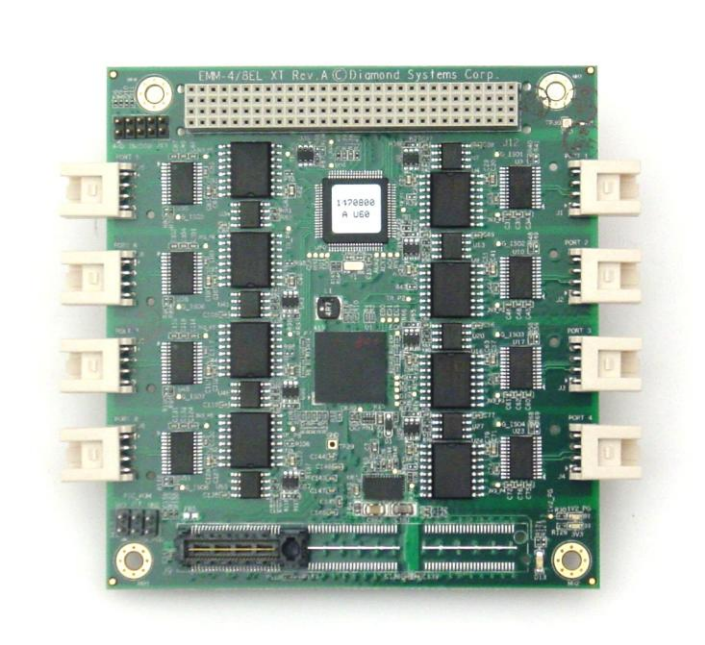
EMERALD-MM-8EL-XT

PCIe/104 4/8-Port Serial I/O Modules with Opto-Isolation



- 4 or 8 RS-232/422/485 ports
- Data rates: RS-232 mode up to 1Mbps
  RS-422/485 modes up to 10Mbps
- 16550 compatible octal UART with 256-byte TX/RX FIFOs
- Models available with or without opto-isolation
- SP330 multiprotocol transceivers, one per port
- Programmable RS-422/485 termination
- +/-15KV ESD protection on each serial port
- Independent 2500VRMS isolation port by port
- Staggered turn-on of isolated devices for reduced inrush current at power on
- 8 programmable digital I/O or analog input lines
- Onboard microcontroller manages and stores configurations
- All configuration done via software; no jumpers
- Comprehensive software suite enables easy configuration and control
- Latching connectors for increased ruggedness
- PCIex1 host interface using PCIe/104 "OneBank™" connector supporting both Type 1 and Type 2
- Supports Linux, Windows XP, 7, Vista & 2000
- Extremely rugged -40°C to +85°C operating temperature
- MIL-STD-202G shock and vibration compatible
- PCI/104-Express form factor:
  3.55" x 3.775" (90mm x 96mm)

High Performance Serial I/O Functionality

The Emerald-MM-8EL-XT is a family of PCIe/104 "OneBank" serial cards offering 4 or 8 serial ports and optional opto-isolation. The module is based on a high speed PCIe UART with 256-byte TX/RX FIFOs and auto RS-485 transmit control. All configuration and control is done with an on-board microcontroller managed by a graphical control panel or console application. The EMM-8EL-XT fits a wide variety of rugged and on-vehicle embedded serial I/O application needs.

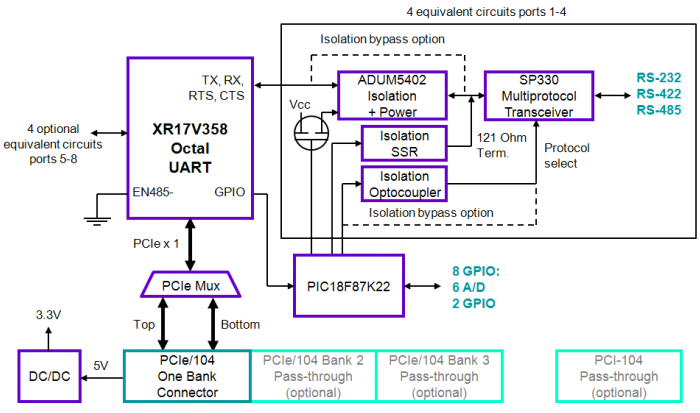
Digital and Analog Lines

EMM-8EL-XT also offers 8 programmable digital I/O or analog input lines. All 8 I/O lines can be configured for digital I/O and seven can be configured for 12-bit analog input.

