BULLETIN NO. PAXC-X
DRAWING NO. LP0510
EFFECTIVE 3/00

RED LION CONTROLS

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MODEL PAXC-1/8 DIN COUNTER PANEL METER

- 6-DIGIT LED DISPLAY (Alternating 8 digits for counting)
- DUAL COUNT QUAD INPUTS
- UP TO 3 COUNT DISPLAYS
- PROGRAMMABLE SCALE FACTORS
- PROGRAMMABLE FUNCTION KEYS / USER INPUTS
- FOUR SETPOINT ALARM OUTPUTS (W/Plug-in card)
- NEMA 4X/IP65 SEALED FRONT BEZEL

GENERAL DESCRIPTION

The PAXC (PAX Counter Panel Meter) offers many features and performance capabilities to suit a wide range of industrial applications. The optional Plug-in Setpoint Alarm Cards allow the opportunity to configure the meter for alarms if that is a requirement.

The PAXC meter accepts digital inputs from a variety of sources including switch contacts, outputs from CMOS or TTL circuits and all standard RLC sensors. The meter can accept directional, uni-directional or Quadrature signals simultaneously. The maximum input signal varies up to 34 KHz depending on the count mode function configurations programmed. Each input signal can be independently scaled to various process values.

The meter provides three different display indications. These include Counter A, Counter B, and Counter C. Counter A and Counter B indicate the corresponding input count value. Counter C indicates the sum or difference between Counter A and Counter B values. Annunciators indicate which display is being shown.

The front panel keys and three user inputs are programmable to perform various meter functions. One function includes exchanging parameter lists, allowing double the number of programmable setpoint, scale factor and count load values.

The meter can have up to four setpoint outputs, determined by the Plug-in cards. The Plug-in cards provide dual FORM-C relays (5 A), quad FORM-A relays (3 A) or either quad sinking or quad sourcing open collector logic outputs. The outputs can be assigned to any of the three displays. The outputs can also be independently configured to suit a variety of control and alarm requirements.

Once the meter has been initially configured, the parameter list may be locked out from further modification entirely or setpoint, scale factor and count load values can be made accessible. This lockout is possible through a security code or user input.

The meter has been specifically designed for harsh industrial environments. With a NEMA 4X/IP65 sealed bezel and extensive testing to meet 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.

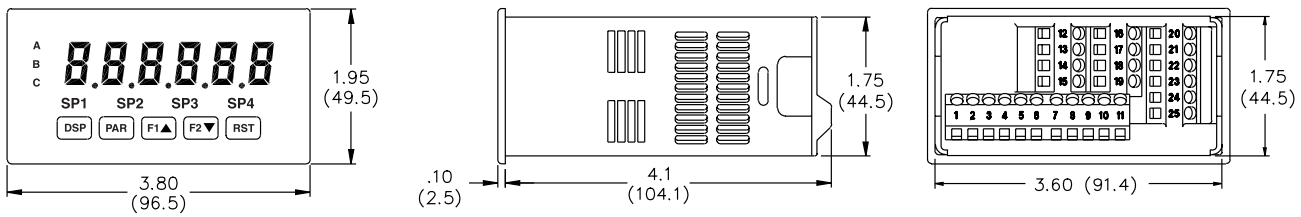
Do not use this meter to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.

CAUTION: 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.



SPECIFICATIONS

1. **DISPLAY**: 6 digit, 0.56" (14.2 mm) red LED
2. **POWER**:
   AC Versions (PAXC0000):
   AC Power: 85 to 250 VAC, 50/60 Hz, 12 VA
   Isolation: 2300 Vrms for 1 min. to all inputs and outputs. (300 V working)
   DC Versions (PAXC0010):
   DC Power: 11 to 36 VDC, 7 W
   AC Power: 24 VAC, ± 10%, 50/60 Hz, 9 VA
   Isolation: 500 Vrms for 1 min. to all inputs and outputs (50 V working)
3. **SENSOR POWER**: 12 VDC, ±10%, 100 mA max. Short circuit protected.
4. **ANNUNCIATORS**:
   A - Counter A
   B - Counter B
   C - Counter C
   OF - Upper significant digit display of counter
   SP1 - Setpoint 1 Output State
   SP2 - Setpoint 2 Output State
   SP3 - Setpoint 3 Output State
   SP4 - Setpoint 4 Output State
5. **KEYPAD**: 3 programmable function keys, 5 keys total.
6. **COUNTER DISPLAYS**:
   Maximum display: 8 digits: ± 99999999 (greater than 6 digits display alternates between high order and low order.)
7. **MAXIMUM SIGNAL FREQUENCIES**:
   To determine the maximum frequency for the input(s), first answer the questions with a yes (Y) or no (N). Next determine the Count Mode to be used for the counter(s). If dual counters are used with different Count Modes, then the lowest frequency applies to both counters.

FUNCTION QUESTIONS	**Single**: Counter A or B				**Dual**: Counter A & B			
Are any setpoints used?	N	N	Y	Y	N	N	Y	Y
Is Counter C used?	N	Y	N	Y	N	Y	N	Y
COUNT MODE	(Values are in KHz)				(Values are in KHz)			
Count x1	34	25	18	15	13	12	9	7.5
Count x2	17	13	9	7	9	7	5	4
Quadrature x1	22	19	12	10	7	6	4	3.5
Quadrature x2	17	13	9	7	7	6	4	3.5
Quadrature x4	8	6	4	3				

Notes:
1. Counter Modes are explained in the Module 1 programming section.
2. Listed values are with frequency DIP switch set on HI frequency.

8. **INPUTS A and B**:
   DIP switch selectable to accept pulses from a variety of sources including switch contacts, outputs from CMOS or TTL circuits, and all standard RLC sensors.
   LOGIC: Input trigger levels V_{IL} = 1.5 V max.; V_{IH} = 3.75 V min.
   Current sinking: Internal 7.8 KΩ pull-up to +12 VDC, I_{MAX} = 1.9 mA.
   Current sourcing: Internal 3.9 KΩ pull-down, 7.3 mA max. @ 28 VDC, V_{MAX} = 30 VDC.
   Filter: Damping capacitor provided for switch contact bounce. Limits input frequency to 50 Hz and input pulse widths to 10 msec. minimum.
   DUAL COUNT MODES:
   When any dual count mode is used, then User Inputs 1 and/or 2 will accept the second signal of each signal pair. The user inputs do not have the Logic/Mag, HI/LO Freq, and Sink/Source input setup switches. The user inputs are inherently a logic input with no low frequency filtering. Any mechanical contacts used for these inputs in a dual count mode must be debounced externally. The user input may only be selected for sink/source by the User Jumper placement.
9. **USER INPUTS**: Three programmable user inputs
   Max. Continuous Input: 30 VDC
   Isolation To Sensor Input Commons: Not isolated
   Logic State: Jumper selectable for sink/source logic

INPUT STATE	SINKING INPUTS 5.1 KΩ pull-up to +12 V	SOURCING INPUTS 5.1 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

   Response Time: 6 msec. typical; function dependent. Certain resets, stores and inhibits respond within 25 µsec if an edge occurs with the associated counter or within 6 msec if no count edge occurs with the associated counter. These functions include rSt1, rSt2, Inhb, and StorE. Once activated, all functions are latched for 50 msec min. to 100 msec max. After that period, another edge/level may be recognized.
10. **SETPOINT OUTPUT CARD**:
   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
   Response Time: 5 msec. nominal with 3 msec. nominal release
   Time Accuracy: ± 0.01% + 10 msec.
   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 both relays energized not to exceed 4 amps
   Life Expectancy: 100 K cycles min. at full load rating. External RC snubber extends relay life for operation with inductive loads
   Response Time: 5 msec. nominal with 3 msec. nominal release
   Time Accuracy: ± 0.01% + 10 msec.
   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: 25 µsec
   Time Accuracy: ± 0.01% + 10 msec.
   Quad Sourcing Open Collector Card:
   Type: Four isolated sinking 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
   External supply: 30 VDC max. 100 mA each output
   Response Time: 25 µsec
   Time Accuracy: ± 0.01% + 10 msec.
11. **MEMORY**: Non-volatile E^2Prom retains all programming parameters and display values.
12. **CERTIFICATIONS AND COMPLIANCE**:
   SAFETY
   EN 61010-1, IEC 1010-1
   Safety requirements for electrical equipment for measurement, control, and laboratory use, Part I
   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 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 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

   Note:
   Refer to the EMC Installation Guidelines section of this bulletin for additional information.
13. **ENVIRONMENTAL CONDITIONS**:
   Operating Temperature Range: 0 to 50°C
   Storage Temperature range: -40 to 60°C
   Operating and Storage Humidity: 0 to 85% max. non-condensing
   Altitude: Up to 2000 meters
14. **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).
15. **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.
16. **WEIGHT**: 10.1 oz (295 g)

ORDERING INFORMATION

TYPE	MODEL NO.	DESCRIPTION	PART NUMBERS
Meter	PAXC	Counter Panel Meter, Upgradeable, AC Powered	PAXC0000
		Counter Panel Meter, Upgradeable, DC/24 VAC Powered	PAXC0010
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

OPTIONAL PLUG-IN CARDS

SETPOINT ALARMS PLUG-IN CARDS (PAXCDS)

The PAXC 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

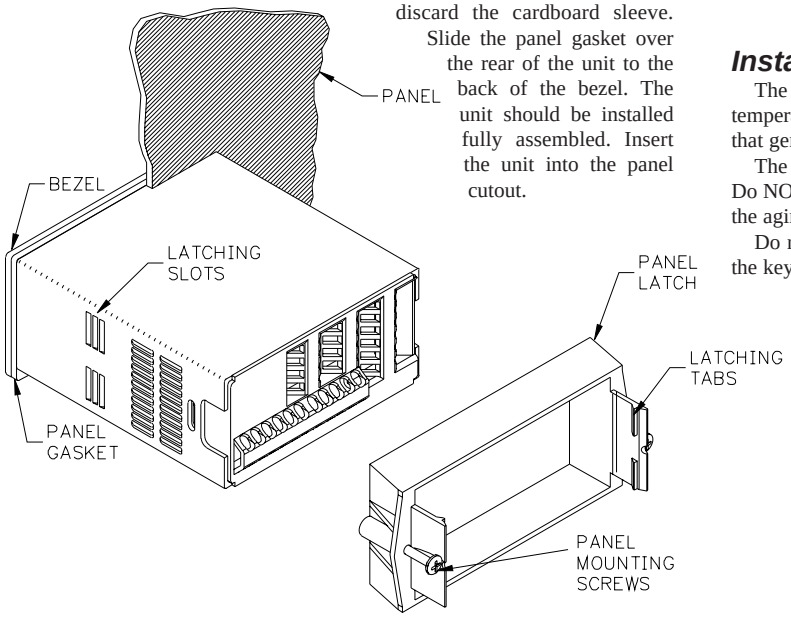
Isolated quad sourcing PNP open collector

The card can be installed initially or at a later date. Each optional plug-in card is shipped with complete installation instructions, however, programming should be reviewed in Module 6.

