

# PIO-12 PIO-24 PIO-96J PIO-SSR Series



- Up to 120 TTL/NMOS/CMOS-compatible digital I/O lines
- High current drivers (PIO-24 and PIO-96J)
- Compatible with ERB-24 and SSI0-24
- 32-bit DriverLINX drivers plus a suite of bundled software including ExceLINX, VisualSCOPE, TestPoint, and LabVIEW drivers

## Ordering Information

PIO-12*	24-Bit Parallel Digital I/O Board
PIO-24	24-Bit Parallel Digital I/O Board with high current outputs
PIO-96J	96-bit Parallel Digital I/O Board
PIO-SSR-24	24-Channel Digital I/O Board
PIO-SSR-48	48-Channel Digital I/O Board
PIO-SSR-120	120-Channel Digital I/O Board

\*Cannot be used in conjunction with ERB-24 and/or enable relays.

# 24/96/120-Line Parallel Digital I/O Boards

## Functional Description

The PIO-12, PIO-24, PIO-96J, and PIO-SSR Series allow up to 120 TTL/NMOS/CMOS-compatible digital I/O lines to be monitored or controlled by a computer with an ISA bus slot. These boards are ideal for controlling relays and process automation. With the PIO-24, PIO-96J, and PIO-SSR Series you can directly drive solid-state relays. The PIO-12 and PIO-24 also provide access to the PC's interrupt input and enable lines, and include connections to the PC's power supplies ( $\pm 5V$ ,  $\pm 12V$ ). By using external solid-state relays, the PIO-SSR Series can control and sense voltages up to 280VAC and VDC while maintaining 4000Vrms of isolation.

	PIO-12	PIO-24	PIO-96J	PIO-SSR Series
Number of Channels	24	24	96	24/48/120
Sink	1.7 mA	64 mA	64 mA	24 mA
Source	-200 $\mu$ A	-15 mA	-15 mA	-15 mA
Interrupt Capability	Yes	Yes	No	Yes
Connector Type	37 pin D type	37 pin D type	50 pin	50 pin
CE Compliance	Yes	Yes	No	No



## Specifications (PIO-12, PIO-24)

### LOGIC INPUTS AND OUTPUTS

	Min	Max
INPUT LOGIC LOW VOLTAGE:	-0.5V	0.8V
INPUT LOGIC HIGH VOLTAGE:	2.0V	5.0V
INPUT LOAD CURRENT PA, PB, PC PORT (0 < V IN < 5V):		
PIO-12:	-10 $\mu$ A	+10 $\mu$ A
PIO-24:	-0.45 mA	+70 $\mu$ A
INPUT LOW CURRENT, INTERRUPT INPUTS:	-	-0.4 mA
INPUT HIGH CURRENT, INTERRUPT INPUTS:	-	+20 $\mu$ A
OUTPUT SINK CURRENT PA, PB, PC PORTS:		
( $V_{OL} = 0.45V$ ) PIO-12:	-	+1.7 mA
( $V_{OL} = 0.55V$ ) PIO-24:	-	+64 mA
OUTPUT SOURCE CURRENT PA, PB, PC PORTS:		
( $V_{OH} = 2.4V$ ) PIO-12:	-	-200 $\mu$ A
( $V_{OH} = 2.0V$ ) PIO-24:	-	-15 mA

All outputs and inputs are TTL/NMOS compatible. CMOS compatibility can be obtained by connecting a 10k $\Omega$  pull-up resistor from the output to +5V

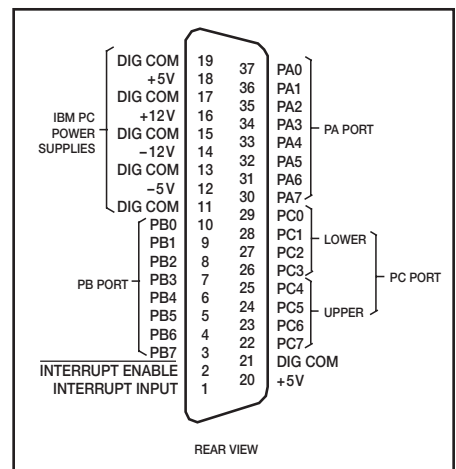
### ENVIRONMENTAL

OPERATING TEMPERATURE RANGE: PIO-12: 0 to 50°C.  
PIO-24: 0 to 70°C.  
STORAGE TEMPERATURE RANGE: -40 to +100°C.  
HUMIDITY: 0 to 90%, non-condensing.  
EMC: Conforms to European Union Directive 89/336/EEC.  
SAFETY: Meets EN61010-1/IEC 1010.  
DIMENSION: 5in  $\times$  4.25in  $\times$  0.75in (half slot); (12.7cm  $\times$  10.8cm  $\times$  1.9cm).  
WEIGHT: 4oz (113g).

