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MXI Controllers for PXI System Expansion

Expansion Options for PXI and PXI Express Chassis



- Build multichassis PXI systems interfaced to the same system computer
- Create star, tree, or daisy-chain configurations
- Connect up to 10 PXI chassis to the same system computer
- System computer (for the master chassis) can be an NI embedded controller or a PC
- Software-transparent link that requires no programming
- Choice of copper or fiber-optic cables
- Up to 200 m separation between PXI chassis by using fiber-optic cables

Overview

National Instruments provides several chassis expansion MXI products you can use to create multichassis PXI systems that interface to the same system computer. The system computer in the master PXI chassis can be either an NI embedded controller or a PC connected via an NI remote controller.

Because MXI links are software transparent, they do not require any programming. All PXI modules in the slave/downstream chassis appear as local devices in the master chassis. Because the underlying communication technology for most National Instruments remote controllers is cabled PCI Express, these controllers offer extremely high bandwidth and low latency. These features simplify the process of expanding PXI systems to include multiple chassis while offering high performance.

NI Measurement & Automation Explorer (MAX) software provides a graphical view of the system hierarchy, making it easy to identify and configure the PXI modules present in chassis.

To support multichassis configurations, PXI embedded and rack-mount controllers from National Instruments have custom basic I/O systems that allow complete device enumerations. NI recommends using either an NI embedded controller or a rack-mount controller as the system computer for the master PXI chassis. To work with desktop and laptop PCs that do not have this capability, NI offers MXI-Express Compatibility Software.

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Application and Technology

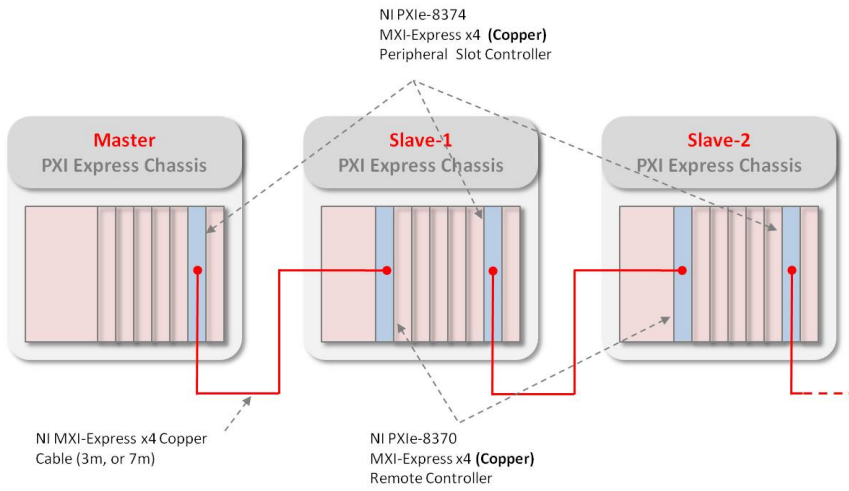
National Instruments offers a variety of chassis expansion options to meet different application needs:

- [Configurations with multiple PXI Express chassis](#)
- [Configurations with a combination of PXI Express and PXI chassis](#)
- [Configurations with multiple PXI chassis](#)

Configurations With Multiple PXI Express Chassis

1. Using the NI PXIe-8374 (x4, Copper) Peripheral Slot Controller
2. Using the NI PXIe-8364 (x1, Copper) Peripheral Slot Controller
3. Using the NI PXIe-PCle8389 Kit With a Desktop PC
4. Using the ExpressCard Slot on the Master PXI Express Embedded Controller
5. Using the NI PXIe-PCle8375 Kit With a Desktop PC
6. Using the NI PXIe-PCle8362 Kit With a Desktop PC
7. Using the NI PXIe-PCle8372 Kit With a Desktop PC

