

MODEL PAXP - 1/8 DIN PROCESS INPUT PANEL METER



- OPTIONAL CUSTOM UNITS OVERLAY W/ BACKLIGHT
- DUAL RANGE INPUT (20 mA or 10 VDC)
- 24 VDC TRANSMITTER POWER
- -19,999 to 99,999 DISPLAY RANGE

- 16 POINT SCALING FOR NON-LINEAR PROCESSES
- MAX AND MIN READING MEMORY
- PROGRAMMABLE INPUT AND OUTPUT RESPONSE TIMES
- TIME-INPUT INTEGRATOR
- PROGRAMMABLE FUNCTION KEYS
- THREE PROGRAMMABLE DIGITAL CONTROL INPUTS
- FOUR SETPOINT ALARM OUTPUTS (W/Plug-in card)
- COMMUNICATION AND BUS CAPABILITIES (W/Plug-in card)
- ANALOG OUTPUT SIGNAL (W/Plug-in card)
- PC SOFTWARE AVAILABLE FOR METER CONFIGURATION
- NEMA 4X/IP65 SEALED FRONT BEZEL



UL Recognized Component,
File # E179259



GENERAL DESCRIPTION

The PAXP (PAX Process Input Meter) offers many features and performance capabilities to suit a wide range of industrial applications. The 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 Process Meter has two inputs: 0 to 20 mA DC or 0 to 10 VDC. A built-in 24 VDC supply powers remote transmitters. The meter incorporates a 16-point input scaling feature for compensation of non-linear processes.

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.

The meter has four setpoint outputs, implemented on Plug-in cards. The Plug-in cards provide dual FORM-C relays (5 A), quad FORM-A relays (3 A) or either sinking or sourcing quad open collector logic outputs. 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

Plug-in cards also facilitate bus communications. These include RS232, RS485 and DeviceNet. 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. This is useful during commissioning phases and diagnostic use. With a communication card installed, set-up software allows configuration from a PC. The configuration data can be saved to a file for later recall.

A linear DC output signal is available as a plug-in card. The card provides either 20 mA or 10 V signals. The output can be scaled independent of the input range.

The features of the linear output cards are:

- Output tracks either input, totalizer, max or min readings
- Programmable output update times

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 NEMA4 X/IP65 sealed bezel and extensive testing of noise effects to CE requirements, the meter provides a tough yet reliable application solution.



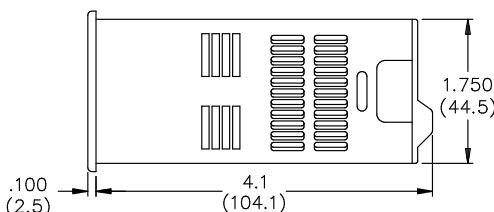
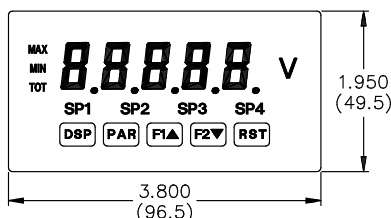
CAUTION: Read complete instructions prior to installation and operation of the unit.



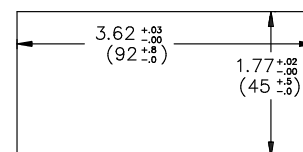
CAUTION: Risk of electric shock.

DIMENSIONS "In inches (mm)"

Note: Recommended minimum clearance (behind the panel) for mounting clip installation is 2.1" (53.4) H x 5.5" (140) W.



PANEL CUT-OUT



SPECIFICATIONS

1. **DISPLAY:** 5 digit, 0.56" red LED, (-19999 to 99999)

2. POWER

AC Versions (PAXP0000):

AC Power: 85 to 250 VAC, 50/60 Hz, 15 VA

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

DC Versions (PAXP0010):

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).

3. ANNUNCIATORS:

MAX - max readout selected

MIN - min. 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 - software controlled 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)**

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. RANGE OVERLOAD RESPONSE:

Display flashes [OLOL] at approximately 130% above range

Display flashes [ULUL] at approximately -10% below range

8. 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.

** 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 0.1% FS over the 0 to 50°C range.

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

9. EXCITATION POWER:

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

10. LOW FREQUENCY NOISE REJECTION:

Normal Mode: > 60 dB @ 50 or 60 Hz ±1%, digital filter off

Common Mode: >100 dB, DC to 120 Hz

11. **USER INPUTS (Logic Level):** Three software defined user inputs, jumper selectable for sink/source logic

Max. Continuous Input: 30 VDC

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

Isolation To Sensor Input Common: Not isolated. Do not tie commons together.

12. 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

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. SERIAL COMMUNICATIONS: (RS232 or RS485)

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 19200

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)

15. ANALOG OUTPUT :

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.

16. SETPOINT OUTPUT: Four types of field installable cards

Dual Relay Card:

Type: Two FORM-C relays

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

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: 100K 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.

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

Quad Sinking Open Collector:

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:

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 ± 10% , 30 mA max. total all four outputs

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

17. **MEMORY:** Nonvolatile E²Prom retains all programmable parameters and display values.

18. CERTIFICATIONS AND COMPLIANCES:

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

electrostatic discharge	EN 61000-4-2	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
RF conducted interference	EN 61000-4-6	level 3; 10 V/rms 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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19. 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. non-condensing

Altitude: Up to 2000 meters

20. CONNECTIONS: High compression cage-clamp terminal block

Wire Strip Length: 0.35" (9 mm)

Wire Gauge Capacity: One 14 AWG solid or Two 18 AWG

21. 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.