1.0 INSTALLING THE METER

Installation

The PAX 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. 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.

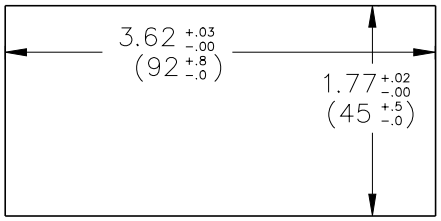
Installation Environment

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

The bezel should only be cleaned 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.

PANEL CUT-OUT



2.0 SETTING THE JUMPER AND DIP SWITCHES

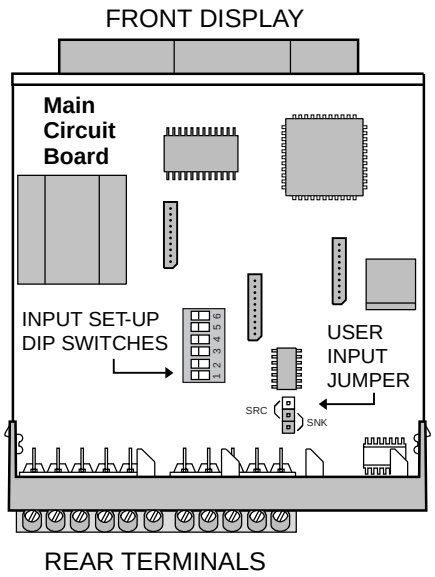
To access the jumper and switches, remove the meter base from the meter case by firmly squeezing and pulling back on the side rear finger tabs. This should lower the latch below the case slot (which is located just in front of the finger tabs). It is recommended to release the latch on one side, then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

Warning: Exposed line voltage exists on the circuit boards. Remove all power to the meter and load circuits before accessing inside of the meter.

2.1 SETTING THE JUMPER

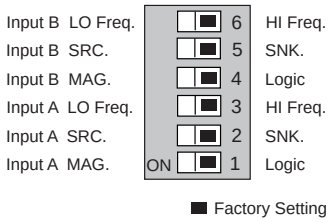
The meter has one jumper for user input logic. When using the user inputs this jumper must be set before applying power. The Main Circuit Board figure shows the location of the jumper and DIP switch.

The user input jumper determines signal logic for the user inputs, when they are used with user functions or for input signal direction. All user inputs are set by this jumper.



2.2 SETTING THE INPUT DIP SWITCH

The meter has six DIP switches for Input A and Input B terminal set-up that must be set before applying power.



SWITCHES 3 and 6

HI Frequency: Removes damping capacitor and allows max. frequency.
LO Frequency: Adds a damping capacitor for switch contact bounce. Also limits input frequency to 50 Hz and input pulse widths to 10 msec.

SWITCHES 2 and 5

SRC.: Adds internal 3.9 KΩ pull-down resistor, 7.3 mA max. @ 28 VDC, V_{MAX} = 30 VDC.
SNK.: Adds internal 7.8 KΩ pull-up resistor to +12 VDC, I_{MAX} = 1.9 mA.

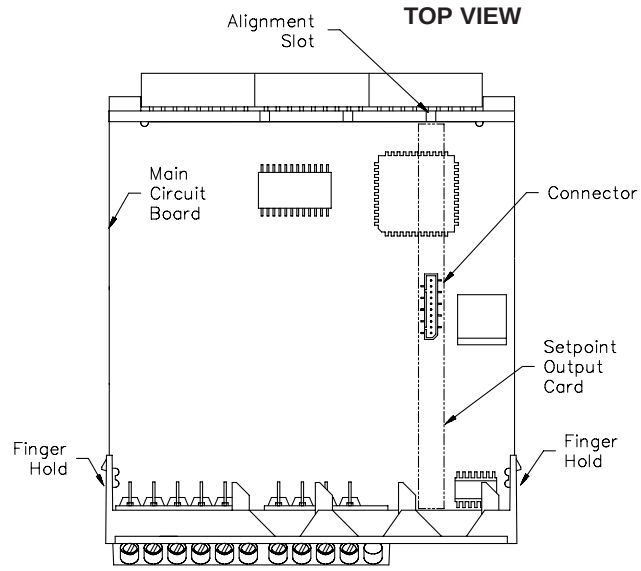
SWITCHES 1 and 4

LOGIC: Input trigger levels V_{IL} = 1.5 V max.; V_{IH} = 3.75 V max.
MAG: Not recommended with counting applications.

3.0 INSTALLING PLUG-IN CARDS

The Plug-in cards are separately purchased optional cards that perform specific functions. These cards plug into the main circuit board of the meter. The Plug-in cards have many unique functions when used with the PAXC. The literature that comes with these cards should be discarded, unless it specifically states in the Plug-in Card literature that the information applies to the PAXC.

CAUTION: The Plug-in card and main circuit board contain static sensitive components. Before handling the cards, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the cards at a static controlled clean workstation. Also, only handle the cards by the edges. Dirt, oil or other contaminants that may contact the cards can adversely affect circuit operation.

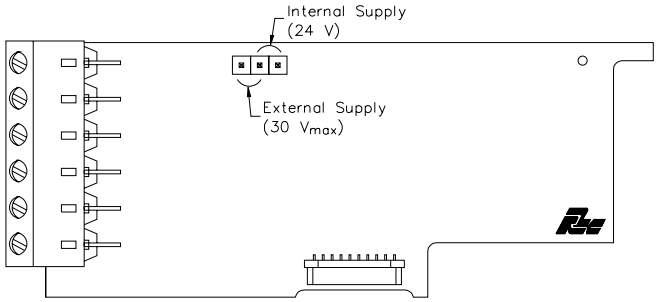


To Install:

1. With the case open, locate the Setpoint Plug-in card connector for the card to be installed. When installing the card, hold the meter by the rear terminals and not by the front display board.*
2. Install the Plug-in card by aligning the card terminals with the slot bay in the rear cover. Be sure the connector is fully engaged and the tab on the Plug-in card rests in the alignment slot on the display board.
3. Slide the meter base back into the case. Be sure the rear cover latches fully into the case.
4. Apply the Plug-in card label to the bottom side of the meter. Do Not Cover the vents on the top surface of the meter. The surface of the case must be clean for the label to adhere properly. Apply the label to the area designated by the large case label.

Quad Sourcing Open Collector Output Card Supply Select

* If installing the Quad sourcing Plug-in Card (PAXCDS40), set the jumper for internal or external supply operation before continuing.



4.0 WIRING THE METER

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 the 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).

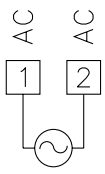
EMC INSTALLATION GUIDELINES

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, source or coupling method into the meter may be different for various installations. The meter becomes more immune to EMI with fewer I/O connections. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed below are some EMC guidelines for successful installation in an industrial environment.

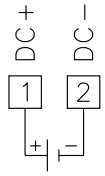
1. The meter should be mounted in a metal enclosure, which is properly connected to protective earth.
2. Use shielded (screened) cables for all Signal and Control inputs. The shield (screen) pigtail connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.
   a. Connect the shield only at the panel where the unit is mounted to earth ground (protective earth).
   b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is above 1 MHz.
   c. Connect the shield to common of the meter and leave the other end of the shield unconnected and insulated from earth ground.
3. 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.
4. Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.
5. 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 # 28B209-0A0
   Line Filters for input power cables:
   Schaffner # FN610-1/07 (RLC# LFIL0000)
   Schaffner # FN670-1.8/07
   Corcom # 1 VR3
   Note: Reference manufacturer's instructions when installing a line filter.
6. Long cable runs are more susceptible to EMI pickup than short cable runs. Therefore, keep cable runs as short as possible.
7. Switching of inductive loads produces high EMI. Use of snubbers across inductive loads suppresses EMI.
   Snubber: RLC# SNUB0000.

4.1 POWER WIRING

AC Power
Terminal 1: VAC
Terminal 2: VAC



DC Power
Terminal 1: +VDC
Terminal 2: -VDC



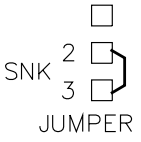
4.2 USER INPUT WIRING

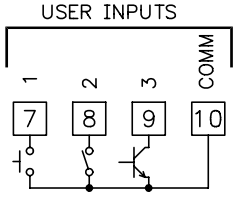
Before connecting the wires, the User Input Logic Jumper should be verified for proper position. If User Input 1 and/or 2 are wired for quadrature or directional counting, an additional switching device should not be connected to that User Input terminal. Only the appropriate User Input terminal has to be wired.

Sinking Logic

Terminals 7-9
Terminal 10
} Connect external switching device between the appropriate User Input terminal and User Comm.

The user inputs of the meter are internally pulled up to +12 V with 5.1 K resistance. The input is active when it is pulled low (<0 .7 V).

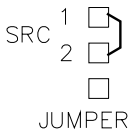


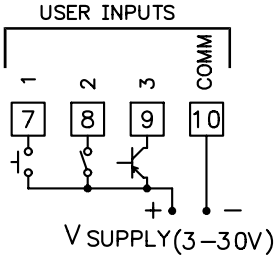


Sourcing Logic

Terminals 7-9:
+ VDC through external switching device
Terminal 10:
-VDC through external switching device

The user inputs of the meter are internally pulled down to 0 V with 5.1 K resistance. The input is active when a voltage greater than 2.5 VDC is applied.





