

INSTALLATION GUIDE

18-Slot PXI Backplane

This guide describes installation requirements for the 18-slot PXI backplane, shown in Figure 1.

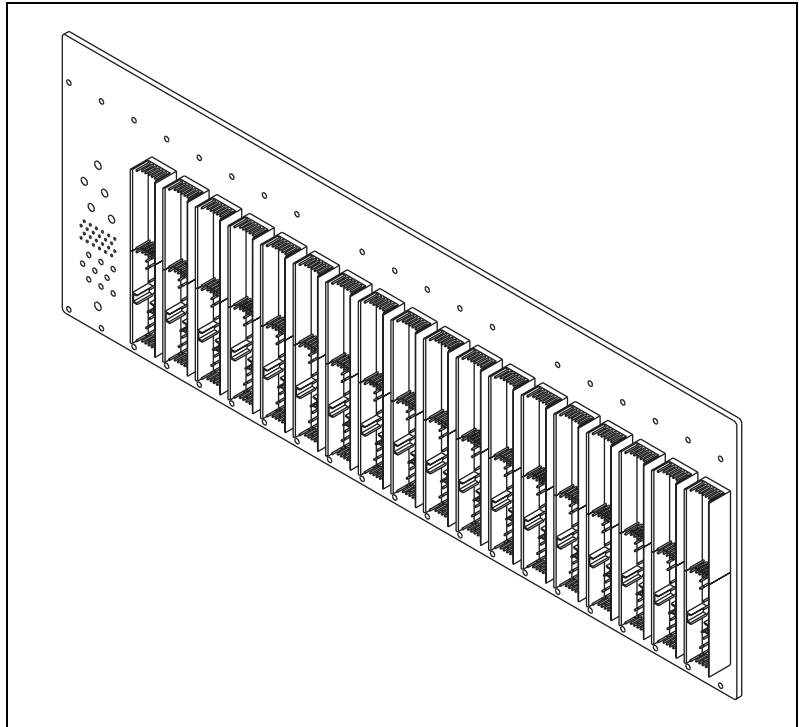


Figure 1. 18-Slot PXI Backplane

Description

The 18-slot PXI backplane contains one PXI controller slot and 17 PXI peripheral slots. It does not include a power supply or cooling solution. You must implement these features when installing the backplane into your system.

The 18-slot backplane supports distribution of current to all peripherals as specified in the PXI specification.

For power requirements, refer to the PXI specification and/or data sheets for PXI peripherals installed in the backplane.

Mechanical Requirements

Mounting

Figure 2 shows the backplane dimensions. There are 40 holes available for mounting with M2.5 hardware.

The use of all mounting holes is recommended for proper backplane support.

There are four mounting holes on top of the 18-slot PXI backplane that have plated annular pads on the front and back of the backplane. (Refer to Figure 3 for the mounting hole locations.) These mounting holes may be used to connect the backplane ground to the chassis in which the backplane is mounted. If you do not desire to connect backplane ground to the chassis, use insulated washers at these mounting holes.

Cooling



Note National Instruments is not responsible for damage to the backplane if inadequate cooling is used.

You should mount a fan below the backplane. Airflow should be from the bottom to the top of the PXI modules. You must determine the airflow requirements for your system based on the *PXI Hardware Specification*.

Handling



Cautions Be careful to avoid bending or otherwise damaging the pins on the backplane connectors. Bent pins may cause functional failures or damage when the backplane is powered.

To protect both yourself and the backplane from electrical hazards, leave the chassis powered off until you finish installing the PXI controller and modules.



Caution Electrostatic discharge can damage your equipment. To avoid such damage, discharge the static built up on your body by touching a grounded metal object before handling the PXI equipment. Then touch the antistatic plastic package containing the backplane to a metal part of your PXI chassis before removing the backplane from the packaging.