22. WEIGHT: 10.4 oz. (295 g)

Safety Summary

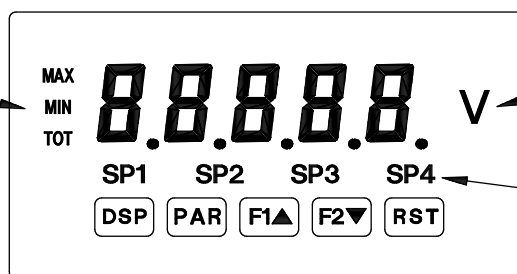


All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection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

FRONT PANEL

Display
Readout
Legends



Custom Units
Overlay

Setpoint Alarm
Annunciators

KEY DISPLAY MODE OPERATION

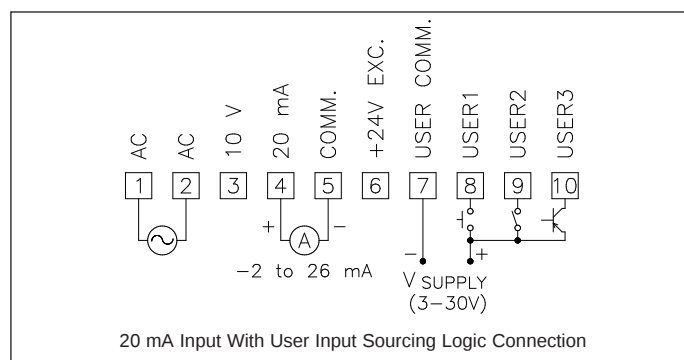
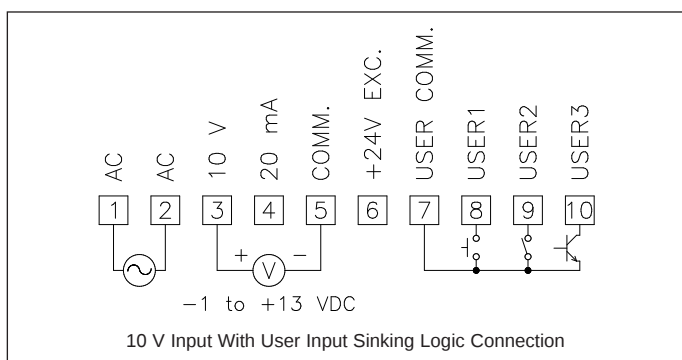
DSP	Index display through max/min/total/input readouts
PAR	Access parameter list
F1▲	Function key #1; hold for 3 seconds for Second Function #1
F2▼	Function key #2; hold for 3 seconds for Second Function #2
RST	Reset (function key)

PROGRAMMING MODE OPERATION

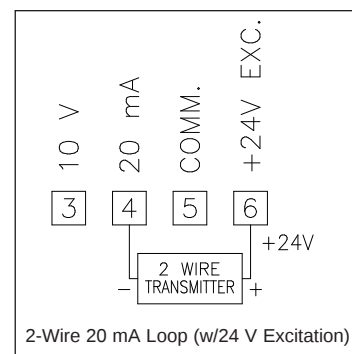
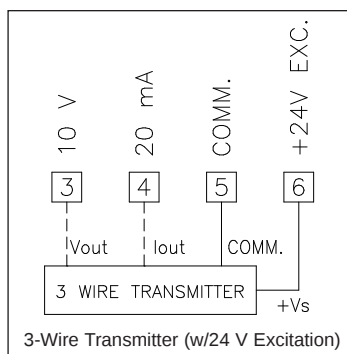
	Quit programming and return to display mode
	Store selected parameter and index to next parameter
	Increment selected parameter value
	Decrement selected parameter value
	Hold with F1▲, F2▼ to scroll value by x1000

BASIC CONNECTIONS

Note: Option card field connection diagrams are supplied with the card.



Sensor Input Common is NOT isolated from User Input Common. Do NOT tie commons together. 24 VDC supply is intended to power remote transmitters, do NOT use it for any other purpose.



CUSTOM UNITS OVERLAY

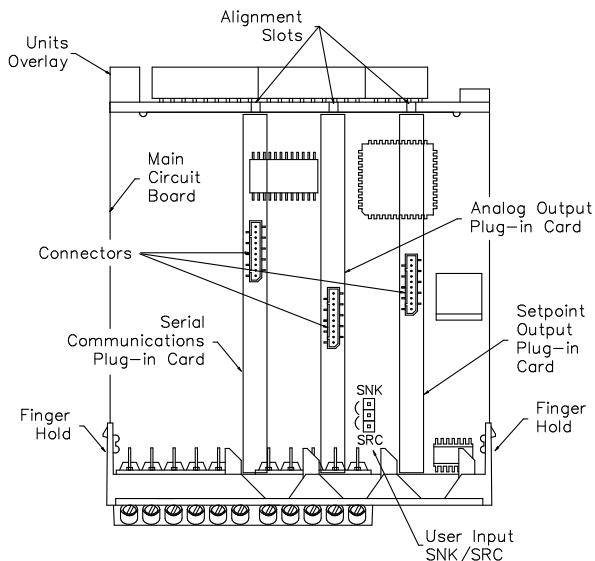
The meter has a backlighted units indicator that can be customized to the application. The backlight is turned on by programming the “b-lt” parameter. Overlays are available in the Units Label Kit. To install an overlay, remove the unit from the case. Select the label and apply it to the label frame, noting that the label must be aligned accurately. Install the label frame to the display board in the alignment holes located on the right side of the display.

PLUG-IN CARDS

The meter has three plug-in card slots. Each slot is dedicated to a specific function. These functions are:

- Setpoint Outputs
- Analog Outputs
- Communication Option

The plug-in cards can be used in any combination, however, it is only possible to use one type of card from each category. Cards can be installed initially, or at a later date as system needs arise.



WARNING: Disconnect power to the unit before installing plug-in cards. To install a card, depress the side latches at the finger holds and remove the unit from the rear of the case. Insert the card into the appropriate slot and re-install the unit.

INPUTS

User Input Jumper Link

Select source position for use with sourcing logic (PNP).

Select sink position for use with sinking logic (NPN) and mechanical switches.

20 mA Input

The total range of the 20 mA input extends from -2 mA to 26 mA DC. The input is overload protected to 150 mA.

10 VDC Input

The total range of the 10 VDC input extends from -1 VDC to 13 VDC. The input is overload protected to 300 VDC.

Scaling

The meter has been factory calibrated on all ranges as a basic multimeter (voltmeter/ammeter). The basic meter readout can then be post scaled to read out in the process units (level, flow, temperature, etc.). The meter provides two ways in which to scale the display:

Key-in: Key in the input and display scaling points using known data.

Apply: Apply the actual input value and key in the corresponding display value. The meter records the input value applied.

