EMERALD-MM-8E/EL PCI/104-Express 4/8-Port Serial Port Module with Opto-isolation

PCIe104

EMM-8E-XT 8 non-isolated serial ports

EMM-8EL-XT 8 isolated serial ports

FEATURES

- 4 or 8 multiprotocol serial ports
- Optional opto-isolation with 2500VRMS isolation between ports
- 100% software configured - no jumpers
- 16550 compatible octal UART with 256-byte TX/RX FIFOs
- Software configurable for RS-232/422/485 protocols
- Maximum baud rate:
  RS-232 mode: 1Mbps
  RS-422/485 mode: 10Mbps
- SP330 multiprotocol transceivers, one per port
- Programmable RS-422/485 termination
- +/-15KV ESD protection on each port
- 8 programmable digital I/O or analog input lines
- On-board microcontroller manages and stores configurations
- All configuration done via software; no jumpers
- Latching connectors for imcreased ruggedness
- PCIe x1 host interface using PCIe/104 OneBank™ connector
- Staggered turn-on of isolated power circuits for reduced inrush current at power-on
- -40°C to +85°C operating temperature
- Industry-standard UART supported by most popular embedded operating systems
- Comprehensive software suite enables easy configuration and control
- MIL-STD-202G shock and vibration compatible
- PCI/104-Express One-Bank form factor 3.55 x 3.775" / 90x96mm

Description

The Emerald-MM-8EL-XT is a family of high performance PCIe/104 "OneBank" serial I/O modules offering 4 or 8 multiprotocol serial ports with software-controlled configuration and optional opto-isolation. An accessory microcontroller manages all port configuration and provides 8 auxiliary digital / analog I/O lines for general purpose use.

Available Models

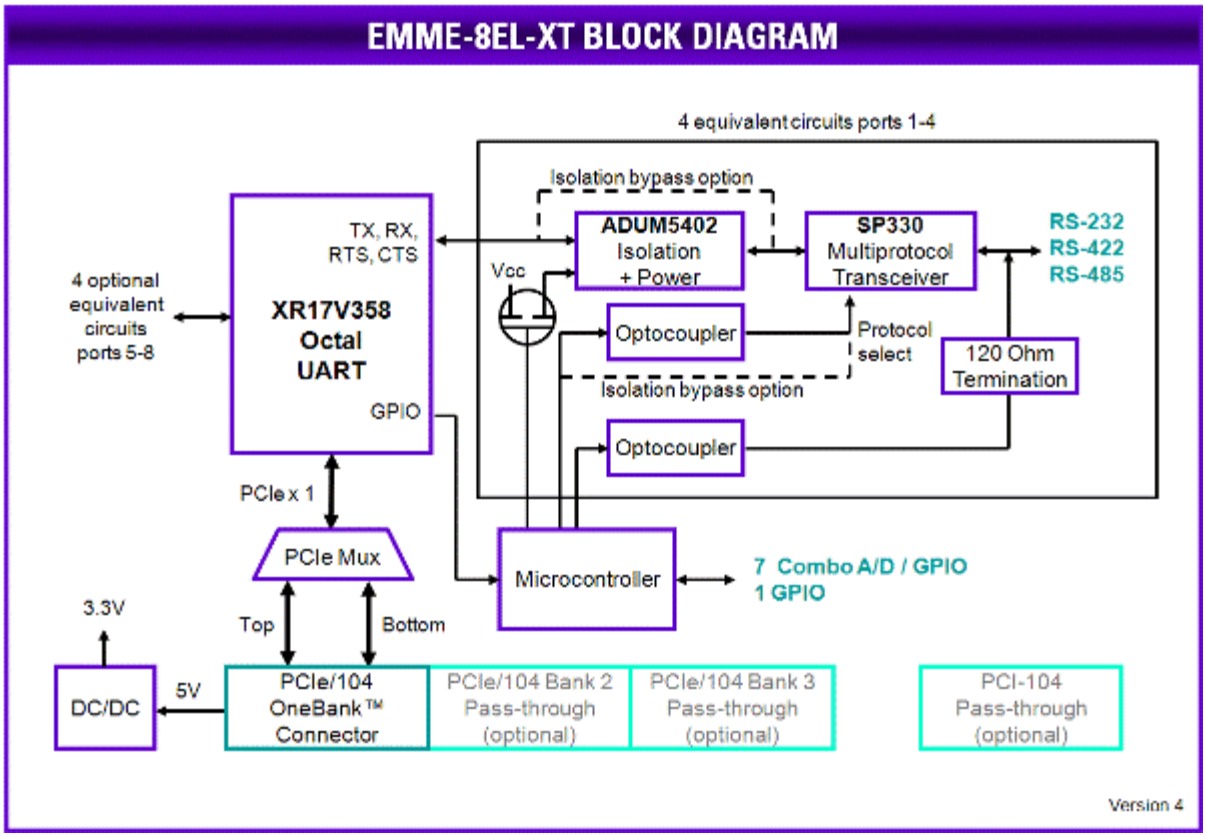
Model #	Description
EMM-8EL-XT	8-Port serial module with opto-isolation
EMM-4EL-XT	4-Port serial module with opto-isolation
EMM-8E-XT	8-Port serial module without opto-isolation
EMM-4E-XT	4-Port serial module without opto-isolation

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 using application software included with the product. All configuration settings are stored in the microcontroller's flash memory and are automatically loaded on power-up.



