EMERALD-MM-4M 4-Port RS-232/422/485
PC/104 Module

DIAMOND SYSTEMS

PC104
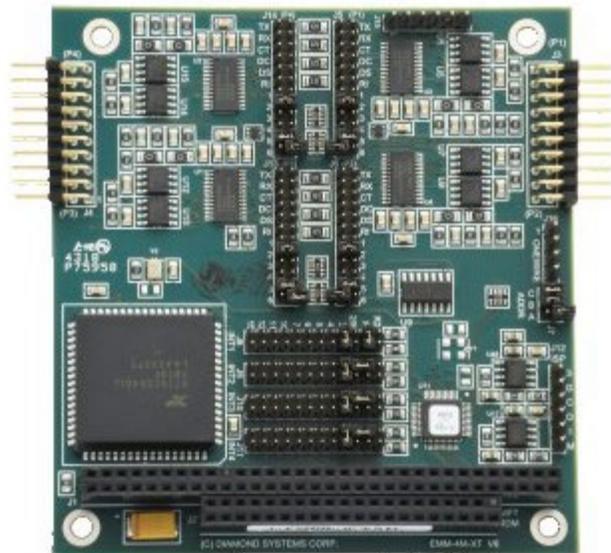
FEATURES

4 serial ports

Jumper configurable RS-232, RS-422, RS-485 on all ports

Flexible address and interrupt selection

Full interrupt sharing capability

Interrupt status register for Windows NT

Dual 20-pin I/O headers (2 ports per header)

+5V only power supply

-40°C to +85°C extended temperature operation

◆ **Description**

Our Emerald-MM PC/104 module gives you 4 serial ports operating at speeds up to 115kbps. In RS-232 mode, the full complement of standard PC serial port signals (8 signals + ground) are provided for each port and are grouped onto two 20-pin headers (2 ports per header). In RS-422 mode, Signals RX+, RX-, TX+, and TX- are provided, along with ground. In RS-485 mode, signals TX+/RX+ and TX-/RX- are provided, along with ground.

5V-only operation and -40 to +85C industrial operating temperature range are standard features. The industry-standard 16C554 UART is compatible with all popular embedded operating systems.

Flexible Configuration

Emerald-MM offers more interrupt level and I/O address options than other quad serial port modules. Therefore, integrating the board into your computer system is a simpler task. Eight different I/O address combinations and 10 different interrupt levels are available.

Interrupt Sharing

To help conserve ISA bus interrupts, any number of ports can share the same interrupt level. If you have two boards in one system, both boards can share the same interrupt level as well. An interrupt status register is provided to indicate the status of each serial port's interrupt request signal.

◆ **Block Diagram**

EMERALD-MM BLOCK DIAGRAM
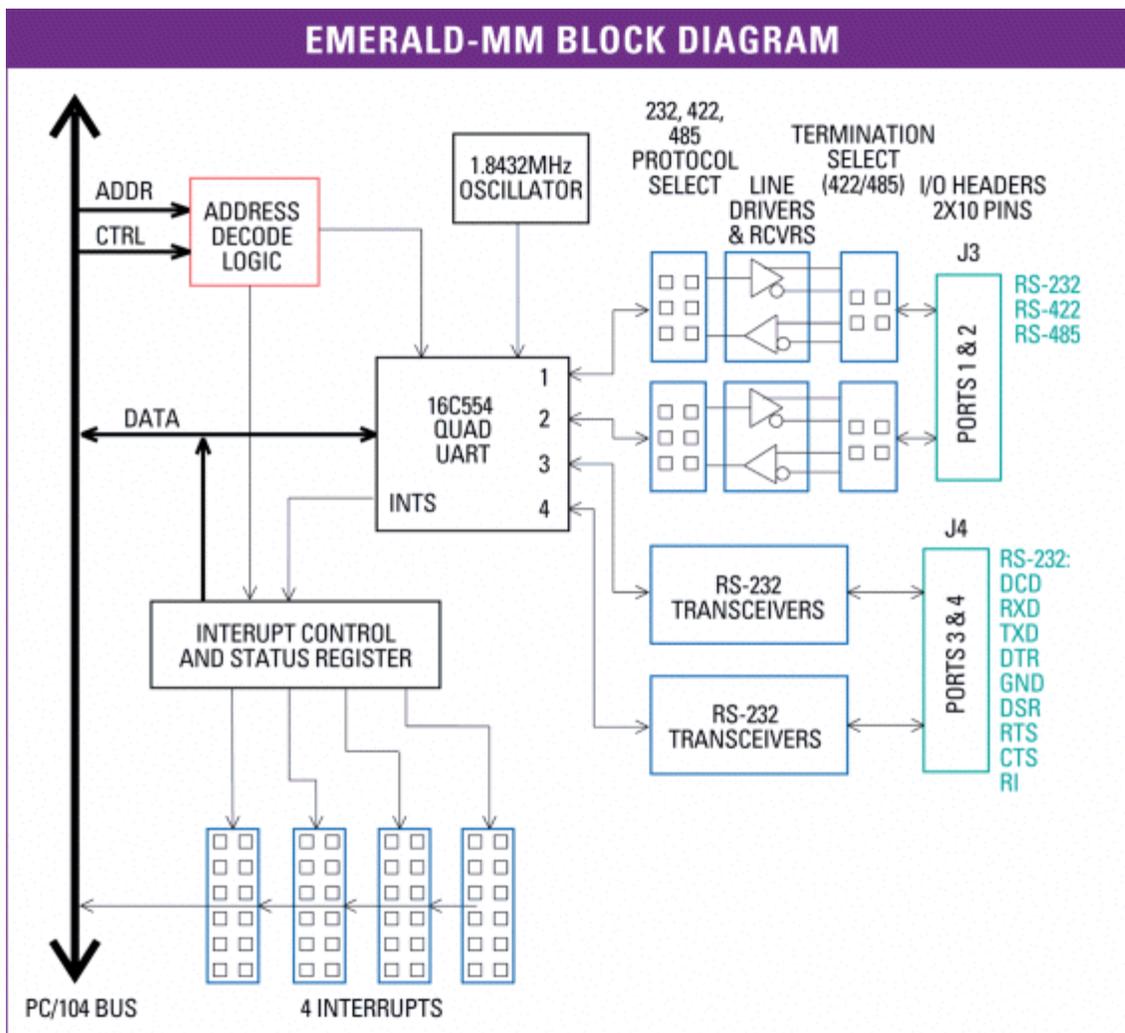
◆ **Configuration Options**