Dimensions

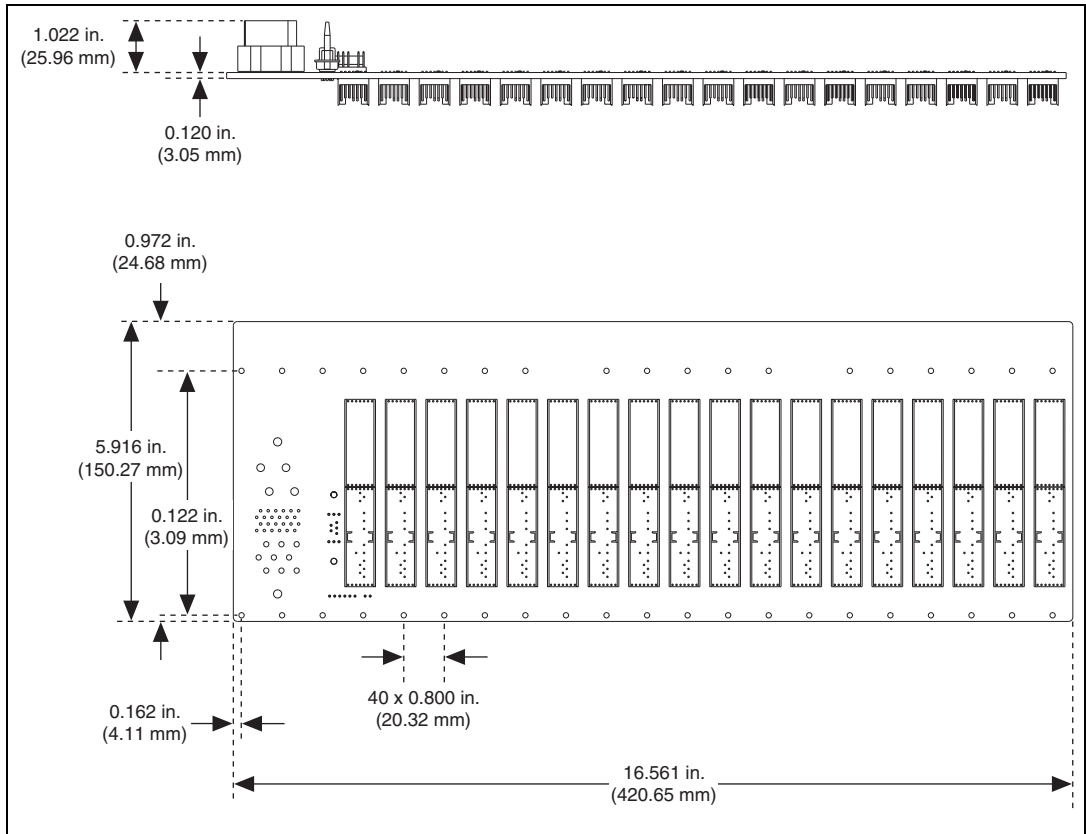


Figure 2. Dimensions

Electrical Requirements

PXI Connectors

The PXI connectors have pin descriptions defined in the *PXI hardware Specification*. The connectors are shown in Figure 3.