For processes that require linearity compensation, up to 16 scaling points can be used for correction. The scaling range is extended up to five digits of resolution with selectable display rounding factors.

Input Features

A unique adaptive input filter is used. Whenever the difference between one reading and the next is less than the filter band value, the input is filtered. When the difference exceeds the filter band value, the input is not filtered. This avoids the usual compromise between using a relative high time constant for good noise rejection and using a low time constant filter for quick step response.

The readout can be corrected for process zero errors with an offset value. A tare function zeros the readout via a function operation.

FUNCTION KEYS AND USER INPUTS

The Function Keys and User inputs can be programmed to perform specific meter control operations. There are three function keys, with Function Keys #1 and #2 each having two types of functions, primary and secondary. The primary function is executed the instant the key is pressed. Holding the key for three seconds executes the second function. If the key is not held for 3 seconds, the second function is not executed. To implement a hidden key, program no function for the primary and program the desired function for the second.

The three user inputs can be selected for sinking or sourcing logic.

MAX AND MIN READING DETECTION

The meter records the maximum (max) and minimum (min) process inputs. Conditions such as valve activation, sudden change in material flow rate, etc., can result in false peaks which are not reflective of the true maximum and minimum of the process. In this case, Max and Min capture delay times can be used to prevent the detection of false maximums and minimums.

TOTALIZER (integrator)

The totalizer can be used to integrate a time-input product. The totalizer accumulates input readings according to the following relation:

$$\text{Total}(n) = \text{Total}(n-1) + [\text{Input}(n) * (\text{scale factor}/\text{time base})]$$

n = nth sample instant (seconds)

input = input reading (ignore decimal point position)

scale factor = 0.001 to 65,000

time base: sec = 1

min = 60

hour = 3600

day = 86,400

When the total exceeds 5 digits, the front panel annunciator “TOT” flashes. In this case, the meter continues to totalize up to a 9 digit value. The high order 4 digits and the low order 5 digits of the total are displayed alternately. The letter “h” denotes the high order display.

The total decimal point position is independent of the input. A low cut value disables totalization below a set input value. Alarms can be programmed to activate when a set total is reached. Alternately, the totalizer can be used to accumulate batch weighing operations.

PARAMETER LOCK MODE

A user input can be used to lock the parameter list. When the user input is active, the meter is in the protected parameter mode, where it is only possible to access the setpoint values and the security code.

It is possible to lock the parameter list without using a user input as a program lock function. In this case, set the security code to a non-zero value. With a non-zero security value set, press the PAR key to view the programmed setpoint values. The security code requires a “key” value to gain access to the full parameter list.

SETPOINT ALARMS

The meter has four setpoint alarm Plug-in cards. Only one of these cards can be installed at a time. These are:

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

The setpoint alarms can be independently configured for a variety of operating modes. It is also possible to set the alarms to trigger from the totalizer value. The setpoint alarm figures illustrate the operating modes:

Setpoint Alarm Values

When setpoint alarm is programmed as deviation or band acting, the effective trigger point is offset by SP1. In these modes, SP1 acts as a master setpoint, that the other setpoints track.

An alternate list of setpoint values can be stored and recalled as needed. Select the alternate list with a function key or user input and program the setpoint values. This allows for quick changeover for a new process condition.

Setpoint Alarm Hysteresis and On/Off Time Delay

Depending on the application, hysteresis or On/Off time delays can be used. When the setpoint is a control output, hysteresis is usually used to control the cycle period. Optionally, time delay can also be employed to ensure minimum On/Off times. This is useful to limit the cycling of refrigeration compressors.

On/Off time delays are effective when the setpoint is used as an alarm output. The time delays can be used to prevent false triggering during process transient events, while hysteresis eliminates output chatter at the switch point.

The hysteresis value can be selected to act in the balanced mode or unbalanced mode. In the balanced mode, the hysteresis action is centered about the trigger point, while in the unbalanced mode the hysteresis acts on one side of the trigger point. When the setpoint is a control output, usually balanced hysteresis is used. This tends to center the oscillation around the setpoint value. For alarm applications, usually unbalanced hysteresis is used. This makes the alarm activate precisely at the trigger value.

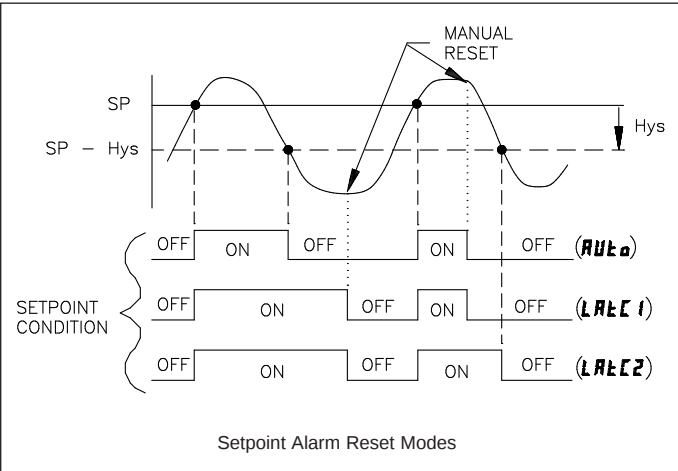
Setpoint Alarm Output Phase and Panel Annunciator

The output phase (logic) of each setpoint can be reversed. While the front panel indicator follows the output state, it can be programmed to reverse as well; or flash for added emphasis.

