

# DIGITAL PANEL METERS





**มิเตอร์รับสัญญาณอนาล็อกคุณภาพสูง**

- ใช้งานง่าย
- มีความเที่ยงตรง และแม่นยำสูง
- Calibrate แม่นยำ



**The Trusted Source for  
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Solutions**





## QUICK Specs

มิเตอร์วัดกระแส และแรงดันไฟฟ้า DC				
	VOLT/CURRENT			UNIVERSAL
	CUB4V / I	CUB5V / I	PAXLV / I	PAXLA
				
รายละเอียด	Miniature DC Volt/Current Meter	DC Volt/Current Meter with Output Option Card Capability	1/8 DIN, AC or DC Volt/Current Meter	1/8 DIN, DC Volt/Current/Process Meter with Setpoint Card Capability
ขนาดและรูปร่าง (สูง x กว้าง)	39mm (H) x 75mm (W)	39mm (H) x 75mm (W)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)
ส่วนแสดงผล	3 1/2 Digit, .6" (15mm) Reflective, Green and Red Backlight LCD	5 Digit, .48" (12mm) Reflective, Green and Red Backlight LCD	3 1/2 Digit, .56" (14mm) Red LED	5 Digit, .56" (14mm) Red LED
ย่านการวัดของอินพุต	Current (CUB4I) 0 to 199.9 $\mu$ A DC through 199.9 mA DC Voltage (CUB4V) 0 to 199.9 mV DC through 199.9 VDC	Current (CUB5I) 0 to 200 $\mu$ A DC through 200 mA DC Voltage (CUB5V) 0 to 200 mV DC through 200 VDC	Current (PAXLI) (AC or DC) 0 to 199.9 $\mu$ A through 1.999 A Voltage (PAXLV) (AC or DC) 0 to 1.999 mV DC through 300 VDC	Current: 0 to 200 $\mu$ A through 200 mA DC Voltage: 0 to 200 mV through 200 VDC Process: 4 to 20 mA and 0 to 10 VDC
Zero/Offset	Zero Based	Zero Based	Zero Based	Non Zero Based
Setpoint Capability †	No	Single Form C Relay Dual Sinking	No	Dual Form C Relays
Communication Capability	No	RS232 RS485	No	No
Other Features/Options	No	User Input Min/Max Memory Custom Units Indicator	Custom Units Overlay	User Input Excitation Custom Units Overlay Min/Max Memory
แหล่งจ่ายไฟ	9 to 28 VDC	9 to 28 VDC	115/230 VAC	50 to 250 VAC 21.6 to 250 VDC

\*See website for product information.

† Field Installable Option Card

## QUICK Specs





มิเตอร์วัดกระแส และแรงดันไฟฟ้า DC				
VOLT/CURRENT				
	PAXLIT	PAXLHV	DP5D	PAXD
				
รายละเอียด	1/8 DIN, 5 amp AC Current Meter	1/8 DIN, AC Voltage Monitor	1/8 DIN, Universal DC Meter	1/8 DIN, Universal DC Meter with Output Option Card Capability
ขนาดและรูปร่าง (สูง x กว้าง)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)
ส่วนแสดงผล	3 1/2 Digit, .56" (14mm) Red LED	3 1/2 Digit, .56" (14mm) Red LED	4 1/2 Digit, .56" (14mm) Red LED	4 1/2 Digit, .56" (14mm) Standard Green or Sunlight Readable Red LED, Adjustable Intensity
ย่านการวัดของอินพุต	0 to 5 A AC	0 to 600 VAC	Current +/-200 $\mu$ A DC to +/-2 A DC Voltage +/-200 mV DC to +/-300 VDC Resistance 100 Ohm to 10K Ohm	Current +/-200 $\mu$ A DC to +/-2 A DC Voltage +/-200 mV DC to +/-300 VDC Resistance 100 Ohm to 10K Ohm
Zero/Offset	Zero Based	Zero Based	Non Zero Based	Non Zero Based
Setpoint Capability †	No	Yes	No	Form C Relay (Dual) Form A Relay (Quad) Solid State Outputs (Quad)
Communication Capability	No	No	No	RS232 RS485 Modbus DeviceNet Profibus Ethernet w/ICM8
Other Features/Options	Custom Units Overlay	Custom Units Overlay	Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay	Analog Output †, Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay
แหล่งจ่ายไฟ	115/230 VAC	115/230 VAC	85 to 250 VAC or 11 to 36 VDC	85 to 250 VAC or 11 to 36 VDC

\*See website for product information.

† Field Installable Option Card

# QUICK Specs





## มิเตอร์วัดกระแส และแรงดันไฟฟ้า DC

	VOLT/CURRENT PAXH	CUB4CL / LP	PROCESS CUB5P	PAXLCL
				
รายละเอียด	1/8 DIN, AC True RMS Voltage and Current Meter with Output Option Card Capability	Miniature Current Loop and Loop Powered Meters	DC Process meter with Output Option Card Capability	1/8 DIN, Current Loop Meter
ขนาดและรูปร่าง (สูง x กว้าง)	50mm (H) x 97mm (W)	39mm (H) x 75mm (W)	39mm (H) x 75mm (W)	50mm (H) x 97mm (W)
ส่วนแสดงผล	4 1/2 Digit, .56" (14mm) Standard Green or Sunlight Readable Red LED, Adjustable Intensity	3 1/2 Digit, .6" (15mm) Reflective, Green and Red Backlight LCD	5 Digit, .48" (12mm) Reflective, Green and Red Backlight LCD	3 1/2 Digit, .56" (14mm) Red LED
ย่านการวัดของอินพุต	Current +200 $\mu$ A AC to +5 A AC Voltage +200 mV AC to +300 VAC	Current Loop Dual Range 4 to 20 mA DC or 10 to 50 mA DC	0 to 10 VDC 4 to 20 mA DC or 10 to 50 mA DC	Current Loop Dual Range 4 to 20 mA DC or 10 to 50 mA DC
Zero/Offset	Non Zero Based	Non Zero Based	Non Zero Based	Non Zero Based
Setpoint Capability †	Yes	No	Single Form C Relay Dual Sinking	No
Communication Capability	RS232 RS485 Modbus DeviceNet Profibus Ethernet w/ICM8	No	RS232 RS485	No
Other Features/Options	Analog Output †, Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay	No	User Input Min/Max Memory Custom Units Indicator	Custom Units Overlay, Excitation
แหล่งจ่ายไฟ	85 to 250 VAC or 11 to 36 VDC	9 to 28 VDC (CUB4CL) Derives Operating Power from Current Loop 3 Volts Max. (CUB4LP)	9 to 28 VDC	85 to 250 VAC

\*See website for product information.

† Field Installable Option Card

## QUICK Specs

มิเตอร์วัดกระแส และแรงดันไฟฟ้า DC				
PROCESS				
	PAXLPV	DP5P	PAXP	PAXDP
				
รายละเอียด	1/8 DIN, Process Volt Meter	1/8 DIN, Process Meter	1/8 DIN, Process Meter with Output Option Card Capability	1/8 DIN, Dual Input Process Meter with Output Option Card Capability
ขนาดและรูปร่าง (สูง x กว้าง)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)
ส่วนแสดงผล	3 1/2 Digit, .56" (14mm) Red LED	4 1/2 Digit, .56" (14mm) Red LED	4 1/2 Digit, .56" (14mm) Standard Green or Sunlight Readable Red LED, Adjustable Intensity	4 1/2 Digit, .56" (14mm) Sunlight Readable Red LED, Adjustable Intensity
ย่านการวัดของอินพุต	Process Volt 1 to 5 VDC	Process Current/Voltage 0 to 20 mA DC or 0 to 10 VDC	Process Current/Voltage 0 to 20 mA DC or 0 to 10 VDC	Dual Inputs Process Current/Voltage 0 to 20 mA DC/0 to 10 VDC
Zero/Offset	Non Zero Based	Non Zero Based	Non Zero Based	Non Zero Based
Setpoint Capability †	No	No	Form C Relay (Dual) Form A Relay (Quad) Solid State Outputs (Quad)	Form C Relay (Dual) Form A Relay (Quad) Solid State Outputs (Quad)
Communication Capability	No	No	RS232 RS485 Modbus DeviceNet Profibus Ethernet w/ICM8	RS232 RS485 Modbus DeviceNet Profibus Ethernet w/ICM8
Other Features/Options	Custom Units Overlay, Excitation	Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay	Analog Output †, Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay	Analog Output †, Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay
แหล่งจ่ายไฟ	85 to 250 VAC	85 to 250 VAC or 11 to 36 VDC	85 to 250 VAC or 11 to 36 VDC	85 to 250 VAC or 18 to 36 VDC

\*See website for product information.

† Field Installable Option Card

## QUICK Specs

### มิเตอร์วัดกระแส และแรงดันไฟฟ้า DC

#### STRAIN GAGE

##### PAXLSG



##### PAXS























รายละเอียด	1/8 DIN, Strain Gage Meter	1/8 DIN, Strain Gage Meter with Output Option Card Capability
ขนาดและรูปร่าง (สูง x กว้าง)	50mm (H) x 97mm (W)	50mm (H) x 97mm (W)
ส่วนแสดงผล	3 1/2 Digit, .56" (14mm) Red LED	4 1/2 Digit, .56" (14mm) Standard Green or Sunlight Readable Red LED, Adjustable Intensity
ย่านการวัดของอินพุต	Single-ended or Differential Input 0 to 10 mV through 1.999 A	+/- 24 mV DC or +/- 240 mV DC
Zero/Offset	Non Zero Based	Non Zero Based
Setpoint Capability †	No	Form C Relay (Dual) Form A Relay (Quad) Solid State Outputs (Quad)
Communication Capability	No	RS232 RS485 Modbus DeviceNet Profibus Ethernet w/ICM8
Other Features/Options	Custom Units Overlay Excitation,	Analog Output †, Tare, Min/Max Memory, Integrator/Totalizer, Linearizer, Excitation, Custom Units Overlay
แหล่งจ่ายไฟ	115/230 VAC	85 to 250 VAC or 11 to 36 VDC

\*See website for product information.

† Field Installable Option Card

# REPLACEMENT *Guide*

ตารางการเทียบรุ่น ระหว่างมิเตอร์ RED LION รุ่นเก่ากับรุ่นใหม่

WHAT YOU'RE USING NOW		CURRENT PRODUCT	
MODEL NUMBER	FEATURES	MODEL NUMBER	FEATURES
 <b>CUBID / CUBVD</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .35" (9 mm) Reflective LCD</li> <li>■ Power Source: 5 VDC or 7 to 28 VDC</li> <li>■ Measurement: DC Current or Voltage</li> </ul>	 <b>CUB5I / CUB5V</b>	<ul style="list-style-type: none"> <li>■ Display: 5 Digit, .48" (12 mm) Reflective LCD</li> <li>■ Power Source: 9 to 28 VDC</li> <li>■ Measurement: DC Current or Voltage</li> </ul>
 <b>LPPI</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .35" (9 mm) Reflective LCD</li> <li>■ Power Source: Loop Powered</li> <li>■ Measurement: Current Loop</li> </ul>	 <b>CUB4LP</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .6" (15 mm) Reflective LCD</li> <li>■ Power Source: Loop Powered</li> <li>■ Measurement: Current Loop</li> </ul>
 <b>APLI / APLV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: AC or DC Current and Voltage</li> </ul>	 <b>PAXLI / PAXLV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Reflective LCD</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: AC or DC Current and Voltage</li> </ul>
 <b>APLIT / APLHV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: 5 Amp AC Current/600 VAC</li> </ul>	 <b>PAXLIT / PAXLHV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: 5 Amp AC/600 VAC</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>
 <b>APLCL / APLPV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: Current Loop/Process Volt</li> </ul>	 <b>PAXLCL / PAXLPV</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 85 to 250 VAC</li> <li>■ Measurement: Current Loop/Process Volt</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>
 <b>APLSG</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: Strain Gage</li> </ul>	 <b>PAXLSG</b>	<ul style="list-style-type: none"> <li>■ Display: 3 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: Strain Gage</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>
 <b>IMP</b>	<ul style="list-style-type: none"> <li>■ Display: 4 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: Process Signals</li> </ul>	 <b>PAXP</b>	<ul style="list-style-type: none"> <li>■ Display: 6 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 85 to 250 VAC, 11 to 36 VDC, 24 VAC</li> <li>■ Measurement: Process Signals</li> <li>■ Requires Appropriate Option Card</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>
 <b>IMD</b>	<ul style="list-style-type: none"> <li>■ Display: 4 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: DC Current and Voltage</li> </ul>	 <b>PAXD</b>	<ul style="list-style-type: none"> <li>■ Display: 6 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 85 to 250 VAC, 11 to 36 VDC, 24 VAC</li> <li>■ Measurement: DC Current and Voltage</li> <li>■ Requires Appropriate Option Card</li> </ul>
 <b>IMH</b>	<ul style="list-style-type: none"> <li>■ Display: 4 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: 5 Amp AC</li> </ul>	 <b>PAXH</b>	<ul style="list-style-type: none"> <li>■ Display: 6 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 85 to 250 VAC, 11 to 36 VDC, 24 VAC</li> <li>■ Measurement: AC Current and Voltage</li> <li>■ Requires Appropriate Option Card</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>
 <b>IMS</b>	<ul style="list-style-type: none"> <li>■ Display: 4 1/2 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 115/230 VAC</li> <li>■ Measurement: Strain Gage</li> </ul>	 <b>PAXS</b>	<ul style="list-style-type: none"> <li>■ Display: 6 Digit, .56" (14 mm) Red LED</li> <li>■ Power Source: 85 to 250 VAC, 11 to 36 VDC, 24 VAC</li> <li>■ Measurement: Strain Gage</li> <li>■ Requires Appropriate Option Card</li> <li><b>Panel Cut-Out Dimension Differences</b></li> </ul>

Note: Refer to the current product literature, as some differences may exist.

# มิเตอร์วัดกระแส และแรงดันไฟฟ้า

## MODEL PAXLI - PAX LITE CURRENT METERS & MODEL PAXLV - PAX LITE VOLTMETERS



- **FOUR MULTI-RANGE UNITS COVER:**
  - 199.9  $\mu$ A to 1.999 A \*, 199.9 mV (AC or DC)
  - 1.999 V to 300 V (AC or DC)
- **3 1/2-DIGIT, 0.56" (14.2 mm) HIGH LED DISPLAY W/POLARITY**
- **BUILT-IN SCALING PROVISIONS**
- **SELECTABLE DECIMAL POINT LOCATION**
- **AUTO ZEROING CIRCUITS**
- **OVER-RANGE INDICATION**
- **NEMA 4X/IP65 SEALED FRONT BEZEL**
- **OPTIONAL CUSTOM UNITS OVERLAY W/BACKLIGHT**

\* Accessory Shunts Available For Higher Current Ranges.

### GENERAL DESCRIPTION

PAX Lite Current and Volt Meters are premium quality instruments designed for tough industrial applications. With multi-range capability, built-in provision for scaling, and DIP switch selectable decimal points, these meters offer the ultimate in application flexibility. Four models cover your voltage and current indicator needs. The meter can provide direct readout from pressure, speed or flow transducers, or any other variable that can be translated to voltage or current. The built-in scaling allows the display to be scaled to the desired engineering unit.

