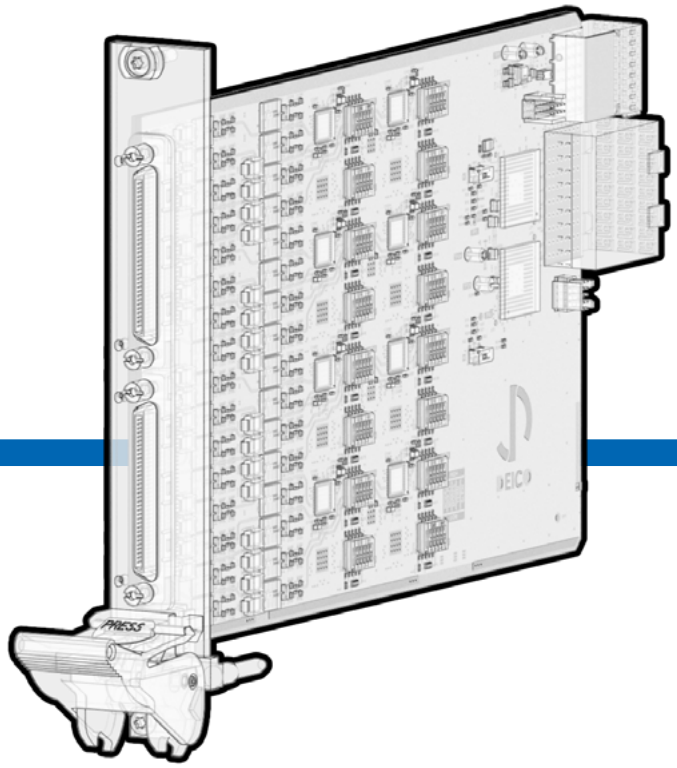
Datasheet



DE140500

PXIe Serial Communication Module 16 CH

RS-232/RS-422/RS-485

DEICO

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Contents

1. Description

DE140500 PXIe RS-232/RS-422/RS-485 Serial Communication Module 16 CH is a PCI eXtension for Instrumentation (PXIe) compatible module offering 16 channels of high-performance RS-232/RS-422/RS-485 programmable asynchronous serial interface.

The serial channels can be individually programmed to operate as RS-232, RS-422 or RS-485 full duplex/half duplex interface. In addition, programmable termination is provided for the RS-422/RS-485 interfaces. After power-up all serial I/O lines are in a high impedance state.

- Each RS-232 channel supports RxD, TxD, RTS, CTS, and GND.
- A four-wire interface (RX+, RX-, TX+, TX-) and ground (GND) are supported in RS-422 and RS-485 full-duplex modes.
- RS-485 half-duplex supports a two-wire interface (DX+, DX-) plus ground (GND).

Each channel has 256-byte transmit and receive FIFOs to significantly reduce the overhead required to provide data to and get data from the transmitters and receivers. The FIFO trigger levels are programmable and the baud rate is individually programmable up to 1 Mb/s for RS-232 channels and 20 Mb/s for RS-422/RS-485 channels with selectable 250 kb/s slew limiting. The UART offers readable FIFO levels.

The design is ideal for point-to-multi-point (broadcast) systems, enabling a single master device to reliably stream continuous data or commands to multiple listening slave devices (RS422 mode).

All serial channels use ESD and surge protected transceivers. ESD protection is up to ±30 kV.

1.1. Key Features

- New high performance serial communication
  - RS-232 mode up to 1 Mb/s
  - RS-422/RS-485 modes up to 20 Mb/s
  - PCIe interface UART with 256-byte FIFOs
  - Independent serial 16 ports
  - RS-422/RS-485 termination programmable
- Individually configurable RS-232/RS-422/RS-485 ports, selectable via software or hardware
- Dedicated RS-422 full-duplex operation
- ±30 kV ESD and Level 4 surge protection on all serial ports

DE140500 is compatible with IEC 60068-2-1 / IEC 60068-2-2 / IEC 60068-2-78 / IEC 60068-2-27 / IEC 60068-2-64 / EN 61326 (IEC 61326) / EN 55011 (CISPR 11) / AS/NZS CISPR 11 / FCC 47 CFR Part 15B / ICES-001 standards.