4.3 INPUT WIRING

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 voltage; or input common must be at protective earth ground potential. If not, hazardous 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 ground; and the common of the isolated plug-in cards with respect to input common.

If you are wiring Input B, connect signal to Terminal 6 instead of 5, and set DIP switches 4, 5, and 6 to the positions shown for 1, 2, and 3.

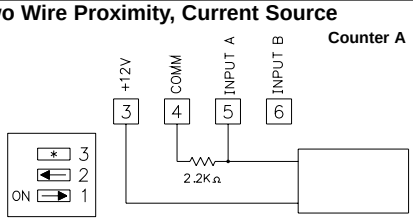
Magnetic Pickup

NOT RECOMMENDED

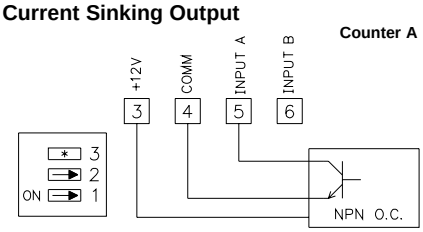
AC Inputs From Tach Generators, Etc.

NOT RECOMMENDED

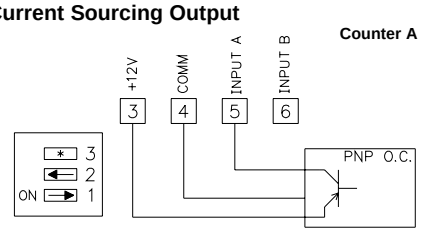
Two Wire Proximity, Current Source



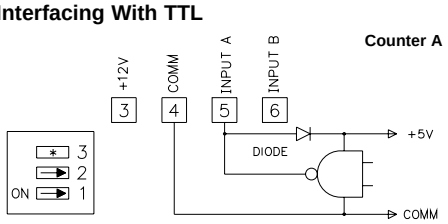
Current Sinking Output



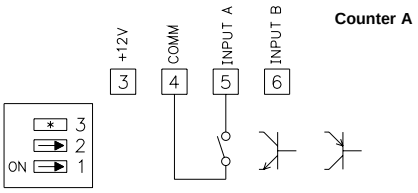
Current Sourcing Output



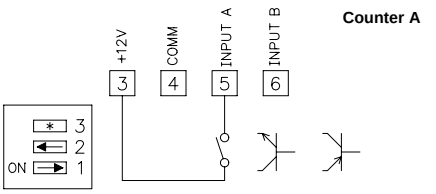
Interfacing With TTL



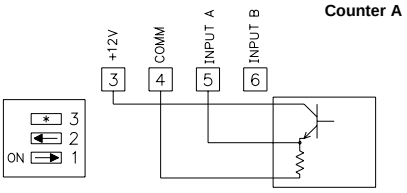
Switch or Isolated Transistor; Current Sink



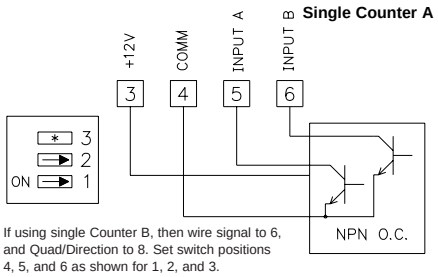
Switch or Isolated Transistor; Current Source



Emitter Follower; Current Source

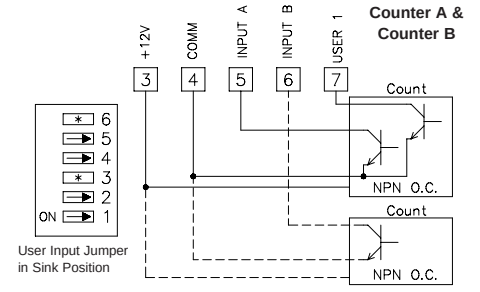


Current Sink Output; Quad/Direction



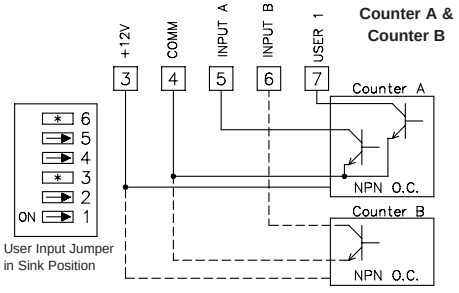
If using single Counter B, then wire signal to 6, and Quad/Direction to 8. Set switch positions 4, 5, and 6 as shown for 1, 2, and 3.

Current Sink Output; Quad/Direction



User Input Jumper in Sink Position

Current Sink Output; Quad/Direction



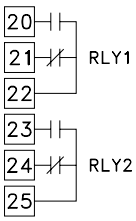
User Input Jumper in Sink Position

** Switch position is application dependent*

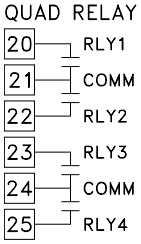
4.4 SETPOINT (ALARMS) WIRING

SETPOINT PLUG-IN CARD TERMINALS

DUAL RELAY PAXCDS10



QUAD RELAY PAXCDS20



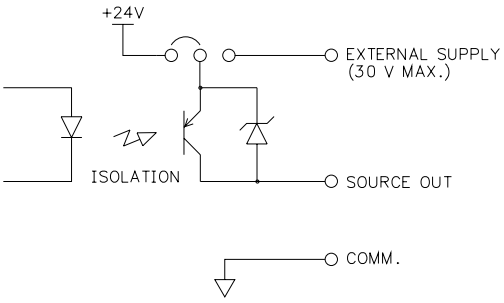
QUAD SINKING PAXCDS30

20 – COMMON
21 – O1 SNK.
22 – O2 SNK.
23 – O3 SNK.
24 – O4 SNK.
25 – COMMON

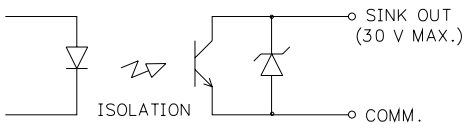
QUAD SOURCING PAXCDS40

20 – EXTERNAL SUPPLY
21 – O1 SRC.
22 – O2 SRC.
23 – O3 SRC.
24 – O4 SRC.
25 – COMMON

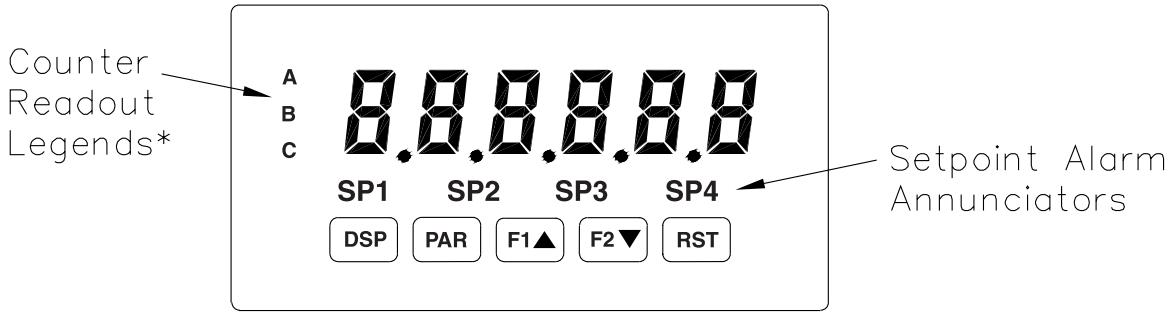
SOURCING OUTPUT LOGIC CARD



SINKING OUTPUT LOGIC CARD



5.0 REVIEWING THE FRONT BUTTONS AND DISPLAY

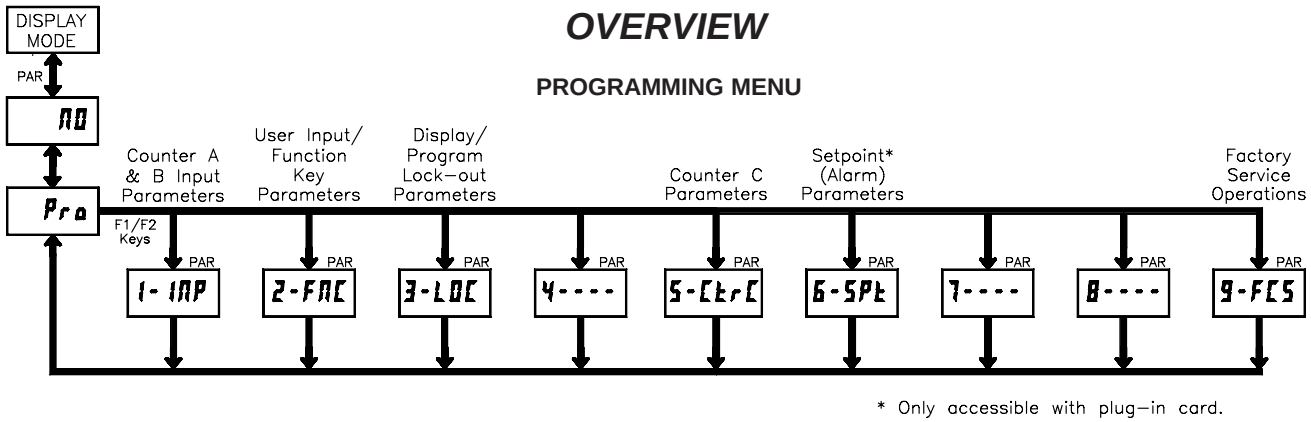


KEY	DISPLAY MODE OPERATION	PROGRAMMING MODE OPERATION
DSP	Index display through Counters (A, B, C).	Quit programming and return to Display Mode
PAR	Access Programming Mode	Store selected parameter and index to next parameter
F1▲	Function key 1; hold for 3 seconds for Second Function 1 **	Increment selected parameter value or selections
F2▼	Function key 2; hold for 3 seconds for Second Function 2 **	Decrement selected parameter value or selections
RST	Reset (Function key) ***	Advances digit location in parameter values

* Counters B, and C are locked out in Factory Settings.
** Factory setting for the F1, and F2 keys is NO mode.
*** Factory setting for the RST key is dSPrSt (Reset Display)

6.0 PROGRAMMING THE METER

OVERVIEW



* Only accessible with plug–in card.