The 3 1/2 -digit bi-polar display (minus sign displayed when current or voltage is negative) features a 0.56" high, 7-segment LEDs for easy reading. The meter is also available with custom units label capability. Using the PAX label kit (PAXLBK30), the selected label is installed behind the panel, keeping it safe from washdown or other environmental conditions. A DIP switch is used to control the backlight for the units label.

The meters have a NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, allowing the meter to provide a tough yet reliable application solution.

### SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

### DEFINITION OF TERMS

#### INSTALLATION CATEGORY (overvoltage category) I, (CAT I):

Signal level, special equipment or parts of equipment, telecommunication, electronic, etc. with smaller transient overvoltages than Installation Category (overvoltage category) II. (See IEC 664 & IEC 61010)

#### INSTALLATION CATEGORY (overvoltage category) II, (CAT II):

Local level, appliances, portable equipment, etc. with smaller transient overvoltages than Installation Category (overvoltage category) III. (See IEC 664 & IEC 61010)



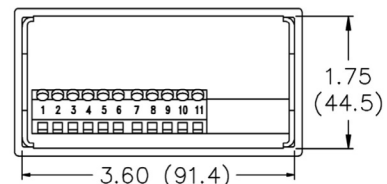
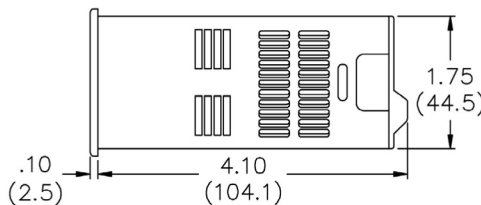
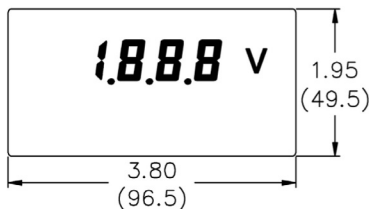
**CAUTION: Risk of Danger.**  
Read complete instructions prior to installation and operation of the unit.



**CAUTION: Risk of electric shock.**

### DIMENSIONS In inches (mm)

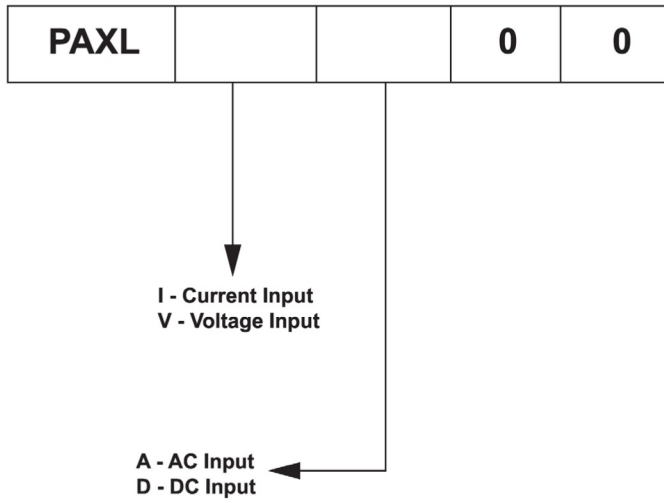
Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.





## วิธีการสั่งซื้อ

### Meter Part Numbers



### Accessories Part Numbers

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Accessories	PAXLBK	Units Label Kit Accessory	PAXLBK30
	APSCM	10 Amp DC Current Shunt	APSCM010
		100 Amp DC Current Shunt	APSCM100

# GENERAL METER SPECIFICATIONS

1. **DISPLAY:** 3 1/2-digit, 0.56" (14.2 mm) high, 7-segment LED, (-) minus sign displayed when current or voltage is negative. Decimal points inserted before 1st, 2nd, or 3rd least significant digits by DIP switch selection.

2. **POWER:** 115/230 VAC, switch selectable. Allowable power line variation  $\pm 10\%$ , 50/60 Hz, 6 VA.

**Isolation:** 2300 Vrms for 1 min. between input and supply

**Working Voltage:** 300 V max., CAT II

3. **INPUT RANGES/RESOLUTION:** (Selectable by jumper connections.):

AC Voltmeters	AC Current Meters	DC Voltmeters	DC Current Meters
0-1.999 V/1 mV	0-199.9 $\mu$ A/0.1 $\mu$ A	$\pm 1.999$ V/1 mV	$\pm 199.9$ $\mu$ A/0.1 $\mu$ A
0-19.99 V/10 mV	0-1.999 mA/1 $\mu$ A	$\pm 19.99$ V/10 mV	$\pm 1.999$ mA/1 $\mu$ A
0-199.9 V/100 mV	0-19.99 mA/10 $\mu$ A	$\pm 199.9$ V/100 mV	$\pm 19.99$ mA/10 $\mu$ A
0-300 V/1 V	0-199.9 mA/100 $\mu$ A	$\pm 300$ V/1 V	$\pm 199.9$ mA/100 $\mu$ A
	0-1.999 A/1 mA		$\pm 1.999$ A/1 mA
	0-199.9 mV/100 $\mu$ V		$\pm 199.9$ mV/100 $\mu$ V

**Working Voltage:** 300 V max., CAT II

4. **ACCURACY:**

**AC Voltmeters:**  $\pm(0.1\%$  of Reading + 3 digits) (45-500 Hz)

**AC Current Meters (45-500 Hz):**

**199.9  $\mu$ A/199.9 mV, 1.999 mA, 19.99 mA:**  $\pm(0.1\%$  of Reading + 3 digits)

**199.9 mA:**  $\pm(0.15\%$  of Reading + 3 digits)

**1 A:**  $\pm(0.5\%$  of Reading + 3 digits)

**DC Voltmeters:**  $\pm(0.1\%$  of Reading + 1 digit)

**DC Current Meters:**

**199.9  $\mu$ A/199.9 mV, 1.999 mA, 19.99 mA:**  $\pm(0.1\%$  of Reading + 1 digit)

**199.9 mA:**  $\pm(0.15\%$  of Reading + 1 digit)

**1.999 A:**  $\pm(0.5\%$  of Reading + 1 digit)

*Note: Any individual range may be recalibrated (scaled) to 0.1% accuracy with appropriate calibration equipment.*

5. **OVER-RANGE INDICATION:** on all modes is indicated by blanking 3 least significant digits.

6. **MAX. VOLTAGE ON LOWEST INPUT RANGE:** 75 VAC or DC (Both voltmeters and current meters).

7. **MAX. VOLTAGE ON TERMINAL BLOCK:** 300 VAC or DC (Both voltmeters and current meters).

8. **MAX. CURRENTS (FOR CURRENT METERS):**

**199.9  $\mu$ A through 19.99 mA:** 10 times max. range current

**199.9 mA:** 1 A

**1.999 A:** 3 A

*Caution: In circuits where fault currents can exceed the maximum shunt current, a fast-blow fuse should be installed in series with the input signal. Otherwise, a slow blow 10 amp fuse is recommended that will allow for start-up over current situations, while still protecting the instrument.*

9. **TEMPERATURE COEFFICIENTS:**

Current meters	Voltmeters
DC: $\pm 100$ PPM/ $^{\circ}$ C	DC: $\pm 75$ PPM/ $^{\circ}$ C
AC: $\pm 200$ PPM/ $^{\circ}$ C	AC: $\pm 150$ PPM/ $^{\circ}$ C

10. **ENVIRONMENTAL CONDITIONS:**

**Operating Temperature:** 0 $^{\circ}$  to 60 $^{\circ}$ C

**Storage Temperature:** -40 $^{\circ}$  to 80 $^{\circ}$ C

**Operating and Storage Humidity:** 85% max. relative humidity (non-condensing)

**Altitude:** Up to 2000 meters

11. **RESPONSE TIME TO STEP CHANGE INPUT:** 1 sec. nominal

12. **READING RATE:** 2.5 readings/sec., nominal

13. **NORMAL MODE REJECTION:** 50 dB 50/60 Hz (DC units only)

14. **COMMON MODE REJECTION:** 110 dB DC or 50/60 Hz (DC units only)

15. **COMMON MODE VOLTAGE (COMM. TO EARTH):** 350 volt peak

16. **CERTIFICATIONS AND COMPLIANCES:**

## SAFETY

UL Recognized Component, File #E179259, UL61010A-1, CSA C22.2 No. 61010-1

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

UL Listed, File #E137808, UL508, CSA C22.2 No. 14-M95

LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards Type 4X Enclosure rating (Face only), UL50

IECEE CB Scheme Test Certificate #UL/8843A/UL

CB Scheme Test Report #04ME11209-20041018

Issued by Underwriters Laboratories, Inc.

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

IP65 Enclosure rating (Face only), IEC 529

## ELECTROMAGNETIC COMPATIBILITY:

Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

### Immunity to Industrial Locations:

Test	Standard	Criterion
Electrostatic discharge	EN 61000-4-2	Criterion A 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion B 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion B 2 kV power 2 kV signal
Surge	EN 61000-4-5	Criterion A 1 kV L-L, 2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Voltage dip/interruptions	EN 61000-4-11	Criterion A 0.5 cycle; 40 % variation
<b>Emissions:</b>		
Emissions	EN 55011	Class B

## Notes:

1. *Criterion A: Normal operation within specified limits.*

2. *Criterion B: Temporary loss of performance from which the unit self-recovers.*

17. **CONNECTIONS:** High compression cage-clamp terminal block

Wire Strip Length: 0.3" (7.5 mm)

Wire Gauge: 30-14 AWG copper wire

Torque: 4.5 inch-lbs (0.51 N-m) max.

18. **CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 use. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Panel gasket and mounting clip included.

19. **WEIGHT:** 0.65 lbs. (0.24 Kg)

## ACCESSORIES

### UNITS LABEL KIT (PAXLBK)

Each meter has a units indicator with backlighting that can be customized using the Units Label Kit. The backlight is controlled by a DIP switch.

### EXTERNAL CURRENT SHUNTS (APSCM)

To measure DC current signals greater than 2 ADC, a shunt must be used. The APSCM010 current shunt converts a maximum 10 ADC signal into 100.0 mV. The APSCM100 current shunt converts a maximum 100 ADC signal into 100.0 mV. The continuous current through the shunt is limited to 115% of the rating.

# Dual Line Display Meter

Model PAX2A

มีเตอร์แบบจอแสดงผล 2 บรรทัด  
สามารถรับสัญญาณได้หลายแบบ



## PAX2A—the next generation in panel meters.

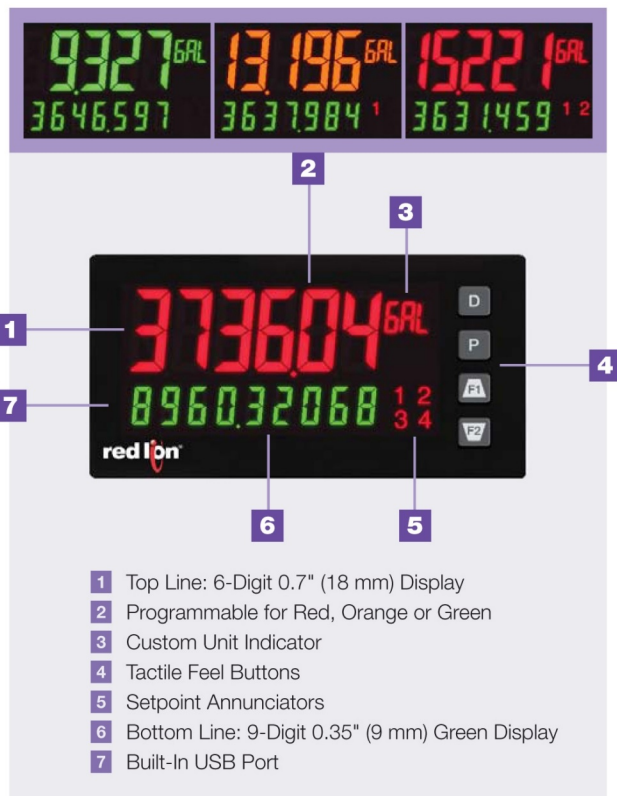
From its dual line display to its universal functionality, the PAX2A is packed full of features that set it apart from any other panel meter. The input, total, min., max. or setpoints can be displayed on the 0.7" high 6-digit main LCD display. The main display also offers three programmable, easy-to-read colors: red, orange and green. The color change can be tied to the setpoints, providing the operator with a visual display of changing conditions in the application. And that's not all! A second display line is a 0.35" high 9-digit, green LCD that can be programmed for any of the above parameters as well. The 9-digit display accommodates totalizing applications that easily exceed the normal 6-digit displays. In addition to the dual displays, the meter also offers a 3-digit programmable custom unit indicator.

Beyond the display, the PAX2A provides the maximum in application flexibility, allowing users to stock just one meter for numerous applications. Featuring universal input, the same meter accepts DC current, DC voltage, process signal, and thermocouple and RTD temperature sensor inputs. Plus, the PAX2A features a universal power input. Whether it's 50 to 250 VAC or 21.6 to 250 VDC, just hook it up.

With its dual display and versatile functionality, the PAX2A delivers an ideal solution for applications that require two parameters to be visualized at the same time. For instance, the PAX2A can read a flow rate through a pipeline while simultaneously totalizing the gallons, or indicate the temperature of an oven while also displaying the setpoint value.

Take the dual line display with color change capability and add the universal capability and other user-friendly features, and you will understand why the PAX2A represents the next generation of panel meters.

- Universal Process Inputs, DC Current, DC Voltage, Process Signals, Resistance, Thermocouples or RTDs
- Universal Power Supply: 50 to 250 VAC or 21.6 to 250 VDC
- Built-in USB Port
- Meter Update Rate up to 160/Second
- Built-in Modbus Communications
- Setpoints: Dual and Quad Relay; Quad Sinking and Sourcing
- Retransmitted Analog Output
- Communications: RS232, RS485, DeviceNet, and Profibus



# Dual Line Strain Gage Meter

Model PAX2S

มิเตอร์ชั่งน้ำหนัก, วัดค่าแรงดัน  
แบบจอแสดงผล 2 บรรทัด



## PAX2S—the next generation in panel meters.

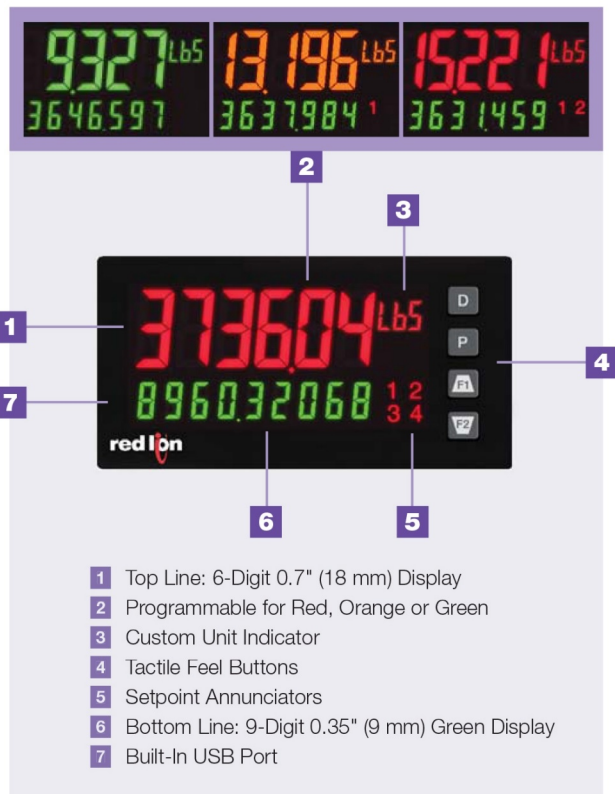
Our next generation panel product line continues to expand as we announce the new Strain Gage Meter, the PAX2S. From its dual line display to its universal power supply, the meter is packed full of features that set it apart from any other meter. The input, gross, tare, total, min, max or setpoints can be displayed on the 0.7" high 6-digit Line 1 of the LCD display. Line 1 of the display also offers three programmable easy-to-read colors: red, orange and green. The color change can be tied to the setpoints; providing the operator with a visual display of changing conditions in the application. Line 2 of the display is a 0.35" high 9-digit, green LCD that can be programmed for any of the above parameters as well. The 9-digit display allows for totalizing applications that easily exceed the normal 6-digit displays. In addition to the dual line display, the meter also offers a 3-digit programmable mnemonic, which allows the user to add identification to the display value.

