

## MODEL PAXS - SMART STRAIN GAGE METER



- LOAD CELL, PRESSURE AND TORQUE BRIDGE INPUTS
- DUAL RANGE INPUT:  $\pm 24$  mV OR  $\pm 240$  mV
- SELECTABLE 5 VDC OR 10 VDC BRIDGE EXCITATION
- OPTIONAL CUSTOM UNITS OVERLAY W/ BACKLIGHT
- PROGRAMMABLE AUTO-ZERO TRACKING
- 16 POINT SCALING FOR NON-LINEAR CORRECTION
- 9 DIGIT TOTALIZER (INTEGRATOR) WITH BATCHING
- PROGRAMMABLE FUNCTION KEYS/USER INPUTS
- PLUG 'N' PLAY FIELD INSTALLABLE OPTION CARDS



Click Icon For  
User Bulletin



FAX/WEB  
DOC # 04020

### Product Features

The PAXS (PAX Strain Gage Input Meter) offers many features and performance capabilities to suit a wide range of industrial applications. The  $4\frac{1}{2}$  digit meter employs advanced technology for stable, drift free readout, while incorporating features that provide flexibility now and in the future with Plug-in option cards. The plug-in card options allow the opportunity to configure the meter for present applications, while providing easy upgrades for future needs.

The Strain Gage meter has two bipolar mV input ranges:  $\pm 24$  mV DC or  $\pm 240$  mV DC. The internal bridge excitation is selectable for 5 VDC or 10 VDC. The excitation output is based on a reference, ensuring accurate and drift-free readouts. A 16 point scaling feature compensates for square-law devices and other non-linear process characteristics.

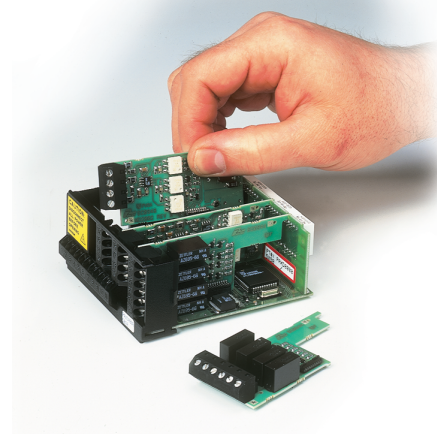
The meter provides a Max and Min reading memory with programmable capture time. The capture time is used to prevent detection of false max and min readings which may occur during start-up or unusual process events.

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 and pumps, etc. The totalizer can also accumulate batch weighing operations.

Once the meter has 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.

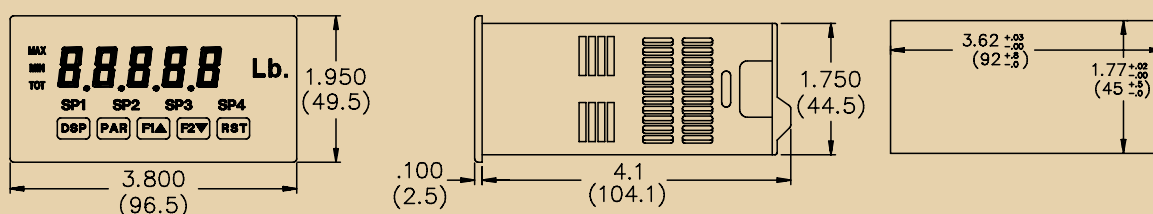
The meter has been specifically designed for harsh industrial environments. With NEMA 4X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.

### OPTIONAL PLUG-IN CARDS



The PAX series meters can be fitted with up to three optional plug-in cards. However, only one card from each function type can be installed at a time. The function types include Setpoint Alarms (PAXCDS), Communications (PAXCDC), and Analog Output (PAXCDL). The cards can be installed initially or at a later date. Each optional plug-in card is shipped with complete installation and programming instructions.