PROGRAMMING MODE ENTRY (PAR KEY)

The meter normally operates in the Display Mode. No parameters can be programmed in this mode. The Programming Mode is entered by pressing the **PAR** key. If it is not accessible then it is locked by either a security code, or a hardware lock.

Two types of programming modes are available. Quick Programming Mode permits only certain parameters to be viewed and/or modified. All meter functions continue to operate except for the front panel keys, which change to Programming Mode Operations. Quick Programming Mode is configured in Module 3. Full Programming Mode permits all parameters to be viewed and modified. In this mode, incoming counts may not be recognized correctly, the front panel keys change to Programming Mode Operation,s and certain user input functions are disabled. Throughout this document, Programming Mode (without Quick in front) always refers to “Full” Programming.

MODULE ENTRY (ARROW & PAR KEYS)

The Programming Menu is organized into six modules. These modules group together parameters that are related in function. The display will alternate between Pro and the present module. The arrow keys (**F1** and **F2**) are used to select the desired module. The displayed module is entered by pressing the **PAR** key.

MODULE MENU (PAR KEY)

Each module has a separate module menu (which is shown at the start of each module discussion). The **PAR** key is pressed to advance to a particular parameter to be changed, without changing the programming of preceding parameters. After completing a module, the display will return to Pro no. Programming may continue by accessing additional modules.

SELECTION / VALUE ENTRY (ARROW & PAR KEYS)

For each parameter, the display alternates between the present parameter and the selections/value for that parameter. The arrow keys (**F1** and **F2**) are used to move through the selections/values for that parameter. Pressing the **PAR** key, stores and activates the displayed selection/value. This also advances the meter to the next parameter.

PROGRAMMING MODE EXIT (DSP KEY or at Pro no PAR KEY)

The Programming Mode is exited by pressing the **DSP** key (from anywhere in the Programming Mode) or the **PAR** key (with Pro no displayed). This will commit any stored parameter changes to memory and return the meter to the Display Mode. If a parameter was just changed, the **PAR** key should be pressed to store the change before pressing the **DSP** key. (If power loss occurs before returning to the Display Mode, verify recent parameter changes.)

PROGRAMMING TIPS

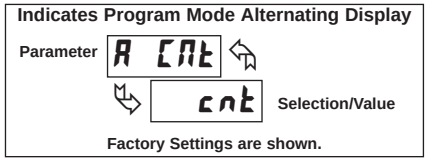
It is recommended to start with Module 1. If lost or confused while programming, press the **DSP** key and start over. When programming is complete, it is recommended to record the parameter programming on the Parameter User Chart and lock out parameter programming with a user input or lock-out code.

FACTORY SETTINGS

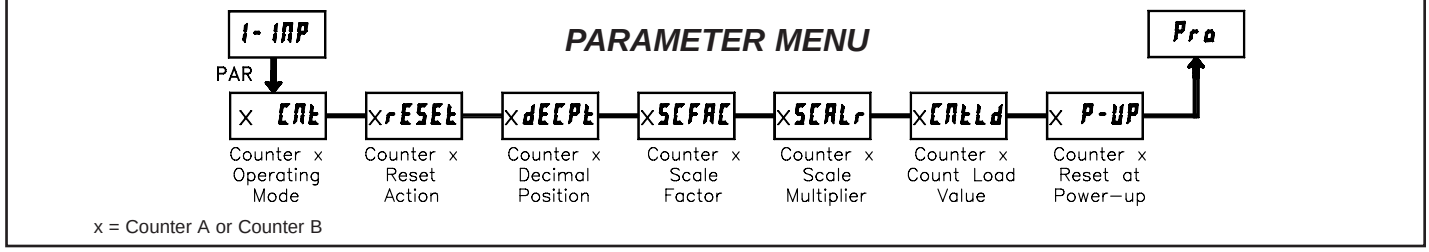
Factory Settings may be completely restored in Module 9. This is a good starting point for programming problems. Most parameters can be left at their Factory Settings without affecting basic start-up. These parameters are identified throughout the module explanations.

ALTERNATING SELECTION DISPLAY

In the explanation of the modules, the following dual display with arrows will appear. This is used to illustrate the display alternating between the parameter on top and the parameter's Factory Setting on the bottom. In most cases, selections and values for the parameter will be listed on the right.

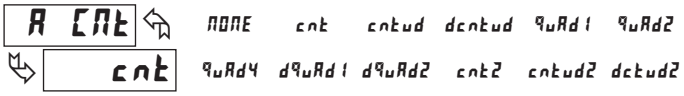


6.1 MODULE 1 - Count A & B Input Parameters (1-INP)



Module 1 is the programming for Counter A and Counter B. For maximum input frequency, the unused counter should be set to mode NONE when not in use. When set to NONE, the remaining related parameters are not accessible. A corresponding annunciator indicates the counter being shown in the Display Mode. An Exchange Parameter Lists feature for scale factors and count load values is explained in Module 2.

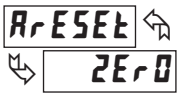
COUNTER A OPERATING MODE



Select the operating mode for Counter A.

SELECTION	MODE	DESCRIPTION
NONE		Does not count.
cnt	Count X1	Adds Input A falling edge.
cntud	Count X1 w/direction	Adds Input A falling edge if Input B is high. Subtracts Input A falling edge if Input B is low.
dcntud	Count X1 w/direction	Adds Input A falling edge if User 1 is high. Subtracts Input A falling edge if User 1 is low.
9uRd1	Quad X1	Adds Input A rising edge when Input B is high. Subtracts Input A falling edge when Input B is high.
9uRd2	Quad X2	Adds Input A rising edge when Input B is high and Input A falling edge when Input B is low. Subtracts Input A falling edge when Input B is high and Input A rising edge when Input B is low.
9uRd4	Quad X4	Adds Input A rising edge when Input B is high, Input A falling edge when Input B is low, Input B rising edge when Input A is low, and Input B falling edge when Input A is high. Subtracts Input A falling edge when Input B is high, Input A rising edge when Input B is low, Input B rising edge when Input A is high, and Input B falling edge when Input A is low.
d9uRd1	Quad X1	Adds Input A rising edge when User 1 is high. Subtracts Input A falling edge when User 1 is high.
d9uRd2	Quad X2	Adds Input A rising edge when User 1 is high and Input A falling edge when User 1 is low. Subtracts Input A falling edge when User 1 is high and Input A rising edge when User 1 is low.
cnt2	Count X2	Adds Input A rising and falling edges.
cntud2	Count X2 w/direction	Adds Input A rising and falling edges if Input B is high. Subtracts Input A rising and falling edge if Input B is low.
dctud2	Count X2 w/direction	Adds Input A rising and falling edges if User 1 is high. Subtracts Input A rising and falling edge if User 1 is low.

COUNTER A RESET ACTION



When Counter A is reset, it returns to zero or Counter A count load value. This reset action affects all Counter A resets, except the Setpoint Counter Auto Reset in Module 6.

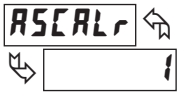
COUNTER A DECIMAL POSITION

This selects the decimal point position for Counter A and any setpoint value assigned to Counter A. The selection will also affect Counter A scale factor calculations.

COUNTER A SCALE FACTOR

The number of input counts is multiplied by the scale factor and the scale multiplier to obtain the desired process value. A scale factor of 1.00000 will result in the display of the actual number of input counts. (Details on scaling calculations are explained at the end of this section.)

COUNTER A SCALE MULTIPLIER *



The number of input counts is multiplied by the scale multiplier and the scale factor to obtain the desired process value. A scale multiplier of 1 will result in only the scale factor affecting the display. (Details on scaling calculations are explained at the end of this section.)

COUNTER A COUNT LOAD VALUE *

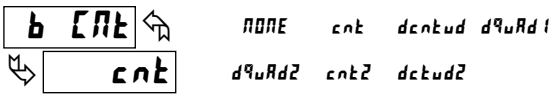
When reset to count load action is selected, Counter A will reset to this value.

COUNTER A RESET POWER-UP *

Counter A may be programmed to reset at each meter power-up.

* *Factory Setting can be used without affecting basic start-up.*

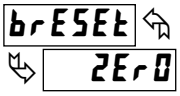
COUNTER B OPERATING MODE



Select the operating mode for Counter B.

SELECTION	MODE	DESCRIPTION
NONE		Does not count.
cnt	Count X1	Adds Input B falling edge.
dcntud	Count X1 w/direction	Adds Input B falling edge if User 2 is high. Subtracts Input B falling edge if User 2 is low.
dQuAd1	Quad X1	Adds Input B rising edge when User 2 is high. Subtracts Input B falling edge when User 2 is high.
dQuAd2	Quad X2	Adds Input B rising edge when User 2 is high and Input B falling edge when User 2 is low. Subtracts Input B falling edge when User 2 is high and Input B rising edge when User 2 is low.
cnt2	Count X2	Adds Input B rising and falling edges.
dctud2	Count X2 w/direction	Adds Input B rising and falling edges if User 2 is high. Subtracts Input B rising and falling edge if User 2 is low.

COUNTER B RESET ACTION



When Counter B is reset, it returns to zero or Counter B count load value. This reset action affects all Counter B resets, except the Setpoint Counter Auto Reset Action in Module 6.

COUNTER B DECIMAL POSITION

This selects the decimal point position for Counter B and any setpoint value assigned to Counter B. The selection will also affect Counter B scale factor calculations.

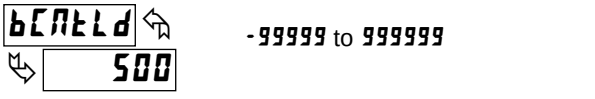
COUNTER B SCALE FACTOR

The number of input counts is multiplied by the scale factor and the scale multiplier to obtain the desired process value. A scale factor of 1.00000 will result in the display of the actual number of input counts. (Details on scaling calculations are explained at the end of this section.)