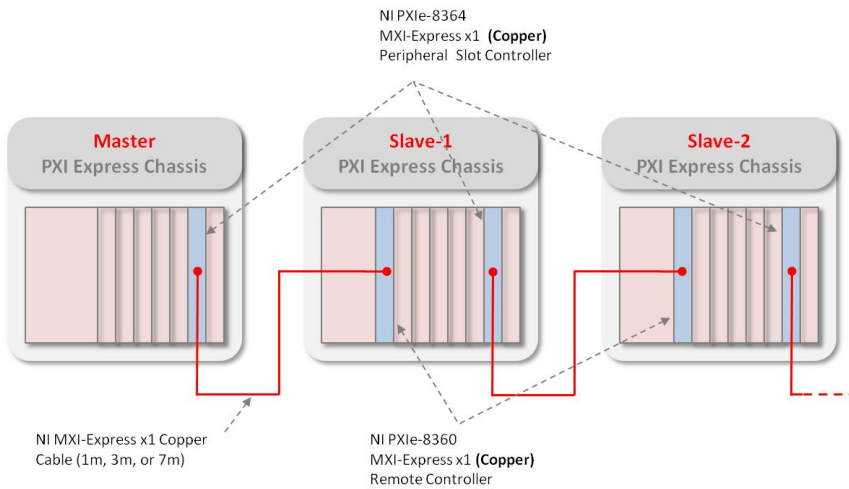
Option 1: Using the NI PXIe-8374 (x4, Copper) Peripheral Slot Controller



Product Name	Part Number	Installation Location
NI PXIe-8374	781820-04	Any PXI Express Peripheral Slot in the Master or Slave PXI Express Chassis
NI PXIe-8370	779720-01	Slot 1 (first) of the Slave/Downstream PXI Express Chassis
NI MXI-Express x4 Copper Cable 3 m	779725-03	Connect the NI PXIe-8374 to the NI PXIe-8370
NI MXI-Express x4 Copper Cable 7 m	779725-07	Connect the NI PXIe-8374 to the NI PXIe-8370

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI Express chassis for streaming data is 1 GB/s/direction.

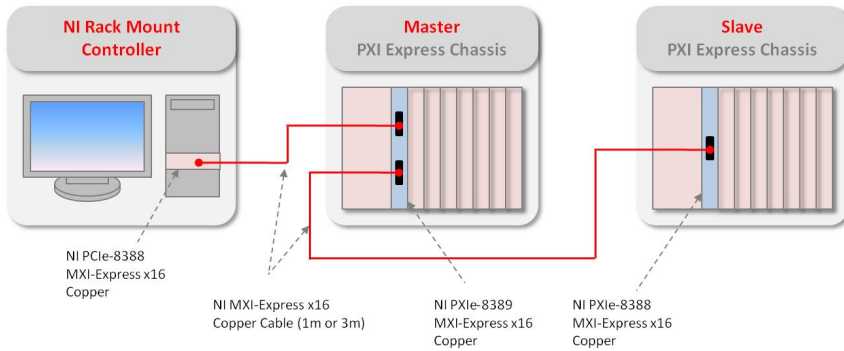
Option 2: Using the NI PXIe-8364 (x1, Copper) Peripheral Slot Controller



Product Name	Part Number	Installation Location
NI PXIe-8364	781819-01	Any PXI Express Peripheral Slot in the Master or Slave PXI Express Chassis
NI PXIe-8360	779700-01	Slot 1 (first) of the Slave/Downstream PXI Express Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PXIe-8364 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PXIe-8364 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PXIe-8364 to the NI PXIe-8360

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI Express chassis for streaming data is 250 MB/s/direction.

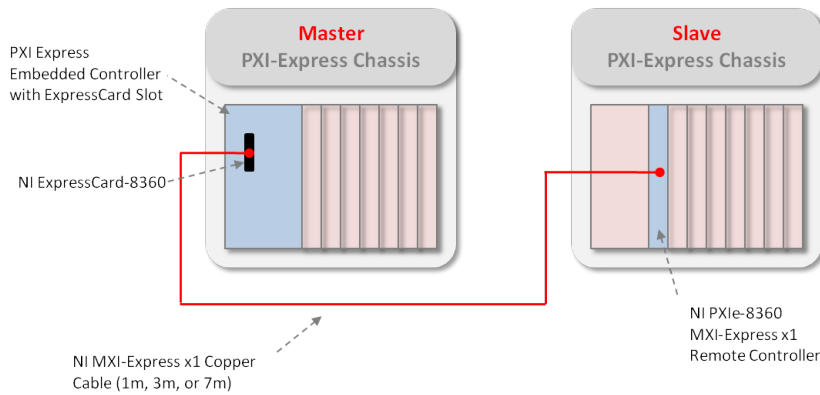
Option 3: Using the NI PXIe-PCIe8389 Kit With a Desktop PC