Cable Kits

Cable kits are available for both 4-port and 8-port boards They include individual cables with dB9 male connectors for each serial port and a ribbon cable for the auxiliary analog/digital I/O.

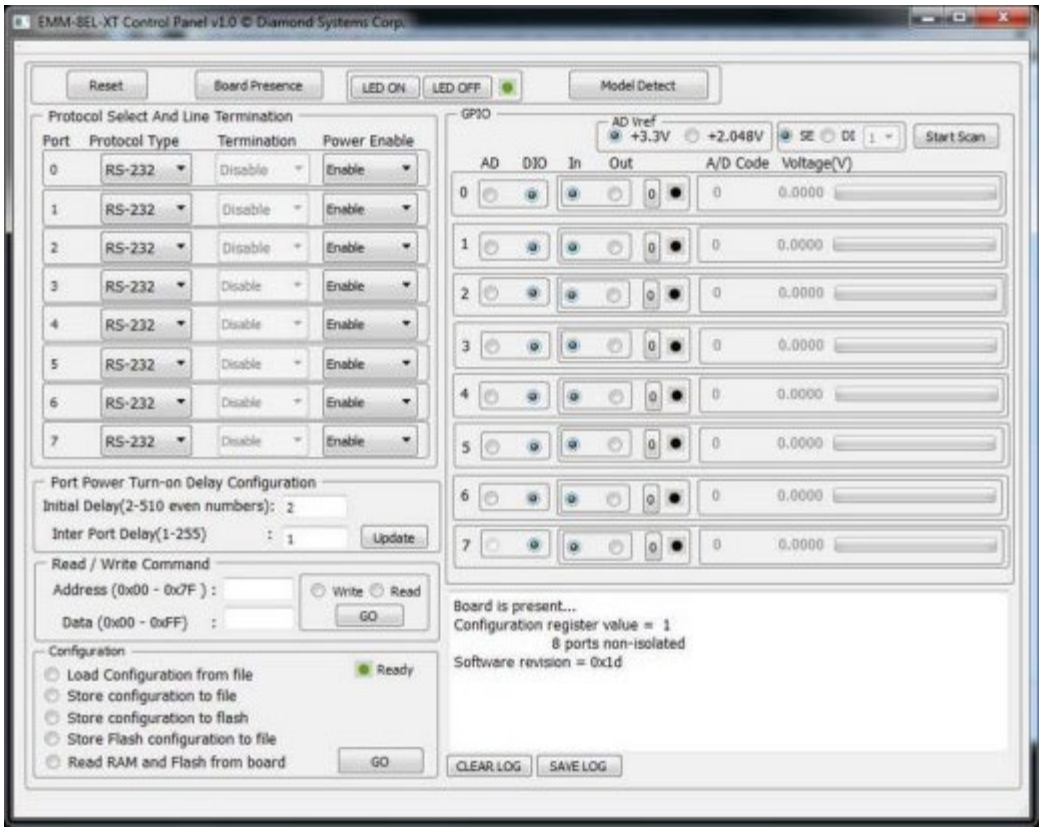
CK-EMM-4EL

CK-EMM-8EL

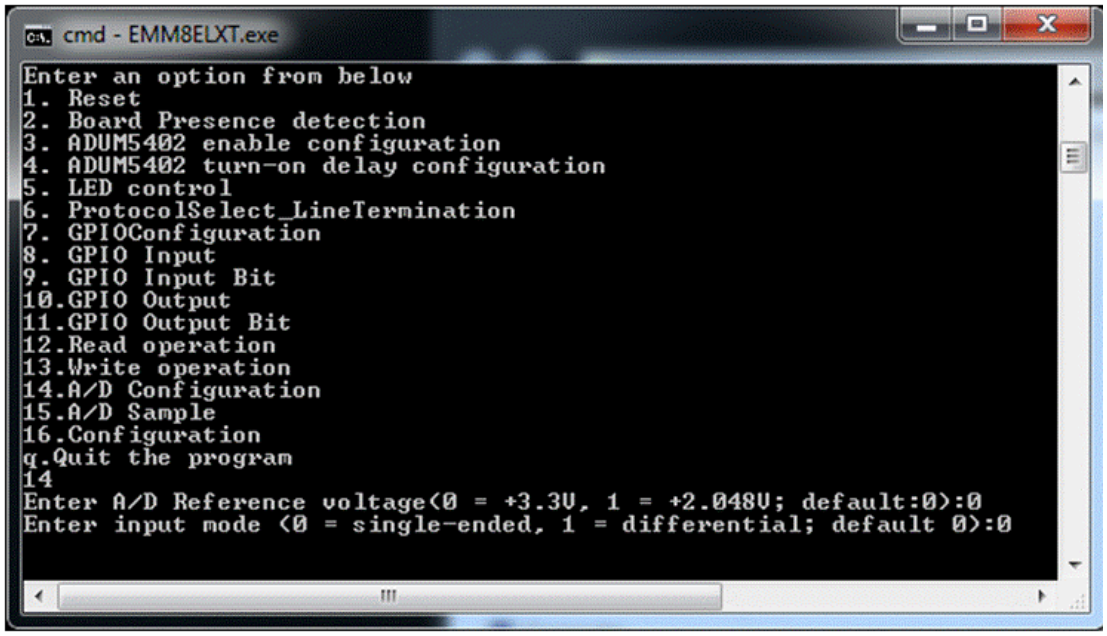
Cable kits include the following cables:

No.	Cable	Description	Drawing	CK-EMM-4EL	CK-EMM-8EL
	6981212	Serial port cable, 2x5 2mm socket to DB9 Male panel mount	Show	4	8
	6981077	GPIO cable	Show	1	1

The EMM-8E family includes an on-board microcontroller to handle all configuration and control of the board's features. The microcontroller is managed with a comprehensive software suite that makes configuring the EMM-8E 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.



GUI Control Panel



Command Line Interface Control Panel

Specifications

Serial Ports	
Number of serial ports	4 or 8
Protocols	RS-232, RS-422, RS-485 configured with software, no jumpers
Maximum baud rate	RS-232 mode: 1Mbps RS-422/485 mode: 10Mbps
UART	16550 compatible octal UART with 256-byte TX/RX FIFOs
Transceivers	SP330 multiprotocol transceivers, one per port
Communications parameters	5, 6, 7, or 8 data bits; Even, odd, or no parity
Termination	Software programmable RS-422/485 termination
Isolation	Independent 2500VRMS isolation port-by-port
ESD protection	+/-15KV on each port
Short circuit protection	Continuous, all outputs
RS-232 mode	
Input Impedance	3KΩ min
Input voltage swing	±30V maximum
Output voltage swing	±5V min, ±7V typical
RS-422/485 modes	
Differential input threshold	-0.2V min, +0.2V max
Input impedance	12KΩ minimum
Input current	+1.0mA max (Vin = 12V) -0.8mA max (Vin = -7V)
Differential output voltage	2.0V min (RL=50Ω)