Beyond the display, the PAX2S provides the maximum in application flexibility, allowing users to stock just one meter for numerous applications. Users will find the strain gage input easy to connect to load cell, strain gage or pressure sensors. Plus, the PAX2S features a universal power input. Whether it's 40 to 250 VAC or 21.6 to 250 VDC, polarity does not matter, just hook it up.

With its dual line display and versatile functionality, the PAX2S delivers an ideal solution for applications that require two parameters to be visualized at the same time. For instance, the PAX2S can read a net weight while simultaneously displaying the material weight being added to the proces.

Take the dual line display with color change capability, add the universal power input capability and other user-friendly features, and you will understand why the PAX2S represents the next generation of panel meters.

- Load cells, Strain Gage, and Pressure Sensors
- Universal Power Supply: 40 to 250 VAC or 21.6 to 250 VDC
- Built-in USB Port
- Meter Update Rate up to 160/Second
- Built-in Modbus Communications
- Setpoints: Dual and Quad Relay; Quad Sinking and Sourcing
- Retransmitted Analog Output
- Communications: RS232, RS485, DeviceNet, and Profibus



# มิเตอร์คุณภาพสูงรุ่นยอดนิยมน PAX Series จากประเทศอเมริกา

## MODEL PAX – 1/8 DIN ANALOG INPUT PANEL METERS

**MODELS: VOLT/CURRENT (PAXD) PROCESS (PAXP) AC TRUE RMS VOLT AND CURRENT (PAXH) STRAIN GAGE (PAXS) THERMOCOUPLE/RTD (PAXT)**



- PROCESS, VOLTAGE, CURRENT, TEMPERATURE, AND STRAIN GAGE INPUTS
- 5-DIGIT 0.56" RED SUNLIGHT READABLE DISPLAY
- VARIABLE INTENSITY DISPLAY
- 16 POINT SCALING FOR NON-LINEAR PROCESSES
- PROGRAMMABLE FUNCTION KEYS/USER INPUTS
- 9 DIGIT TOTALIZER (INTEGRATOR) WITH BATCHING
- OPTIONAL CUSTOM UNITS OVERLAY W/BACKLIGHT
- FOUR SETPOINT ALARM OUTPUTS (W/OPTION CARD)
- COMMUNICATION AND BUS CAPABILITIES (W/OPTION CARD)
- RETRANSMITTED ANALOG OUTPUT (W/OPTION CARD)
- CRIMSON PROGRAMMING SOFTWARE
- NEMA 4X/IP65 SEALED FRONT BEZEL

### GENERAL DESCRIPTION

The PAX<sup>®</sup> Analog Panel Meters offer many features and performance capabilities to suit a wide range of industrial applications. Available in five different models to handle various analog inputs, including DC Voltage/Current, AC Voltage/Current, Process, Temperature, and Strain Gage Inputs. Refer to pages 4 through 6 for the details on the specific models. The optional plug-in output cards allow the opportunity to configure the meter for present applications, while providing easy upgrades for future needs.

The meters employ a bright 0.56" LED display. The unit is available with a red sunlight readable or a standard green LED. The intensity of display can be adjusted from dark room applications up to sunlight readable, making it ideal for viewing in bright light applications.

The meters provide a MAX and MIN reading memory with programmable capture time. The capture time is used to prevent detection of false max or min readings which may occur during start-up or unusual process events.

The signal totalizer (integrator) can be used to compute a time-input product. This can be used to provide a readout of totalized flow, calculate service intervals of motors or pumps, etc. The totalizer can also accumulate batch weighing operations.

The meters have four setpoint outputs, implemented on Plug-in option cards. The Plug-in cards provide dual FORM-C relays (5A), quad FORM-A (3A), or either quad sinking or quad sourcing open collector logic outputs. The setpoint alarms can be configured to suit a variety of control and alarm requirements.

Communication and Bus Capabilities are also available as option cards. These include RS232, RS485, Modbus, DeviceNet, and Profibus-DP. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the meters have a feature that allows a remote computer to directly control the outputs of the meter. With an RS232 or RS485 card installed, it is possible to configure the meter using a Windows<sup>®</sup> based program. The configuration data can be saved to a file for later recall.

A linear DC output signal is available as an optional Plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range and can track either the input, totalizer, max or min readings.

Once the meters have been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible.

The meters have been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.

### SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.



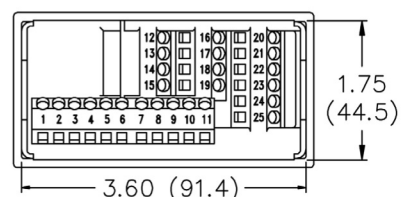
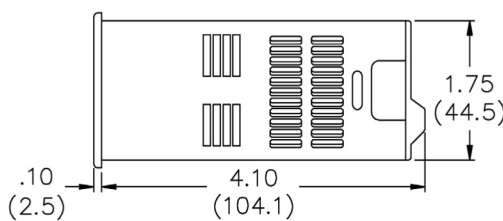
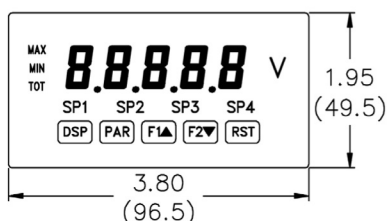
**CAUTION: Risk of Danger**  
Read complete instructions prior to installation and operation of the unit.



**CAUTION: Risk of electric shock.**

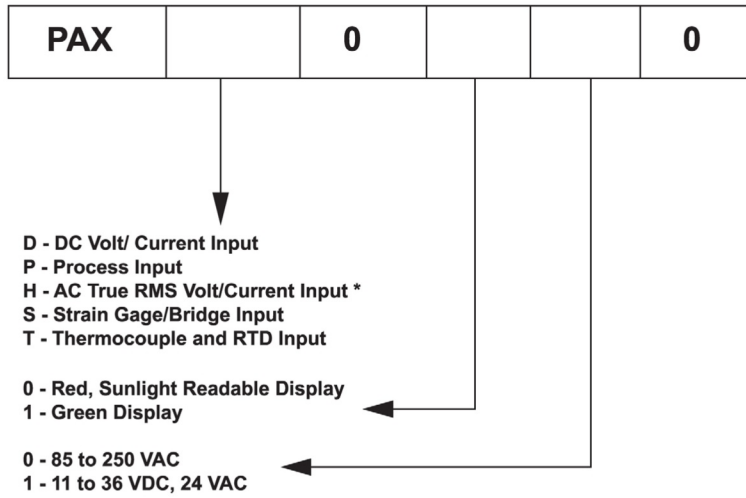
### DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.



## วิธีการสั่งซื้อ

### Meter Part Numbers



\* PAXH is only available with 85-250 VAC power supply.

### Option Card and Accessories Part Numbers

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
<b>Optional Plug-In Cards</b>	<b>PAXCDS</b>	Dual Setpoint Relay Output Card	PAXCDS10
		Quad Setpoint Relay Output Card	PAXCDS20
		Quad Setpoint Sinking Open Collector Output Card	PAXCDS30
		Quad Setpoint Sourcing Open Collector Output Card	PAXCDS40
	<b>PAXCDC</b>	RS485 Serial Communications Output Card with Terminal Block	PAXCDC10
		Extended RS485 Serial Communications Output Card with Dual RJ11 Connector	PAXCDC1C
		RS232 Serial Communications Output Card with Terminal Block	PAXCDC20
		Extended RS232 Serial Communications Output Card with 9 Pin D Connector	PAXCDC2C
		DeviceNet Communications Card	PAXCDC30
		Modbus Communications Card	PAXCDC40
Extended Modbus Communications Card with Dual RJ11 Connector		PAXCDC4C	
Profibus-DP Communications Card	PAXCDC50		
<b>PAXCDL</b>	Analog Output Card	PAXCDL10	
<b>Accessories</b>	<b>PAXLBK</b>	Units Label Kit Accessory (Not required for PAXT)	PAXLBK10
	<b>SFCRD*</b>	Crimson 2 PC Configuration Software for Windows 98, ME, 2000 and XP	SFCRD200

\*Crimson software is available for download from <http://www.redlion.net/>

- หน้าจอแสดงผลเป็นแบบ Display LED สีแดง 5 digits สามารถมองเห็นได้ชัดเจน โดยการปรับความสว่างของตัวแสดงผล
- มีแรงดันไฟเลี้ยงสำหรับ Transmitter
- สามารถเก็บบันทึกค่าวัดสูงสุด และต่ำสุดได้
- มี Analog Output แปรผันตามค่าที่วัดได้ Retransmission
- สามารถทำการปรับแต่ง Calibration ได้ละเอียด ถึง 16 จุด (Linearization)
- มีฟังก์ชันการทำ Totalizer แสดงผลรวมของค่า Input
- สามารถสื่อสารผ่าน RS232, RS485, MODBUS, PROFIBUS
- มี Alarm Output ได้ถึง 4 Alarms สามารถตั้งค่า Alarm, ค่า Hysteresis, ฟังก์ชัน Alarm, ค่าหน่วงเวลา และตั้ง Reset Alarm เป็นแบบอัตโนมัติ หรือ Reset ด้วยมือ
- มีระบบป้องกันการเปลี่ยนค่าด้วยพาสเวิร์ด
- มีระดับป้องกัน IP65

# GENERAL METER SPECIFICATIONS

1. **DISPLAY:** 5 digit, 0.56" (14.2 mm) red sunlight readable or standard green LEDs, (-19999 to 99999)
2. **POWER:**  
AC Versions:  
AC Power: 85 to 250 VAC, 50/60 Hz, 15 VA  
Isolation: 2300 Vrms for 1 min. to all inputs and outputs.  
DC Versions (Not available on PAXH):  
DC Power: 11 to 36 VDC, 11 W  
(derate operating temperature to 40° C if operating <15 VDC and three plug-in option cards are installed)  
AC Power: 24 VAC,  $\pm 10\%$ , 50/60 Hz, 15 VA  
Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working).
3. **ANNUNCIATORS:**  
MAX - maximum readout selected  
MIN - minimum readout selected  
TOT - totalizer readout selected, flashes when total overflows  
SP1 - setpoint alarm 1 is active  
SP2 - setpoint alarm 2 is active  
SP3 - setpoint alarm 3 is active  
SP4 - setpoint alarm 4 is active  
Units Label - optional units label backlight
4. **KEYPAD:** 3 programmable function keys, 5 keys total
5. **A/D CONVERTER:** 16 bit resolution
6. **UPDATE RATES:**  
A/D conversion rate: 20 readings/sec.  
Step response: 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)  
700 msec. max. (digital filter disabled, internal zero correction enabled)  
PAXH Only: 1 sec max. to within 99% of final readout value (digital filter disabled)  
Display update rate: 1 to 20 updates/sec.  
Setpoint output on/off delay time: 0 to 3275 sec.  
Analog output update rate: 0 to 10 sec  
Max./Min. capture delay time: 0 to 3275 sec.
7. **DISPLAY MESSAGES:**  
"LOL" - Appears when measurement exceeds + signal range.  
"ULUL" - Appears when measurement exceeds - signal range  
PAXT: "SHrt" - Appears when shorted sensor is detected. (RTD only)  
PAXT: "OPEN" - Appears when open sensor is detected.  
". . ." - Appears when display values exceed + display range.  
"- . . ." - Appears when display values exceed - display range.  
"E . . ." - Appears when Totalizer exceeds 9 digits.  
"h . . ." - Denotes the high order display of the Totalizer.
8. **INPUT CAPABILITIES:** See specific product specifications, pages 4-6
9. **EXCITATION POWER:** See specific product specifications, pages 4-6
10. **LOW FREQUENCY NOISE REJECTION:** (Does not apply to PAXH)  
Normal Mode: > 60 dB @ 50 or 60 Hz  $\pm 1\%$ , digital filter off  
Common Mode: >100 dB, DC to 120 Hz
11. **USER INPUTS:** Three programmable user inputs  
Max. Continuous Input: 30 VDC  
Isolation To Sensor Input Common: Not isolated. (Not PAXH)  
PAXH: Isolation to Sensor Input Common: 1400 Vrms for 1 min.  
Working Voltage: 125 V  
Response Time: 50 msec. max.  
Logic State: Jumper selectable for sink/source logic
- | INPUT STATE | SINKING INPUTS<br>22 K $\Omega$ pull-up to +5 V | SOURCING INPUTS<br>22 K $\Omega$ pull-down |
|-------------|---|--|
| Active      | $V_{IN} < 0.9$ VDC                              | $V_{IN} > 3.6$ VDC                         |
| Inactive    | $V_{IN} > 3.6$ VDC                              | $V_{IN} < 0.9$ VDC                         |
12. **TOTALIZER:**  
Function:  
Time Base: second, minute, hour, or day  
Batch: Can accumulate (gate) input display from a user input  
Time Accuracy: 0.01% typical  
Decimal Point: 0 to 0.0000  
Scale Factor: 0.001 to 65.000  
Low Signal Cut-out: -19,999 to 99,999  
Total: 9 digits, display alternates between high order and low order readouts
13. **CUSTOM LINEARIZATION:**  
Data Point Pairs: Selectable from 2 to 16  
Display Range: -19,999 to 99,999  
Decimal Point: 0 to 0.0000  
PAXT: Ice Point Compensation: user value (0.00 to 650.00  $\mu\text{V}/^\circ\text{C}$ )
14. **MEMORY:** Nonvolatile E<sup>2</sup>PROM retains all programmable parameters and display values.
15. **ENVIRONMENTAL CONDITIONS:**  
Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)  
Vibration According to IEC 68-2-6: Operational 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2g's.  
Shock According to IEC 68-2-27: Operational 25 g (10g relay), 11 msec in 3 directions.  
Storage Temperature Range: -40 to 60°C  
Operating and Storage Humidity: 0 to 85% max. RH non-condensing  
Altitude: Up to 2000 meters
16. **CERTIFICATIONS AND COMPLIANCES:**  
**SAFETY**  
UL Recognized Component, File #E179259, UL61010A-1, CSA C22.2 No. 61010-1  
PAXT Only: File # E156876, UL873, CSA C22.2 No. 24  
Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.  
UL Listed, File # E137808, UL508, CSA C22.2 No. 14-M95  
LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards  
Type 4X Enclosure rating (Face only), UL50  
IECEE CB Scheme Test Certificate #US/8843A/UL  
CB Scheme Test Report #04ME11209-20041018  
Issued by Underwriters Laboratories, Inc.  
IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part I  
IP65 Enclosure rating (Face only), IEC 529  
IP20 Enclosure rating (Rear of unit), IEC 529
- ELECTROMAGNETIC COMPATIBILITY**
- Immunity to EN 50082-2**
- |                                   |              |  |
|-----------------------------------|--------------|--|
| Electrostatic discharge           | EN 61000-4-2 | Level 2; 4 Kv contact<br>Level 3; 8 Kv air                       |
| Electromagnetic RF fields         | EN 61000-4-3 | Level 3; 10 V/m <sup>1</sup><br>80 MHz - 1 GHz                   |
| Fast transients (burst)           | EN 61000-4-4 | Level 4; 2 Kv I/O<br>Level 3; 2 Kv power                         |
| RF conducted interference         | EN 61000-4-6 | Level 3; 10 V/rms<br>150 KHz - 80 MHz                            |
| Simulation of cordless telephones | ENV 50204    | Level 3; 10 V/m<br>900 MHz $\pm 5$ MHz<br>200 Hz, 50% duty cycle |
- Emissions to EN 50081-2**
- |                 |          |  |
|-----------------|----------|--|
| RF interference | EN 55011 | Enclosure class A<br>Power mains class A |
|-----------------|----------|--|
- Notes:*  
1. *Self-recoverable loss of performance during EMI disturbance at 10 V/m: Measurement input and/or analog output signal may deviate during EMI disturbance.*  
*For operation without loss of performance: Unit is mounted in a metal enclosure (Buckeye SM7013-0 or equivalent) I/O and power cables are routed in metal conduit connected to earth ground.*  
*Refer to EMC Installation Guidelines section of the bulletin for additional information.*
17. **CONNECTIONS:** High compression cage-clamp terminal block  
Wire Strip Length: 0.3" (7.5 mm)  
Wire Gauge: 30-14 AWG copper wire  
Torque: 4.5 inch-lbs (0.51 N-m) max.
18. **CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 outdoor use. IP20 Touch safe. Installation Category II, Pollution Degree 2. One piece bezel/case. Flame resistant. Synthetic rubber keypad. Panel gasket and mounting clip included.
19. **WEIGHT:** 10.4 oz. (295 g)