Product Name	Part Number	Installation Location
NI PCIe-8388	781762-01	x16 PCI Express Slot in the Desktop PC
NI PXIe-8389	781761-01	Slot 1 (first) of the Master/First PXI Express Chassis
NI PXIe-8388	781760-01	Slot 1 (first) of the Slave/Downstream PXI Express Chassis
NI MXI-Express x16 Copper Cable, 1m	781763-01	Connect the NI PCIe-8388 to the NI PXIe-8389 or an NI PXIe-8389 to NI PXIe-8388
NI MXI-Express x16 Copper Cable, 3m	781763-03	Connect the NI PCIe-8388 to the NI PXIe-8389 or an NI PXIe-8389 to NI PXIe-8388

Note: In this configuration, the total theoretical maximum data throughput available for all PXI Express chassis for streaming data to and from the NI rackmount controller is 5.6 GB/s/direction. The NI PXIe-8388 in the slot-1 of the second slave/downstream PXI Express chassis can be replaced with another NI PXIe-8389 to interface more chassis to the same system host computer. Depending on the size of the PXI Express chassis used, this configuration can support up to three PXI Express chassis daisy chained to the same system computer.

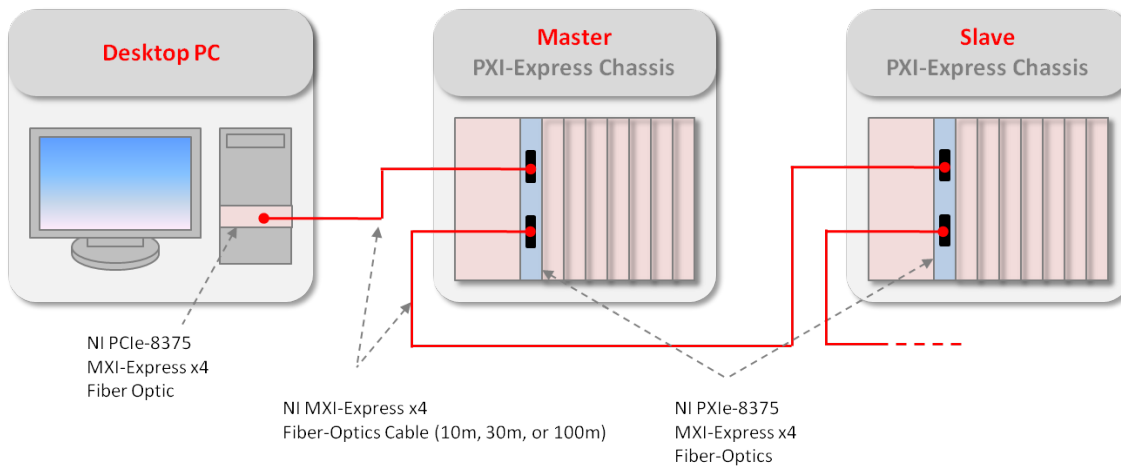
Option 4: Using the ExpressCard Slot on the Master PXI Express Embedded Controller



Product Name	Part Number	Installation Location
NI ExpressCard-8360	779507-01	ExpressCard Slot on the Master Chassis PXI Express Embedded Controller
NI PXIe-8360	779700-01	Slot 1 (first) of the Slave/Downstream PXI Express Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI ExpressCard-8360 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI ExpressCard-8360 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI ExpressCard-8360 to the NI PXIe-8360

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI Express chassis for streaming data to and from the NI embedded controller is 250 MB/s/direction.