Areas of Application

- Next generation point-of-sale systems
- Factory automation and process control
- Multi-port RS-232/RS-422/RS-485 cards
- High performance serial communication

2. Hardware Overview

2.1. Circuitry

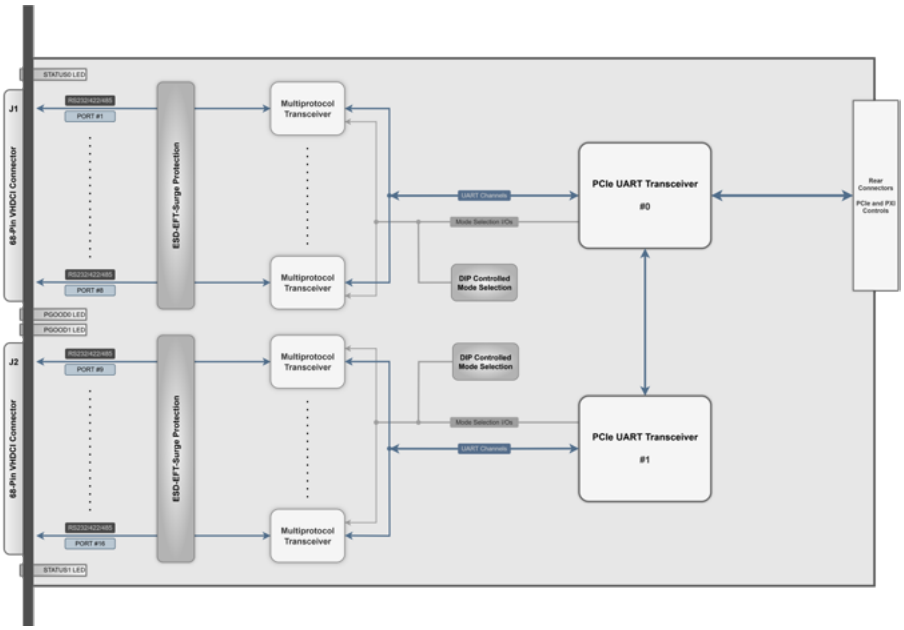

Figure 1: Block Diagram of DE140500

2.2. Hardware Specifications

2.2.1. Electrical Specifications

Table 1: Electrical Specifications

Specification	Description
Number of Ports	16
Serial Interface	RS-232/RS-422/RS-485 serial ports with programmable protocol
Data Rate	RS-232 mode up to 1 Mb/s RS-422/RS-485 Modes up to 20 Mb/s
Baud Rate	Software programmable
RS-232 Output	±10.0 V no load
RS-485/RS-422 Enhanced Failsafe	Yes
Tx/Rx FIFO (Bytes)	256/256
Data Bus Interface	PCIe 2.0 (2.5 Gb/s)
Power Down Mode	Yes
Power Consumption	0.6 A @3.3 V or 2 W
Status Indication	Status LEDs for system development/debugging
Protection	±30 kV ESD, IEC61000-4-5, Level 4, 4 kV 1.2/50 µs surge protection

2.2.2. Physical Specifications

Table 2: Physical Specifications

Specification	Description
Dimensions (L/W)	200 mm x 130.5 mm (3U rack height)
Height (H)	4 HP (20.32 mm)
Front Panel Connectors (x2)	68-pin VHDCI connector

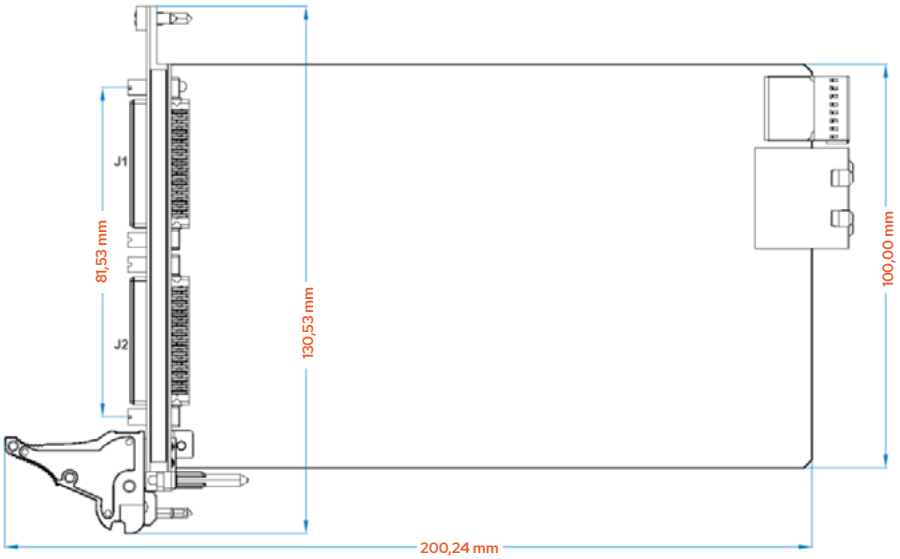

Figure 2: Module Dimensions

2.2.3. Environmental Specifications

Table 3: Environmental Specifications

Specification	Condition	Value
Operating Humidity	Relative, non-condensing	10% - 90%
Storage Humidity	Relative, non-condensing	5% - 95%
Operating Temperature	Forced-air cooling from chassis	0°C - +40°C
Storage Temperature	-	-40°C - +85°C

3. Software Overview

This module is compatible with IVISwtch class.