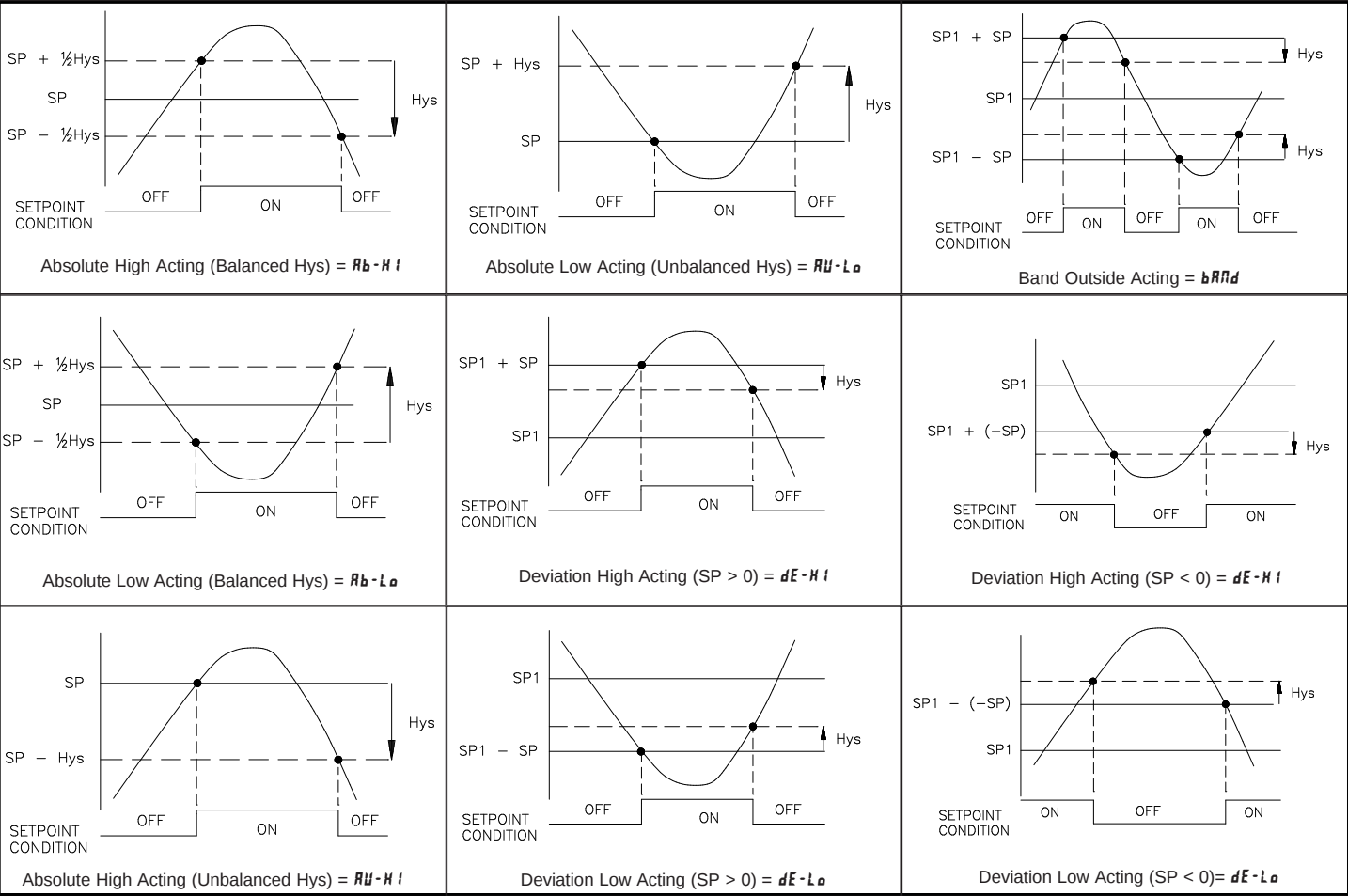
OUTPUT	ON CONDITION
RELAY	Energized
SNK O.C.	$V_{OUT} = 0\text{ V}$
SRC O.C.	$V_{OUT} = V_S$

Setpoint Alarm Reset Modes, Standby Operation

Each setpoint alarm can be programmed for auto or latching reset modes. Standby operation can be used to prevent the triggering of a low alarm until the process first exceeds the alarm value. This suppresses false alarms during system start-up.



Setpoint Alarm Figures



RS232 PLUG-IN CARD

An RS232 communication port can be installed with a Plug-in card. RS232 is intended to allow only 2 devices to communicate to each other (i.e., printer or computer).

RS485 PLUG-IN CARD

An RS485 communication port can be added with a Plug-in card. RS485 offers multi-drop bus communications. All devices connect in parallel on a 485 bus. Only one device is permitted to transmit at any one time, while all other devices are in receive mode. The meter controls the bus when it transmits data, otherwise the meter is in the receive mode.

DEVICENET PLUG-IN CARD

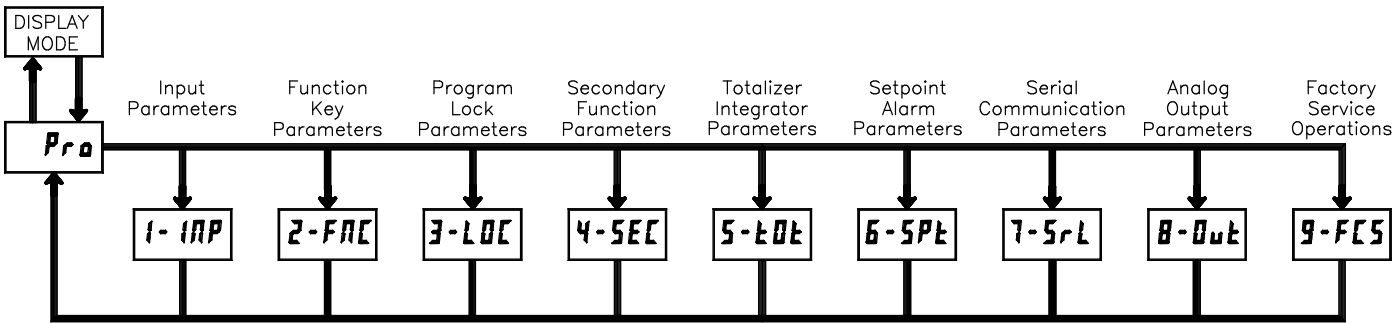
A DeviceNet communication port can be added to the meter. DeviceNet is a high level bus protocol based upon the CAN specification. The protocol allows the integration of devices of different types and manufacturers within a common communication framework.

ANALOG OUTPUT PLUG-IN CARD

The analog output is available as a Plug-in card. Either the 20 mA or the 10 V output can be used. The output can be scaled independent of the input range. Reverse acting output is possible by reversing the scaling point positions. Other features are selectable update rate and output source selection.