# MODEL PAXD - UNIVERSAL DC INPUT

รับสัญญาณอินพุตได้ทั้งค่ากระแส ค่าแรงดัน  
และค่าความต้านทาน

- FOUR VOLTAGE RANGES (300 VDC Max)
- FIVE CURRENT RANGES (2A DC Max)
- THREE RESISTANCE RANGES (10K Ohm Max)
- SELECTABLE 24 V, 2 V, 1.75 mA EXCITATION

## PAXD SPECIFICATIONS

### INPUT RANGES:

INPUT RANGE	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	IMPEDANCE/ COMPLIANCE	MAX CONTINUOUS OVERLOAD	RESOLUTION
±200 µADC	0.03% of reading +0.03 µA	0.12% of reading +0.04µA	1.11 Kohm	15 mA	10 nA
±2 mADC	0.03% of reading +0.3 µA	0.12% of reading +0.4 µA	111 ohm	50 mA	0.1 µA
±20 mADC	0.03% of reading +3µA	0.12% of reading +4 µA	11.1 ohm	150 mA	1 µA
±200 mADC	0.05% of reading +30 µA	0.15% of reading +40 µA	1.1 ohm	500 mA	10 µA
±2 ADC	0.5% of reading +0.3 mA	0.7% of reading +0.4 mA	0.1 ohm	3 A	0.1 mA
±200 mVDC	0.03% of reading +30 µV	0.12% of reading +40 µV	1.066 Mohm	100 V	10 µV
±2 VDC	0.03% of reading +0.3 mV	0.12% of reading +0.4 mV	1.066 Mohm	300 V	0.1 mV
±20 VDC	0.03% of reading +3 mV	0.12% of reading +4 mV	1.066 Mohm	300 V	1 mV
±300 VDC	0.05% of reading +30 mV	0.15% of reading +40 mV	1.066 Mohm	300 V	10 mV
100 ohm	0.05% of reading +30 Mohm	0.2% of reading +40 Mohm	0.175 V	30 V	0.01 ohm
1000 ohm	0.05% of reading +0.3 ohm	0.2% of reading +0.4 ohm	1.75 V	30 V	0.1 ohm
10 Kohm	0.05% of reading +1 ohm	0.2% of reading +1.5 ohm	17.5 V	30 V	1 ohm

\* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

### EXCITATION POWER:

Transmitter Power: 24 VDC, ±5%, regulated, 50 mA max.  
Reference Voltage: 2 VDC, ± 2%  
Compliance: 1 kohm load min. (2 mA max.)  
Temperature coefficient: 40 ppm/°C max.  
Reference Current: 1.75 mADC, ± 2%  
Compliance: 10 kohm load max.  
Temperature coefficient: 40 ppm/°C max.

# MODEL PAXP - PROCESS INPUT

รับสัญญาณอินพุตมาตรฐานได้ทั้ง 4-20 mA,  
0-20 mA และ 0-10 VDC

- DUAL RANGE INPUT (20 mA or 10 VDC)
- 24 VDC TRANSMITTER POWER

## PAXP SPECIFICATIONS

### SENSOR INPUTS:

INPUT (RANGE)	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	IMPEDANCE/ COMPLIANCE	MAX CONTINUOUS OVERLOAD	DISPLAY RESOLUTION
20 mA (-2 to 26 mA)	0.03% of reading +2 µA	0.12% of reading +3 µA	20 ohm	150 mA	1 µA
10 VDC (-1 to 13 VDC)	0.03% of reading +2 mV	0.12% of reading +3 mV	500 Kohm	300 V	1 mV

\* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85%RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

### EXCITATION POWER:

Transmitter Power: 24 VDC, ±5%, regulated, 50 mA max.




# MODEL PAXH - AC TRUE RMS VOLT AND CURRENT

รับสัญญาณอินพุต ได้ทั้ง DC และ AC  
สามารถรับค่ากระแสจาก CT (Current  
Transformer) ได้ถึง 5 Amp

- FOUR VOLTAGE RANGES (300 VAC Max)
- FIVE CURRENT RANGES (5 A Max)
- ACCEPTS AC OR DC COUPLED INPUTS
- THREE WAY ISOLATION: POWER, INPUT AND OUTPUTS

## PAXH SPECIFICATIONS

### INPUT RANGES:

 Isolation To Option Card Commons and User Input Commons: 125 Vrms  
Isolation To AC Power Terminals: 250 Vrms

INPUT RANGE	ACCURACY*	IMPEDANCE (60 Hz)	MAX CONTINUOUS OVERLOAD	MAX DC BLOCKING	RESOLUTION
200 mV	0.1% of reading +0.4 mV	686 Kohm	30 V	±10 V	0.01 mV
2 V	0.1% of reading +2 mV	686 Kohm	30 V	±50 V	0.1 mV
20 V	0.1% of reading +20 mV	686 Kohm	300 V	±300 V	1 mV
300 V	0.2% of reading +0.3 V	686 Kohm	300 V	±300 V***	0.1 V
200 µA	0.1% of reading +0.4 µA	1.11 Kohm	15 mA	±15 mA	0.01 µA
2 mA	0.1% of reading +2 µA	111 ohm	50 mA	±50 mA	0.1 µA
20 mA	0.1% of reading +20 µA	11.1 ohm	150 mA	±150 mA	1 µA
200 mA	0.1% of reading +0.2 mA	1.1 ohm	500 mA	±500 mA	10 µA
5 A	0.5% of reading +5 mA	0.02 ohm	7 A**	±7 A***	1 mA

\*Conditions for accuracy specification:

- 20 minutes warmup
- 18-28°C temperature range, 10-75% RH non-condensing
- 50 Hz - 400 Hz sine wave input
- 1% to 100% of range
- Add 0.1% reading + 20 counts error over 0-50°C range
- Add 0.2% reading + 10 counts error for crest factors up to 3, add 1% reading up to 5
- Add 0.5% reading + 10 counts of DC component
- Add 1% reading + 20 counts error over 20 Hz to 10 KHz range

\*\* Non-repetitive surge rating: 15 A for 5 seconds

\*\*\* Inputs are direct coupled to the input divider and shunts. Input signals with high DC component levels may reduce the usable range.

**MAX CREST FACTOR (Vp/VRMS):** 5 @ Full Scale Input

**INPUT COUPLING:** AC or AC and DC

**INPUT CAPACITANCE:** 10 pF

**COMMON MODE VOLTAGE:** 125 VAC working

**COMMON MODE REJECTION:** (DC to 60 Hz) 100 dB

# MODEL PAXS - STRAIN GAGE INPUT

รับ Input mV จาก Load Cell  
หรือ Pressure

- LOAD CELL, PRESSURE AND TORQUE BRIDGE INPUTS
- DUAL RANGE INPUT: ±24 mV OR ±240 mV
- SELECTABLE 5 VDC OR 10 VDC BRIDGE EXCITATION
- PROGRAMMABLE AUTO-ZERO TRACKING

## PAXS SPECIFICATIONS

### SENSOR INPUTS:

INPUT RANGE	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	IMPEDANCE	MAX CONTINUOUS OVERLOAD	RESOLUTION
±24 mVDC	0.02% of reading +3 µV	0.07% of reading +4 µV	100 Mohm	30 V	1 µV
±240 mVDC	0.02% of reading +30 µV	0.07% of reading +40 µV	100 Mohm	30 V	10 µV

\* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

**CONNECTION TYPE:** 4-wire bridge (differential)  
2-wire (single-ended)

**COMMON MODE RANGE** (w.r.t. input common): 0 to +5 VDC  
Rejection: 80 dB (DC to 120 Hz)

**BRIDGE EXCITATION :**

Jumper Selectable: 5 VDC @ 65 mA max., ±2%

10 VDC @ 125 mA max., ±2%

Temperature coefficient (ratio metric): 20 ppm/°C max.

# MODEL PAXT - THERMOCOUPLE AND RTD INPUT

## สัญญาณที่เข้า Thermocouple และ RTD

- THERMOCOUPLE AND RTD INPUTS
- CONFORMS TO ITS-90 STANDARDS
- CUSTOM SCALING FOR NON-STANDARD PROBES
- TIME-TEMPERATURE INTEGRATOR

### PAXT SPECIFICATIONS

**READOUT:**

Resolution: Variable: 0.1, 0.2, 0.5, or 1, 2, or 5 degrees  
 Scale: F or C  
 Offset Range: -19,999 to 99,999 display units

**THERMOCOUPLE INPUTS:**

Input Impedance: 20 MΩ  
 Lead Resistance Effect: 0.03μV/ohm  
 Max. Continuous Overvoltage: 30 V

**RTD INPUTS:**

Type: 3 or 4 wire, 2 wire can be compensated for lead wire resistance  
 Excitation current: 100 ohm range: 165 μA  
 10 ohm range: 2.6 mA  
 Lead resistance: 100 ohm range: 10 ohm/lead max.  
 10 ohm range: 3 ohms/lead max.  
 Max. continuous overload: 30 V

INPUT TYPE	RANGE	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	STANDARD	WIRE COLOR	
					ANSI	BS 1843
T	-200 to 400°C -270 to -200°C	1.2°C **	2.1°C	ITS-90	(+) blue (-) red	(+) white (-) blue
E	-200 to 871°C -270 to -200°C	1.0°C **	2.4°C	ITS-90	(+) purple (-) red	(+) brown (-) blue
J	-200 to 760°C	1.1°C	2.3°C	ITS-90	(+) white (-) red	(+) yellow (-) blue
K	-200 to 1372°C -270 to -200°C	1.3°C **	3.4°C	ITS-90	(+) yellow (-) red	(+) brown (-) blue
R	-50 to 1768°C	1.9°C	4.0°C	ITS-90	no standard	(+) white (-) blue
S	-50 to 1768°C	1.9°C	4.0°C	ITS-90	no standard	(+) white (-) blue
B	100 to 300°C 300 to 1820°C	3.9°C 2.8°C	5.7°C 4.4°C	ITS-90	no standard	no standard
N	-200 to 1300°C -270 to -200°C	1.3°C **	3.1°C	ITS-90	(+) orange (-) red	(+) orange (-) blue
C (W5/W26)	0 to 2315°C	1.9°C	6.1°C	ASTM E988-90***	no standard	no standard

INPUT TYPE	RANGE	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	STANDARD ***
100 ohm Pt alpha = .00385	-200 to 850°C	0.4°C	1.6°C	IEC 751
100 ohm Pt alpha = .003919	-200 to 850°C	0.4°C	1.6°C	no official standard
120 ohm Nickel alpha = .00672	-80 to 260°C	0.2°C	0.5°C	no official standard
10 ohm Copper alpha = .00427	-100 to 260°C	0.4°C	0.9°C	no official standard

**CUSTOM RANGE:** Up to 16 data point pairs

Input range: -10 to 65 mV  
 0 to 400 ohms, high range  
 0 to 25 ohms, low range

Display range: -19999 to 99999

INPUT TYPE	RANGE	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)
Custom mV range	-10 to 65mV (1 μV res.)	0.02% of reading + 4μV	0.12% of reading + 5μV
Custom 100 ohm range	0 to 400 Ω (10 MΩ res.)	0.02% of reading + 0.04 Ω	0.12% of reading + 0.05 Ω
Custom 10 ohm range	0 to 25 Ω (1 MΩ res.)	0.04% of reading + 0.005 Ω	0.20% of reading + 0.007 Ω

\*After 20 min. warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 15 to 75% RH environment; and Accuracy over a 0 to 50°C and 0 to 85% RH (non condensing) environment. Accuracy specified over the 0 to 50°C operating range includes meter tempco and ice point tracking effects. The specification includes the A/D conversion errors, linearization conformity, and thermocouple ice point compensation. Total system accuracy is the sum of meter and probe errors. Accuracy may be improved by field calibrating the meter readout at the temperature of interest.

\*\* The accuracy over the interval -270 to -200°C is a function of temperature, ranging from 1°C at -200°C and degrading to 7°C at -270°C. Accuracy may be improved by field calibrating the meter readout at the temperature of interest.

\*\*\* These curves have been corrected to ITS-90.

## ACCESSORIES

**UNITS LABEL KIT (PAXLBK) - Not required for PAXT**

Each meter has a units indicator with backlighting that can be customized using the Units Label Kit. The backlight is controlled in the programming.

Each PAXT meter is shipped with °F and °C overlay labels which can be installed into the meter's bezel display assembly.

**EXTERNAL CURRENT SHUNTS (APSCM)**

To measure DC current signals greater than 2 ADC, a shunt must be used. The APSCM010 current shunt converts a maximum 10 ADC signal into 100.0 mV. The APSCM100 current shunt converts a maximum 100 ADC signal into 100.0 mV. The continuous current through the shunt is limited to 115% of the rating.