Port Address Selection (Hex)

Selection	Port 1	Port 2	Port 3	Port 4	Status Register
0	3F8	2F8	3E8	2E8	220
1	3E8	2E8	3A8	2A8	220
2	380	388	288	230	224
3	240	248	260	268	224
4	100	108	110	118	240
5	120	128	130	138	244
6	140	148	150	158	248
7	160	168	170	178	24C

Interrupt Configuration

Interrupt levels are individually selectable for each port. The available interrupt levels are 2, 3, 4, 5, 6, 7, 10, 11, 12, and 15. In addition, a 1K Ohm pulldown resistor is provided for each port.

A single interrupt level can be shared by 2, 3, or 4 ports on one board and can even be shared by more than one board in the system. To enable interrupt sharing, set two or more interrupt level jumpers to the same level and pull out all but one pulldown resistor

jumper.

◆ I/O Headers

Emerald-MM has two 20-pin I/O headers with two serial ports on each header. These headers mate with standard ribbon cable connectors. Our cable no. C-DB9M-18 provides a 20-pin IDC connector at one end to mate with the pin headers on the board, and it has two DB-9 male connectors at the other end with the standard PC serial port pinout. Each cable handles two ports; two cables provide access to all four ports on the board.

DCD 1	1	2	DSR 1
RXD 1	3	4	RTS 1
TXD 1	5	6	CTS 1
DTR 1	7	8	RI 1
GND	9	10	N/C
DCD 2	11	12	DSR 2
RXD 2	13	14	RTS 2
TXD 2	15	16	CTS 2
DTR 2	17	18	RI 2
GND	19	20	N/C

RS-422 Mode

N/C	1	2	N/C
TXD+ 1	3	4	TXD- 1
GND	5	6	RXD- 1
RXD+ 1	7	8	N/C
GND	9	10	N/C
N/C	11	12	N/C
TXD+ 2	13	14	TXD- 2
GND	15	16	RXD- 2
RXD+ 2	17	18	N/C
GND	19	20	N/C

RS-485 Mode

N/C	1	2	N/C
TX/RX+ 1	3	4	TX/RX- 1
GND	5	6	N/C
N/C	7	8	N/C
GND	9	10	N/C
N/C	11	12	N/C
TX/RX + 2	13	14	TX/RX- 2
GND	15	16	N/C
N/C	17	18	N/C
GND	19	20	N/C

◆ Specifications

Serial Ports

Number of ports	4
Protocols supported	RS-232, RS-422, RS-485
Protocol selection	Individual jumper selection for each port
Maximum baud rate	230.4kbps
Communication parameters	5, 6, 7, or 8 data bits; Even, odd, or no parity
Short circuit protection	All outputs protected against continuous short circuit

RS-232 Protocol

Input impedance	3KΩ minimum
Input voltage swing	±30V maximum
Output voltage swing	±5V min, ±7V typical

RS-422, RS-485 Protocols

Differential	-0.2V min, +0.2V max input threshold
Input impedance	12KΩ minimum
Input current	+1.0µA max (Vin = 12V), -0.8µA max (VIN = -7V)
Differential output voltage	2.0V min (RL=50Ω)
High/low states differential output voltage symmetry	0.2V maximum

General

I/O Headers	2 20-position (2x10) .1" pitch right-angle pin headers
Dimensions	3.55" x 3.775" / 90x96mm (not including I/O connector pins)
Power supply	+5VDC ±10%
Current consumption	80mA typical, all outputs unloaded
PC/104 bus	8-bit and 16-bit bus headers are installed; 8-bit databus width
Weight	2.6oz/74g
MTBF	555,000 hrs
RoHS	Compliant

◆ **Ordering Information**

◆ **Models and Accessories**

Emerald-MM-4M
available models:
EMM-4M-XT   Emerald-MM 4-ch RS-232/422/485, Extended Temperature   Available

Please login or signup for an online quote request.