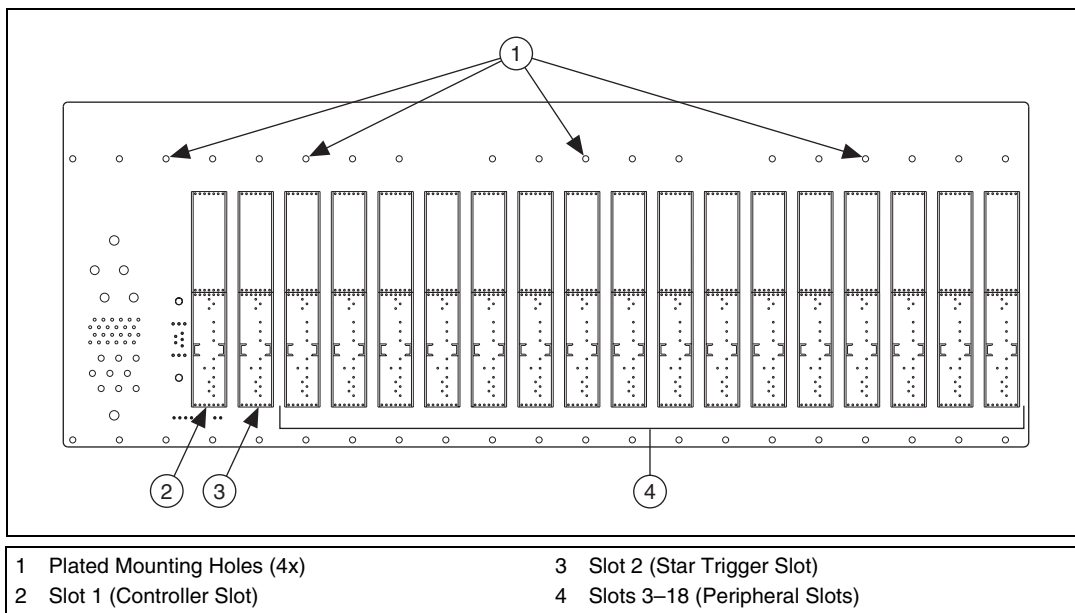


Figure 3. PXI Connectors

System Reference Clock

The 18-slot Backplane supplies the PXI 10 MHz system clock signal (PXI_CLK10) independently to each peripheral slot. An independent buffer (having a source impedance matched to the backplane and a skew of less than 250 ps between slots) drives the clock signal to each peripheral slot. You can use this common reference clock signal to synchronize multiple modules in a measurement or control system. You can drive PXI_CLK10 from an external source through the PXI_CLK10_IN pin on the P2 connector of the Star Trigger Slot or 10 MHz IN pin on the J40 connector. Refer to Figure 3 for the Star Trigger Slot location. Refer to Figure 4 for the J40 connector location. Refer to the *PXI Specification* for the Pinout for the Star Trigger Slot. Sourcing an external clock on either of these pins automatically replaces the backplane's 10 MHz source.

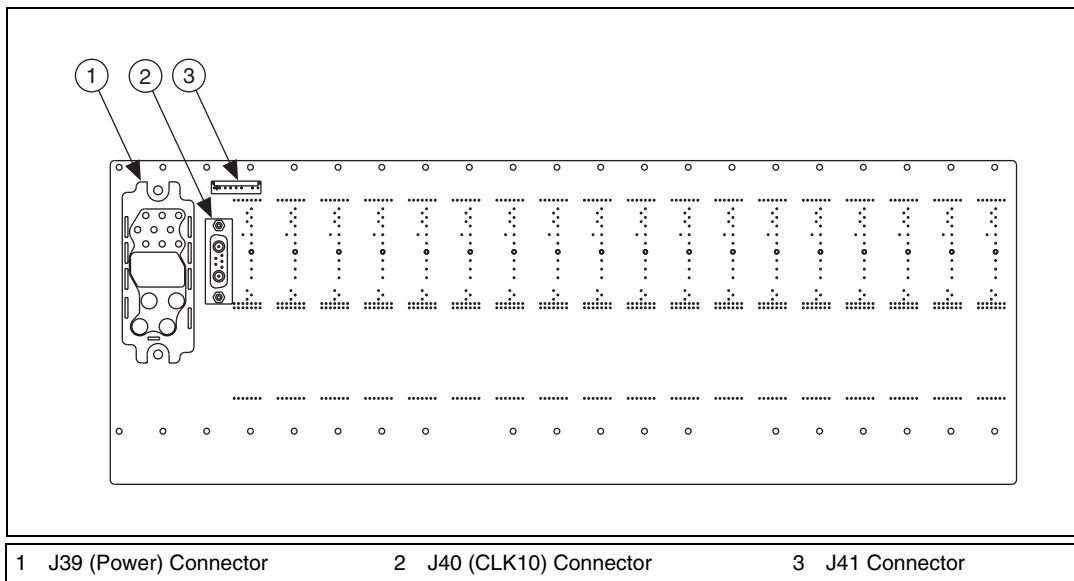


Figure 4. Backplane Power and CLK10 Connectors

Power

Please refer to the *PXI Hardware Specification* for power requirements and to the specifications of the chosen power supply to determine the minimum load required.

