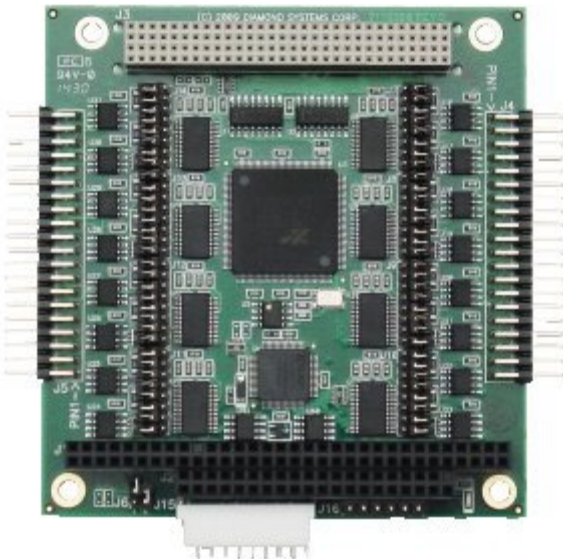


**EMERALD-  
MM-  
8PLUS PC/104-  
Plus 8-Port  
RS232/422/485  
Serial I/O Module**



**DIAMOND**  
S Y S T E M S



## FEATURES

- 8 serial ports with up to 1.8432Mbps data rates
- Exar 17D158 octal UART with 64-byte FIFOs
- Configurable for RS-232/RS-422/RS-485 protocols or TTL level operation
- Plug and Play configuration
- Supports interrupt sharing
- 8 programmable digital I/O lines
- Dual 40-pin I/O headers, 4 ports per header
- +5V only operation
- 40°C to +85°C operating temperature
- PC/104-Plus form factor

## ◆ Description

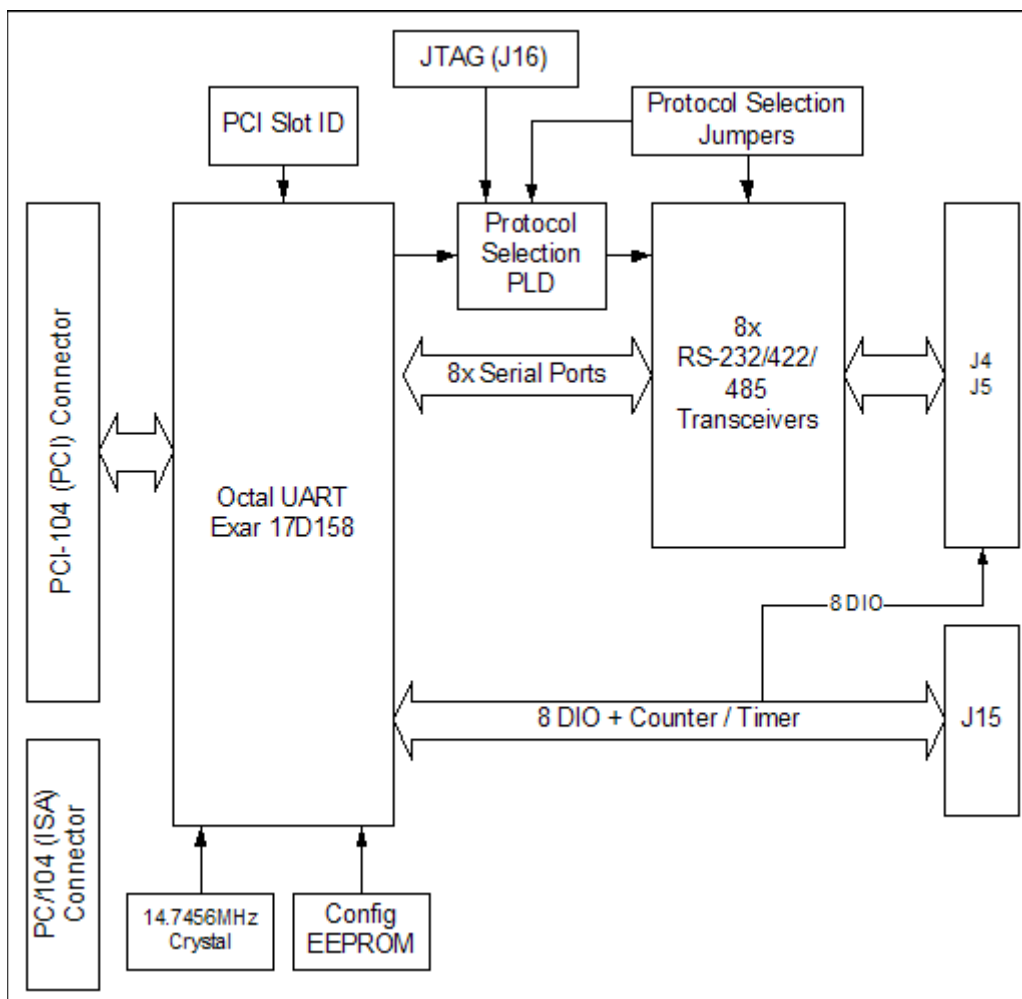
Emerald-MM-8Plus is a high performance multi-protocol serial communications board offering eight ports on a single PC/104-Plus module. Supporting baud rates up to 921.6K bps in RS-232 mode or 1.8432Mbps in RS422 or RS485 mode, each port can be individually selected for RS-232, RS-422, RS-485 or TTL level operation. Both local-echo and non-local-echo modes are supported for RS-485. Protocol selection is achieved via a jumper block for each of the eight ports. Line termination for RS-422/485 modes is also jumper-selectable.