4. Signal Connections

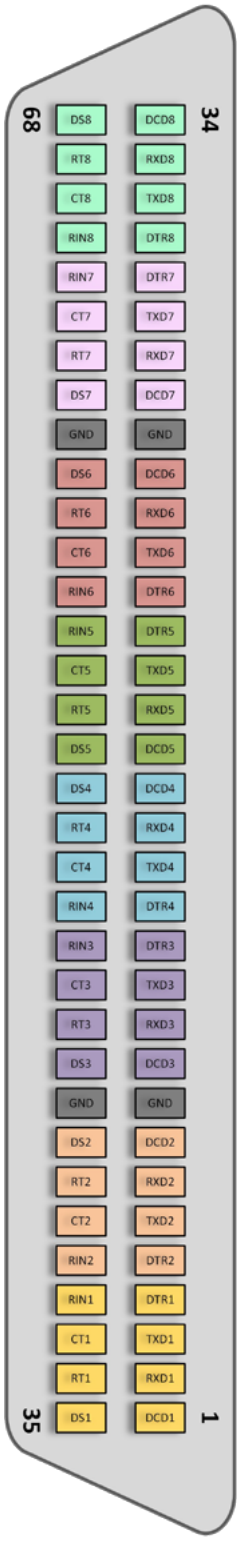

Figure 3: DB68 Pinout Diagram

Table 4: DB68 J1 Connectour Pin-out

68-Pin Connector Port								RS-485	RS-232
Port1	Port2	Port3	Port4	Port5	Port6	Port7	Port8		
1	8	10	17	18	25	27	34	TX-	DCD
2	7	11	16	19	24	28	33	TX+	RXD
3	6	12	15	20	23	29	32	RX+	TXD
4	5	13	14	21	22	30	31	RX-	DTR
			9, 26, 43, 60					GND	GND
35	42	44	51	52	59	61	68	NC	DSR
36	41	45	50	53	58	62	67	NC	RTS
37	40	46	49	54	57	63	66	NC	CTS
38	39	47	48	55	56	64	65	NC	RI

Table 5: DB68 J2 Connector Pin-out

68-Pin Connector Port								RS-485	RS-232
Port9	Port10	Port11	Port12	Port13	Port14	Port15	Port16		
1	8	10	17	18	25	27	34	TX-	DCD
2	7	11	16	19	24	28	33	TX+	RXD
3	6	12	15	20	23	29	32	RX+	TXD
4	5	13	14	21	22	30	31	RX-	DTR
			9, 26, 43, 60					GND	GND
35	42	44	51	52	59	61	68	NC	DSR
36	41	45	50	53	58	62	67	NC	RTS
37	40	46	49	54	57	63	66	NC	CTS
38	39	47	48	55	56	64	65	NC	RI

Table 6: DB9 Connector Pin-out

Pin Number	RS-485 Half Duplex	RS-485 / RS-422 Full Duplex	RS-232
1	Data- (TX- / RX-)	TX-	DCD
2	Data+ (TX+ / RX+)	TX+	RXD
3	NC	RX+	TXD
4	NC	RX-	DTR
5	GND	GND	GND
6	NC	NC	DSR
7	NC	NC	RTS
8	NC	NC	CTS
9	NC	NC	RI

5. Safety Guidelines

Caution

The DE140500 shall not be operated in any manner not specified in this document. Misuse of the product may result in a hazard. Safety protection features may be compromised if the product is damaged. In the event of damage, the product shall be returned for repair.

6. Compatibility Guidelines

This product has been tested and found to comply with the applicable regulatory requirements and limits for electromagnetic compatibility (EMC). These requirements and limits are intended to provide reasonable protection against harmful interference when the product is operated within the specified electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in certain installations if the product is connected to peripheral devices or test objects, or if it is used in residential or commercial areas. To minimize interference with radio and television reception and to prevent unacceptable performance degradation, the product shall be installed and operated in strict accordance with the instructions specified in the product documentation.

Any changes or modifications to the product not expressly approved by DEICO may void the user's authority to operate the equipment under local regulatory rules.

Caution

To ensure the specified EMC performance, the product shall be operated only with shielded cables and accessories.

Caution

To ensure the specified EMC performance, the length of any cable attached to the front connectors shall not exceed 3 m (10 ft.).