Connector J39

Connector J39 is the power supply connector for the 18-slot backplane. The location of the J39 connector is shown in Figure 4. Refer to Table 1 for the pin descriptions. The mating connector for J39 is manufactured by Tyco Electronics, and can be ordered with the part number 6648167-1.



Note The system slot (slot 1) receives +12 V power from pin 17 of J39. If this pin is not connected to +12 V the system controller will not function properly.

Table 1. Connector J39 Pin Descriptions

| Connector | Pin | Signal | Description | Required for Basic Power-up |
|-----------|-----|-------------------|---|-----------------------------|
| | 1 | +5 V | Backplane +5 V power plane. | Yes |
| | 2 | GND | Backplane ground plane. | Yes |
| | 3 | +5 V | Backplane +5 V power plane. | Yes |
| | 4 | GND | Backplane ground plane. | Yes |
| | 5 | +12 V | Backplane +12 V power plane. | Yes |
| | 6 | GND | Backplane ground plane. | Yes |
| | 7 | -12 V | Backplane -12 V power plane. | Yes |
| | 8 | GND | Backplane ground plane. | Yes |
| | 9 | GND | Backplane ground plane. | Yes |
| | 10 | +12V_SENSE | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 11 | +12V_SENSE_RTN | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 12 | -12V_SENSE | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 13 | -12V_SENSE_RTN | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 14 | INHIBIT | Connects to pin 7 of J41. | No |
| | 15 | GND | Backplane ground plane. | Yes |
| | 16 | LED1 | Connects to pin 5 of J41. | No |
| | 17 | LED2 | Connects to pin 8 of J41. | No |
| | 18 | +5V_SENSE | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 19 | +5V_SENSE_RTN | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 20 | THERM1 (optional) | Connects to pin 2 of J41. | No |
| | 21 | THERM2 (optional) | Connects to pin 1 of J41. | No |
| | 22 | SM_SCL | Connects to pin D19 on J2 (slot 1). | No |
| | 23 | SM_SDA | Connects to pin C19 on J2 (slot 1). | No |
| | 24 | SM_ALERT# | Connects to pin E19 on J2 (slot 1). | No |
| | 25 | +3.3V_SENSE | Connect to power supply sense if needed. Do not use for carrying current. | Yes |

Table 1. Connector J39 Pin Descriptions (Continued)

| Connector | Pin | Signal | Description | Required for Basic Power-up |
|-----------|-----|-----------------|---|-----------------------------|
| | 26 | +3.3V_SENSE_RTN | Connect to power supply sense if needed. Do not use for carrying current. | Yes |
| | 27 | NC | — | — |
| | 28 | NC | — | — |
| | 29 | I2C_SDA | Connects through R34 to pin A2 of J9. | No |
| | 30 | I2C_SCL | Connects through R34 to pin A2 of J9. | No |
| | 31 | +12V_FAN | Separate +12 V for slot 1. | Yes |
| | 32 | GND | Backplane ground plane. | Yes |
| | 33 | NC | — | — |
| | 34 | GND | Backplane ground plane. | Yes |
| | 35 | GND | Backplane ground plane. | Yes |
| | 36 | +3.3 V | Backplane +3.3 V power plane. | Yes |
| | 37 | +5 V | Backplane +5 V power plane. | Yes |

Connector J40

Connector J40 is for interfacing with the backplane's PXI_CLK10 circuitry. The location of the J40 connector is shown in Figure 4. The mating connector for J40 is manufactured by Positronic and can be ordered with the part number CBD7W2M2000Z-759.1.

