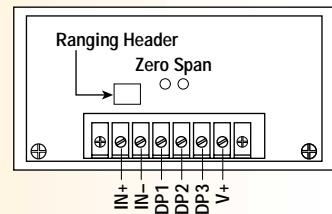


Terminal	Description
V+	10-28VDC power input
IN HI IN LO	Signal Input
DP1, DP2, DP3	Decimal point selection, connect to V+ as follows: DP1=XXX.X, DP2=XX.XX, DP3=X.XXX
AC Power LO AC Power HI	AC Power Input, 115VAC or 230VAC depending on model selected



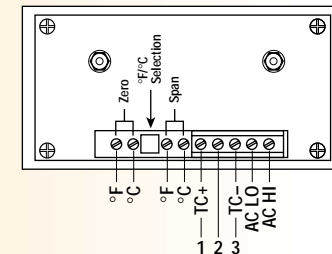
12V Power GND	12VDC power input } (optional)
24V Power GND	

### 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

 3<sup>1</sup> - 3 

c	d
4	6 1

 - 

e	f
0 4	2

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

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

c	DPM Power <sup>2</sup>	
	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

d	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 <sup>3</sup>	
	19 = 4 to 20mADC scaled 0 to 100.0 <sup>3</sup>	
	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 <sup>4</sup> RMS	
	37 = 50.0AAC <sup>4</sup> RMS	
	38 = 0 - 5AAC <sup>4</sup> AVG	
	39 = 0 - 50AAC <sup>4</sup> AVG	
	60 = 40 to 440Hz	
	61 = 40.0 to 199.9Hz	
	70 = 100 Ohms Pt 1 <sup>°</sup> Resolution	
	71 = 100 Ohms Pt .1 <sup>°</sup> Resolution	
	80 = Type J Thermocouple	
	81 = Type K Thermocouple	
	82 = Type T Thermocouple	

e	Backlit Power <sup>2</sup>	
	00 = No Backlight	01 = 5VDC
	02 = 12VDC	03 = 24VDC
	04 = 115VAC	05 = 230VAC
	06 = 10 to 28VDC	07 = 12 or 24VDC

f	Display <sup>5</sup>		
	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
<b>Type J thermocouple</b>			
-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
<b>Type K thermocouple</b>			
-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
<b>Type T thermocouple</b>			
-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

<sup>1</sup> Change Order Number to "4" for 200 VDC Input

<sup>2</sup> Backlit power must be the same as the selected DPM power.

<sup>3</sup> Available on Non-Backlit meters only.

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

<sup>5</sup> 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
<b>Display</b>								
LCD	•	•	•	•	•	•	•	•
Backlit LCD	•	•	•	•	•	•		
LED						•		•
<b>Mounting</b>								
Surface	•	•					•	
Window	•		•	•			•	
Bezel	•	•	•		•	•	•	•
<b>Connections</b>								
Pins	•	•	•					
Solder Pads	•							
Screw Terminal Connector	•			•	•	•		•
Banana Plugs				•				
<b>Inputs</b>								
DC Volt	•	•	•		•	•	•	•
DC AMP	•	•		•	•	•	•	•
AC Volt	•				•	•	•	
AC AMP	•				•	•	•	
Frequency	•				•	•		
RTD	•				•	•		•
Thermocouple	•				•	•		
<b>DPM Power</b>								
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.