# OPTIONAL PLUG-IN OUTPUT CARDS

## สามารถเพิ่ม Option Card Output ได้ตามต้องการ



**WARNING: Disconnect all power to the unit before installing Plug-in cards.**

### Adding Option Cards

The PAX and MPAX series meters can be fitted with up to three optional plug-in cards. The details for each plug-in card can be reviewed in the specification section below. Only one card from each function type can be installed at one time. The function types include Setpoint Alarms (PAXCDS), Communications (PAXCDC), and Analog Output (PAXCDL). The plug-in cards can be installed initially or at a later date.

### PAXH Isolation Specifications For All Option Cards

**Isolation To Sensor Commons:** 1400 Vrms for 1 min.

Working Voltage: 125 V

**Isolation to User Input Commons:** 500 Vrms for 1 min.

Working Voltage 50 V

### COMMUNICATION CARDS (PAXCDC)

A variety of communication protocols are available for the PAX and MPAX series. Only one of these cards can be installed at a time. When programming the unit via RLCPro, a Windows® based program, the RS232 or RS485 Cards must be used.

PAXCDC10 - RS485 Serial	PAXCDC40 - Modbus
PAXCDC20 - RS232 Serial	PAXCDC50 - Profibus-DP
PAXCDC30 - DeviceNet	

#### SERIAL COMMUNICATIONS CARD

**Type:** RS485 or RS232

**Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

**Data:** 7/8 bits

**Baud:** 300 to 19,200

**Parity:** no, odd or even

**Bus Address:** Selectable 0 to 99, Max. 32 meters per line (RS485)

**Transmit Delay:** Selectable for 2 to 50 msec or 50 to 100 msec (RS485)

#### DEVICENET™ CARD

**Compatibility:** Group 2 Server Only, not UCMM capable

**Baud Rates:** 125 Kbaud, 250 Kbaud, and 500 Kbaud

**Bus Interface:** Phillips 82C250 or equivalent with MIS wiring protection per DeviceNet™ Volume I Section 10.2.2.

**Node Isolation:** Bus powered, isolated node

**Host Isolation:** 500 Vrms for 1 minute (50 V working) between DeviceNet™ and meter input common.

#### MODBUS CARD

**Type:** RS485; RTU and ASCII MODBUS modes

**Isolation To Sensor & User Input Commons:** 500 Vrms for 1 minute.

Working Voltage: 50 V. Not isolated from all other commons.

**Baud Rates:** 300 to 38400.

**Data:** 7/8 bits

**Parity:** No, Odd, or Even

**Addresses:** 1 to 247.

**Transmit Delay:** Programmable; See Transmit Delay explanation.

#### PROFIBUS-DP CARD

**Fieldbus Type:** Profibus-DP as per EN 50170, implemented with Siemens SPC3 ASIC

**Conformance:** PNO Certified Profibus-DP Slave Device

**Baud Rates:** Automatic baud rate detection in the range 9.6 Kbaud to 12 Mbaud

**Station Address:** 0 to 126, set by the master over the network. Address stored in non-volatile memory.

**Connection:** 9-pin Female D-Sub connector

**Network Isolation:** 500 Vrms for 1 minute (50 V working) between Profibus network and sensor and user input commons. Not isolated from all other commons.

### PROGRAMMING SOFTWARE

The Crimson® software is a Windows® based program that allows configuration of the PAX® meter from a PC. Crimson offers standard drop-down menu commands, that make it easy to program the meter. The meter's program can then be saved in a PC file for future use. A PAX® serial plug-in card is required to program the meter using the software.

### SETPOINT CARDS (PAXCDS)

The PAX and MPAX series has 4 available setpoint alarm output plug-in cards. Only one of these cards can be installed at a time. (Logic state of the outputs can be reversed in the programming.) These plug-in cards include:

PAXCDS10 - Dual Relay, FORM-C, Normally open & closed

PAXCDS20 - Quad Relay, FORM-A, Normally open only

PAXCDS30 - Isolated quad sinking NPN open collector

PAXCDS40 - Isolated quad sourcing PNP open collector

#### DUAL RELAY CARD

**Type:** Two FORM-C relays

**Isolation To Sensor & User Input Commons:** 2000 Vrms for 1 min.

Working Voltage: 240 Vrms

**Contact Rating:**

One Relay Energized: 5 amps @ 120/240 VAC or 28 VDC (resistive load),

1/8 HP @120 VAC, inductive load

Total current with both relays energized not to exceed 5 amps

**Life Expectancy:** 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads

#### QUAD RELAY CARD

**Type:** Four FORM-A relays

**Isolation To Sensor & User Input Commons:** 2300 Vrms for 1 min.

Working Voltage: 250 Vrms

**Contact Rating:**

One Relay Energized: 3 amps @ 240 VAC or 30 VDC (resistive load), 1/10

HP @120 VAC, inductive load

Total current with all four relays energized not to exceed 4 amps

**Life Expectancy:** 100K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads

#### QUAD SINKING OPEN COLLECTOR CARD

**Type:** Four isolated sinking NPN transistors.

**Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

**Rating:** 100 mA max @  $V_{SAT} = 0.7$  V max.  $V_{MAX} = 30$  V

#### QUAD SOURCING OPEN COLLECTOR CARD

**Type:** Four isolated sourcing PNP transistors.

**Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

**Rating:** Internal supply: 24 VDC  $\pm 10\%$ , 30 mA max. total

External supply: 30 VDC max., 100 mA max. each output

#### ALL FOUR SETPOINT CARDS

**Response Time:** 200 msec. max. to within 99% of final readout value (digital filter and internal zero correction disabled)

700 msec. max. (digital filter disabled, internal zero correction enabled)

### LINEAR DC OUTPUT (PAXCDL)

Either a 0(4)-20 mA or 0-10 V retransmitted linear DC output is available from the analog output plug-in card. The programmable output low and high scaling can be based on various display values. Reverse slope output is possible by reversing the scaling point positions.

PAXCDL10 - Retransmitted Analog Output Card

#### ANALOG OUTPUT CARD

**Types:** 0 to 20 mA, 4 to 20 mA or 0 to 10 VDC

**Isolation To Sensor & User Input Commons:** 500 Vrms for 1 min.

Working Voltage: 50 V. Not Isolated from all other commons.

**Accuracy:** 0.17% of FS (18 to 28°C); 0.4% of FS (0 to 50°C)

**Resolution:** 1/3500

**Compliance:** 10 VDC: 10 K $\Omega$  load min., 20 mA: 500  $\Omega$  load max.

**Powered:** Self-powered

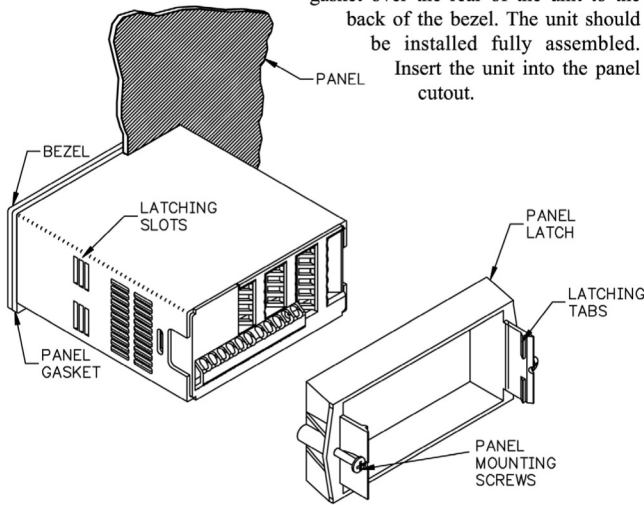
**Update time:** 200 msec. max. to within 99% of final output value (digital filter and internal zero correction disabled)

700 msec. max. (digital filter disabled, internal zero correction enabled)

# 1.0 INSTALLING THE METER

## Installation

The PAX meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.



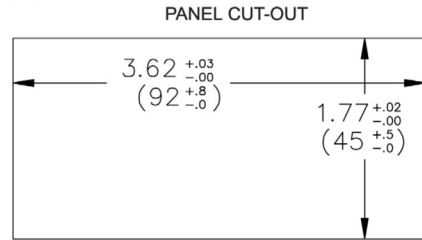
While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

## Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.



# 2.0 SETTING THE JUMPERS

## สามารถเปลี่ยนย่านการวัดได้อย่างง่ายดาย โดยการเปลี่ยนตำแหน่ง Jumper บนแผงวงจร

The meter can have up to four jumpers that must be checked and / or changed prior to applying power. The following Jumper Selection Figures show an enlargement of the jumper area.

To access the jumpers, remove the meter base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

### Input Range Jumper

This jumper is used to select the proper input range. The input range selected in programming must match the jumper setting. Select a range that is high enough to accommodate the maximum input to avoid overloads. The selection is different for each meter. See the Jumper Selection Figure for appropriate meter.

### Excitation Output Jumper

If your meter has excitation, this jumper is used to select the excitation range for the application. If excitation is not being used, it is not necessary to check or move this jumper.

### User Input Logic Jumper

This jumper selects the logic state of all the user inputs. If the user inputs are not used, it is not necessary to check or move this jumper.

### PAXH: Signal Jumper

This jumper is used to select the signal type. For current signals, the jumper is installed. For voltage signals, remove the jumper from the board. (For 2 V inputs, this removed jumper can be used in the "2 V only" location.)

### Couple Jumper

This jumper is used for AC / DC couple. If AC couple, then the jumper is removed from the board. If DC couple is used, then the jumper is installed.

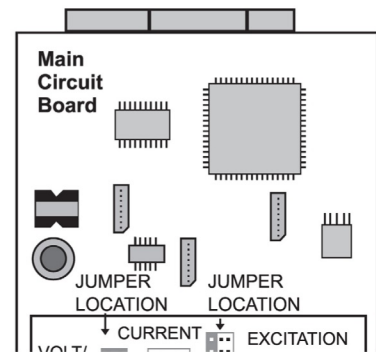
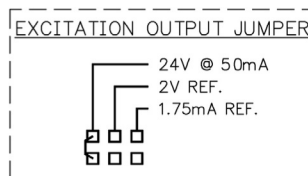
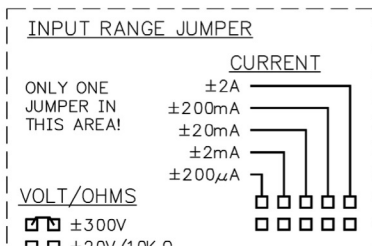
## PAXD Jumper Selection

### Input Range Jumper

One jumper is used for voltage/ohms or current input ranges. Select the proper input range high enough to avoid input signal overload. Only one jumper is allowed in this area. Do not have a jumper in both the voltage and current ranges at the same time. Avoid placing the jumper across two ranges.

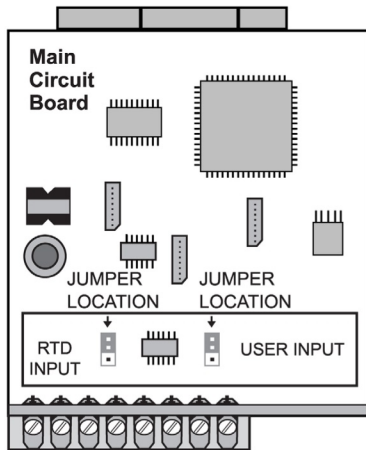
### JUMPER SELECTIONS

The  indicates factory setting.






## PAXT Jumper Selection

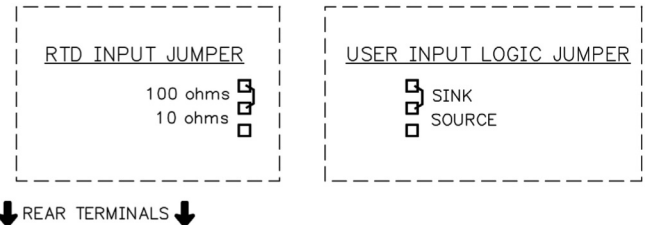


### RTD Input Jumper

One jumper is used for RTD input ranges. Select the proper range to match the RTD probe being used. It is not necessary to remove this jumper when not using RTD probes.

### JUMPER SELECTIONS

The  indicates factory setting.



## วิธีการต่อสาย

### WIRING OVERVIEW

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

When wiring the meter, compare the numbers embossed on the back of the meter case against those shown in wiring drawings for proper wire position. Strip the wire, leaving approximately 0.3" (7.5 mm) bare lead exposed (stranded wires should be tinned with solder). Insert the lead under the correct screw-clamp terminal and tighten until the wire is secure. (Pull wire to verify tightness.) Each terminal can accept up to one #14 AWG (2.55 mm) wire, two #18 AWG (1.02 mm), or four #20 AWG (0.61 mm).

### EMC INSTALLATION GUIDELINES

Although this meter is designed with a high degree of immunity to Electro-Magnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, its source or the method of coupling into the unit may be different for various installations. Listed below are some EMC guidelines for successful installation in an industrial environment.

1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. With use of the lower input ranges or signal sources with high source impedance, the use of shielded cable may be necessary. This helps to guard against stray AC pick-up. Attach the shield to the input common of the meter. Line voltage monitoring and 5A CT applications do not usually require shielding.
3. To minimize potential noise problems, power the meter from the same power branch, or at least the same phase voltage as that of the signal source.

4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.
5. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
6. In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:

Ferrite Suppression Cores for signal and control cables:

Fair-Rite # 0443167251 (RLC #FCOR0000)

TDK # ZCAT3035-1330A

Steward #28B2029-0A0

Line Filters for input power cables:

Schaffner # FN610-1/07 (RLC #LFIL0000)

Schaffner # FN670-1.8/07

Corcom #1VR3

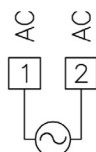
*Note: Reference manufacturer's instructions when installing a line filter.*

7. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
8. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.  
Snubber: RLC#SNUB0000.

### 3.1 POWER WIRING

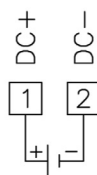
#### AC Power

Terminal 1: VAC  
Terminal 2: VAC



#### DC Power

Terminal 1: +VDC  
Terminal 2: -VDC



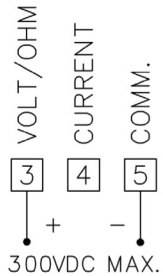
## 3.2 INPUT SIGNAL WIRING

### PAXD INPUT SIGNAL WIRING

Before connecting signal wires, the Input Range Jumper and Excitation Jumper should be verified for proper position.

