

MODEL PX2FCA - Analog Input FlexCards

Process Input/Remote Setpoint w/PID Control Heater Current Monitor

- USE IN PAX2 WITH FlexBus™ OPTION
- FOUR SOLID STATE OUTPUTS
- INSTALL FlexCard™ OPTION CARD IN ANY OPEN SLOT

DESCRIPTION

FlexCard option cards are for use in PAX2 series meters/controllers with FlexBus option. FlexCard programming is integrated into the host PAX2 programming, which provides for parameters to be shared between them. FlexCards provide increased flexibility of input/output capabilities. The selection of FlexCard functionality is independent of other installed option card(s) functionality. A FlexCard can be installed in any available PAX2 FlexBus slot.

This bulletin contains information for Analog Input FlexCards including Process Input/Remote Setpoint and Heater Current Monitor. Input connections are made through a screw-clamp terminal block at the rear of the PAX2 meter/controller. Each card provides four solid-state outputs, that can be mapped to numerous parameter values in the host meter/controller. Output wiring connections are provided by a removable spring-cage terminal block, which engages PCB edge fingers through an access slot on the top of the PAX2 meter/controller.

The **Process Input/Remote Setpoint (Pr)** FlexCard accepts a DC Voltage (0 to 10V) or DC Current (0 to 20mA) input signal and provides a process value to the host PAX2 meter/controller. PID control, if desired, is performed directly by the card, separate from the host meter/controller. This allows for multiple PID loops to be used in a single PAX2 meter/controller. Process parameters such as input range selection, scaling, offset value and PID control parameters are programmed through the host meter/controller.

When installed in a PAX2C controller, this FlexCard provides an additional analog input, which can be configured as a remote setpoint input or as a secondary process input. Configuration of the analog input as a remote setpoint signal allows ratio control, master setpoint/multiple slave operation, and the ability to cascade the PAX2C with another controller. Configuration of the analog input as a secondary process signal allows operation as a two-process cascade controller within a single unit.

The **Heater Current Monitor (H_{cur})** FlexCard is useful for early warning of heater degradation, or heater circuit failure. The input is designed to connect to a current transformer with an output of 100 mA AC, to monitor the AC current load of the heater. A Heater Current alarm ensures that proper heater current is present when the control output is ON, and little or no current is present when the output is OFF. This provides indication of a shorted or open heater circuit. A direct readout of process heater current can also be displayed, if desired. Heater current limit values and input scaling are programmed through the host PAX2 meter/controller.

ORDERING INFORMATION

| MODEL NO. | DESCRIPTION | PART NUMBER |
|-----------|--|-------------|
| PX2FCA | Process Input/Remote Setpoint Input Card | PX2FCA00 |
| | Heater Current Monitor Input Card | PX2FCA10 |

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in this literature or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Do not use this unit to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the unit.



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

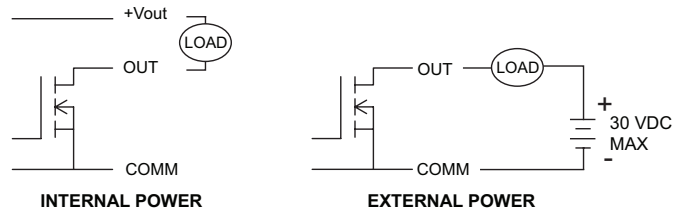
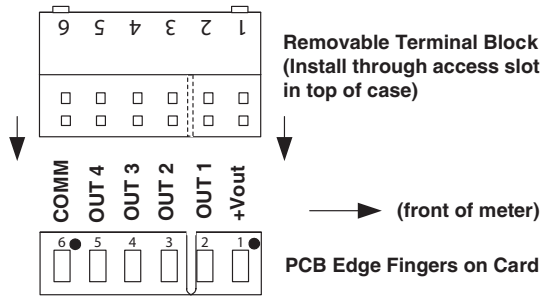


CAUTION:
 Risk of electric shock.