High/low states differential output voltage symmetry	0.2V max

Digital / Analog I/O	
Number of lines	8 individually programmable lines: 8 as digital input or output 7 as 12-bit analog input
Analog input ranges	0-2.048V or 0-3.3V
General	
Host interface	PCIex1 using PCIe/104 OneBank connector
Inrush current	Staggered turn-on of isolated devices for reduced inrush current at power on
On-board microcontroller	On-board PIC microcontroller with flash to manage and store configurations
Connectors	Latching connectors on all ports for increased ruggedness
Dimensions	3.55" x 3.775" (90mm x 96mm) Conforms to PCIe/104 OneBank form factor supporting Type 1 and Type 2
Power supply	+5VDC ±5%
Current consumption	160mA typical, all outputs unloaded
Software drivers	Windows Embedded Standard 7, XP, 2000 and Vista Linux 2.6.16, 2.6.31 and 2.6.32
Operating temperature	-40°C to +85°C (-40°F to +185°F)
Operating humidity	5% to 95% non-condensing
Shock	MIL-STD-202G compatible
Vibration	MIL-STD202G compatible
MTBF	579,352 hours at 20°C
Weight	2.5oz (71g)
RoHS	Compliant

Models and Accessories

Emerald-MM-8E/EL		
available models:		
EMM-8EL-XT	8-port PCI/104-Express Serial Module with opto-isolation	Available
EMM-8E-XT	8-port PCI/104-Express Serial Module no opto-isolation	Available
EMM-4EL-XT	4-port PCI/104-Express Serial Module with opto-isolation	Available
EMM-4E-XT	4-port PCI/104-Express Serial Module no opto-isolation	Available

Please login or signup for an online quote request.

Cables and accessories	
available models:	
6981212	Serial port cable, 2x5 2mm socket to DB9 Male panel mount
6981077	GPIO cable

Please login or signup for an online quote request.

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