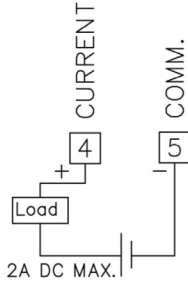
#### Voltage Signal (self powered)

Terminal 3: +VDC  
Terminal 5: -VDC



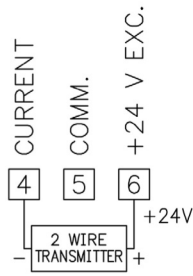
#### Current Signal (self powered)

Terminal 4: +ADC  
Terminal 5: -ADC



#### Current Signal (2 wire requiring excitation)

Terminal 4: -ADC  
Terminal 6: +ADC  
Excitation Jumper: 24 V

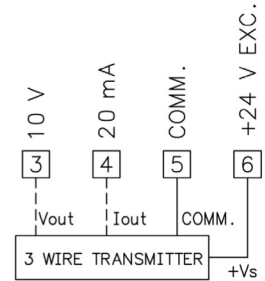


#### Current Signal (3 wire requiring excitation)

Terminal 4: +ADC (signal)  
Terminal 5: -ADC (common)  
Terminal 6: +Volt supply  
Excitation Jumper: 24 V

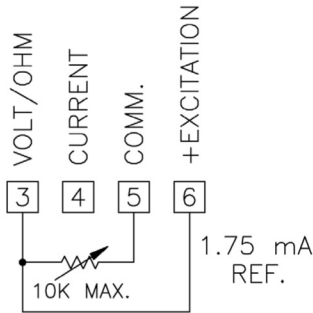
#### Voltage Signal (3 wire requiring excitation)

Terminal 3: +VDC (signal)  
Terminal 5: -VDC (common)  
Terminal 6: +Volt supply  
Excitation Jumper: 24 V



#### Resistance Signal (3 wire requiring excitation)

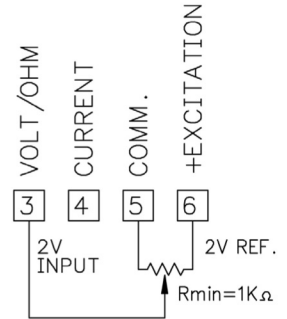
Terminal 3: Resistance  
Terminal 5: Resistance  
Terminal 6: Jumper to terminal 3  
Excitation Jumper: 1.75 mA REF.



#### Potentiometer Signal (3 wire requiring excitation)

Terminal 3: Wiper  
Terminal 5: Low end of pot.  
Terminal 6: High end of pot.  
Excitation Jumper: 2 V REF.  
Input Range Jumper: 2 Volt  
Module 1 Input Range: 2 Volt

Note: The Apply signal scaling style should be used because the signal will be in volts.

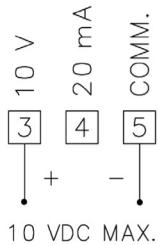


**CAUTION:** Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

### PAXP INPUT SIGNAL WIRING

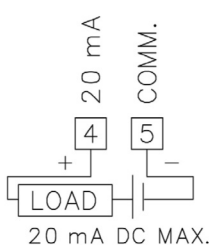
#### Voltage Signal (self powered)

Terminal 3: +VDC  
Terminal 5: -VDC



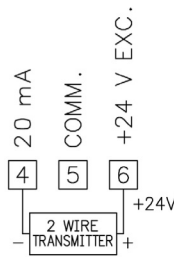
#### Current Signal (self powered)

Terminal 4: +ADC  
Terminal 5: -ADC



#### Current Signal (2 wire requiring excitation)

Terminal 4: -ADC  
Terminal 6: +ADC

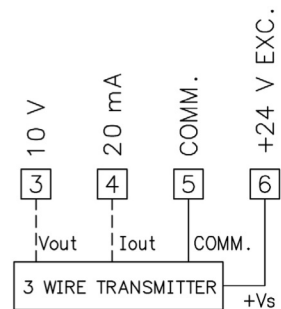


#### Current Signal (3 wire requiring excitation)

Terminal 4: +ADC (signal)  
Terminal 5: -ADC (common)  
Terminal 6: +Volt supply

#### Voltage Signal (3 wire requiring excitation)

Terminal 3: +VDC (signal)  
Terminal 5: -VDC (common)  
Terminal 6: +Volt supply

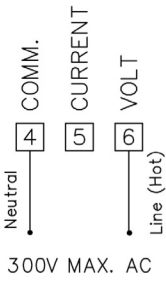


**CAUTION:** Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

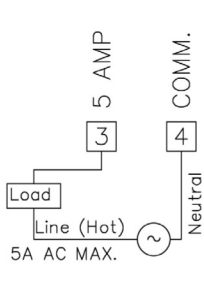
### PAXH INPUT SIGNAL WIRING

Before connecting signal wires, the Signal, Input Range and Couple Jumpers should be verified for proper position.

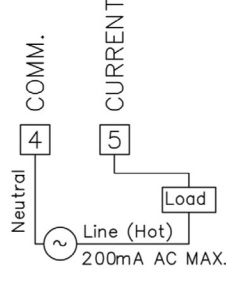
#### Voltage Signal



#### Current Signal (Amps)



#### Current Signal (Milliamps)



**CAUTION:** Connect only one input signal range to the meter. Hazardous signal levels may be present on unused inputs.

**CAUTION:** The isolation rating of the input common of the meter with respect to the option card commons and the user input common Terminal 8 (If used) is 125 Vrms; and 250 Vrms with respect to AC Power (meter Terminals 1 & 2). To be certain that the ratings are not exceeded, these voltages should be verified by a high-voltage meter before wiring the meter.



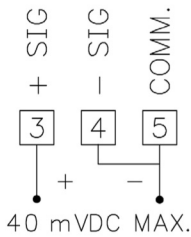
**CAUTION:**

1. Where possible, connect the neutral side of the signal (including current shunts) to the input common of the meter. If the input signal is sourced from an active circuit, connect the lower impedance (usually circuit common) to the input signal common of the meter.
2. For phase-to-phase line monitoring where a neutral does not exist, or for any other signal input in which the isolation voltage rating is exceeded, an isolating potential transformer must be used to isolate the input voltage from earth. With the transformer, the input common of the meter can then be earth referenced for safety.
3. When measuring line currents, the use of a current transformer is recommended. If using external current shunts, insert the shunt in the neutral return line. If the isolation voltage rating is exceeded, the use of an isolating current transformer is necessary.

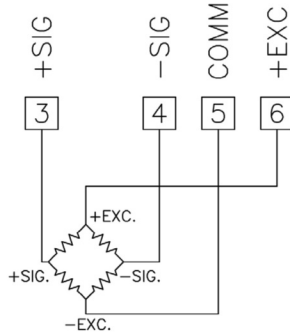
### PAXS INPUT SIGNAL WIRING

Before connecting signal wires, the Input Range Jumper should be verified for proper position.

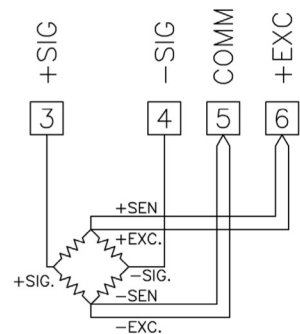
#### 2-Wire Single Ended Input



#### 4-Wire Bridge Input



#### 6-Wire Bridge Input



### DEADLOAD COMPENSATION

In some cases, the combined deadload and liveload output may exceed the range of the 24 mV input. To use this range, the output of the bridge can be offset a small amount by applying a fixed resistor across one arm of the bridge. This shifts the electrical output of the bridge downward to within the operating range of the meter. A 100 K ohm fixed resistor shifts the bridge output approximately -10 mV (350 ohm bridge, 10 V excitation).

Connect the resistor between +SIG and -SIG. Use a metal film resistor with a low temperature coefficient of resistance.

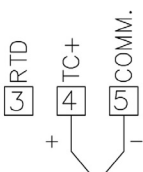
### BRIDGE COMPLETION RESISTORS

For single strain gage applications, bridge completion resistors must be employed externally to the meter. Only use metal film resistors with a low temperature coefficient of resistance.

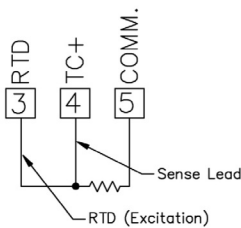
Load cells and pressure transducers are normally implemented as full resistance bridges and do not require bridge completion resistors.

### PAXT INPUT SIGNAL WIRING

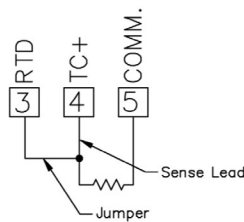
#### Thermocouple



#### 3-Wire RTD



#### 2-Wire RTD



**CAUTION:** Sensor input common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.



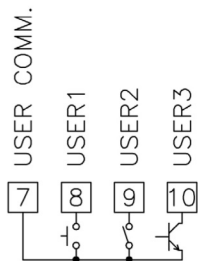
### 3.3 USER INPUT WIRING

Before connecting the wires, the User Input Logic Jumper should be verified for proper position. If not using User Inputs, then skip this section. Only the appropriate User Input terminal has to be wired.

#### Sinking Logic

Terminal 8-10: } Connect external switching device between  
Terminal 7: } appropriate User Input terminal and User Comm.

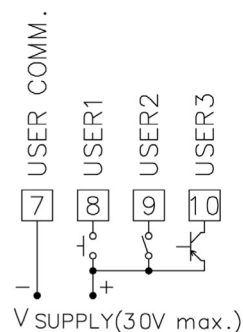
In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).



#### Sourcing Logic

Terminal 8-10: + VDC thru external switching device  
Terminal 7: -VDC thru external switching device

In this logic, the user inputs of the meter are internally pulled down to 0 V with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.

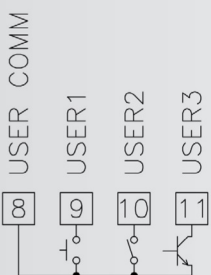


### PAXH ONLY

#### Sinking Logic

Terminals 9-11 } Connect external  
Terminal 8 } switching device between  
appropriate User Input  
terminal and User Comm.

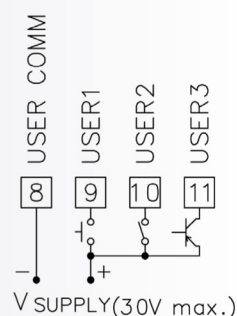
In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).



#### Sourcing Logic

Terminals 9-11: + VDC through external switching device  
Terminal 8: -VDC through external switching device

In this logic, the user inputs of the meter are internally pulled down with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.



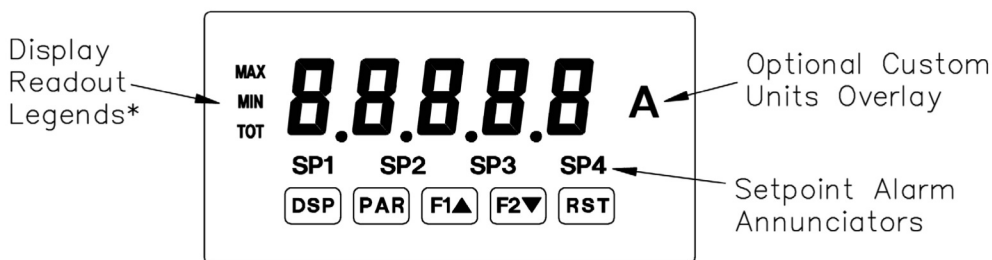
### 3.4 SETPOINT (ALARMS) WIRING

### 3.5 SERIAL COMMUNICATION WIRING

### 3.6 ANALOG OUTPUT WIRING

See appropriate plug-in card bulletin for details.

## 4.0 REVIEWING THE FRONT BUTTONS AND DISPLAY



#### KEY DISPLAY MODE OPERATION

- DSP** Index display through max/min/total/input readouts
- PAR** Access parameter list
- F1▲** Function key 1; hold for 3 seconds for Second Function 1\*\*
- F2▼** Function key 2; hold for 3 seconds for Second Function 2\*\*
- RST** Reset (Function key)\*\*

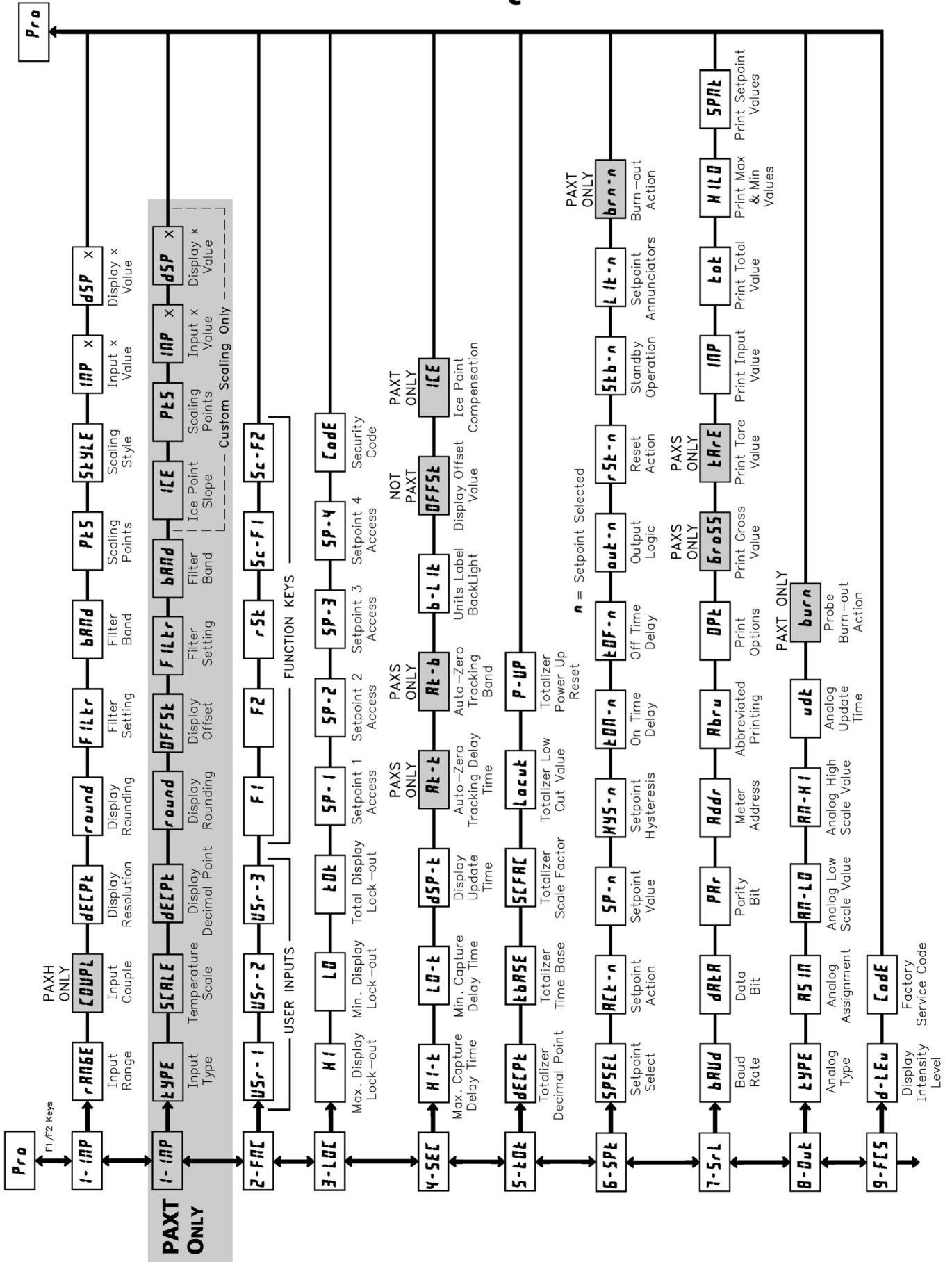
\* Display Readout Legends may be locked out in Factory Settings.

\*\* Factory setting for the F1, F2, and RST keys is NO mode.

