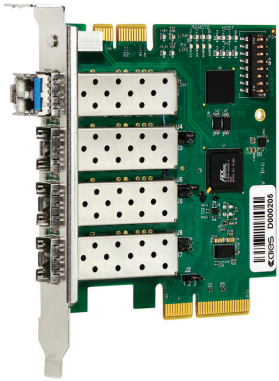
Low-Cost, Optical MXI-Express Link for NI CompactRIO

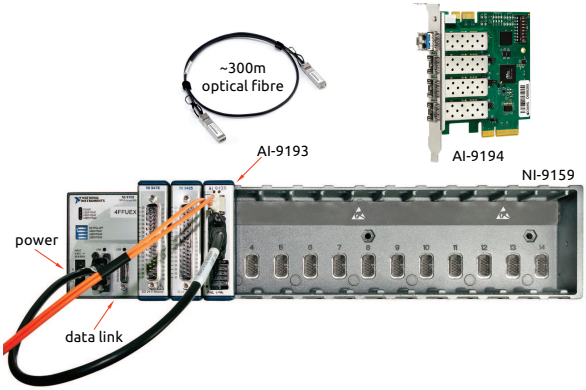
AI-9193
cRIO module with a single lane PCIe optical cannection



AI-9194
Host card with four independent PCIe optical connections

Overview

The PCI express interface is widely used in various industrial applications. It is the main transmission medium applied in embedded and desktop computers. The protocol allows to connect hundreds of devices to a single Root Complex device (host computer).
The optical MXI-Express link is ideal for connecting a Compact RIO chassis installed in a distance from the host computer using the optical fiber.
The MXI-Express link is composed of the AI-9193 Compact RIO module and the AI-9194 CPU card.
The PCIe fiber-based connection guarantees galvanic isolation and provides data transmission up to 1000 m.
PCIe optical link hardware is designed to operate reliably in environments with high magnetic fields. In addition, the optical link host controller (AI-9194) provides a power control function of the external Compact RIO chassis. The cRIO chassis can be fully restarted (power cycle) using an application running on a host computer.



Equipment Needed

1. AI-9193 Optical MXI-Express Interface for the NI CompactRIO
2. AI-9194 Quad Fiber Optical MXI-Express Host Card for the NI CompactRIO
3. AI-9195-3 SFP LC-LC Optical Cable – 3 m (1 m, 5 m 10 m, 100 m, 200 m, 300, 1000 m as option)
4. AI-9197-0.5 0.5m TDP (Triad Differential Pair) PCIe x1 Cable Assembly, 28 AWG, 0.50m

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Features

- Data Rate up to 256 MB/s
- Supports PCIe x1, Gen 1
- Dedicated to NI CompactRIO
- Long distance (up to 1000 m) SFP LC-LC Optical Cable
- MXI-Express connection to the cRIO chassis via the copper cable

Typical Applications

- Long distance, high speed Data Acquisition and Control Systems based on the Compact RIO
- Machine protection systems
- Slow feedback control systems

Requirements

The Optical MXI-Express Link for the NI CompactRIO requires a PCIe Host card AI-9194 Quad Optical MXI-Express Host Card for the NI CompactRIO. The host computer can operate with the Spread Spectrum or non-Spread Spectrum Clock. The Compact RIO power supply could be controlled via the Linux application. A single AI-9194 host card allows for controlling up to 4 cRIO systems.

Order information	RoHS Compilant
Part Number	**Description**
AI-9193	Optical MXI-Express Interface for NI CompactRIO
AI-9194	Quad Fiber Optical MXI-Express Host Card for NI CompactRIO
AI-9195-X	SFP LC-LC Optical Cable (X-1, 3, 5, 10, 200, 300 m)
AI-9196-X	MXI-Express/ExspressCard MXI Cable, X (X-1,3, 7 m)
AI-9197-0.5	0.5 m TDP (Triad Differential Pair) PCIe x1 Cable Assembly, 28 AWG 0.50 m Length

Hardware Features	
AI-9193 Optical MXI-Express Interface for NI CompactRIO	
Form Factor	• CompactRIO module enclosure
Power Consumption	• <1.5W
Connectors	• LC Optical SFP Transceiver • MXI-Express x1 Copper • Power Supply Connector • Compact RIO Power Supply output
Status indicators	• Link Status (x1) • Cable Presence • Power Output State
Dimmensions	• 23 x 90 x 70 mm
PCIe Cable	• 1 m MXI-EXPRESS x1 or 0.5 m PCIe x1 Cable Assembly, 28 AWG
PCIe Fiber	• SFP LC-LC Fiber Optical Cable - 3 m (1m, 5m, 10m, 100m, 200m, 300m, 1000m as options)
Power control	• Max 40 W
Industry Specifications	• PCIe External Cabling SpecificationRev. 1.0 • PCI Express Base SpecificationRev. 3.0
Operating Temperature	• 0°C to +70°C
Storage Temperature	• -40°C to +85°C
Operating Huminity	• 10% to 90% relative humidity non-condensing
Storage Humidity	• 5% to 95% relative humidity non-condensing

AI-9194 Optical MXI-Express Interface for NI CompactRIO	
Form Factor	• Standard Height, Half Length PCIe Card
Power Consumption	• <15W
Connectors	• 4 x LC Potical SFP Transceiver • PCI Express X4 connector
Status indicators	• PCIe Link Status (x1) for each MXI-E link • Cable Presence • Power Output State
Dimmensions	• 107 x 168 mm

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