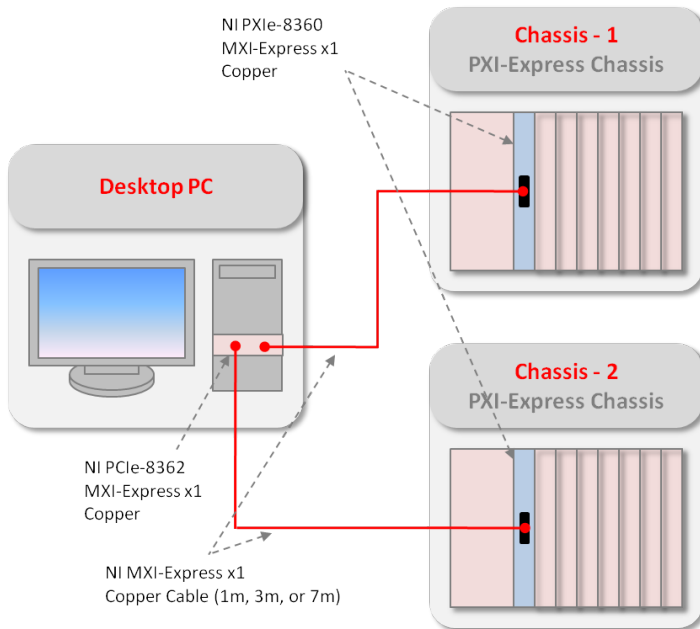
Option 5: Using the NI PXIe-PCIe8375 Kit With a Desktop PC



Product Name	Part Number	Installation Location
NI PCIe-8375	781040-01	x4 PCI Express Slot in the Desktop PC
NI PXIe-8375	781041-01	Slot 1 (first) of the Master/First PXI Express Chassis
NI PXIe-8375	781041-01	Slot 1 (first) of the Slave/Downstream PXI Express Chassis
NI MXI-Express x4 Fiber-Optic Cable 10 m	781042-10	Connect the NI PCIe-8375 to the NI PXIe-8375 or an NI PXIe-8375 to another NI PXIe-8375
NI MXI-Express x4 Fiber-Optic Cable 30 m	781042-30	Connect the NI PCIe-8375 to the NI PXIe-8375 or an NI PXIe-8375 to another NI PXIe-8375
NI MXI-Express x4 Fiber-Optic Cable 100 m	781042-100	Connect the NI PCIe-8375 to the NI PXIe-8375 or an NI PXIe-8375 to another NI PXIe-8375

Note: In this configuration, the total theoretical maximum data throughput available for all PXI Express chassis for streaming data to and from the desktop PC is 1 GB/s/direction. Depending on the size of the PXI Express chassis used, this configuration can support up to eight PXI Express chassis daisy chained to the same desktop PC.

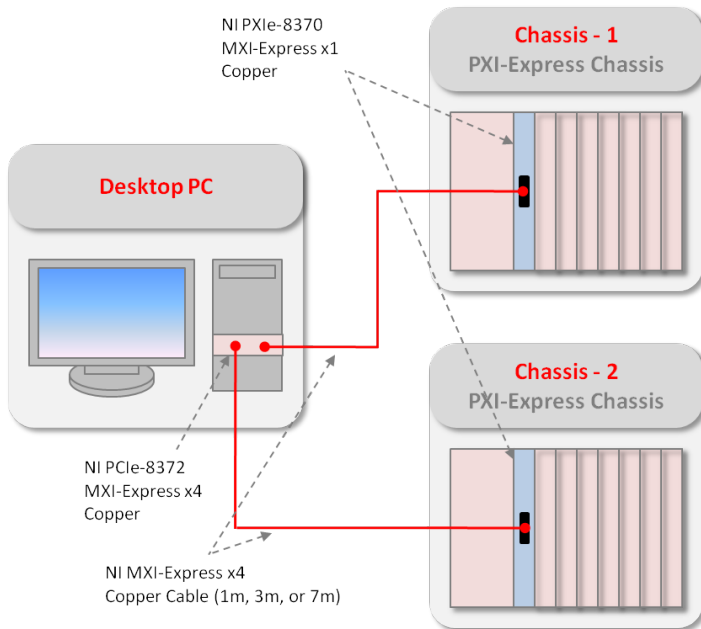
Option 6: Using the NI PXIe-PCle8362 Kit With a Desktop PC