#### PROGRAMMING MODE OPERATION

- Quit programming and return to display mode
- Store selected parameter and index to next parameter
- Increment selected parameter value
- Decrement selected parameter value
- Hold with F1▲, F2▼ to scroll value by x1000

# PAX PROGRAMMING QUICK OVERVIEW



# มิเตอร์รับสัญญาณ 4 -20 mA หรือ 0-10 VDC สามารถทำฟังก์ชัน บวก, ลบ, คูณ,หาร ได้

## MODEL PAXDP – 1/8 DIN DUAL PROCESS INPUT METER



- ACCEPTS TWO 4 - 20 mA OR 0 - 10 VDC INPUT SIGNALS
- PROGRAMMABLE A/D CONVERSION RATE, 5 TO 105 READINGS PER SECOND
- 5-DIGIT 0.56" RED SUNLIGHT READABLE DISPLAY
- VARIABLE INTENSITY DISPLAY
- LINEARIZATION/SQUARE ROOT EXTRACTION INPUT RANGE
- PROGRAMMABLE FUNCTION KEYS/USER INPUTS
- 9 DIGIT TOTALIZER (INTEGRATOR) WITH BATCHING
- OPTIONAL CUSTOM UNITS OVERLAY W/BACKLIGHT
- FOUR SETPOINT ALARM OUTPUTS (W/OPTION CARD)
- COMMUNICATION AND BUS CAPABILITIES (W/OPTION CARD)
- RETRANSMITTED ANALOG OUTPUT (W/OPTION CARD)
- NEMA 4X/IP65 SEALED FRONT BEZEL
- PC SOFTWARE AVAILABLE FOR METER CONFIGURATION

### GENERAL DESCRIPTION

The PAXDP Dual Process Input Meter offers many features and performance capabilities to suit a wide range of industrial applications. Available in two models, AC or DC power, the meter has the capability to accept two, 4 to 20 mA or 0 to 10 VDC input signals. Each input signal can be independently scaled and displayed. In addition, a math function can be performed on the two signals, C + A + B, C - A - B, C + A - B, AB / C, CA / B, or C (A / B - 1). Any of the three meter values can have Alarms, Comms, and/or a Retrasmitted Analog Output capability by simply adding optional cards. The optional plug-in output cards allow the opportunity to configure the meter for current applications, while providing easy upgrades for future needs.

The update rate of the meter is user selectable. This will help in those applications where a quick response from the meter is of the utmost importance. The rate can be adjusted from eight selections with a minimum of 5 updates/second to a maximum of 105 updates/second.

The meters employ a bright 0.56" (14.2 mm) red sunlight readable LED display. The intensity of display can be adjusted from dark room applications up to sunlight readable, making it ideal for viewing in bright light applications.

The meters provide a MAX and MIN reading memory with programmable capture time. The capture time is used to prevent detection of false max or min readings which may occur during start-up or unusual process events.

The signal totalizer (integrator) can be used to compute a time-input product. This can be used to provide a readout of totalized flow, calculate service intervals of motors or pumps, etc. The totalizer can also accumulate batch operations.

The meter has four setpoint outputs, implemented on Plug-in option cards. The Plug-in cards provide dual FORM-C relays (5A), quad FORM-A (3A), or either quad sinking or quad sourcing open collector logic outputs. The setpoint alarms can be configured to suit a variety of control and alarm requirements.

Communication and Bus Capabilities are also available as option cards. The standard output is in Modbus Protocol. Any of the following option cards, RS232, RS485, DeviceNet, or Profibus can be used with the meter. Readout

values and setpoint alarm values can be controlled through the bus. Additionally, the meters have a feature that allows a remote computer to directly control the outputs of the meter.

A linear DC output signal is available as an optional Plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range and can track either the input, totalizer, max/min readings, or math calculation value.

Once the meters have been initially configured, the parameter list may be locked out from further modification in its entirety or only the setpoint values can be made accessible.

The meters have been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.

### SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.



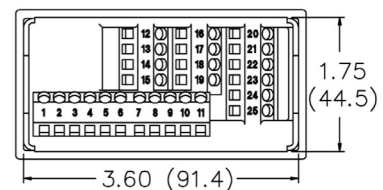
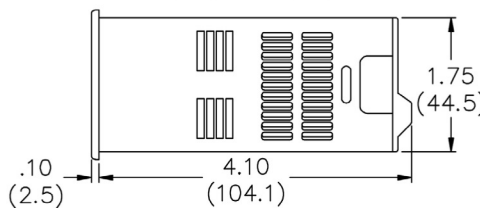
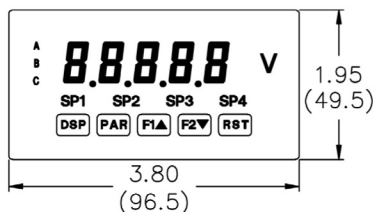
**CAUTION: Risk of Danger.**  
Read complete instructions prior to installation and operation of the unit.



**CAUTION: Risk of electric shock.**

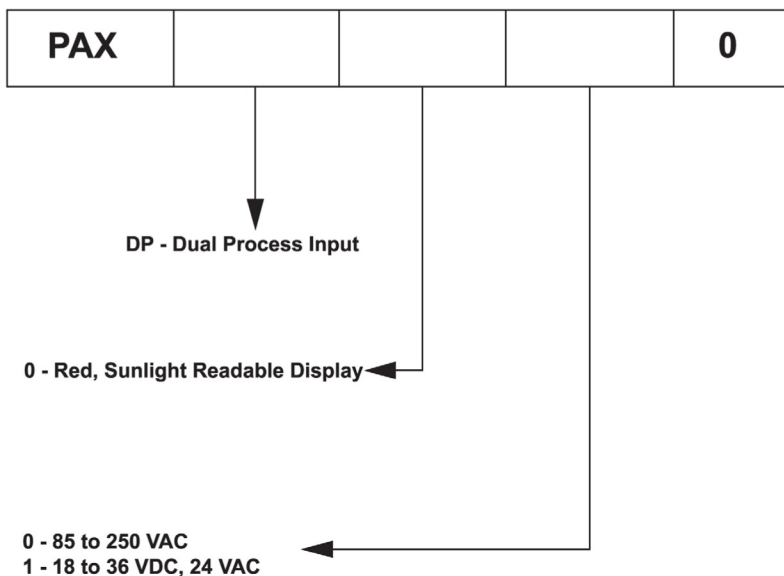
### DIMENSIONS In inches (mm)

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.0" (127) W.



## วิธีการสั่งซื้อ

### Meter Part Numbers



### Option Card and Accessories Part Numbers

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Optional Plug-In Cards	PAXCDS	Dual Setpoint Relay Output Card	PAXCDS10
		Quad Setpoint Relay Output Card	PAXCDS20
		Quad Setpoint Sinking Open Collector Output Card	PAXCDS30
		Quad Setpoint Sourcing Open Collector Output Card	PAXCDS40
	PAXCDC	RS485 Serial Communications Output Card with Terminal Block	PAXCDC10
		Extended RS485 Serial Communications Output Card with Dual RJ11 Connector	PAXCDC1C
		RS232 Serial Communications Output Card with Terminal Block	PAXCDC20
		Extended RS232 Serial Communications Output Card with 9 Pin D Connector	PAXCDC2C
		DeviceNet Communications Card	PAXCDC30
		Profibus-DP Communications Card	PAXCDC50
PAXCDL	Analog Output Card	PAXCDL10	
Accessories	PAXLBK	Units Label Kit Accessory	PAXLBK10
	SFCRD	Crimson® 2 PC Configuration Software for Windows 98, ME, 2000, XP <sup>2</sup>	SFCRD200

Notes:

1. For Modbus communications use RS485 Communications Output Card and configure communication (**TYPE**) parameter for Modbus.
2. Crimson® 2 software is available as a free download at <http://www.redlion.net/>

# GENERAL METER SPECIFICATIONS

1. **DISPLAY:** 5 digit, 0.56" (14.2 mm) variable intensity red sunlight readable (-19999 to 99999)

2. **POWER:**

AC Versions:

AC Power: 85 to 250 VAC, 50/60 Hz, 21 VA

Isolation: 2300 Vrms for 1 min. to all inputs and outputs.

DC Versions: (Derate operating temperature to 40° C if three plug-in option cards or PAXCDC50 are installed.)

DC Power: 18 to 36 VDC, 13 W

AC Power: 24 VAC,  $\pm 10\%$ , 50/60 Hz, 16 VA

Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working).

Must use a Class 2 or SELV rated power supply

3. **ANNUNCIATORS:**

A - Programmable Display

B - Programmable Display

C - Programmable Display

SP1 - Setpoint alarm 1 is active

SP2 - Setpoint alarm 2 is active

SP3 - Setpoint alarm 3 is active

SP4 - Setpoint alarm 4 is active

Units Label - Optional units label backlight

4. **KEYPAD:** 3 programmable function keys, 5 keys total

5. **A/D CONVERTER:** 16 bit resolution

6. **UPDATE RATES:**

A/D conversion rate: Adjustable 5.3 to 105 readings/sec.

Step response: (to within 99% of final readout value with digital filter disabled)

INPUT UPDATE RATE	MAX. TIME (msec)
5.3	770
7.5	560
16.7	260
19.8	220
20	220
30	150
105	60

Display update rate: adjustable 1 to 20 readings/sec.

Setpoint output on/off delay time: 0 to 3275 sec.

Analog output update rate: 0 to 10 sec

Max./Min. capture delay time: 0 to 3275 sec.

7. **DISPLAY MESSAGES:**

"OLOL" - Appears when measurement exceeds + signal range.

"ULUL" - Appears when measurement exceeds - signal range

". . ." - Appears when display values exceed + display range.

"- . ." - Appears when display values exceed - display range.

8. **SENSOR INPUTS:**

INPUT (RANGE)	ACCURACY* (18 to 28°C)	ACCURACY* (0 to 50°C)	IMPEDANCE/ COMPLIANCE	MAX CONTINUOUS OVERLOAD	DISPLAY RESOLUTION
$\pm 20$ mA (-26 to 26 mA)	0.03% of reading +2 $\mu$ A	0.12% of reading +3 $\mu$ A	24.6 ohm	90 mA	1 $\mu$ A
$\pm 10$ VDC (-13 to 13 VDC)	0.03% of reading +2 mV	0.12% of reading +3 mV	500 Kohm	50 V	1 mV

\* After 20 minute warm-up. Accuracy is specified in two ways: Accuracy over an 18 to 28°C and 10 to 75% RH environment; and accuracy over a 0 to 50°C and 0 to 85% RH (non-condensing environment). Accuracy over the 0 to 50°C range includes the temperature coefficient effect of the meter.

9. **EXCITATION POWER:**

Transmitter Power: 18 VDC,  $\pm 20\%$ , unregulated, 70 mA max. per input channel.

10. **LOW FREQUENCY NOISE REJECTION:**

Normal Mode: (digital filter off)

INPUT UPDATE RATE	50 Hz $\pm 1$ Hz	60 Hz $\pm 1$ Hz
5.3	>90 dB	>65 dB
7.5	>60 dB	>55 dB
16.7	>100 dB	>50 dB
19.8*	>60 dB	>95 dB
20	>55 dB	>100 dB
30	>20 dB	>20 dB
105	>20 dB	>13 dB

\*Note: 19.8 Hz Input Rate provides best rate performance and simultaneous 50/60 Hz rejection.

Common Mode: >100 dB @ 50/60  $\pm 1$  Hz (19.8 or 20 Input Rate)

11. **USER INPUTS:** Three programmable user inputs

Max. Continuous Input: 30 VDC

Isolation To Sensor Input A Common: 500 Vrms for 1 min;

Working Voltage: 50 V

Isolation To Sensor Input B Common: Not isolated.

INPUT STATE	SINKING INPUTS 22 K $\Omega$ pull-up to +5 V	SOURCING INPUTS 22 K $\Omega$ pull-down
Active	$V_{IN} < 0.9$ VDC	$V_{IN} > 3.6$ VDC
Inactive	$V_{IN} > 3.6$ VDC	$V_{IN} < 0.9$ VDC

Response Time: 20 msec. max.

Logic State: Jumper selectable for sink/source logic

12. **TOTALIZER:**

Function:

Time Base: second, minute, hour, or day

Batch: Can accumulate (gate) input display from a user input

Time Accuracy: 0.01% typical

Decimal Point: 0 to 0.0000

Scale Factor: 0.001 to 65.000

Low Signal Cut-out: -19,999 to 99,999

Total: 9 digits, display alternates between high order and low order readouts

13. **CUSTOM LINEARIZATION:**

Data Point Pairs: Selectable from 2 to 16

Display Range: -19,999 to 99,999

Decimal Point: 0 to 0.0000

14. **MEMORY:** Nonvolatile memory retains all programmable parameters and display values.

15. **CERTIFICATIONS AND COMPLIANCES:**

**SAFETY**

UL Recognized Component, File #E179259, UL61010A-1, CSA C22.2 No. 61010-1

Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

UL Listed, File #E137808, UL508, CSA C22.2 No. 14-M95

LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards

Type 4X Enclosure rating (Face only), UL50

IECEE CB Scheme Test Certificate #US/8843A/UL

CB Scheme Test Report #04ME11209-20041018

Issued by Underwriters Laboratories, Inc.

IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.

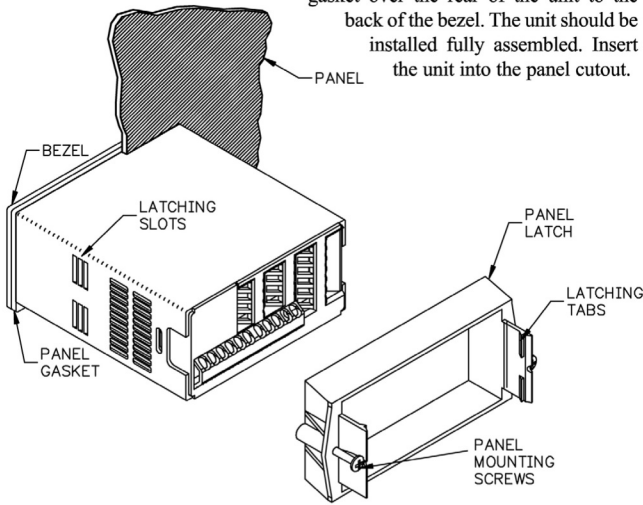
IP65 Enclosure rating (Face only), IEC 529

IP20 Enclosure rating (Rear of unit), IEC 529

# 1.0 INSTALLING THE METER

## Installation

The PAX meets NEMA 4X/IP65 requirements when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown. Remove the panel latch from the unit. Slide the panel gasket over the rear of the unit to the back of the bezel. The unit should be installed fully assembled. Insert the unit into the panel cutout.



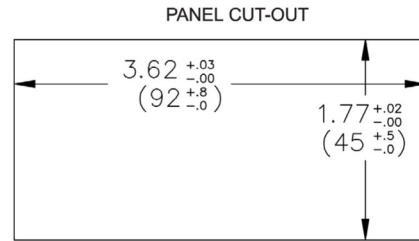
While holding the unit in place, push the panel latch over the rear of the unit so that the tabs of the panel latch engage in the slots on the case. The panel latch should be engaged in the farthest forward slot possible. To achieve a proper seal, tighten the latch screws evenly until the unit is snug in the panel (Torque to approximately 7 in-lbs [79N-cm]). Do not over-tighten the screws.

## Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. Placing the unit near devices that generate excessive heat should be avoided.

The bezel should be cleaned only with a soft cloth and neutral soap product. Do NOT use solvents. Continuous exposure to direct sunlight may accelerate the aging process of the bezel.

Do not use tools of any kind (screwdrivers, pens, pencils, etc.) to operate the keypad of the unit.



# 2.0 SETTING THE JUMPERS

สามารถเลือกย่านการวัดได้อย่างง่ายดาย โดยการเปลี่ยนตำแหน่ง Jumper บนแผงวงจร

The meter has three jumpers that must be checked and/or changed prior to applying power. The following Jumper Selection Figures show an enlargement of the jumper area.

To access the jumpers, remove the meter base from the case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then start the other side latch.

## Input Jumpers

These jumpers are used to select the proper input types, Voltage (V) or Current (I). The input type selected in programming must match the jumper setting. See the Jumper Selection Figures for more details.

## User Input Logic Jumper

This jumper selects the logic state of all the user inputs. If the user inputs are not used, it is not necessary to check or move this jumper.

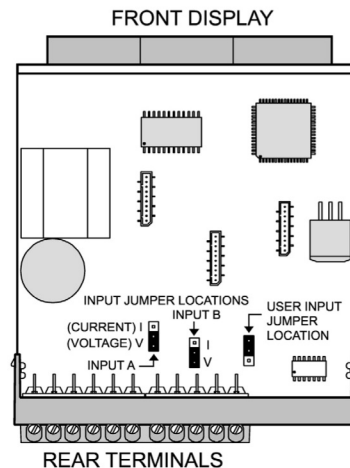
## PAXDP Jumper Selection

### JUMPER SELECTIONS

The  indicates factory setting.

INPUT A VOLT/CURRENT	INPUT B VOLT/CURRENT	USER INPUT
<input type="checkbox"/> CURRENT (I)	<input type="checkbox"/> CURRENT (I)	<input type="checkbox"/> SINK
<input type="checkbox"/> VOLTAGE (V)	<input type="checkbox"/> VOLTAGE (V)	<input type="checkbox"/> SOURCE (SRC)

Note: In the figures above, the text shown in parenthesis is printed on the circuit board to help with proper jumper positioning.



# วิธีการต่อสาย

## WIRING OVERVIEW

Electrical connections are made via screw-clamp terminals located on the back of the meter. All conductors should conform to the meter's voltage and current ratings. All cabling should conform to appropriate standards of good installation, local codes and regulations. It is recommended that power supplied to the meter (DC or AC) be protected by a fuse or circuit breaker.

When wiring the meter, compare the numbers embossed on the back of the meter case against those shown in wiring drawings for proper wire position. Strip the wire, leaving approximately 0.3" (7.5 mm) bare lead exposed (stranded wires should be tinned with solder). Insert the lead under the correct screw-clamp terminal and tighten until the wire is secure. (Pull wire to verify tightness.) Each terminal can accept up to one #14 AWG (2.55 mm) wire, two #18 AWG (1.02 mm), or four #20 AWG (0.61 mm).

## EMC INSTALLATION GUIDELINES

Although this meter is designed with a high degree of immunity to Electro-Magnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, its source or the method of coupling into the unit may be different for various installations. Listed below are some EMC guidelines for successful installation in an industrial environment.

1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. With use of the lower input ranges or signal sources with high source impedance, the use of shielded cable may be necessary. This helps to guard against stray AC pick-up. Attach the shield to the input common of the meter.
3. To minimize potential noise problems, power the meter from the same power branch, or at least the same phase voltage as that of the signal source.
4. Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors feeding motors, solenoids, SCR controls, and

heaters, etc. The cables should be run in metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter.

5. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
6. In extremely high EMI environments, the use of external EMI suppression devices, such as ferrite suppression cores, is effective. Install them on Signal and Control cables as close to the unit as possible. Loop the cable through the core several times or use multiple cores on each cable for additional protection. Install line filters on the power input cable to the unit to suppress power line interference. Install them near the power entry point of the enclosure. The following EMI suppression devices (or equivalent) are recommended:

Ferrite Suppression Cores for signal and control cables:

Fair-Rite # 0443167251 (RLC #FCOR0000)

TDK # ZCAT3035-1330A

Steward #28B2029-0A0

Line Filters for input power cables:

Schaffner # FN610-1/07 (RLC #LFIL0000)

Schaffner # FN670-1.8/07

Corcom #1VR3

*Note: Reference manufacturer's instructions when installing a line filter.*

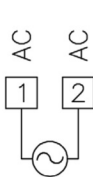
7. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
8. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.  
Snubber: RLC#SNUB0000.

## 3.1 POWER WIRING

### AC Power

Terminal 1: VAC

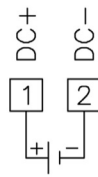
Terminal 2: VAC



### DC Power

Terminal 1: +VDC

Terminal 2: -VDC



## 3.2 INPUT SIGNAL WIRING

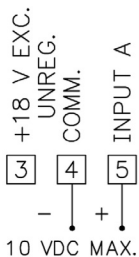
Before connecting signal wires, the Input Range Jumper must be verified for proper position.

### INPUT A SIGNAL WIRING

#### Voltage Signal (self powered)

Terminal 4: -VDC

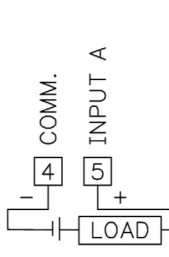
Terminal 5: +VDC



#### Current Signal (self powered)

Terminal 4: -ADC

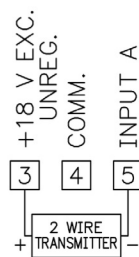
Terminal 5: +ADC



#### Current Signal (2 wire requiring excitation)

Terminal 3: +ADC

Terminal 5: -ADC

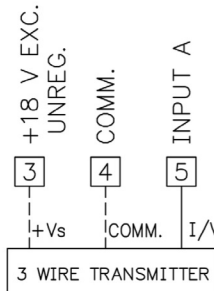


#### Voltage/Current Signal (3 wire requiring excitation)

Terminal 3: +Volt supply

Terminal 4: -ADC (common)

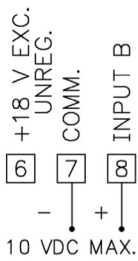
Terminal 5: +ADC (signal)



### INPUT B SIGNAL WIRING

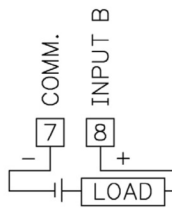
#### Voltage Signal (self powered)

Terminal 7: -VDC  
Terminal 8: +VDC



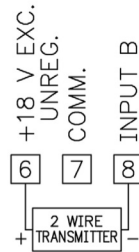
#### Current Signal (self powered)

Terminal 7: -ADC  
Terminal 8: +ADC



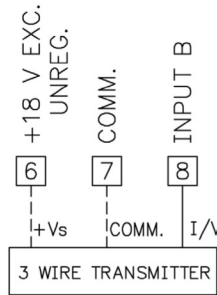
#### Current Signal (2 wire requiring excitation)

Terminal 6: +ADC  
Terminal 8: -ADC



#### Voltage/Current Signal (3 wire requiring excitation)

Terminal 6: +VOLT supply  
Terminal 7: -ADC (common)  
Terminal 8: +ADC (signal)



**CAUTION:** Sensor Input B common is NOT isolated from user input common. In order to preserve the safety of the meter application, the sensor input common must be suitably isolated from hazardous live earth referenced voltages; or input common must be at protective earth ground potential. If not, hazardous live voltage may be present at the User Inputs and User Input Common terminals. Appropriate considerations must then be given to the potential of the user input common with respect to earth common; and the common of the isolated plug-in cards with respect to input common.

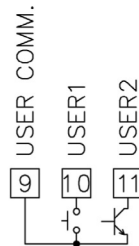
### 3.3 USER INPUT WIRING

Before connecting the wires, the User Input Logic Jumper should be verified for proper position. If not using User Inputs, then skip this section. Only the appropriate User Input terminal has to be wired.

#### Sinking Logic

Terminal 9: } Connect external switching device between  
Terminal 10-11: } appropriate User Input terminal and User Comm.

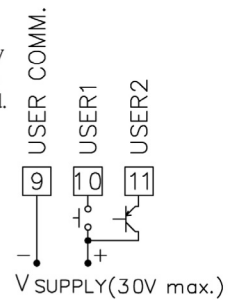
In this logic, the user inputs of the meter are internally pulled up to +5 V with 22 K resistance. The input is active when it is pulled low (<0.9 V).



#### Sourcing Logic

Terminal 9: -VDC thru external switching device  
Terminal 10-11: + VDC thru external switching device

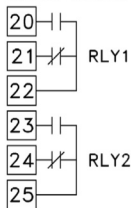
In this logic, the user inputs of the meter are internally pulled down to 0 V with 22 K resistance. The input is active when a voltage greater than 3.6 VDC is applied.



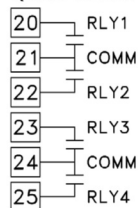
### 3.4 SETPOINT (ALARMS) WIRING

#### SETPOINT PLUG-IN CARD TERMINALS

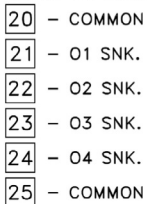
##### DUAL RELAY PAXCDS10



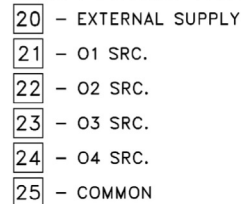
##### QUAD RELAY PAXCDS20



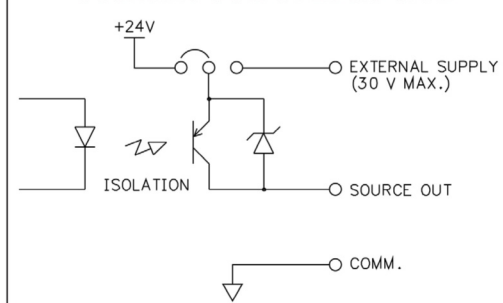
##### QUAD SINKING PAXCDS30



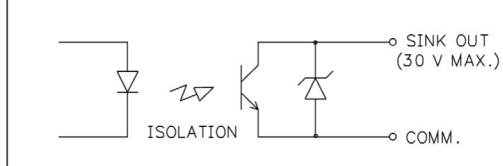
##### QUAD SOURCING PAXCDS40



#### SOURCING OUTPUT LOGIC CARD



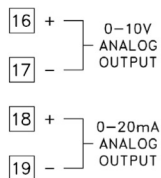
#### SINKING OUTPUT LOGIC CARD





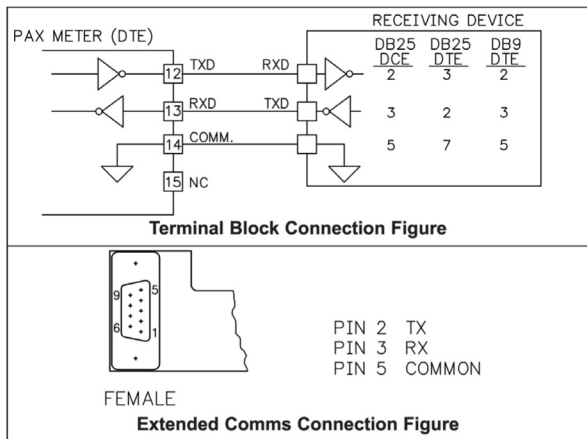
### 3.5 ANALOG OUTPUT WIRING

#### ANALOG OPTION CARD FIELD TERMINALS



### 3.6 SERIAL COMMUNICATION WIRING

#### RS232 Communications



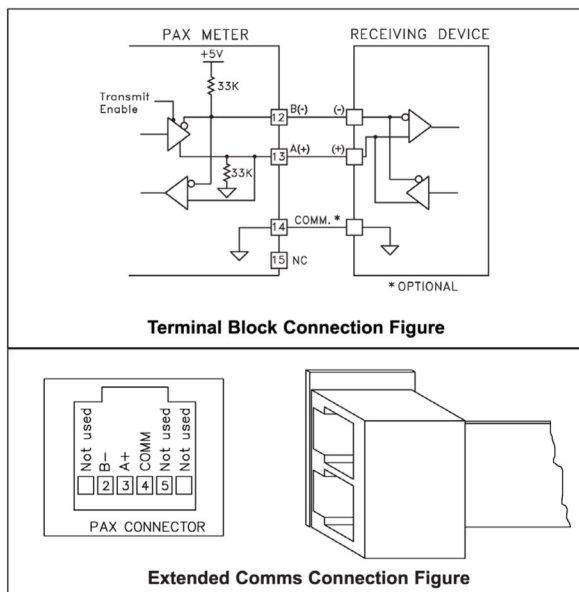
RS232 is intended to allow two devices to communicate over distances up to 50 feet. Data Terminal Equipment (DTE) transmits data on the Transmitted Data (TXD) line and receives data on the Received Data (RXD) line. Data Computer Equipment (DCE) receives data on the TXD line and transmits data on the RXD line. The PAX emulates a DTE. If the other device connected to the meter also emulates a DTE, the TXD and RXD lines must be interchanged for communications to take place. This is known as a null modem connection. Most printers emulate a DCE device while most computers emulate a DTE device.

Some devices cannot accept more than two or three characters in succession without a pause in between. In these cases, the meter employs a busy function.

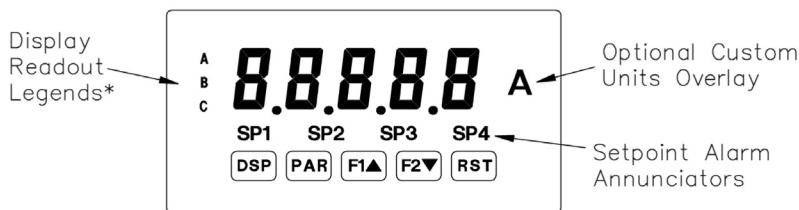
As the meter begins to transmit data, the RXD line (RS232) is monitored to determine if the receiving device is "busy". The receiving device asserts that it is busy by setting the RXD line to a space condition (logic 0). The meter then suspends transmission until the RXD line is released by the receiving device.

#### RS485 Communications

The RS485 communication standard allows the connection of up to 32 devices on a single pair of wires, distances up to 4,000 ft. and data rates as high as 10M baud (the PAX is limited to 19.2k baud). The same pair of wires is used to both transmit and receive data. RS485 is therefore always half-duplex, that is, data cannot be received and transmitted simultaneously.



## 4.0 REVIEWING THE FRONT BUTTONS AND DISPLAY



#### KEY DISPLAY MODE OPERATION

- DSP** Index display through main displays as programmed in **3-L11**
- PAR** Access parameter list
- F1▲** Function key 1; hold for 3 seconds for Second Function 1\*\*
- F2▼** Function key 2; hold for 3 seconds for Second Function 2\*\*
- RST** Reset (Function key)\*\*

\* Display Readout Legends may be locked out in Factory Settings.

\*\* Factory setting for the F1, F2, and RST keys is NO mode.

#### PROGRAMMING MODE OPERATION

- Quit programming and return to display mode
- Store selected parameter and index to next parameter
- Increment selected parameter value
- Decrement selected parameter value
- Hold with F1▲, F2▼ to scroll value by x1000