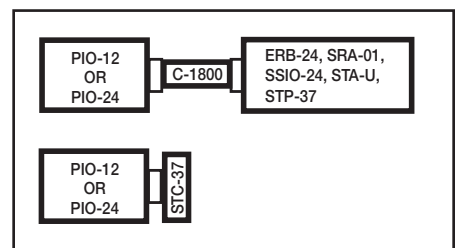
## Connector Pin Assignments

### (PIO-12, PIO-24)

All connections are made through a standard 37-pin D-type male connector that projects through the rear panel of the computer. For soldered connections a standard 37-pin D female connector is the correct mating part and can be ordered from Keithley as part number SFC-37.



## Configuration Guide (PIO-12, PIO-24)



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[www.keithley.com](http://www.keithley.com)

**KEITHLEY**

# PIO-12 PIO-24 PIO-96J PIO-SSR

# 24/96/120-Line Parallel Digital I/O Boards

## Specifications (PIO-96J)

### LOGIC INPUTS AND OUTPUTS

I/O SIGNAL: LSTTL, non-isolated.

$V_{IH}$ : 2.0V (min.).

$V_{IL}$ : 0.8V (max.).

$I_{IH}$ : 20mA (max.).

$I_{IL}$ : -0.2mA (max.) @  $V_i = 2.7V$

$V_{OH}$ : 2.4V (min.) @  $I_{OH} = -3mA$ .

$V_{OL}$ : 0.4V (max.) @  $I_{OH} = 12mA$ .

$I_{OH}$ : -15mA (max.).

$I_{OL}$ : 64mA (max.).

Note that all outputs and inputs are TTL/NMOS compatible. CMOS compatibility can be obtained on outputs by installing a 10K $\Omega$  pull-up resistor on the board's SIP connector. The resistor is powered by the computer +5VDC supply; this is not required on inputs.

### ENVIRONMENTAL

EXTERNAL CONNECTIONS: via 50-pin headers (one per 24 ch.).

OPERATING TEMP RANGE: 0 to 50°C (32 to 122°F).

STORAGE TEMP RANGE: 0 to 70°C (32 to 158°F).

HUMIDITY: 20 to 90% non-condensing.

POWER CONSUMPTION: +5VDC @ 1.6A typical.

DIMENSIONS: 13.2 in L x 4.25 in. H x 0.75 in. D (335mm x 108mm x 19mm).

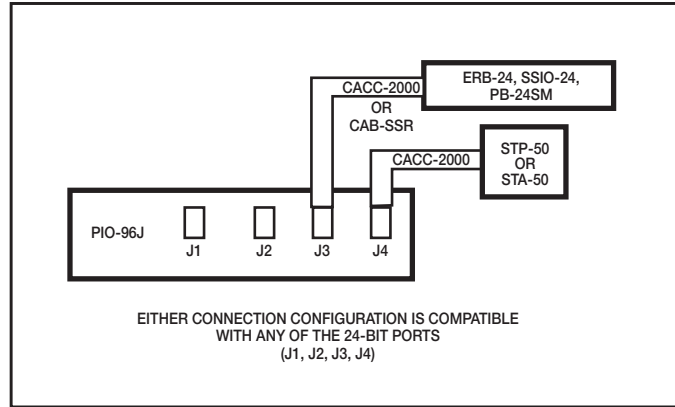
### ACCESSORIES AVAILABLE (PIO-12, PIO-24)

C1800	PIO-12&24 to STA-U or STP-37 Cable
ERB-24	24-Channel, DPDT Relay Output Board
SSIO-24	24-Channel, Solid-State I/O Module Board
STA-U	Universal Screw Terminal Accessory
STP-37	Screw Terminal Panel
STC-37	Direct Screw Terminal Connector
TESTPOINT	TestPoint Software Package

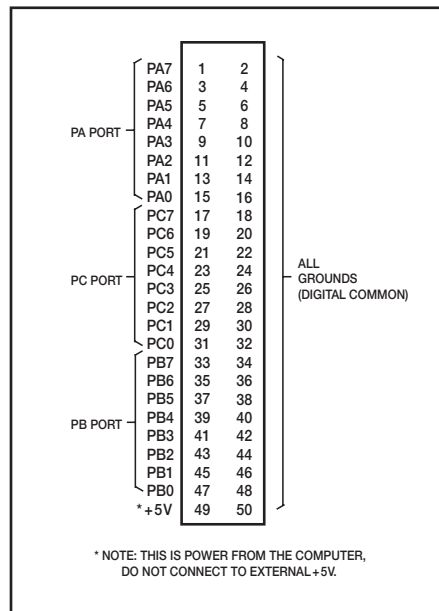
### ACCESSORIES AVAILABLE (PIO-96J)