Product Name	Part Number	Installation Location
NI PCIe-8362	779502-01	x1 PCI Express Slot in the Desktop PC
NI PXIe-8360	779700-01	Slot 1 (first) of the First and Second PXI Express Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PCIe-8362 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PCIe-8362 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PCIe-8362 to the NI PXIe-8360

Note: In this configuration, the total theoretical maximum data throughput available for all PXI Express chassis for streaming data to and from the desktop PC is 250 MB/s/direction.

Option 7: Using the NI PXIe-PCle8372 Kit With a Desktop PC



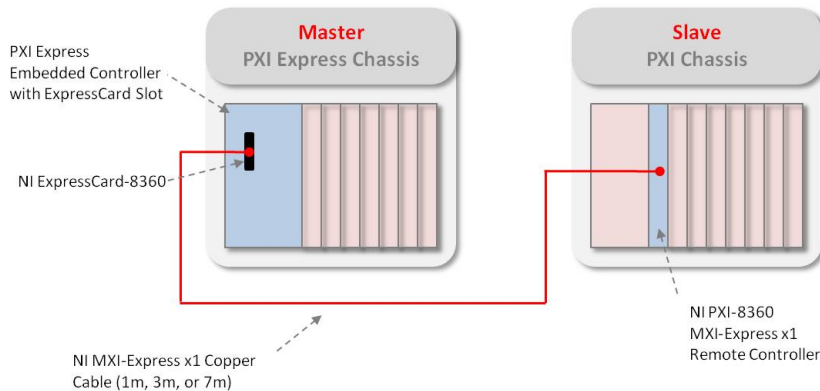
Product Name	Part Number	Installation Location
NI PCIe-8372	779724-01	x4 PCI Express Slot in the Desktop PC
NI PXIe-8370	779720-01	Slot 1 (first) of the First and Second PXI Express Chassis
NI MXI-Express x4 Copper Cable 3 m	779725-03	Connect the NI PCIe-8372 to the NI PXIe-8370
NI MXI-Express x4 Copper Cable 7 m	779725-07	Connect the NI PCIe-8372 to the NI PXIe-8370

Note: In this configuration, the total theoretical maximum data throughput available for all PXI Express chassis for streaming data to and from the desktop PC is 1 GB/s/direction.

Configurations With a Combination of PXI Express and PXI Chassis

- Using the ExpressCard Slot on the Master PXI Express Embedded Controller
- Using the ExpressCard Slot on the Master PXI Embedded Controller
- Using the NI PXI-8364 (x1, Copper) Peripheral Slot Controller
- Using the NI PCIe-8362 Remote Controller With a Desktop PC

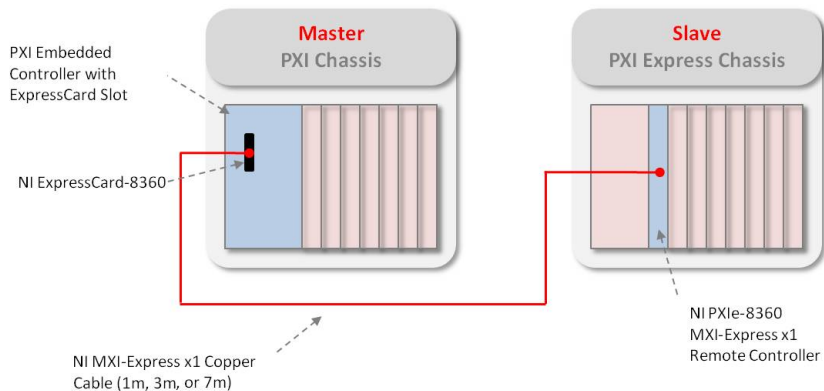
Option 1: Using the ExpressCard Slot on the Master PXI Express Embedded Controller



Product Name	Part Number	Installation Location
NI ExpressCard-8360	779507-01	ExpressCard Slot on the Master Chassis PXI Express Embedded Controller
NI PXI-8360	779501-01	Slot 1 (first) of the Slave/Downstream PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI ExpressCard-8360 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI ExpressCard-8360 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI ExpressCard-8360 to the NI PXI-8360

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI chassis for streaming data to and from the NI embedded controller is 132 MB/s.