### DIMENSIONS "In inches (mm)"



## MODEL PAXS - SMART STRAIN GAGE METER

### Product Features Continued

#### SETPOINT ALARMS PLUG-IN CARDS (PAXCDS)

The PAX series has four 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:

- Dual relay, FORM-C, Normally open & closed
- Quad relay, FORM-A, Normally open only
- Isolated quad sinking NPN open collector
- Isolated quad sourcing PNP open collector

The setpoint alarms can be configured in modes to suit a variety of control and alarm requirements.

- High and low absolute, high and low deviation and band acting
- Balanced or unbalanced hysteresis
- On and off delay timers
- Auto reset or latching modes
- Reverse phase output and/or panel indicator
- Selection of alternate list of setpoint values

#### COMMUNICATION CARDS (PAXCDC)

Plug-in cards also facilitate bus communications. Readout values and setpoint alarm values can be controlled through the bus. Additionally, the meter has features that allow a remote computer to directly control the outputs of the meter. With a communication 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.

#### SERIAL RS485 PLUG-IN CARD

An RS485 communication port can be installed with the serial RS485 plug-in card. The RS485 option allows the connection of up to 32 meters or other devices (such as a printer, PLC, HMI, or a host computer) on a single pair of wires not longer than 4,000 feet. The address number of each meter on the line can be programmed from 0-99. Data from the meter(s) can be interrogated or changed and alarm outputs can be reset by sending the proper command string. The function keys and user inputs can be programmed to send data to a printer or other device via serial communications.

#### SERIAL RS232 PLUG-IN CARD

An RS232 communication port can be installed with the serial RS232 plug-in card. The RS232 is intended to allow only 2 devices, not more than 50 feet apart, to communicate to each other (such as a printer, PLC, HMI, or host computer). Data from the meter(s) can be interrogated or changed and alarm outputs can be reset by sending the proper command string. The function keys and user inputs can be programmed to send data to a printer or device via serial communication.

#### DEVICENET™ PLUG-IN CARD

A DeviceNet communication port can be installed with the DeviceNet plug-in card. DeviceNet is a high level bus protocol based upon the CAN specifications. The protocol allows the integration of devices of different types and manufacturers within a common communication framework.

#### ANALOG OUTPUT PLUG-IN CARD (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 the input, max, min, or total display value. Reverse acting output is possible by reversing the scaling point positions. The output can be scaled independent of the input range. The features of the linear output card are:

- Output tracks either input, totalizer, max or min readings
- Programmable output update times
- Programmable for forward or reverse acting

#### 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 in the programming. See Accessories for details on this kit.

#### PC SOFTWARE (SFPAX)

The SFPAX is a Windows® based program that allows configuration of the PAX meter from a PC. Using SFPAX makes it easier to program the PAX meter and allows saving the PAX program in a PC file for future use. On-line help is available within the software. A PAX serial plug-in card is required to program the meter using the software.

### General Specifications

- DISPLAY:** 5 digit, 0.56" (14.2 mm) red LED, (-19999 to 99999)
- POWER:**
  - AC Versions (PAXS0000):**
    - AC Power:** 85 to 250 VAC, 50/60 Hz, 15 VA
    - Isolation:** 2300 Vrms for 1 min. to all inputs and outputs.
  - DC Versions (PAXS0010):**
    - DC Power:** 11 to 36 VDC, 11 W
    - (derate operating temperature to 40° C if operating <15 VDC and three plug-in 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
- 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)\*\*
  - 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.
- BRIDGE EXCITATION:**
  - Jumper Selectable:** 5 VDC @ 65 mA max., ±2%
  - 10 VDC @ 125 mA max., ±2%
  - Temperature coefficient (ratio metric):** 20 ppm/°C max.
- TOTALIZER:**
  - Time Base:** second, minute, hour, or day
  - 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

## MODEL PAXS - SMART STRAIN GAGE METER

### General Specifications Continued

8. **MEMORY:** Nonvolatile E<sup>2</sup>PROM retains all programmable parameters and display values.
9. **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. relative humidity non-condensing
  - Altitude:** Up to 2000 meters
10. **CERTIFICATIONS AND COMPLIANCES:**
  - SAFETY**
    - EN 61010-1, IEC 1010-1
    - UL Recognized Component, File #E179259
    - Recognized to U.S. and Canadian requirements under the Component Recognition Program of Underwriters Laboratories, Inc.