COUNTER B SCALE MULTIPLIER *

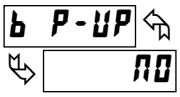
The number of input counts is multiplied by the scale multiplier and the scale factor to obtain the desired process value. A scale multiplier of 1 will result in only the scale factor affecting the display. (Details on scaling calculations are explained at the end of this section.)

COUNTER B COUNT LOAD VALUE *



When reset to count load action is selected, Counter B will reset to this value.

COUNTER B RESET POWER-UP *



Counter B may be programmed to reset at each meter power-up.

***** *Factory Setting can be used without affecting basic start-up.*

8 DIGIT COUNT VALUES

Any counter display value below -99999 or above 999999 (less decimal point) will consist of a two part display. This display alternates between the least 6 significant digits and the remaining most significant digits beginning with "OF" in the display. If the display exceeds ± 99999999 the display will roll to zero and continue counting. Outputs cannot be set to counter values above 6 digits. The annunciator, indicating the counter being displayed, will flash when the value is above 6 digits.

SCALING CALCULATIONS

Each counter has the ability to scale an input signal to a desired display value. This is accomplished by the counter mode (x-CNt), scale factor (xSCFAC), scale multiplier (xSCALr) and decimal point (xdECPt). The scale factor is calculated using:

$$SF\ (xSCFAC) = \frac{\text{Desired Display Decimal DDD}}{\text{(Number of pulses per 'single' unit x CM x SM)}}$$

Where:

Desired Display Decimal DDD	xdECPt	Counter Decimal Selection
1	0	None
10	0.0	Tenths
100	0.00	Hundredths
1000	0.000	Thousandths
10000	0.0000	Ten Thousandths
100000	0.00000	Hundred Thousandths

Number of pulses per 'single' unit: pulses per unit generated by the process (i.e. # of pulses per foot)
CM: Counter Mode(x-CNt) times factor of the mode 1,2 or 4.
SM: Scale Multiplier (xSCALr) selection of 1, 0.1 or 0.01.

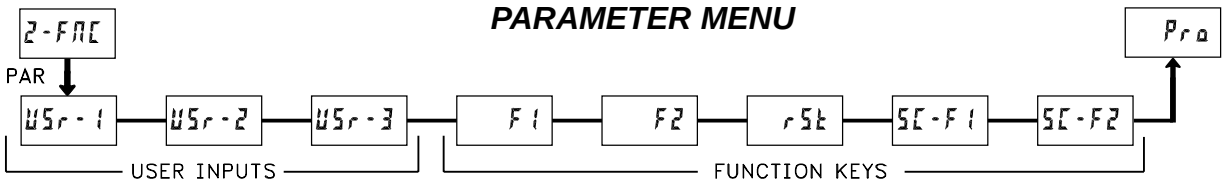
Example:

1. Show feet to the hundredths (0.00) with 100 pulses per foot:
   Scale Factor would be 100 / (100 x 1 x 1) = 1
   (In this case, the scale multiplier and counter mode factor are 1)
2. Show feet with 120 pulses per foot: Scale Factor would be 1 / (120 x 1 x 1) = 0.0083333. (In this case, the scale multiplier of 0.01 could be used: 1 / (120 x 1 x 0.01) = 0.83333 or show to hundredths (0.00): 100 / (120 x 1 x 1) = 0.8333.)

General Rules on Scaling

1. It is recommended that, the scale factor be as close as possible to, but not exceeding 1.00000. This can be accomplished by increasing or decreasing the counter decimal point position, using the scale multiplier, or selecting a different count mode.
2. To double the number of pulses per unit, use counter modes direction X2 or quad X2. To increase it by four times, use counter mode quad X4. Using these modes will decrease the maximum input frequency.
3. A scale factor greater than 1.00000 will cause Counter display rounding. In this case, digit jumps could be caused by the internal count register rounding the display. The precision of a counter application cannot be improved by using a scale factor greater than 1. 00000.
4. The number of pulses per single unit must be greater than or equal to the DDD value for the scale factor to be less than or equal to one.
5. Lowering the scale factor can be accomplished by lowering the counter decimal position. (Example: 100 (Hundredths)/10 pulses = 10.000 lowering to 10 (Tenths)/10 = 1.000.)

6.2 MODULE 2 - User Input and Front Panel Function Key Parameters (2-FnC)



Module 2 is the programming for rear terminal user inputs and front panel function keys.

Three rear terminal user inputs are individually programmable to perform specific meter control functions. While in the Display Mode, the function is executed when the user input transitions to the active state. (Refer to the user input specifications for active state response times.) Certain user input functions are disabled in "full" Programming Mode.

Three front panel function **F1**, **F2** and **RST** keys are also individually programmable to perform specific meter control functions. While in the Display Mode, the primary function is executed when the key is pressed. Holding the **F1** or **F2** function key for three seconds executes a secondary function. It is possible to program a secondary function without a primary function. The front panel key functions are disabled in both Programming Modes.

In most cases, if more than one user input and/or function key is programmed for the same function, the maintained (level trigger) actions will be performed while at least one of those user inputs or function keys are activated. The momentary (edge trigger) actions are performed every time any of those user inputs or function keys transition to the active state. All functions are available to both user inputs and function keys.

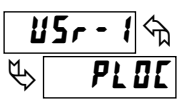
Some of the user functions have a sublist of parameters. The sublist is accessed when **PAR** is pressed at the listed function. The function will only be performed for the parameters entered as YES. If a user input or function key is configured for a function with a sublist, then that sublist will need to be scrolled through each time to access the following user inputs or function keys parameters.

NO FUNCTION

With this selection, NO function is performed. This is the factory setting for all user inputs and function keys except the Reset (**RST**) Key.

NOTE: When a user input is used to accept a quad or directional input signal, then that user input should be programmed for NO function.

PROGRAMMING MODE LOCK-OUT



Programming Mode is locked-out, as long as activated (maintained action). In Module 3, certain parameters can be setup where they are still accessible during Programming Mode Lockout. A security code can be configured to allow complete programming access during user input lockout. Function keys should not be programmed for PLOC.

ADVANCE DISPLAY

When activated (momentary action), the display advances to the next display that is not locked out from the Display Mode.

RESET DISPLAY

When activated (momentary action), the shown display is reset. This is the factory setting for the Reset (**RST**) Key.

EXCHANGE PARAMETER LISTS

Two lists of values are available for SP-1, SP-2, SP-3, SP-4, ASCFAC, bSCFAC, CSCFAC, ACntLd, bCntLd, CCntLd. The two lists are named LIST-A and LIST-b. If a user input is used to select the list then LIST-A is selected when the user input is not active and LIST-b is selected when the user input is active, (maintained action). If a front panel key is used to select the list then the list will toggle for each key press, (momentary action). The meter will suspend ALL operations for approximately 1 msec. while the new values are loaded. The display will only indicate which list is active when the list is changed or when entering any Programming Mode.

To program the values for LIST-A and LIST-b, first complete the programming of all the parameters. Exit programming and switch to the other list. Re-enter programming and enter the values for SP-1, SP-2, SP-3, SP-4, ASCFAC, bSCFAC, CSCFAC, ACntLd, bCntLd, CCntLd. If any other parameters are changed then the other list values must be reprogrammed.

MAINTAINED (LEVEL) RESET AND INHIBIT

The meter performs a reset and inhibits the displays configured as YES, as long as activated (maintained action).

DISPLAY	DESCRIPTION	FACTORY
A Cnt	Counter A	NO
b Cnt	Counter B	NO
C Cnt	Counter C	NO

MOMENTARY (EDGE) RESET

When activated (momentary action), the meter resets the displays configured as YES. (Momentary resets improve maximum input frequencies over maintained resets.)

DISPLAY	DESCRIPTION	FACTORY
A Cnt	Counter A	NO
b Cnt	Counter B	NO
C Cnt	Counter C	NO

INHIBIT

The meter inhibits the displays configured as YES, as long as activated (maintained action).

DISPLAY	DESCRIPTION	FACTORY
A Cnt	Counter A	NO
b Cnt	Counter B	NO
C Cnt	Counter C	NO

STORE DISPLAY

The meter holds (freeze) the displays configured as YES, as long as activated (maintained action). Internally the counters continue to update.

DISPLAY	DESCRIPTION	FACTORY
A Cnt	Counter A	NO
b Cnt	Counter B	NO
C Cnt	Counter C	NO

DEACTIVATE SETPOINT MAINTAINED (LEVEL)

The meter deactivates the setpoints configured as YES, as long as activated (maintained action). This action only functions with a Setpoint plug-in card installed.

DISPLAY	DESCRIPTION	FACTORY
SP-1	Setpoint 1	NO
SP-2	Setpoint 2	NO
SP-3	Setpoint 3	NO
SP-4	Setpoint 4	NO

DEACTIVATE SETPOINT MOMENTARY (EDGE)

When activated (momentary action), the meter deactivates the setpoints configured as YES. This action only functions with a Setpoint plug-in card installed.

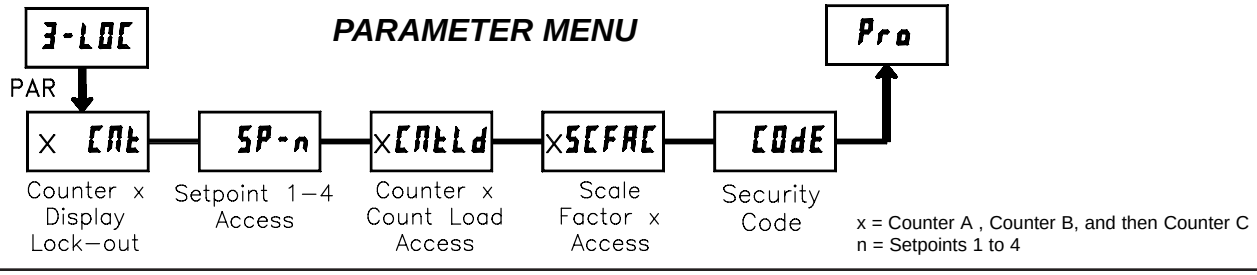
DISPLAY	DESCRIPTION	FACTORY
SP-1	Setpoint 1	NO
SP-2	Setpoint 2	NO
SP-3	Setpoint 3	NO
SP-4	Setpoint 4	NO

HOLD SETPOINT STATE

The meter holds the state of the setpoints configured as YES, as long as activated (maintained action). This action only functions with a Setpoint plug-in card installed.