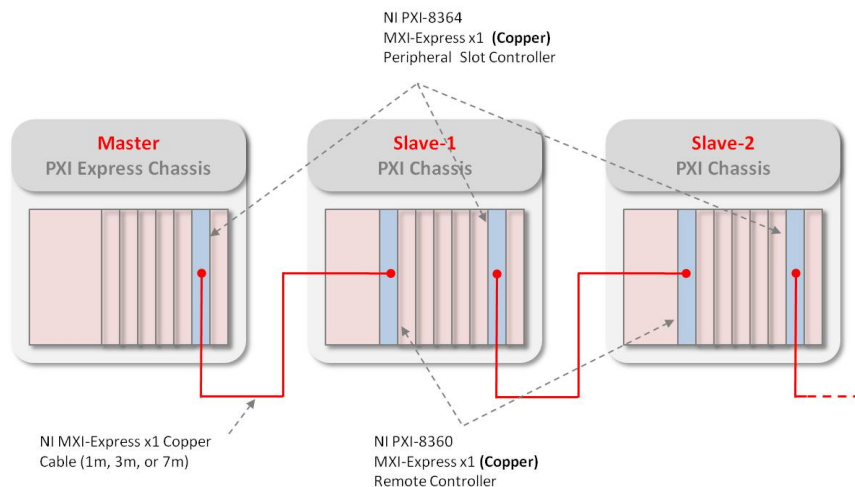
Option 2: Using the ExpressCard Slot on the Master PXI Embedded Controller



Product Name	Part Number	Installation Location
NI ExpressCard-8360	779507-01	ExpressCard Slot on the Master Chassis PXI Express Embedded Controller
NI PXIe-8360	779700-01	Slot 1 (first) of the Slave/Downstream PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI ExpressCard-8360 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI ExpressCard-8360 to the NI PXIe-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI ExpressCard-8360 to the NI PXIe-8360

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI Express chassis for streaming data to and from the NI embedded controller is 250 MB/s/direction.

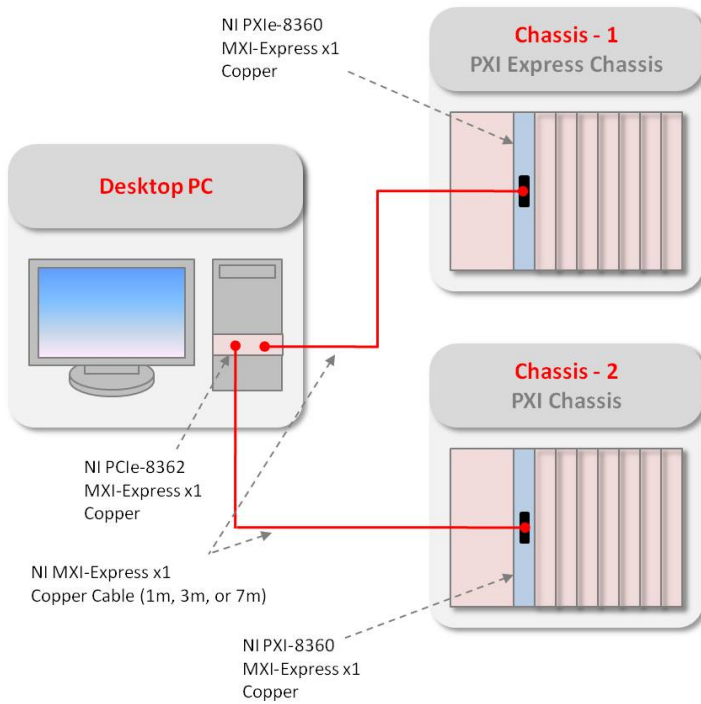
Option 3: Using the NI PXI-8364 (x1, Copper) Peripheral Slot Controller