PROGRAMMING MENU

The programming menu of the meter is accessed by pressing the PAR key. The menu is organized into modules, which group together parameters which are related in function. Use the arrow keys to select the module, then press PAR to enter the module. The PAR key stores the selected parameter and simultaneously indexes to the next parameter. (Note: Since many parameters are dependent on scaling of process units, it is recommended to scale the display first, then set the other parameters.)



PARAMETER MODULE 1 - Input Configuration Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
rANGE	Input Range	002R - 20 mA 10u - 10 V	Select the input range
decPt	Display Resolution	0 0.0 0.00 0.000 0.0000	Select scaling decimal point position
round	Display Rounding Increment	1 - round by 1 2 - round by 2 5 - round by 5 10 - round by 10 20 - round by 20 50 - round by 50 100 - round by 100	Select least significant display rounding factor
Filter	Filter Setting	00 to 250 seconds	Sets the digital filter time constant. 0 = disabled

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
band	Filter Enable Band	0 to 250 display units	0 = always on Δ = reading - previous reading filter on : Δ < band filter off : Δ > band
PtS	Scaling Points	2 to 16	Select # of scaling points
style	Scaling Style	KEY - key-in data APLY - apply signal	Select Scaling technique
INP x	Input Value for Scaling Point x	- 19999 to 19999	Key-in or apply input value for scaling point x. If applied, press PAR to accept signal. Decimal point follows range selected.
dSP x	Display Value for Scaling Point x	- 19999 to 99999	Key-in display value for scaling point x. Decimal point follows that assigned.

PARAMETER MODULE 2 - External Input and Front Panel Function Key Configuration Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
USr-1 USr-2 USr-3	User Input Function	na - no function PL0C - Lock parameter list rEL - Zero display d-rEL - Select relative display (net/gross) d-HLd - Hold Display R-HLd - Hold all functions SynC - Synchronize meter readings bRt - Store batch readings in totalizer d-tot - Select total display r-tot1 - Reset totalizer r-tot2 - Reset and gate totalizer E-tot - Gate totalizer d-h1 - Select max display r-h1 - Reset, display and gate max reading d-La - Select min display r-La - Reset, display and gate min reading r-HL - Reset max and min L15t - Select main or alternate setpoint list r-1 - Reset setpoint 1 r-2 - Reset setpoint 2	User Input #1, #2, and #3 programming. Active = Lock Active = relative *net = rEL *gross = Rb5 Active = Enable Active = Alternate *main = Lad-R *alternate = Lad-b Maintained Reset

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
		r-3 - Reset setpoint 3 r-4 - Reset setpoint 4 r-34 - Reset setpoint 34 r-234 - Reset setpoint 234 r-ALL - Reset all setpoints Print - Print Request	Maintained Reset Maintained Action
F1 F2 rSt Sc-F1 Sc-F2	Function Keys Second F1 Second F2	na - same as above rEL - same as above d-rEL - Select relative display (net/gross) bRt - same as above r-tot - reset totalizer r-h1 - reset max r-La - reset min r-HL - reset max and min L15t - Select main or alternate setpoint list r-1 - same as above r-2 - same as above r-3 - same as above r-4 - same as above r-34 - same as above r-234 - same as above r-ALL - same as above Print - same as above	Function key programming. Function is executed when key is pressed. Hold key for 3 seconds for second function. *main = Lad-R *alternate = Lad-b Momentary Reset Momentary Action

* Momentarily displayed at transition.

PARAMETER MODULE 3 - Parameter and Display Lock-out Configuration Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
H1 La t0t	Maximum Display Minimum Display Total Display	L0C - lockout rEd - display readout	Display Readout Options
SP-1 SP-2 SP-3 SP-4	Setpoint 1 Setpoint 2 Setpoint 3 Setpoint 4	L0C - lockout rEd - read only ERt - read and enter value	Protected Parameter Mode Options
LadE	Security Code	0 to 250	Security Code; code ≠ 0 parameters are locked. 222 = universal unlock

PARAMETER MODULE 4 - Secondary Function Configuration Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
H1-t L0-t	Max Capture Delay Time Min Capture Delay Time	00 to 32750 sec	Sets time delay for capturing new max/min values. Helps to avoid false captures.
dSP-t	Display Update Rate	1, 2, 5, 10, 20 updates/second	Affects display rate only. 20/sec disables zero correction (See Specs)
b-L1t	Units Label Backlight	00 - Backlight on 0FF - Backlight off	Install label
0FF5t	Post Scaling Offset	-19999 to 99999	Applies directly to scaled readout. Holds value (tare) from rEL operation

PARAMETER MODULE 5 - Totalizer Configuration Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
dECPt	Totalizer Decimal Point Position	0 00 000 0000 00000	Independent of input scaling.
tBASE	Totalizer Time Base	SEC _in hour day	Set the time base of the totalizer. _in = minutes

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
SCFAC	Totalizer Scale Factor	0000 to 65000	
Locut	Low Cut Value	-19999 to 99999	Input < locut disables totalizer
P-UP	Power Up Reset	00 - do not reset buffer rSt - reset buffer	Resets totalizer buffer at meter power-up

PARAMETER MODULE 6 - Setpoint Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
SPSEL	Select Setpoint		Select setpoint for configuration
Rct-n	Action for Setpoint	OFF - setpoint is disabled Rb-H I - absolute high, balanced hysteresis Rb-LQ - absolute low, balanced hysteresis RU-H I - absolute high, unbalanced hysteresis RU-LQ - absolute low, unbalanced hysteresis *dE-H I - deviation high, unbalanced hysteresis *dE-LQ - deviation low, unbalanced hysteresis *bRNd - band outside, unbalanced hysteresis **LoLo - Lower totalizer absolute high, unbalanced **LoHi - Upper totalizer absolute high, unbalanced	Select operating action for setpoint See Figures for operation Deviation and Band operation is relative to SP1. *Not available for SP1 ** Totalizer has 9 digit capacity. Select to trigger on the upper or lower portion of the number.