DISPLAY	DESCRIPTION	FACTORY
SP-1	Setpoint 1	NO
SP-2	Setpoint 2	NO
SP-3	Setpoint 3	NO
SP-4	Setpoint 4	NO

6.3 MODULE 3 - Display and Program Lock-out Parameters (3-LOC)



Module 3 is the programming for Display lock-out and "Full" and "Quick" Program lock-out.

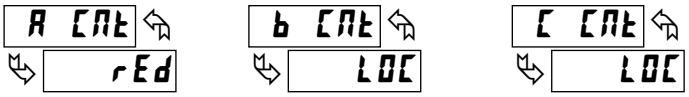
When in the Display Mode, the three displays can be read consecutively by repeatedly pressing the **DSP** key. An annunciator indicates the display being shown. These displays can be locked from being visible. It is recommended that the display be set to LOC when the corresponding function is not used.

SELECTION	DESCRIPTION
rEd	Visible in Display Mode
LOC	Not visible in Display Mode

"Full" Programming Mode permits all parameters to be viewed and modified. This Programming Mode can be locked with a security code and/or user input. When locked and the **PAR** key is pressed, the meter enters a Quick Programming Mode. In this mode, setpoint, count load and scale factor values can still be read and/or changed per the selections below.

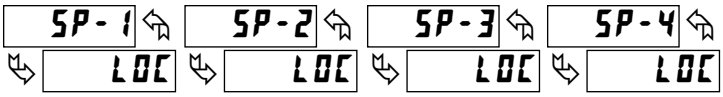
SELECTION	DESCRIPTION
rEd	Visible but not changeable in Quick Programming Mode
ENt	Visible and changeable in Quick Programming Mode
LOC	Not visible in Quick Programming Mode

COUNTER A B C DISPLAY LOCK-OUT *



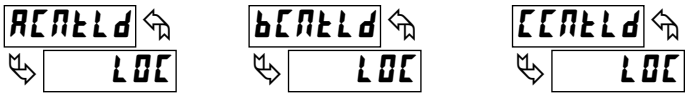
These displays can be programmed for LOC or rEd.

SETPOINT 1 to 4 ACCESS LOCK-OUT *



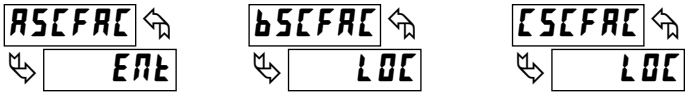
The setpoint displays can be programmed for LOC, rEd, or ENt (See the following table). Accessible only with the Setpoint Plug-in card installed.

COUNT LOAD A B C ACCESS LOCK-OUT *



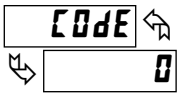
These displays can be programmed for LOC, rEd, or ENt.

SCALE FACTOR A B C ACCESS LOCK-OUT *



The Scale Factor values can be programmed for LOC, rEd, or ENt.

SECURITY CODE *



000 to 999

Entry of a non-zero value will cause the prompt CodE to appear when trying to access the "Full" Programming Mode. Access will only be allowed after entering a matching security code or universal code of 222. With this lock-out, a user input would not have to be configured for Program Lock-out. However, this lock-out is overridden by an inactive user input configured for Program Lock-out.

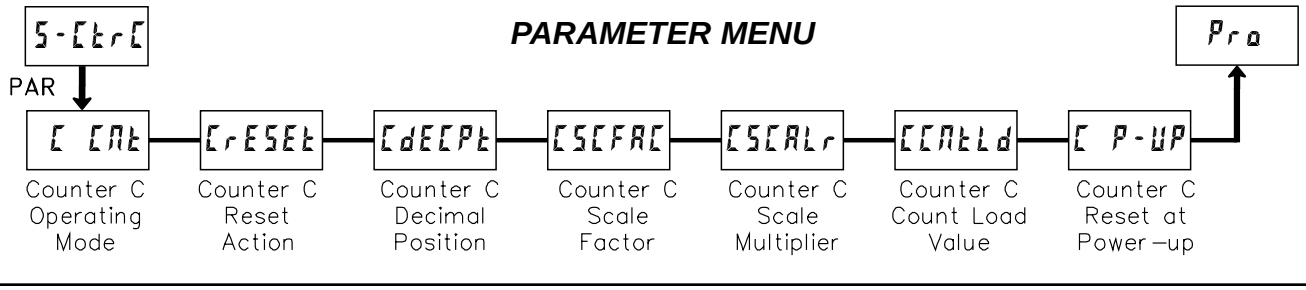
* *Factory Setting can be used without affecting basic start-up.*

PROGRAMMING MODE ACCESS

SECURITY CODE	USER INPUT CONFIGURED	USER INPUT STATE	WHEN PAR KEY IS PRESSED	"FULL" PROGRAMMING MODE ACCESS
0	not PLOC	————	"Full" Programming	Immediate access.
>0	not PLOC	————	Quick Programming	After Quick Programming with correct code # at CodE prompt.
>0	PLOC	Active	Quick Programming	After Quick Programming with correct code # at CodE prompt.
>0	PLOC	Not Active	"Full" Programming	Immediate access.
0	PLOC	Active	Quick Programming	No access
0	PLOC	Not Active	"Full" Programming	Immediate access.

Throughout this document, Programming Mode (without Quick in front) always refers to "Full" Programming (all meter parameters are accessible).

6.4 MODULE 5 - Counter C Input Parameters (5-CtrC)



Module 5 is the programming for Counter C. For maximum input frequency, the counter operating mode should be set to **NONE** when not in use. When set to **NONE** the remaining related parameters are not accessible. The C annunciator indicates that Counter C is being shown in the Display Mode. An Exchange Parameter List feature for scale factor and count load values is explained in Module 2.

COUNTER C OPERATING MODE *

C CNt → NONE

NONE A Add Ab Sub Ab

Select the operating mode for Counter C.

- **NONE** Does not count.
- **A** Counter C counts the incoming pulses from Counter A input as per Counter A mode of operation. The signal is scaled only according to Counter C parameters.
- **Add Ab** Counter C counts the incoming pulses from Counter A and B inputs as per Counter A and B modes of operation. The result is scaled only according to Counter C parameters. (Example: If Counter A is set for Count X1 mode and Counter B is set for Count X2 mode, then Counter C will increment by 1 for each pulse received on Input A and increment by 2 for each pulse received on Input B less any effects of scaling.)
- **Sub Ab** Counter C counts the incoming pulses from Counter A and B inputs as per Counter A and B modes of operation and subtracts the B counts from the A counts. The result is scaled only according to Counter C parameters. (Example: If Counter A is set for Count X1 mode and Counter B is set for Count X2 mode, then Counter C will increment by 1 for each pulse received on Input A and decrement by 2 for each pulse received on Input B less any effects of scaling.)

COUNTER C RESET ACTION

CrESEt → 2Er0

2Er0 CNtLd

When Counter C is reset, it returns to zero or Counter C count load value. This reset action affects all Counter C resets, except the Setpoint Counter Auto Reset Action in Module 6.

COUNTER C DECIMAL POSITION

CdECPt → 0

0 0.00 0.0000
0.0 0.000 0.00000

This selects the decimal point position for Counter C and any setpoint value assigned to Counter C. The selection will also affect Counter C scale factor calculations.

COUNTER C SCALE FACTOR

CSCFAC → 1.00000

0.00001 to 9.99999

The number of input counts is multiplied by the scale factor and the scale multiplier to obtain the desired process value. A scale factor of 1.00000 will result in the display of the actual number of input counts. For **A** (Numeric transmission) modes of operation, the input signal is scaled directly. For **Add Ab** and **Sub Ab** modes of operation, the math is performed on the input signals and then the result is scaled. To achieve correct results, both Input A and Input B must provide the same amount of pulses per unit of measurement. (Details on scaling calculations are explained at the end of Module 1 section.)

COUNTER C SCALE MULTIPLIER

CSCALr → 1

1 0.1 0.01

The number of input counts is multiplied by the scale multiplier and the scale factor to obtain the desired process value. A scale multiplier of 1 will result in only the scale factor affecting the display. (Details on scaling calculations are explained at the end of Module 1 section.)

COUNTER C COUNT LOAD VALUE

CCNtLd → 500

-99999 to 999999

When reset to count load action is selected, Counter C will reset to this value.

COUNTER C RESET POWER-UP *

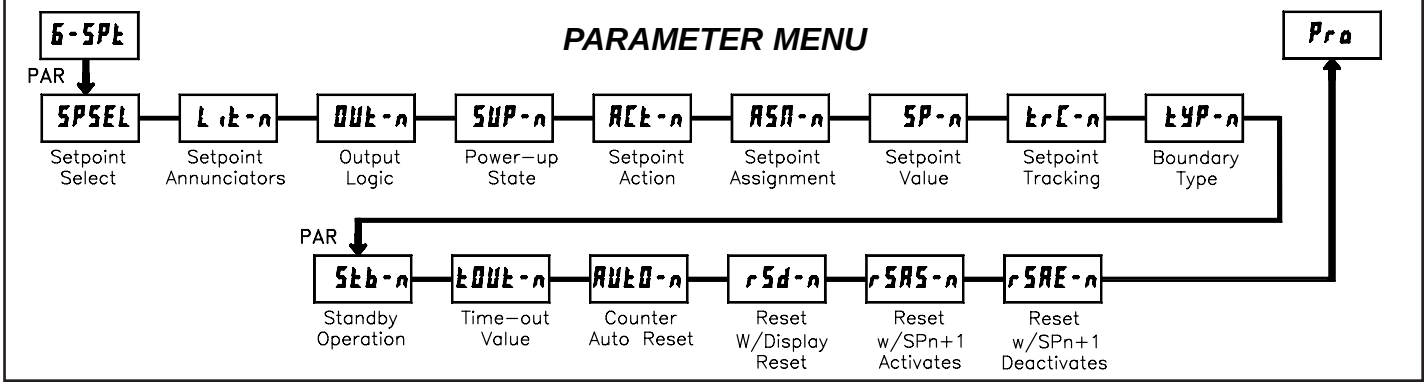
C P-UP → no

YES no

Counter C may be programmed to reset at each meter power-up.