GENERAL SPECIFICATIONS

- POWER:**
Power for the card is provided by the host PAX2 meter/controller.
- INPUT SPECIFICATIONS AND CONNECTIONS:**
Refer to individual card information.
- OUTPUT SPECIFICATIONS:** Four Solid-State NFET outputs
 Type: Switched DC, N Channel open drain MOSFET
 Current Rating: 1 ADC max
 VDS ON: < 0.2 V @ 1 A
 VDS Max: 30 VDC
 Offstate Leakage Current: 0.5 µA max.
- OUTPUT POWER SUPPLY (+Vout):** 18 to 25 VDC @ 40 mA maximum.
- CERTIFICATIONS AND COMPLIANCES:**
Complies with all certifications and compliances of the host PAX2 meter/controller in which it is installed.
- CONNECTIONS:**
 Rear Terminals: Fixed
 Type: High compression cage-clamp terminal block
 Wire Strip Length: 0.31" (8 mm)
 Wire Gauge Capacity: 26 to 16 AWG (0.14 to 1.5 mm²)
 Torque: 4.4-5.3 inch-lbs (0.5-0.6 N-m)
 Top Terminals: Removable
 Type: Spring - cage terminal block.
 Wire Strip Length: 0.27" (7.0 mm)
 Wire Gauge Capacity: 24 to 16 AWG (0.2 to 1.5 mm²) solid or stranded.

OUTPUT CONNECTIONS (Top Terminal Block)

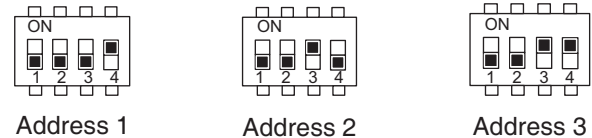


SETTING THE CARD ADDRESS

Each FlexCard contains a four position DIP switch, that is used to set the FlexCard address. The address selection must be unique for each FlexCard inserted in the PAX2 host. The address is used only for internal data exchange between the FlexCard and the host. The address of each FlexCard **MUST** be set to match the PAX2 host slot location in which the card will be installed. A four position dip switch is used to select the address using a binary format. The switch settings for address 1, 2, and 3 are shown.

Note: SET THE ADDRESS PRIOR TO INSTALLING THE CARD.

Binary Bit Weights: 8 4 2 1 (Switch 1 to 4)



INSTALLATION




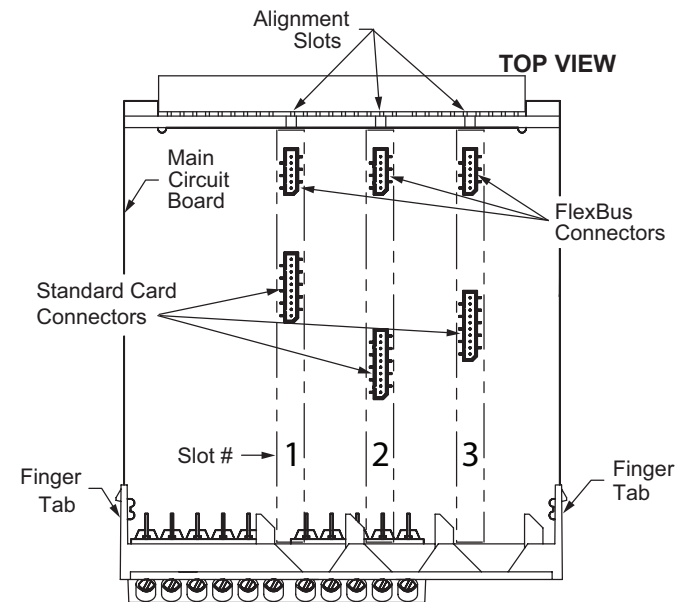
CAUTION: The option card and main circuit board contain static sensitive components. Before handling the cards, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the cards at a static controlled clean workstation. Also, only handle the cards by the edges.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



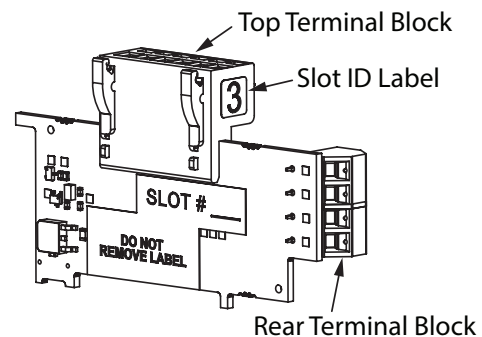
WARNING: Exposed line voltage will be present on the circuit boards when power is applied. Remove all power to the unit AND load circuits before accessing the unit.