Rugged Design

The Emerald-MM-8EL-XT family was designed with harsh applications in mind including latching connectors to further improve reliability. Extended temperature operation of -40°C to +85°C is tested and guaranteed. The module is compatible with MIL-STD-202G shock and vibration specifications.

EMME-8EL-XT BLOCK DIAGRAM



Emerald-MM-8EL: 4- or 8-Port Serial I/O Module

Specifications

Number of serial ports	4 or 8
Protocols	RS-232/422/485 software programmable
Maximum baud rate	RS-232: 1Mbps RS-422/485: 10Mbps
UART	16550 compatible octal UART 256-byte TX/RX FIFOs
Transceivers	SP330 multiprotocol transceivers, one per port
Termination	Software programmable RS-422/485 line termination
Isolation	Optional independent 2500VRMS isolation port-by-port
ESD	+/-15KV protection on each port
Onboard microcontroller	PIC with flash to manage and store configurations
Inrush current	Staggered turn-on of isolated devices for reduced power on current
Analog / digital I/O	8 programmable digital I/O lines 7 can be configured for 12-bit analog input lines Programmable analog input ranges: 0-2.048V or 0-3.3V
Host interface	PCIex1 host interface using PCIe/104 "OneBank" connector
Connectors	Latching connectors for increased ruggedness
Input power	+5VDC +/-5%
Power consumption	160mA at 5VDC typical with all outputs unloaded
Software drivers	Windows Embedded Standard 7, XP, 2000, and Vista Linux versions 2.6.16 through 3.13
Operating temp	-40°C to +85°C (-40°F to +185°F)
Operating humidity	5% to 95% non-condensing
Shock	MIL-STD-202G compatible
Vibration	MIL-STD-202G compatible
MTBF	579,352 hours at 20°C
Form factor	PCIe/104 OneBank supports both Type 1 and Type 2 3.55" x 3.775" (90mm x 96mm)
Weight	2.5oz (71g)
RoHS	Compliant

Software Support

The EMM-8EL-XT family is compatible with Windows 7/Vista/2000/XP and Linux versions 2.6.16 through 3.13. All drivers are shipped with the product.

The on-board microcontroller is managed with a comprehensive software suite that makes configuring the EMM-8EL-XT fast and simple. A graphical control panel, a console application, and drivers for Windows and Linux are provided to enable convenient configuration of the board and control of the I/O features in a laboratory or system assembly environment, or embedded in the customer's application software.

Key Features

Emerald-MM-8EL-XT is a family of high performance PCIe/104 "OneBank" serial I/O modules offering 4 or 8 serial ports with software-controlled configuration and optional opto-isolation.

The serial ports are based on a high speed PCIe octal UART with 256-byte TX/RX FIFOs and auto RS-485 transmit control. Each serial port can be independently configured for RS-232, RS-422, or RS-485 protocols, along with programmable 120-ohm line termination. Each port is independently isolated with an isolated power + signal chip, plus additional isolators for control signals. The board features intelligent power management that limits inrush current on power-up and also enables power-down of unused serial ports for power savings.

Opto-isolated models feature independent 2500VRMS isolation circuits for enhanced reliability in vehicle or long cable applications. All ports also feature +/-15KV ESD protection. Each serial port is available on an independent latching connector for increased isolation and ruggedness. With its wide operating temperature range and high resistance to shock and vibration, the EMM-8EL-XT fits a wide variety of rugged and on-vehicle embedded serial I/O application needs.

EMM-8EL-XT also offers 8 digital/analog I/O lines which are programmable from the on-board microcontroller. Each I/O line can be configured for digital input or output. Seven of the I/O lines can be configured for 12-bit A/D input with selectable 0-2.048V or 0-3.3V input ranges.

EMM-8EL-XT contains no configuration jumpers; all configuration and control is done with an onboard microcontroller. All configuration settings are stored in the microcontroller's flash memory and are automatically loaded on power-up.

Ordering Information

EMM-8EL-XT	8-port PCI/104-Express Serial Module with opto-isolation
EMM-4EL-XT	4-port PCI/104-Express Serial Module with opto-isolation
EMM-8E-XT	8-port PCI/104-Express Serial Module, no opto-isolation
EMM-4E-XT	4-port PCI/104-Express Serial Module, no opto-isolation
CK-EMM-8EL	Cable Kit with 8 serial cables and 1 digital/analog cable
CK-EMM-4EL	Cable Kit with 4 serial cables and 1 digital/analog cable

As a customization option, Emerald-MM-8EL supports the full PCIe/104 three bank form factor definition, both Type 1 and Type 2. Contact Diamond Systems for more information on this option. Minimum order quantities apply.