Configuration of the Emerald-MM-8Plus is simple, using the built-in plug and play technology. For manual configuration, the base address for the board may be set in software, defining a 4K block of configuration space used to access the on-board registers. A single 32-bit read shows the detailed interrupt status for each of the eight ports. The PCI "slot" is defined through a jumper block. As with all Diamond Systems products, jumpers are paralleled with locations for zero ohm resistors to create a rugged, shock-and- vibration-resistant implementation.

Emerald-MM-8Plus is based on the Exar 17D158 octal UART IC. This device contains 8 4 identical sets of 16C55 registers, one for each port, and is compatible with the standard PC serial port. Each port contains 64-byte transmit and receive FIFOs to support the high-speed data rates.

Emerald-MM-8Plus also offers 8 convenient digital I/O lines. The direction of each line is independently programmable. Finally, Emerald-MM-8Plus also offers a 16-bit programmable counter / timer with a configurable clock source.

Two I/O headers are provided, with four serial ports and four digital I/O lines on each header. The board operates on +5V only, eliminating the need for a +12V supply that is often required for serial port operation.



### ◆ Operating Systems Compatibility

The Emerald-MM-8Plus uses the Exar (Maxlinear) XR17D158 UART which is based on the industry-standard 16C550 UART. Drivers are available for most popular embedded operating systems. Check the drivers included with your OS or the Support tab for drivers on this product page, or else visit [maxlinear.com](http://maxlinear.com).

### ◆ Cables

EMM-8Plus-XT uses 2 of Diamond's C-DB9M-4 cable for the 8 serial ports. Each cable has a 2x20 .1" pitch socket header to connect to the board's pin header and 4 DB9 Male panel-mountable connectors for user connections.

Cable	Description	Drawing
C-DB9M-4	Quad DB9 male to 40-pin header 18" cable, Serial ports 1-4 (uses 2)	<a href="#">Show</a>

## ◆ Specifications

Serial Ports	
<b>Number of serial ports</b>	8
<b>Protocols</b>	RS-232, RS-422, RS-485 (local and no echo)
<b>Protocol Configuration</b>	Jumpers
<b>Software Configuration</b>	Plug and Play
<b>Maximum baud rate</b>	1.8432Mbps
<b>Communications parameters</b>	5, 6, 7, or 8 data bits; Even, odd, or no parity
<b>Short circuit protection</b>	Continuous, all outputs
RS-232 mode	
<b>Input Impedance</b>	3K $\Omega$ min
<b>Input voltage swing</b>	$\pm$ 30V maximum
<b>Output voltage swing</b>	$\pm$ 5V min, $\pm$ 7V typical
RS-422/RS-485 modes:	
<b>Differential input threshold</b>	-0.2V min, +0.2V max
<b>Input impedance</b>	12K $\Omega$ minimum
<b>Input current</b>	+1.0mA max (Vin = 12V) -0.8mA max (Vin = -7V)
<b>Differential output voltage</b>	2.0V min (RL=50 $\Omega$ )
<b>High/low states differential output voltage symmetry</b>	0.2V max
Digital I/O	
<b>Number of I/O lines</b>	8 individually programmable
<b>Input voltage</b>	Logic 0: -0.3V min, 0.8V max Logic 1: 2.0V min, 5.3V max
<b>Output voltage</b>	0: 6mA max 1: -4mA max
General	
<b>I/O header</b>	2 40-position (2x20) .025" square pin header on .1" centers; Headers mate with standard ribbon cable (IDC) connectors
<b>Dimensions</b>	3.55" x 3.775"
<b>Power supply</b>	+5VDC $\pm$ 10%
<b>Current consumption</b>	160mA typical, all outputs unloaded
<b>Operating temperature</b>	-40°C to +85°C standard, all versions
<b>Weight</b>	3.1oz (87.9g)
<b>RoHS</b>	Compliant

## ◆ Models and Accessories

Emerald-MM-8PLUS
<b>available models:</b>
<b>EMM-8PLUS-XT</b> 8 RS-232/422/485 Serial Ports PC/104-Plus Module Available
Please <a href="#">login</a> or <a href="#">signup</a> for an online quote request.

Cables and accessories
<b>available models:</b>

**[C-DB9M-4](#)** Quad DB9 male to 40-pin header 18" cable, Serial ports 1-4 (uses **2**)

Please [login](#) or [signup](#) for an online quote request.

[www.diamondsystems.com](http://www.diamondsystems.com) | [Sunnyvale, California USA](#) | [+1-650-810-2500](tel:+16508102500) |  
[sales@diamondsystems.com](mailto:sales@diamondsystems.com)