***** *Factory Setting can be used without affecting basic start-up.*

6.5 MODULE 6 - Setpoint (Alarm) Parameters (6-SPt)



Module 6 is the programming for the setpoint (alarms) output parameters. To have setpoint outputs, a setpoint Plug-in card needs to be installed into the PAXC (see Ordering Information). Depending on the card installed, there will be two or four setpoint outputs available. This section replaces the bulletin which comes with the setpoint plug-in card. Please discard the separate literature when using the Plug-in card with the PAXC. For maximum input frequency, unused Setpoints should be configured for OFF action.

The setpoint assignment and the setpoint action determine certain setpoint feature availability. The chart below illustrates this.

SETPOINT PARAMETER AVAILABILITY

PARAMETER	DESCRIPTION	SETPOINT ACTION		
		TIMED OUT tOUt	BOUNDARY bOUNd	LATCH LAtCH
Lit-n	Annunciators	Yes	Yes	Yes
OUt-n	Output Logic	Yes	Yes	Yes
SUP-n	Power Up State	Yes	Yes	Yes
SP-n	Setpoint Value	Yes	Yes	Yes
trC-n	Setpoint Tracking	Yes	Yes	Yes
tYP-n	Boundary Type	No	Yes	No
Stb-n	Standby Operation	No	Yes	No
tOUt-n	Setpoint Time Out	Yes	No	No
AUtO-n	Counter Auto Reset	Yes	No	Yes
rSd-n	Reset With Display Reset	Yes	No	Yes
rSAS-n	Reset When SPn+1 Activates	Yes	No	Yes
rSAE-n	Reset When SPn+1 Deactivates	Yes	No	Yes

SETPOINT SELECT

SPSEL → nO

nO SP-1 SP-2 SP-3 SP-4

Select a setpoint (alarm output) to open the remaining module menu. (The "n" in the following parameters will reflect the chosen setpoint number.) After the chosen setpoint is programmed, the display will default to SPSEL nO. Select the next setpoint to be programmed and continue the sequence for each setpoint. Pressing **PAR** at SPSEL nO will exit Module 6.

SETPOINT ANNUNCIATORS*

Lit-n → nOr

OFF nOr rEU FLASH

OFF disables the display of the setpoint annunciator. Normal (nOr) displays the corresponding setpoint annunciator of an "on" alarm output. Reverse (rEU) displays the corresponding setpoint annunciator of an "off" alarm output. FLASH flashes the corresponding setpoint annunciator of an "on" alarm output.

SETPOINT OUTPUT LOGIC *

OUt-n → nOr

nOr rEU

Normal (nOr) turns the output "on" when activated and "off" when deactivated. Reverse (rEU) turns the output "off" when activated and "on" when deactivated.

SETPOINT POWER UP STATE *

SUP-n → OFF

SAVE On OFF

SAVE will restore the output to the same state it was at before the meter was powered down. On will activate the output at power up. OFF will deactivate the output at power up.

SETPOINT ACTION

ACt-n → tOUt

OFF tOUt bOUNd LAtCH

OFF When not using a setpoint, it should be set to OFF (no action).

tOUt With Timed Out action, the setpoint output activates when the count value equals the setpoint value and deactivates after the Time Out value. This action is not associated with Boundary types.

bOUNd With boundary action, the setpoint output activates when the count value is greater than or equal to (for tYP = HI) or less than or equal to (for tYP = LO) the setpoint value. The setpoint output will deactivate when the count value is less than (for tYP = HI) or greater than (for tYP = LO) the setpoint value.

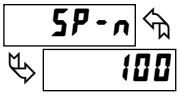
LAtCH With Latch action, the setpoint output activates when the count value equals the setpoint value. The output remains active until reset. This action is not associated with Boundary types.

* *Factory Setting can be used without affecting basic start-up.*

SETPOINT ASSIGNMENT

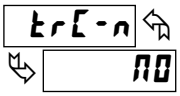
Select the display that the setpoint is to be assigned.

SETPOINT VALUE



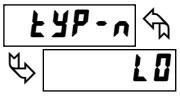
Enter the desired setpoint value. Setpoint values can also be entered in the Quick Programming Mode when the setpoint is configured as EnE in Module 3. (See Module 2 for Exchange Parameter Lists explanation.)

SETPOINT TRACKING *



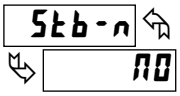
If a selection other than NO is chosen, then the value of the setpoint being programmed ("n") will track the entered selection's value. Tracking means that when the selection's value is changed (in the Quick Programming Mode), the "n" setpoint value will also change (or follow) by the same amount.

SETPOINT BOUNDARY TYPE



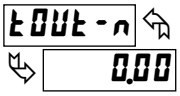
HI activates the output when the assigned display value (ASn-n) equals or exceeds the setpoint value. LO activates the output when the assigned display value is less than or equal to the setpoint.

SETPOINT STANDBY OPERATION *



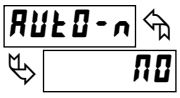
Selecting YES will disable low acting setpoints at a power up until the display value crosses into the alarm "off" area. Once in the alarm "off" area, the setpoint will function according to the configured setpoint parameters.

SETPOINT TIME OUT *



This is the amount of time the output will activate once the count value equals the setpoint value if the setpoint action is Timed Out.

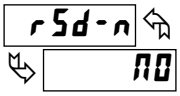
COUNTER AUTO RESET *



This automatically resets the display value of the Setpoint Assignment (ASn-n) counter each time the setpoint value is reached. This reset may be different than the Counter's Reset Action (xrESEt) in Module 1 or 5.

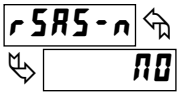
SELECTION	ACTION
no	No auto reset.
2ErOAS	Reset to zero at the start of output activation.
CLdAS	Reset to count load value at the start of output activation.
2ErOAE	Reset to zero at the end of output activation. (tOUt action only).
CLdAE	Reset to count load value at the end of output activation. (tOUt action only).

SETPOINT RESET WITH DISPLAY RESET *



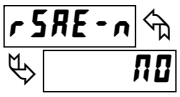
Select YES, so the setpoint output will deactivate (reset) when the Setpoint Assignment (ASn-n) counter display resets. The only exception is if the assigned counter is reset by a Counter Auto reset generated by another setpoint.

SETPOINT RESET WHEN SPn+1 ACTIVATES *



Select YES, so the setpoint output will deactivate (reset) when SPn +1 activates. (Example: SP1 deactivates when SP2 activates and SP4 when SP1 activates.) The last setpoint will wrap around to the first.

SETPOINT RESET WHEN SPn+1 DEACTIVATES *

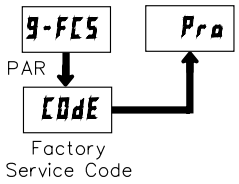


Select YES, so the setpoint output will deactivate (reset) when SPn +1 activates and then times out (deactivates). This function may only be used if the SPn+1 is programmed for Setpoint Action of tOUt. (Example SP1 deactivates when SP2 is activated and then times out.) The last setpoint will wrap around to the first.

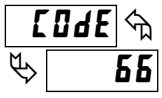
***** *Factory Setting can be used without affecting basic start-up.*

6.6 MODULE 9 - Factory Service Operations (9-FCS)

PARAMETER MENU



RESTORE FACTORY DEFAULTS



Use the arrow keys to display **CodE 66** and press **PAR**. The meter will display **rESEt** and then returns to **CodE 50**. Press the **DSP** key to return to the Display Mode. This will overwrite all user settings with the factory settings.

Pressing the **PAR** and **DSP** keys at the same time on power-up will load the factory settings and display **Err4**. This allows operation in the event of a memory failure or corrupted data. Immediately press **RST** key and reprogram the meter. If the meter is powered down again before pressing the **RST** key, the existing dynamic data will not be overwritten.

TROUBLESHOOTING

For further assistance, contact technical support at the appropriate company numbers listed.

PROBLEM	REMEDIES
NO DISPLAY	**CHECK**: Power level, power connections
PROGRAM LOCKED-OUT	**CHECK**: Active (lock-out) user input **ENTER**: Security code requested
CERTAIN DISPLAYS ARE LOCKED OUT	**CHECK**: Module 3 programming
INCORRECT DISPLAY VALUE or NOT COUNTING	**CHECK**: Input wiring, DIP switch setting, input programming, scale factor calculation, input signal level, user input jumper, lower input signal frequency
USER INPUT NOT WORKING CORRECTLY	**CHECK**: User input wiring, user input jumper, user input being used for signal, Module 2
OUTPUT DOES NOT WORK	**CHECK**: Corresponding plug-in card installation, output configuration, output wiring
JITTERY DISPLAY	**CHECK**: Wiring is per EMC installation guidelines, input signal frequency, signal quality, scaling, update time, DIP switch setting
MODULES or PARAMETERS NOT ACCESSIBLE	**CHECK**: Corresponding plug-in card installation, related controlling parameter selected
ERROR CODE (**Err 1-4**)	**PRESS**: Reset key (if unable to clear contact factory.)