To Install:

1. Remove the main assembly from the rear of the case by squeezing both finger tabs on the rear cover at the same time, and pulling the assembly out of the case. Or use a small screwdriver to depress the finger tab latches and pull the main assembly out of the case. When handling the main circuit board assembly, hold it by the rear cover. Do not remove the rear cover from the main circuit board.
2. Install applicable standard option cards (PAXCDS, PAXCDC, PAXCDL) before continuing.
3. Determine the option slot location in which the FlexCard will be installed. The FlexCard may be installed in any available option card slot. Note that after the FlexCard top terminal case knock-out is removed from the PAX2 case (Reference Step 8), only another FlexCard with top terminals should be installed in the option slot location.
4. Set the FlexCard Card Address DIP switch to match the option card slot position in which it will be installed. Attach the appropriate slot location label to the rear of the top terminal block and then remove the top terminal block from the FlexCard.
5. Align the FlexCard rear terminals with the rear cover slot position (address) that the FlexCard is being installed.
6. Align the option card connector with the appropriate main circuit board FlexCard connector.
7. Verify that the tab on the option card rests in the alignment slot on the main assembly display board.
8. A knock-out on the top of the PAX2 case will need to be removed to allow the FlexCard top terminal block connection to be made later. Locate the  shaped knock-out, positioned at the installed FlexCard option slot location. Carefully remove the knock-out, being careful not to remove additional (unused) knock-outs. Trim knock-out (gates) that remain on the case.
9. Slide the assembly back into the case. Be sure the rear cover latches, at the finger tab, engage in the case.



10. Make output wiring connections to the top terminal block. Install the top terminal block by aligning it with the option card and option slot knock-out hole. Firmly press the top terminal block to engage the terminal block latches. Terminal block should not pull off without depressing the terminal block latches. Do not apply power to the controller if the top terminal block is not in place.

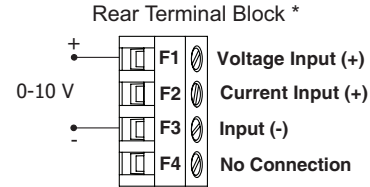


PX2FCA00: PROCESS INPUT / REMOTE SETPOINT (P_{rc})

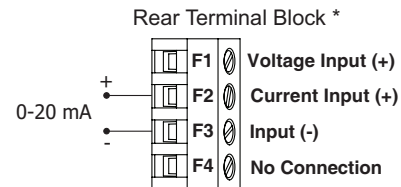
SPECIFICATIONS AND INPUT CONNECTIONS

1. INPUT RANGES: 0 to 10 VDC, 0 to 20 mA DC
2. A/D CONVERSION: 16 bit, 6.8 samples/second
3. INPUT SPECIFICATIONS:

| INPUT RANGE | ACCURACY @ 0-50°C | INPUT IMPEDANCE | MAX INPUT SIGNAL |
|-------------|-------------------|-----------------|------------------|
| 10 V | 0.1% of span | 538 KΩ | 30 V |
| 20 mA | 0.1% of span | 10 Ω | 150 mA |



VOLTAGE INPUT



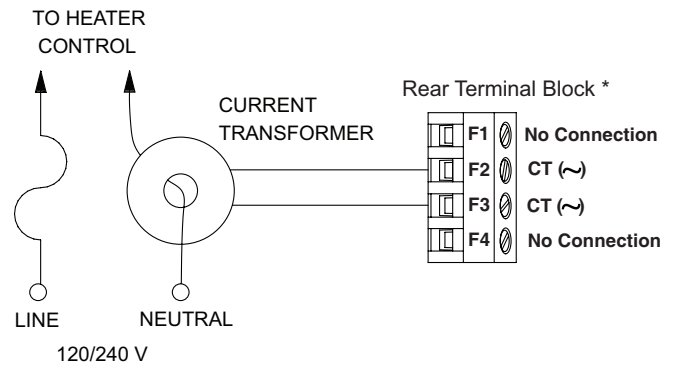
CURRENT INPUT

PX2FCA10: HEATER CURRENT MONITOR (C_{ur})

SPECIFICATIONS AND INPUT CONNECTIONS

1. A/D CONVERSION: 16 bit, 6.8 samples/second
2. INPUT SPECIFICATIONS:

Type: Single phase, full wave monitoring of load currents
 Input: 100 mA AC output from current transformer (RLC p/n CT005001 or equiv.)
 Input Resistance: 5 Ω
 Accuracy: ±2.0% full scale, 5 to 100% of range
 Frequency: 50 to 400 Hz
 Overload: 200 mA (continuous)
 Output on time delay for break alarm: 1 second



HEATER CURRENT MONITOR

* The terminal identification on the rear terminal block does not match the numbers embossed on the rear cover of the PAX2. for cross reference, see the table below.

| FlexCard TERMINAL ID | REAR COVER | | |
|-------------------------|------------|--------|--------|
| | Slot 1 | Slot 2 | Slot 3 |
| F1 | 12 | 16 | 20 |
| F2 | 13 | 17 | 21 |
| F3 | 14 | 18 | 22 |
| F4 | 15 | 19 | 23 |

LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company's liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company's option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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