#### ELECTROMAGNETIC COMPATIBILITY

- Immunity to EN 50082-2
- Emissions to EN 50081-2
- 11. **CONNECTIONS:** High compression cage-clamp terminal block
- Wire Strip Length:** 0.3" (7.5 mm)
- Wire Gauge Capacity:** One 14 AWG (2.55 mm) solid, two 18 AWG (1.02 mm) or four 20 AWG (0.61 mm)
- 12. **CONSTRUCTION:** This unit is rated for NEMA 4X/IP65 indoor 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.
- 13. **WEIGHT:** 10.4 oz. (295 g)

### Input Specifications

1. **A/D CONVERTER:** 16 bit resolution \*\*\*
2. **DISPLAY MESSAGES:**
  - "LOL" - 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.
3. **CONNECTION TYPE:** 4-wire bridge (differential)  
2-wire (single-ended)
4. **COMMON MODE RANGE (w.r.t. input common):** 0 to +5 VDC  
Rejection: 80 db (DC to 120 Hz)
5. **SENSOR INPUTS:**

Input (Range)	Accuracy* (18 to 28°C)	Accuracy* (0 to 50°C)	Impedance/ Compliance	Max Continuous Overload	Display 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.

\*\* The meter periodically (every 12 seconds) imposes a 500 msec delay to compensate for internal zero drift. If the delay affects applications where

step response is critical, it can be defeated. Set the display update to 20/sec to disable. In this case, add a zero error of 0.2% FS to the 24 mV input range over the 0 to 50°C span.

\*\*\* Nominal Resolution. The internal resolution is the input divided by 65,535.

6. **LOW FREQUENCY NOISE REJECTION:**
  - Normal Mode:** > 60 dB @ 50 or 60 Hz ±1%, digital filter off
  - Common Mode:** >100 dB, DC to 120 Hz
7. **USER INPUTS (Logic Level):** Three software defined user inputs, jumper selectable for sink/source logic
- Max. Continuous Input:** 30 VDC
- Isolation To Sensor Input Common:** Not isolated
- Response Time:** 50 msec. max.
- Logic State:** Jumper selectable for sink/source logic.

INPUT STATE	SINKING INPUTS 22 KΩ pull-up to +5 V	SOURCING INPUTS 22 KΩ pull-down
Active	V <sub>IN</sub> < 0.7 VDC	V <sub>IN</sub> > 2.5 VDC
Inactive	V <sub>IN</sub> > 2.5 VDC	V <sub>IN</sub> < 0.7 VDC

8. **CUSTOM LINEARIZATION:**
  - Data Point Pairs:** Selectable from 2 to 16
  - Display Range:** -19,999 to 99,999
  - Decimal Point:** 0 to 0.0000

### Output Specifications

1. **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)
2. **DEVICENET™ CARD:**
  - Compatibility:** Group 2 Server Only, not UCMM capable
  - Baud Rates:** 125Kbaud, 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 (50V working) between DeviceNet™ and meter input common.
3. **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 KΩ load min., 20 mA: 500 Ω load max.

**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)

4. **SETPOINT OUTPUT CARD:** Four types of field installable plug-in cards

**Dual Relay Card:**

**Type:** Two FORM-C relays

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

## MODEL PAXS - SMART STRAIN GAGE METER

### Output Specifications Continued

**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

**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)

**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 @ 250 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

**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)

**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

**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)

**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

**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)

### Ordering Information

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Meter	PAXS	Strain Bridge Input Panel Meter, Upgradeable, AC Powered	PAXS0000
		Strain Bridge Input Panel Meter, Upgradeable, DC Powered	PAXS0010
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 Card	PAXCDC10
		RS232 Serial Communications Card	PAXCDC20
		DeviceNET Communications Card	PAXCDC30
	PAXCDL	Analog Output Card	PAXCDL10
Accessories	PAXLBK	Units Label Kit Accessory	PAXLBK10
	SFPAX	PC Configuration Software for Windows 3.x and 95 (3.5" disk)	SFPAX