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
SP-n	Setpoint Value	- 19999 to 99999	Main or alternate, as selected
HYS-n	Hysteresis	1 to 65000	
tOn-n	On Time Delay	0.0 to 3275.0 sec	
tOff-n	Off Time Delay		
out-n	Output Logic	nor - Normal reu - Reversed	
rSt-n	Reset Action	Auto - Automatic Reset LALC1 - Latch w/immediate reset LALC2 - Latch w/delayed reset	See Reset Mode Figure
Stb-n	Standby Operation	NO - Disable standby YES - Enable standby	Power-up standby operation.
LIt-n	Output Panel Light	OFF - Always off nor - On when output on reu - Reverse from nor FLASH - Flashes when output is on	

PARAMETER MODULE 7 - Serial Communications Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
bRUD	Baud Rate	300 600 1200 2400 4800 9600 19200	Set baud rate to match other equipment. Set to 9600 for PC configuration software.
dRtR	Number of Data Bits	7 8	8 = No parity
PRr	Parity Bit	Odd Even NO	Possible Combinations: 8, N, 1 7, O, 1 7, E, 1 7, N, 2

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
Addr	Node Address	0 to 99	Unique address for each meter. Set to 0 for PC configuration software.
AbRu	Abbreviated Output	NO - ID characters printed YES - ID characters suppressed	Select full or abbreviated transmission
OPT	Print Options	YES - Enter sub-menu NO - Disables parameter INP - Input LoL - Total HiLo - Max & Min SPnt - Setpoint Values	Sub-menu to select parameters shown below for output transmission.

PARAMETER MODULE 8 - Analog Output Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
TYPE	Select Analog Output Type	0-20 - 0 to 20 mA 4-20 - 4 to 20 mA 0-10 - 0 to 10 V	
AS IN	Output Source Assignment	INP - input signal Hi - max reading Lo - min reading LoL - totalizer value	Select source of linear output signal. If totalizer, scaling limited to lower 5 digits.

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
AN-Lo	Display Scale Value Low		Low = 0 mA/ 4 mA/ 0 V
AN-Hi	Display Scale Value High	- 19999 to 99999	High = 20 mA/ 10 V For reverse acting, reverse scale high and scale low
udt	Update Time	0.0 to 10.0 sec	0.0 = Instant updates

PARAMETER MODULE 9 - Factory Service Function Parameters

DISPLAY	PARAMETER	RANGE AND UNITS	DESCRIPTION/ COMMENTS
Code	Factory Service Access Code	40 - Calibration 66 - Restore Factory Defaults	Consult Factory for Calibration Procedure

PARAMETER VALUE CHART Code _____

1- INP - Input Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
rRNGE	INPUT RANGE	0.02A	_____
dECPl	DISPLAY RESOLUTION	0.00	_____
rOund	DISPLAY ROUNDING INCREMENT	0.01	_____
FILtR	FILTER SETTING	10	_____
bRNd	FILTER ENABLE BAND	0.10	_____
PtS	SCALING POINTS	2	_____
INP 1	INPUT VALUE 1	0.000	_____
dSP 1	DISPLAY VALUE 1	0.00	_____
INP 2	INPUT VALUE 2	20.000	_____
dSP 2	DISPLAY VALUE 2	100.00	_____
INP 3	INPUT VALUE 3	0.000	_____
dSP 3	DISPLAY VALUE 3	0.00	_____
INP 4	INPUT VALUE 4	0.000	_____
dSP 4	DISPLAY VALUE 4	0.00	_____
INP 5	INPUT VALUE 5	0.000	_____
dSP 5	DISPLAY VALUE 5	0.00	_____
INP 6	INPUT VALUE 6	0.000	_____
dSP 6	DISPLAY VALUE 6	0.00	_____
INP 7	INPUT VALUE 7	0.000	_____
dSP 7	DISPLAY VALUE 7	0.00	_____
INP 8	INPUT VALUE 8	0.000	_____
dSP 8	DISPLAY VALUE 8	0.00	_____
INP 9	INPUT VALUE 9	0.000	_____
dSP 9	DISPLAY VALUE 9	0.00	_____
INP 10	INPUT VALUE 10	0.000	_____
dSP 10	DISPLAY VALUE 10	0.00	_____
INP 11	INPUT VALUE 11	0.000	_____
dSP 11	DISPLAY VALUE 11	0.00	_____
INP 12	INPUT VALUE 12	0.000	_____
dSP 12	DISPLAY VALUE 12	0.00	_____
INP 13	INPUT VALUE 13	0.000	_____
dSP 13	DISPLAY VALUE 13	0.00	_____
INP 14	INPUT VALUE 14	0.000	_____
dSP 14	DISPLAY VALUE 14	0.00	_____
INP 15	INPUT VALUE 15	0.000	_____
dSP 15	DISPLAY VALUE 15	0.00	_____
INP 16	INPUT VALUE 16	0.000	_____
dSP 16	DISPLAY VALUE 16	0.00	_____

2-FNC - External Input and Function Key Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
USR-1	USER INPUT 1	NO	_____
USR-2	USER INPUT 2	NO	_____
USR-3	USER INPUT 3	NO	_____
F1	FUNCTION KEY 1	NO	_____
F2	FUNCTION KEY 2	NO	_____
rSt	RESET KEY	NO	_____
Sc-F1	2nd FUNCTION KEY 1	NO	_____
Sc-F2	2nd FUNCTION KEY 2	NO	_____

3-LOC - Parameter Lockouts

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
HI	MAX. READING DISPLAY	rEd	_____
LO	MIN. READING DISPLAY	rEd	_____
tOt	TOT READING DISPLAY	rEd	_____
SP-1	SETPOINT 1	LOC	_____
SP-2	SETPOINT 2	LOC	_____
SP-3	SETPOINT 3	LOC	_____
SP-4	SETPOINT 4	LOC	_____
Code	SECURITY CODE	0	_____

4-SEC - Secondary Function Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
HI-t	MAX CAPTURE DELAY TIME	0.0	_____
LO-t	MIN CAPTURE DELAY TIME	0.0	_____
dSP-t	DISPLAY UPDATE TIME	2	_____
b-L It	UNITS LABEL LIGHT	OFF	_____
OFFSt	DISPLAY OFFSET	0.00	_____

5-tOt - Totalizer Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
dECPl	TOTALIZER DECIMAL POINT	0.00	_____
tBASE	TOTALIZER TIME BASE	1h	_____
SCFAC	TOTALIZER SCALE FACTOR	1000	_____
Locut	TOTALIZER LOW CUT VALUE	-199.99	_____
P-UP	TOTALIZER POWER-UP RESET	NO	_____