Product Name	Part Number	Installation Location
NI PXI-8364	781395-01	Hybrid PXI Slot in the Master PXI Express Chassis or Any Peripheral Slot in the Slave PXI Chassis
NI PXI-8360	779501-01	Slot 1 (first) of the Slave/Downstream PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PXI-8364 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PXI-8364 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PXI-8364 to the NI PXI-8360

Note: In this configuration, the total theoretical maximum data throughput available for all slave PXI chassis for streaming data to and from the system computer is 132 MB/s. Depending on the size of the PXI chassis used, this configuration can support up to 10 PXI chassis daisy chained to the same master PXI Express chassis. You can have multiple NI PXI-8364 modules in the same PXI/PXI Express chassis to create star or tree configurations.

Option 4: Using the NI PCIe-8362 Remote Controller With a Desktop PC



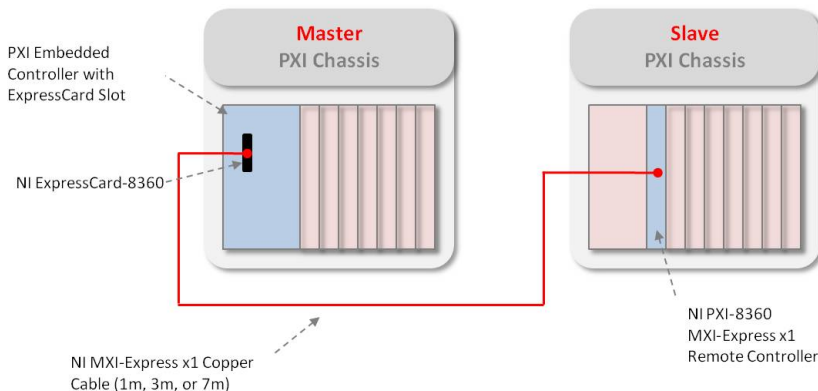
Product Name	Part Number	Installation Location
NI PCIe-8362	779502-01	x1 PCI Express Slot in the Desktop PC
NI PXIe-8360	779700-01	Slot 1 (first) of the PXI Express Chassis
NI PXI-8360	779501-01	Slot 1 (first) of the PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PCIe-8362 to the NI PXIe-8360 or the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PCIe-8362 to the NI PXIe-8360 or the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PCIe-8362 to the NI PXIe-8360 or the NI PXI-8360

Note: In this configuration, the total theoretical maximum data throughput available for the PXI Express and PXI chassis for streaming data to and from the desktop PC is 250 MB/s.

Configurations With Multiple PXI Chassis

1. Using the ExpressCard Slot on the Master PXI Embedded Controller
2. Using the NI PXI-8364 (x1, Copper) Peripheral Slot Controller
3. Using the NI PCIe-8362 Remote Controller With a Desktop PC

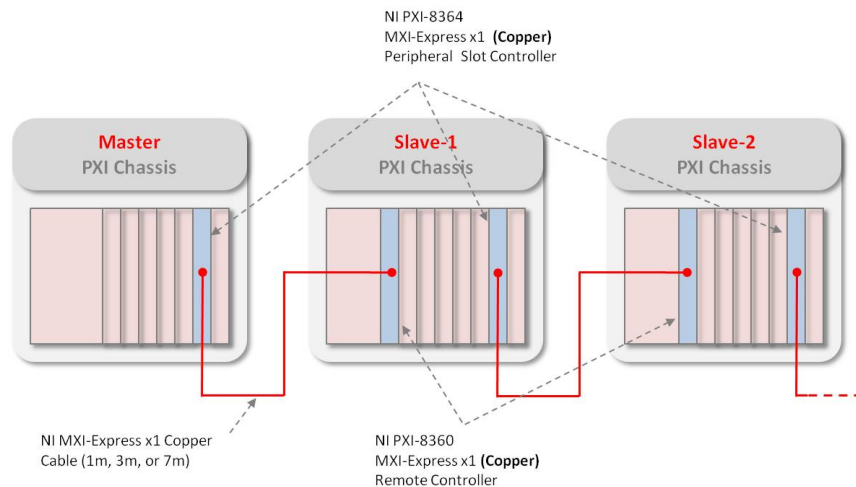
Option 1: Using the ExpressCard Slot on the Master PXI Embedded Controller



