EMERALD-MM-8

8 PORTS, RS-232/422/485 PROTOCOLS, 8 DIGITAL I/O

SPECIFICATIONS

SERIAL PORTS	
No. of serial ports	8
Protocols	RS-232, RS-422, RS-485 (jumper selected)
Maximum baud rate	460.8kbps
Communications parameters	5, 6, 7, or 8 data bits; Even, odd, or no parity
Short circuit protection	Continuous, all outputs
RS-232 MODE:	
Input impedance	3KΩ minimum
Input voltage swing	± 30V maximum
Output voltage swing	± 5V min, ±7V typical
RS-422, RS-485 MODES:	
Differential threshold	-0.2V min, +0.2V max input
Input impedance	12KΩ minimum
Input current	+1.0µA max (VIN = 12V) -0.8µA max (VIN = -7V)
Differential output voltage	2.0V min (R_L = 50Ω)
High/low states differential output voltage symmetry	0.2V maximum
DIGITAL I/O	
No. / Direction	8, individually programmable
Input voltage	Logic 0: -0.3V min, 0.8V max Logic 1: 2.0V min, 5.3V max
Output voltage	Logic 0: 0.0V min, 0.4V max Logic 1: 3.7V min, 5.0V max
Output current	0: 6mA max; 1: -4mA max
GENERAL	
I/O headers	Dual 40-pin headers, 4 ports per
Dimensions	3.55" x 3.775"
Power supply	+5VDC ±10% @ 80mA typical
Operating temp.	-40 to +85°C Extended
Weight	2.6oz / 74g

Emerald-MM-8 has 8 serial ports using two 16C654 UART chips. The 64-byte FIFOs on these UARTS support a higher baud rate of 460.8kbps. The board also features programmable I/O addresses and interrupt levels for maximum flexibility. Configuration data is stored in an on-board EEPROM and is reloaded automatically on power-up.

Emerald-MM-8 is available in a multi-protocol RS-232/422/485 model (EMM-8M-XT) as well as a low-cost fixed RS-232 model (EMM-4232-XT). On EMM-8M-XT, each port's protocol may be selected independently with jumpers.

In RS-232 mode, each port has the full set of 8 signals plus ground. Termination resistors of 120Ω are provided for RS-422/485 protocols and are jumper-selectable.

Interrupt levels may be shared among any or all serial ports and are supported with an on-board status register. 8 digital I/O lines are also included, with independently programmable direction for each line.

The board has two 40-pin I/O headers, with 4 serial ports and 4 DIO lines on each header. Use mating cable C-DB9M-4 (qty. 2). Emerald-MM-8 requires only +5V supply and operates over the industrial temperature range of -40 to +85°C.

ORDERING GUIDE

EMM-8M-XT 8 ports configurable RS-232/422/485
EMM-8232-XT 8 ports fixed RS-232

For cables and accessories, see pages 46-47.

- Industry-standard design compatible with any popular operating system
- 8 asynchronous serial ports
- Dual 16C654 UARTs with 64-byte FIFOs
- 460.8K max baud rate
- RS-232, RS-422, and RS-485 on one board
- Low-cost RS-232-only version available
- Jumper-selected protocols, independent for each port
- Programmable addresses and interrupts
- 8 programmable digital I/O lines
- Built-in interrupt sharing
- +5V-only supply
- -40 to +85°C operation

INPUT/OUTPUT HEADERS (2 PER BOARD)

RS-232 Configuration

	DCD 1	1	2	DSR 1		
	RXD 1	3	4	RTS 1		
PORT 1	TXD 1	5	6	CTS 1		
	DTR 1	7	8	RI 1		
	GND	9	10	DIO A		
	DCD 2	11	12	DSR 2		
	RXD 2	13	14	RTS 2		
PORT 2	TXD 2	15	16	CTS 2		
	DTR 2	17	18	RI 2		
	GND	19	20	DIO B		
	DCD 3	21	22	DSR 3		
	RXD 3	23	24	RTS 3		
PORT 3	TXD 3	25	26	CTS 3		
	DTR 3	27	28	RI 3		
	GND	29	30	DIO C		
	DCD 4	31	32	DSR 4		
	RXD 4	33	34	RTS 4		
PORT 4	TXD 4	35	36	CTS 4		
	DTR 4	37	38	RI 4		
	GND	39	40	DIO D		

RS-422 Configuration

	NC	1	2	NC		
	TXD+1	3	4	TXD-1		
PORT 1	GND	5	6	GND		
	RXD+1	7	8	RXD-1		
	GND	9	10	DIO A		
	NC	11	12	NC		
	TXD+2	13	14	TXD-2		
PORT 2	GND	15	16	GND		
	RXD+2	17	18	RXD-2		
	GND	19	20	DIO B		
	NC	21	22	NC		
	TXD+3	23	24	TXD-3		
PORT 3	GND	25	26	GND		
	RXD+3	27	28	RXD-3		
	GND	29	30	DIO C		
	NC	31	32	NC		
	TXD+4	33	34	TXD-4		
PORT 4	GND	35	36	GND		
	RXD+4	37	38	RXD-4		
	GND	39	40	DIO D		

RS-485 Configuration

	NC	1	2	NC		
	TXD/RXD+1	3	4	TXD/RXD-1		
PORT 1	GND	5	6	NC		
	NC	7	8	NC		
	GND	9	10	DIO A		
	NC	11	12	NC		
	TXD/RXD+2	13	14	TXD/RXD-2		
PORT 2	GND	15	16	NC		
	NC	17	18	NC		
	GND	19	20	DIO B		
	NC	21	22	NC		
	TXD/RXD+3	23	24	TXD/RXD-3		
PORT 3	GND	25	26	NC		
	NC	27	28	NC		
	GND	29	30	DIO C		
	NC	31	32	NC		
	TXD/RXD+4	33	34	TXD/RXD-4		
PORT 4	GND	35	36	NC		
	NC	37	38	NC		
	GND	39	40	DIO D		

All ports shown in same protocol for simplicity. Each port may be independently configured.

EMERALD-MM-8 BLOCK DIAGRAM