7-SrL - Serial Communication Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
bRud	BAUD RATE	9600	_____
dRtR	WORD LENGTH	7	_____
PAR	PARITY	Odd	_____
Addr	ADDRESS	0	_____
Abvu	ABBREVIATED	YES	_____
INP	PRINT INPUT	YES	_____
tOt	PRINT TOTAL	YES	_____
HILO	PRINT MAX & MIN	YES	_____
SPnt	PRINT SETPOINT VALUES	NO	_____

8-Out - Analog Output Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
tYPE	ANALOG TYPE	4-20	_____
AS IN	ANALOG ASSIGNMENT	INP	_____
AN-LO	ANALOG LOW SCALE VALUE	0.00	_____
AN-HI	ANALOG HIGH SCALE VALUE	100.00	_____
udt	UPDATE TIME	0.0	_____

5-SPt - Setpoint Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING	DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
RLt-1	ACTION FOR SETPOINT	OFF		RLt-3	ACTION FOR SETPOINT	OFF	
SP-1	SETPOINT VALUE (main)	1000		SP-3	SETPOINT VALUE (main)	3000	
	SETPOINT VALUE (alternate)*	1000			SETPOINT VALUE (alternate)*	3000	
HYS-1	SETPOINT HYSTERESIS	0.02		HYS-3	SETPOINT HYSTERESIS	0.02	
TON-1	ON TIME DELAY	0.0		TON-3	ON TIME DELAY	0.0	
TOF-1	OFF TIME DELAY	0.0		TOF-3	OFF TIME DELAY	0.0	
OUT-1	OUTPUT LOGIC	nor		OUT-3	OUTPUT LOGIC	nor	
RSlt-1	RESET ACTION	Auto		RSlt-3	RESET ACTION	Auto	
Stb-1	STANDBY OPERATION	NO		Stb-3	STANDBY OPERATION	NO	
Llt-1	OUTPUT PANEL LIGHT	nor		Llt-3	OUTPUT PANEL LIGHT	nor	

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING	DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
RLt-2	ACTION FOR SETPOINT	OFF		RLt-4	ACTION FOR SETPOINT	OFF	
SP-2	SETPOINT VALUE (main)	2000		SP-4	SETPOINT VALUE (main)	4000	
	SETPOINT VALUE (alternate)*	2000			SETPOINT VALUE (alternate)*	4000	
HYS-2	SETPOINT HYSTERESIS	0.02		HYS-4	SETPOINT HYSTERESIS	0.02	
TON-2	ON TIME DELAY	0.0		TON-4	ON TIME DELAY	0.0	
TOF-2	OFF TIME DELAY	0.0		TOF-4	OFF TIME DELAY	0.0	
OUT-2	OUTPUT LOGIC	nor		OUT-4	OUTPUT LOGIC	nor	
RSlt-2	RESET ACTION	Auto		RSlt-4	RESET ACTION	Auto	
Stb-2	STANDBY OPERATION	NO		Stb-4	STANDBY OPERATION	NO	
Llt-2	OUTPUT PANEL LIGHT	nor		Llt-4	OUTPUT PANEL LIGHT	nor	

* Select alternate list to program these values.

TROUBLESHOOTING

As part of the start-up procedure, the meter performs a series of internal self tests. If one or more of the diagnostic tests fails, meter operation is disabled and an error message is displayed. Press the **RST** key to acknowledge the error.

Refer to the error table below for the cause and remedy for the fault detected. For further technical assistance, contact technical support at the appropriate company numbers listed.

Error Code	Problem	Remarks
Err 1	Internal hardware fault	A fault of the microprocessor and/or the input circuit has been detected. Return meter for repair.
Err 2	Parameter list memory fault	One or more of set-up parameters has changed value due to possible electrical glitch or loss of power during parameter save operation. (during "End" display) Verify all set-up parameters, exit parameter set-up mode and cycle power to meter to clear error. If error remains, return meter for repair.
Err 3	Calibration memory fault	Verify calibration accuracy of meter. If out of tolerance, re-calibrate the meter. Otherwise, to clear error, enter and exit parameter set-up mode and cycle power to meter. If error remains, return meter for repair.
Err 4	Analog output calibration memory fault	Verify calibration accuracy of analog output. To clear error, enter and exit parameter set-up mode and cycle power to meter. If error remains, replace analog output card.
Err 5	Defective keypad	The meter has detected one of the keypad switches is defective. Inspect keypad for signs of damage or sticking. Cycle power to meter to clear error. If error remains, return meter for repair.

Installation Environment

The unit should be installed in a location that does not exceed the maximum operating temperature and provides good air circulation. The minimum vertical clearance to allow proper ventilation is 1". Placing the unit near devices that generate excessive heat should be avoided. Be sure to keep it away from heat sources (ovens, furnaces, etc.), away from direct contact with caustic vapors, oils, steams, or any other process by-products that may affect proper operation.

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

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

EMC GUIDELINES

The PAX meter has been designed and tested to meet the requirements of EMC Directive 89/336/EEC. However, successful installations depend upon several factors. These include cable routing, termination of cable shields, associated equipment, etc.

Installation

This meter meets NEMA 4X/IP65 requirements for indoor use when properly installed. The unit is intended to be mounted into an enclosed panel. Prepare the panel cutout to the dimensions shown in the Dimensions drawing. Remove the panel latch and cardboard sleeve from the unit and discard the cardboard sleeve. 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.

APPLICATION - Remote Temperature Readout

The PAXP is used to monitor and control the temperature of a curing oven. The meter is used with the ITMA loop powered temperature transmitter. The transmitter is located in a hostile environment at the point of measurement. The transmitter converts the low level thermocouple signal into a high-level process signal and sends the signal to the meter. The meter provides 24 VDC to power the transmitter.

The analog output of the meter is used to control a steam valve that regulates temperature. The scaling points of the analog output are reversed to provide a reverse acting output. The scaling point values set the control response. The target temperature is 300°F.

Setpoint/Alarms 1 and 2 are used to alarm for over and under oven temperature, respectively. They are programmed as absolute high acting and absolute low acting with unbalanced hysteresis operation.