ERB-24	24-Channel DPDT Relay Output Board
CACC-2000	PIO-96J to STA-50, STP-50, ERB-24, or SSIO-24 Cable (24')
SSIO-24	24-Channel Solid-State I/O Module Board
STA-50	Screw Terminal Accessory
STP-50	Screw Terminal Panel
TESTPOINT	TestPoint Software Package

## Configuration Guide (PIO-96J)



## Connector Pin Assignments (PIO-96J)



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# PIO-12 PIO-24 PIO-96J PIO-SSR

# 24/96/120-Line Parallel Digital I/O Boards

## Specifications (PIO-SSR Series)

### LOGIC INPUTS AND OUTPUTS

I/O SIGNAL: LSTTL, non-isolated.  
 PULL-UP RESISTORS: 10kΩ, one per channel.  
 $V_{IH}$ : 2.0V (min).  
 $V_{IL}$ : 0.8V (max).  
 $I_{IH}$ : 20μA (max) @  $V_I = 2.7V$   
 $I_{IL}$ : -0.2mA (max) @  $V_I = 0.4V$   
 $V_{OH}$ : 2.4V (min) @  $I_{OH} = -3mA$ .  
 $V_{OL}$ : 0.4V (max) @  $I_{OL} = 12mA$ .  
 $I_{OH}$ : -15mA (max).  
 $I_{OL}$ : 24mA (max).

### INTERRUPTS

INPUT CHANNELS: C0 and C3 of each 24-bit port.  
 INPUT REQUIREMENTS: Rising edge of input signal.  
 IRQ LEVELS: 3-7, 9-12, 14, or 15.

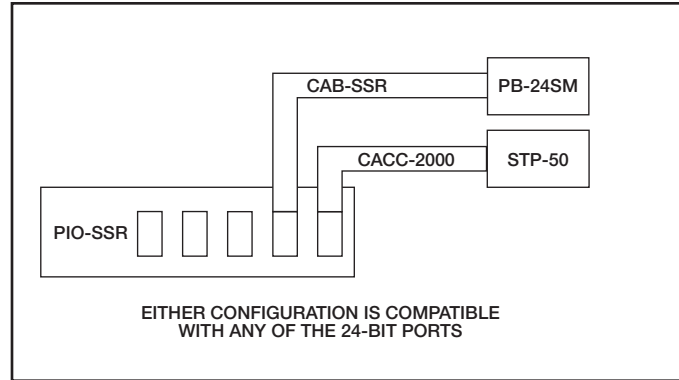
### ENVIRONMENTAL

EXTERNAL CONNECTIONS: Via 50-pin headers (one per 24 ch).  
 OPERATING TEMPERATURE: 0 to 50°C.  
 STORAGE TEMPERATURE: 0 to 70°C.  
 RELATIVE HUMIDITY: 20-90%, non-condensing.  
 POWER CONSUMPTION:  
 (PIO-SSR-24): +5V @ 530mA typ.  
 (PIO-SSR-48): +5V @ 800mA typ.  
 (PIO-SSR-120): +5V @ 1.6A typ.  
 PHYSICAL DIMENSIONS ALL MODELS: 9 in L × 4.25 in H × 0.9 in D (22.9cm × 10.8cm × 2.3cm).

### ACCESSORIES AVAILABLE (PIO-SSR Series)

CAB-SSR	3-foot Ribbon Cable: PIO-SSR to PB-24 or PB-24SM
CACC-2000	2-foot Ribbon Cable: PIO-SSR to STP-50
PB-24SM	24-Channel Baseboard for SM Series SSR modules
SSR Modules	See Signal Conditioning & Accessories section
STP-50	Universal Screw Terminal Panel
TESTPOINT	TestPoint Software Package

## Configuration Guide (PIO-SSR Series)



## Connector Pin Assignments (PIO-SSR Series)

PORT C	PC7	01	02	GND
	PC6	03	04	GND
	PC5	05	06	GND
	PC4	07	08	GND
	PC3	09	10	GND
	PC2	11	12	GND
	PC1	13	14	GND
	PC0	15	16	GND
PORT B	PB7	17	18	GND
	PB6	19	20	GND
	PB5	21	22	GND
	PB4	23	24	GND
	PB3	25	26	GND
	PB2	27	28	GND
	PB1	29	30	GND
	PB0	31	32	GND
PORT A	PA7	33	34	GND
	PA6	35	36	GND
	PA5	37	38	GND
	PA4	39	40	GND
	PA3	41	42	GND
	PA2	43	44	GND
	PA1	45	46	GND
	PA0	47	48	GND
+5 V	49	50	GND	

### APPLICATIONS

- Contact closure monitoring
- Digital I/O control
- Alarm monitoring
- Direct relay control (PIO-24 recommended)
- Display driver
- Interface to ERB-24, SSIO-24 relay boards
- Useful with parallel interface devices; e.g. A/Ds, DINs, DPMs, plotters, etc.