Product Name	Part Number	Installation Location
NI ExpressCard-8360	779507-01	ExpressCard Slot on the Master Chassis PXI Embedded Controller
NI PXI-8360	779501-01	Slot 1 (first) of the Slave/Downstream PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI ExpressCard-8360 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI ExpressCard-8360 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI ExpressCard-8360 to the NI PXI-8360

Note: In this configuration, the theoretical maximum data throughput available to the slave/downstream PXI chassis for streaming data to and from the NI embedded controller is 132 MB/s.

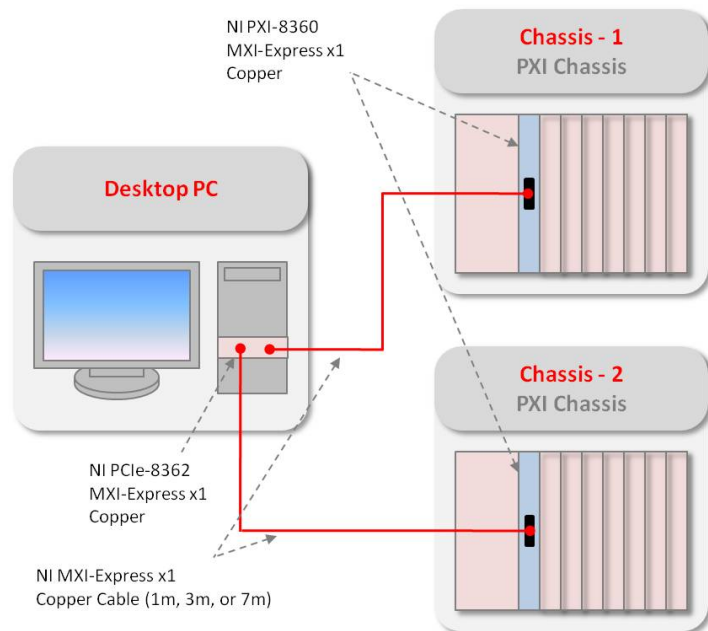
Option 2: Using the NI PXI-8364 (x1, Copper) Peripheral Slot Controller



Product Name	Part Number	Installation Location
NI PXI-8364	781395-01	Any Peripheral Slot in the Master or Slave PXI Chassis
NI PXI-8360	779501-01	Slot 1 (first) of the Slave/Downstream PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PXI-8364 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PXI-8364 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PXI-8364 to the NI PXI-8360

Note: In this configuration, the total theoretical maximum data throughput available for all slave PXI chassis for streaming data to and from the system computer is 132 MB/s. Depending on the size of the PXI chassis used, this configuration can support up to 10 PXI chassis daisy chained to the same master PXI Express chassis. You can have multiple NI PXI-8364 modules in the same PXI chassis to create star or tree configurations.

Option 3: Using the NI PCIe-8362 Remote Controller With a Desktop PC



Product Name	Part Number	Installation Location
NI PCIe-8362	779502-01	x1 PCI Express Slot in the Desktop PC
NI PXI-8360	779501-01	Slot 1 (first) of the PXI Chassis
NI MXI-Express x1 Copper Cable 1 m	779500-01	Connect the NI PCIe-8362 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 3 m	779500-03	Connect the NI PCIe-8362 to the NI PXI-8360
NI MXI-Express x1 Copper Cable 7 m	779500-07	Connect the NI PCIe-8362 to the NI PXI-8360

Note: In this configuration, the total theoretical maximum data throughput available for the PXI Express and PXI chassis for streaming data to and from the desktop PC is 250 MB/s.

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NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

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Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 700 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit ni.com/alliance.

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