

MODEL PAX – 1/8 DIN ANALOG INPUT PANEL METERS



- 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)
- PC SOFTWARE AVAILABLE FOR METER CONFIGURATION
- NEMA 4X/IP65 SEALED FRONT BEZEL

GENERAL DESCRIPTION

The PAX 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® 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.



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.

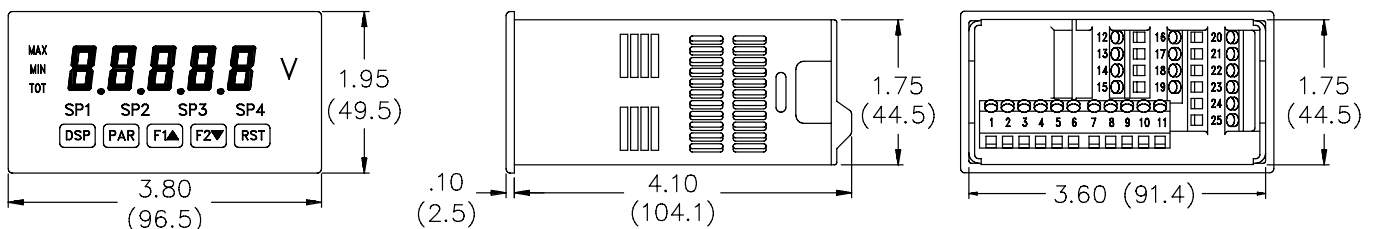
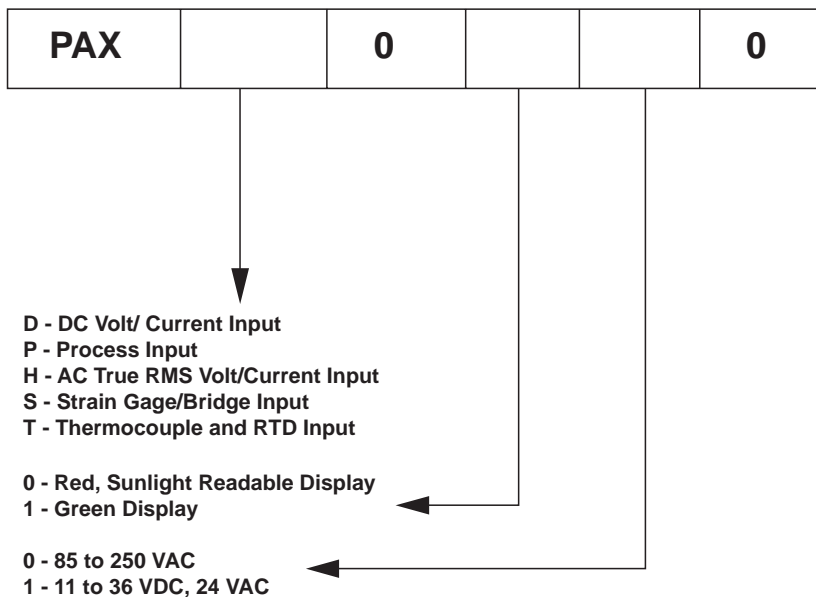


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ORDERING INFORMATION

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
		Modbus Communications Card	PAXCDC40
Extended Modbus Communications Card with Dual RJ11 Connector		PAXCDC4C	
Profibus-DP Communications Card	PAXCDC50		
PAXCDL	Analog Output Card	PAXCDL10	
Accessories	PAXLBK	Units Label Kit Accessory (Not required for PAXT)	PAXLBK10
	SFPAX*	PC Configuration Software for Windows 3.x and 95 (3.5" disk)	SFPAX

**Software can be downloaded from www.redlion-controls.com*

GENERAL METER SPECIFICATIONS

- DISPLAY:** 5 digit, 0.56" (14.2 mm) red sunlight readable or standard green LEDs, (-19999 to 99999)
- 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, ± 10%, 50/60 Hz, 15 VA
 - Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working).

- 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
- KEYPAD:** 3 programmable function keys, 5 keys total
- A/D CONVERTER:** 16 bit resolution
- 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.

- DISPLAY MESSAGES:**
 - "OLOL" - 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.
- INPUT CAPABILITIES:** See specific product specifications, pages 4-6
- EXCITATION POWER:** See specific product specifications, pages 4-6
- LOW FREQUENCY NOISE REJECTION:** (Does not apply to PAXH)
 - Normal Mode: > 60 dB @ 50 or 60 Hz ±1%, digital filter off
 - Common Mode: >100 dB, DC to 120 Hz

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

- 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

- 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 μ V/°C)
- MEMORY:** Nonvolatile E²PROM retains all programmable parameters and display values.
- ENVIRONMENTAL CONDITIONS:**
 - Operating Temperature Range: 0 to 50°C (0 to 45°C with all three plug-in cards installed)
 - Storage Temperature Range: -40 to 60°C
 - Operating and Storage Humidity: 0 to 85% max. RH non-condensing
 - Altitude: Up to 2000 meters

- CERTIFICATIONS AND COMPLIANCES:**
 - SAFETY**
 - UL Recognized Component, File #E179259, UL3101-1, CSA C22.2 No. 1010-1
 - 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 #UL/5854B/UL
 - CB Scheme Test Report #02ME04503-04122002
 - Issued by Underwriters Laboratories, Inc.
 - IEC 1010-1, 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 Level 3; 8 Kv air
Electromagnetic RF fields	EN 61000-4-3	Level 3; 10 V/m ¹ 80 MHz - 1 GHz
Fast transients (burst)	EN 61000-4-4	Level 4; 2 Kv I/O Level 3; 2 Kv power
RF conducted interference	EN 61000-4-6	Level 3; 10 Vrms 150 KHz - 80 MHz
Simulation of cordless telephones	ENV 50204	Level 3; 10 V/m 900 MHz ±5 MHz 200 Hz, 50% duty cycle

Emissions to EN 50081-2

RF interference	EN 55011	Enclosure class A Power mains class A
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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.

- CONNECTIONS:** High compression cage-clamp terminal block
 - Wire Strip Length: 0.3" (7.5 mm)
 - Wire Gage: 30-14 AWG copper wire
 - Torque: 4.5 inch-lbs (0.51 N-m) max.
- 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.
- WEIGHT:** 10.4 oz. (295 g)

MODEL PAXD - UNIVERSAL DC INPUT

- 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

- 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.