PARAMETER VALUE CHART
PAXC Counter Meter

Programmer _____ ***Date*** _____

Meter# _____ ***Security Code*** _____

1-INP Counter A & B Input Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
A CNt	COUNTER A OPERATING MODE	cnt	
ArESEt	COUNTER A RESET ACTION	2Er0	
AdECPt	COUNTER A DECIMAL POSITION	0	
ASCFAC	COUNTER A SCALE FACTOR (A)	1.00000	
	COUNTER A SCALE FACTOR (B) *	1.00000	
ASCALr	COUNTER A SCALE MULTIPLIER	1	
ACNtLd	COUNTER A COUNT LOAD VALUE (A)	500	
	COUNTER A COUNT LOAD VALUE (B)*	500	
A P-UP	COUNTER A RESET POWER-UP	no	
b CNt	COUNTER B OPERATING MODE	nonE	
brESEt	COUNTER B RESET ACTION	2Er0	
bdECPt	COUNTER B DECIMAL POSITION	0	
bSCFAC	COUNTER B SCALE FACTOR (A)	1.00000	
	COUNTER B SCALE FACTOR (B)*	1.00000	
bSCALr	COUNTER B SCALE MULTIPLIER	1	
bCNtLd	COUNTER B COUNT LOAD VALUE (A)	500	
	COUNTER B COUNT LOAD VALUE (B)*	500	
b P-UP	COUNTER B RESET POWER-UP	no	

** See Module 2, Exchanging Parameter Lists, for details on programming this value.*

2-FNC User 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	dSPrSt	
Sc-F1	2nd FUNCTION KEY 1	no	
Sc-F2	2nd FUNCTION KEY 2	no	

3-LOC Display and Program Lockout Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
A CNt	COUNTER A DISPLAY LOCK-OUT	rEd	
b CNt	COUNTER B DISPLAY LOCK-OUT	LOC	
C CNt	COUNTER C DISPLAY LOCK-OUT	LOC	
SP-1	SETPOINT 1 ACCESS LOCK-OUT	LOC	
SP-2	SETPOINT 2 ACCESS LOCK-OUT	LOC	
SP-3	SETPOINT 3 ACCESS LOCK-OUT	LOC	
SP-4	SETPOINT 4 ACCESS LOCK-OUT	LOC	
ACntLd	COUNT LOAD A ACCESS	LOC	
bCntLd	COUNT LOAD B ACCESS	LOC	
CCntLd	COUNT LOAD C ACCESS	LOC	
ASCFAC	SCALE FACTOR A ACCESS	Ent	
bSCFAC	SCALE FACTOR B ACCESS	LOC	
CSCFAC	SCALE FACTOR C ACCESS	LOC	
CodE	SECURITY CODE	0	

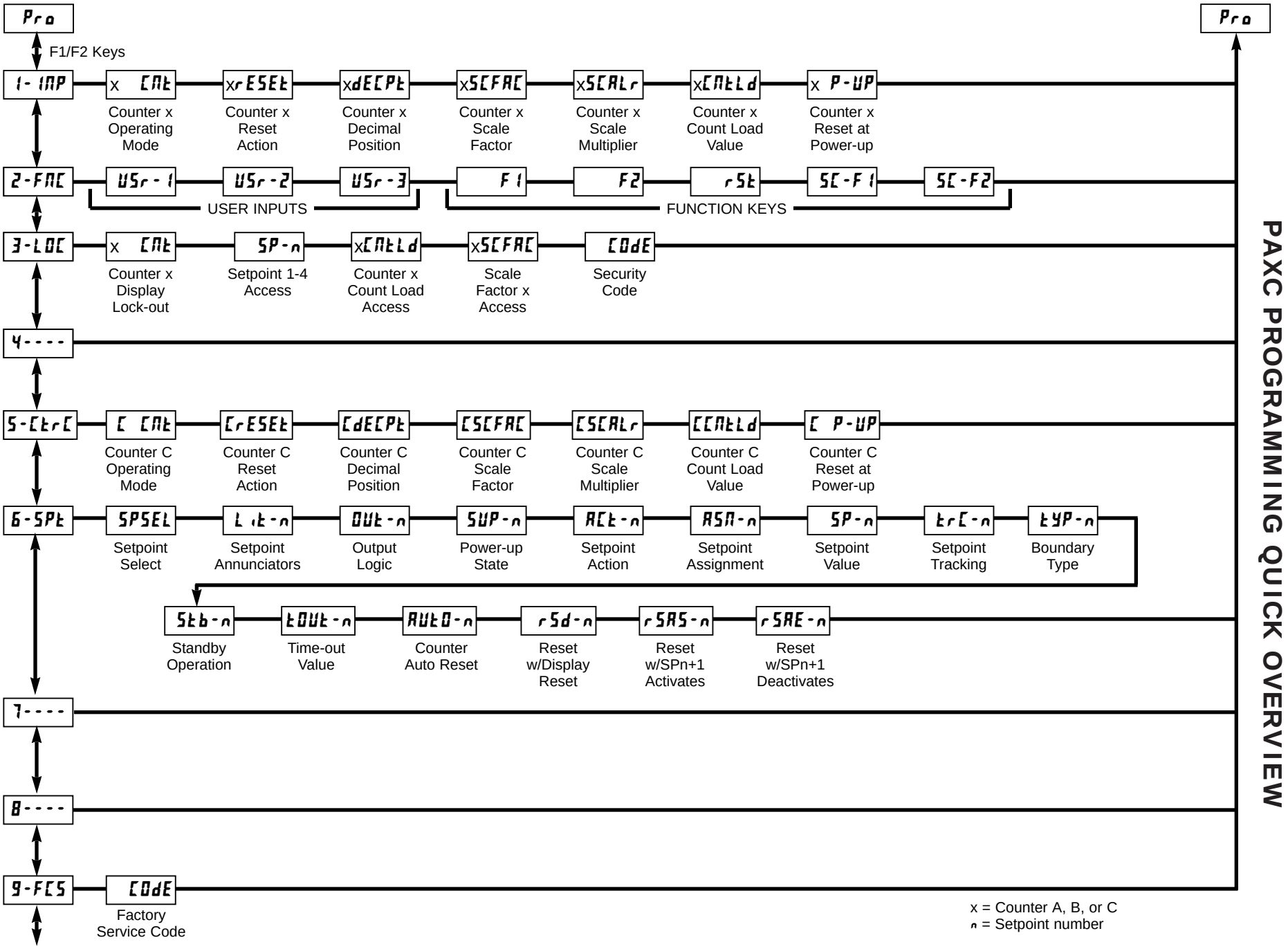
5-CtrC Counter C Input Parameters

DISPLAY	PARAMETER	FACTORY SETTING	USER SETTING
C CNt	COUNTER C OPERATING MODE	NONE	
CrESEt	COUNTER C RESET ACTION	2Er0	
CdECPt	COUNTER C DECIMAL POSITION	0	
CSCFAC	COUNTER C SCALE FACTOR (A)	1.00000	
	COUNTER C SCALE FACTOR (B)	1.00000	
CSCALr	COUNTER C SCALE MULTIPLIER	1	
CCntLd	COUNTER C COUNT LOAD VALUE (A)	500	
	COUNTER C COUNT LOAD VALUE (B)*	500	
C P-UP	COUNTER C RESET POWER-UP	no	

6-SPt Setpoint (Alarm) Parameters

DISPLAY	PARAMETER	SP-1 FACTORY SETTING	SP-1 USER SETTING	SP-2 FACTORY SETTING	SP-2 USER SETTING	SP-3 FACTORY SETTING	SP-3 USER SETTING	SP-4 FACTORY SETTING	SP-4 USER SETTING
Lit-n	SETPOINT ANNUNCIATORS	nor		nor		nor		nor	
Out-n	SETPOINT OUTPUT LOGIC	nor		nor		nor		nor	
SUP-n	SETPOINT POWER UP STATE	OFF		OFF		OFF		OFF	
ACt-n	SETPOINT ACTION	OFF		OFF		OFF		OFF	
ASn-n	SETPOINT ASSIGNMENT	A CNt		A CNt		A CNt		A CNt	
SP-n	SETPOINT VALUE (A)	100		100		100		100	
	SETPOINT VALUE (B)*	100		100		100		100	
trC-n	SETPOINT TRACKING	no		no		no		no	
tYP-n	SETPOINT BOUNDARY TYPE	Hi		Hi		Hi		Hi	
Stb-n	STANDBY OPERATION	no		no		no		no	
tOUt-n	SETPOINT TIME OUT	1.00		1.00		1.00		1.00	
AUtO-n	COUNTER AUTO RESET ACTION	no		no		no		no	
rSd-n	SETPOINT RESET WITH DISPLAY	no		no		no		no	
rSAS-n	RESET WHEN SPn+1 ACTIVATES	no		no		no		no	
rSAE-n	RESET WHEN SPn+1 DEACTIVATES	no		no		no		no	

** See Module 2, Exchanging Parameter Lists, for details on programming this value.*


Pro
F1/F2 Keys
1- INP
x CNt
Counter x Operating Mode
xrESEt
Counter x Reset Action
xdECPt
Counter x Decimal Position
xSCFAC
Counter x Scale Factor
xSCALr
Counter x Scale Multiplier
xCNtLd
Counter x Count Load Value
x P-UP
Counter x Reset at Power-up
2-FNC
USr-1
USr-2
USr-3
USER INPUTS
F1
F2
rSt
FUNCTION KEYS
SC-F1
SC-F2
3-LOC
x CNt
Counter x Display Lock-out
SP-n
Setpoint 1-4 Access
xCNtLd
Counter x Count Load Access
xSCFAC
Scale Factor x Access
CodE
Security Code
4----
5-CtrC
C CNt
Counter C Operating Mode
CrESEt
Counter C Reset Action
CdECPt
Counter C Decimal Position
CSCFAC
Counter C Scale Factor
CSCALr
Counter C Scale Multiplier
CCNtLd
Counter C Count Load Value
C P-UP
Counter C Reset at Power-up
6-SPt
SPSEL
Setpoint Select
LitE-n
Setpoint Annunciators
OUt-n
Output Logic
SUP-n
Power-up State
ACt-n
Setpoint Action
ASn-n
Setpoint Assignment
SP-n
Setpoint Value
trC-n
Setpoint Tracking
tYP-n
Boundary Type
Stb-n
Standby Operation
tOUt-n
Time-out Value
AUtO-n
Counter Auto Reset
rSd-n
Reset w/Display Reset
rSAS-n
Reset w/SPn+1 Activates
rSAE-n
Reset w/SPn+1 Deactivates
7----
8----
9-FCS
CodE
Factory Service Code
Pro
PAXC PROGRAMMING QUICK OVERVIEW
x = Counter A, B, or C
n = Setpoint number

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