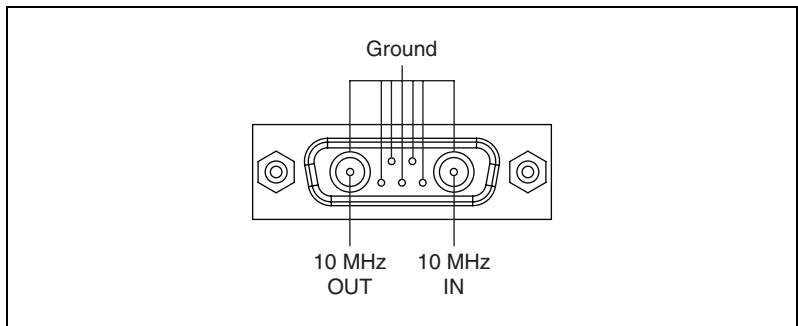
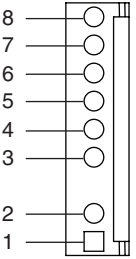


Figure 5. J40 Connector

Connector J41

Connector J41 may be used in conjunction with J39 for interfacing with an inhibit switch, LED, and thermistor. It is not necessary to connect to J41 for basic power-up of the backplane. Refer to Table 2 for the pin descriptions. The mating connector for pins 1–6 of J41 is manufactured by Molex and can be ordered with the part number 22-01-2067.

Table 2. Connector J41 Pin Descriptions

| Connector | Pin | Signal | Description |
|---|-----|----------|--|
|  | 1 | THERM2 | Connects to pin 11 of J39 |
| | 2 | THERM1 | Connects to pin 10 of J39 |
| | 3 | (No Pin) | — |
| | 4 | NC | Not connected. |
| | 5 | LED1 | Connects to pin 6 of J39. |
| | 6 | +5V | Connects to backplane's +5V power plane. |
| | 7 | INH | Connects to pin 5 of J39. |
| | 8 | LED2 | Connects to pin 4 of J39. |
| | 9 | GND | Connects to backplane's ground plane. |

Backplane

Size3U-sized; one system slot (with three system expansion slots) and 17 peripheral slots.
 Compliant with IEEE 1101.10 mechanical packaging.
 PXI Specification Revision 2.2 compliant. Accepts both PXI and CompactPCI (PICMG 2.0 R 3.0) 3U modules.

Backplane bare-board materialUL 94 V-0 Recognized

Backplane connectorsConforms to IEC 917 and IEC 1076-4-101, and are UL 94 V-0 rated

10 MHz System Reference Clock (PXI_CLK10)

Maximum clock skew
between slots 250 ps

Built-in 10 MHz clock

Accuracy ± 25 ppm (guaranteed over the
operating temperature range)
Maximum jitter 5 ps RMS in 10 Hz to 1 MHz
range

External clock sources

Connectors Connector J40 on rear of
backplane (ground referenced) or
Slot 2 J2 (pin D17)

Input frequency 10 MHz ± 100 ppm or better

Input amplitude

Rear connector 200 mV_{pp} to 5 V_{pp}, 10 MHz
squarewave or sinewave

Slot 2 5 V or 3.3 V, 10 MHz TTL signal

Input impedance $50 \Omega \pm 5 \Omega$ (rear connector)

Maximum jitter introduced

by backplane circuitry 1 ps RMS in 10 Hz to 1 MHz
range

External clock output

Connector Connector J40 on rear of
backplane (ground-referenced)

Output amplitude 1 V_{pp} $\pm 20\%$ squarewave into 50Ω
2 V_{pp} into open circuit

Output impedance $50 \Omega \pm 5 \Omega$

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