Setpoint/Alarm 4 is used to alarm for loop current loss. The alarm is set for absolute low acting, with reverse output and the value programmed is -600°F. This alarm correlates to approximately 2 mA loop current. The control output of the meter is looped through the contacts of Setpoint/Alarm 4 to interrupt the 20 mA valve command signal.*

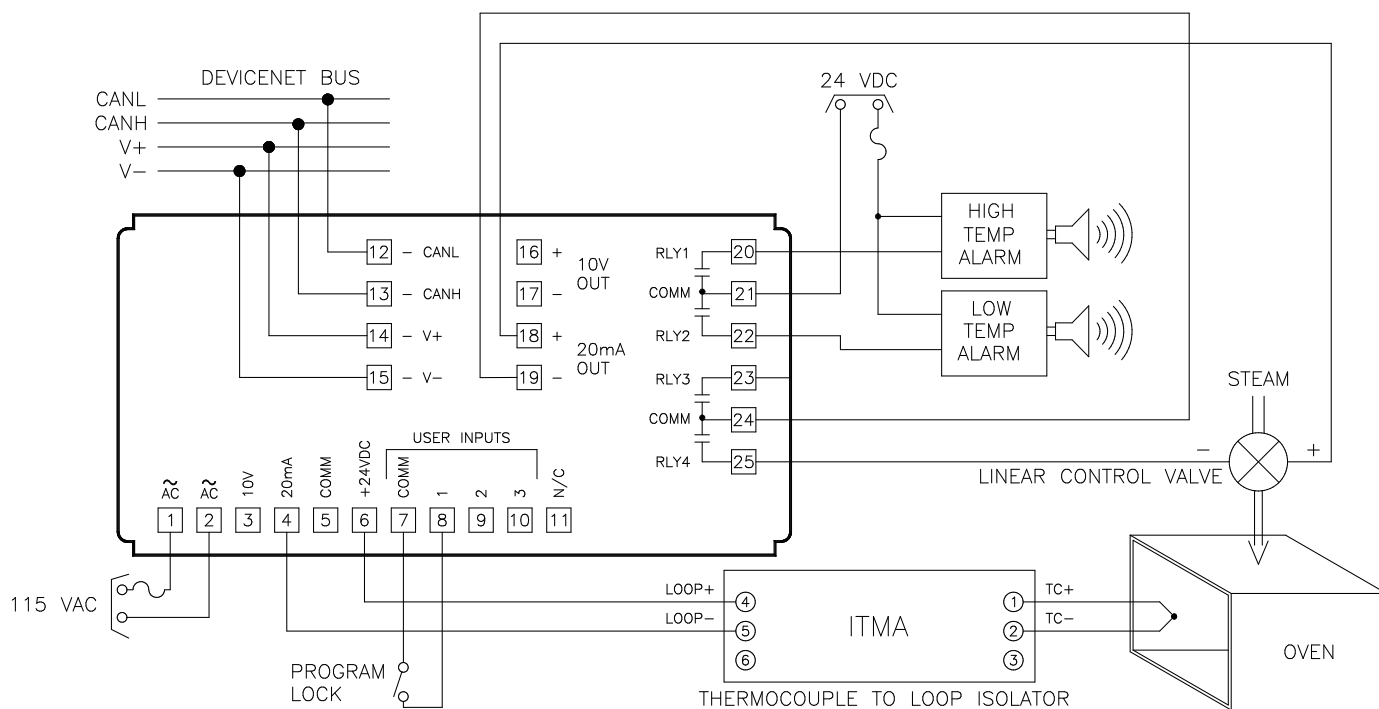
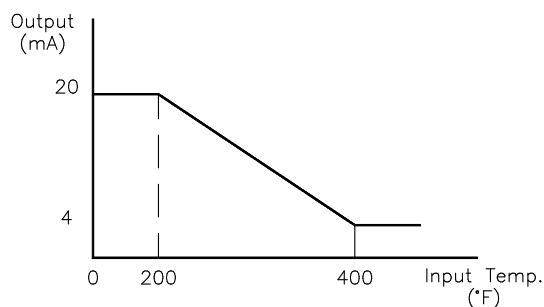
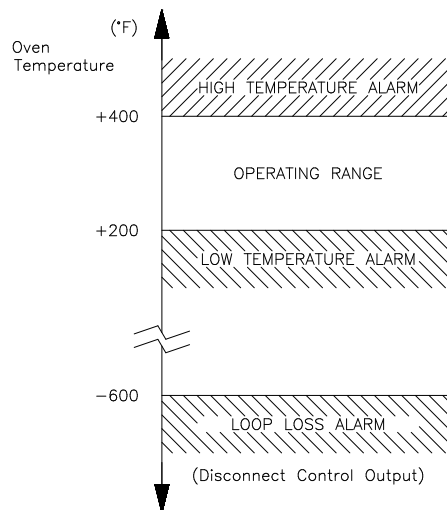
The ITMA is configured to provide full scale output in the event of a probe failure. The meter drives the control valve to 0% scale when this occurs. The meter is connected with other devices on the DeviceNet™ bus. The temperature and alarm status are monitored from the control room.

The RST function key is programmed to reset all of the alarm outputs. Function F1 is used to reset max/min memory which is retained during off periods. User Input 1 is used for local program lock, so parameters cannot be changed by the operators.

* In applications where personnel safety or material property damage can occur due to a fault of a component within the system, due consideration of an independent fail safe device must be given.

Equipment:

- PAXP0000 - Process Input Meter
- PAXCDC30 - PAX DeviceNet Plug-in Card
- PAXCDS20 - PAX Quad Relay Plug-in Card
- PAXCDL10 - PAX Analog Output Plug-in Card
- ITMA2003 - Thermocouple Loop Transmitter



ORDERING INFORMATION

MODEL NO.	DESCRIPTION	PART NUMBERS
PAXP	Process Input Panel Meter, Upgradeable, AC Powered	PAXP0000
	Process Input Panel Meter, Upgradeable, DC Powered	PAXP0010
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
PAXLBK	Units Label Kit Accessory	PAXLBK10
SFPAX	PC Configuration Software for Windows 3.x and 95 (3.5" disk)	SFPAX