DA Series Expansion Modules

Expansion modules with time-synchronization ports, RS-232/422/485 and RS-232/485 serial ports, 10/100 Mbps LAN and unmanaged switch ports, 100 Mbps fiber LAN ports, and PCI development kit

> IRIG-B time-synchronization module
> Universal PCI expansion module
> 4-port 10/100 Mbps LAN module
> 4-port 100 Mbps Fiber LAN module
> 8-port 10/100 Mbps unmanaged switch module
> 8-port RS-422/485 serial module with terminal block connectors
> 8-port RS-232/422/485 software-selectable serial modules with isolation protection
> Fully compatible with Moxa embedded computers that have peripheral expansion slots

RoHS   CE   FC

Overview

Moxa's peripheral expansion modules, which come with serial ports, LAN ports, switch ports, fiber ports, time-synchronization IRIG-B ports, and PCI slots, give end-users the greatest flexibility for setting up industrial applications and are fully compatible with Moxa's embedded computers that have perpheral expansion slots.

The serial port modules include an 8-port RS-232/422/485 module with either DB9 or terminal block connectors, and an 8-port RS-422/485 module with terminal block connectors. Some modules are even designed with 2 kV digital isolation, making them fully suitable for the great demands of industrial applications that use serial communication.
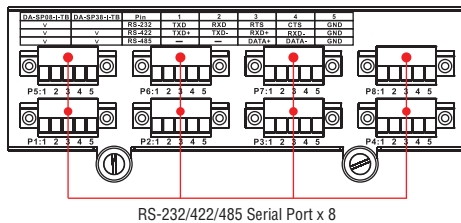
In addition, a 4-port LAN module, 8-port switch module, and 4-port fiber LAN module are available for setting up industrial communication applications with Ethernet-based devices. A universal PCI development kit is also available for PCI-based devices for expanding industrial applications at a reasonable cost.

The time-synchronization module features 3 digital inputs and 4 digital outputs and provides precision timing information using IRIG-B input signals. The module is designed for embedded computers that support the PCI/104 interface.
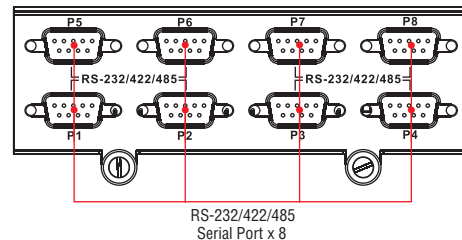
All modules are designed to offer the greatest flexibility for setting up applications and performing industrial tasks. In particular, users can swap out modules quickly and easily.

Appearance
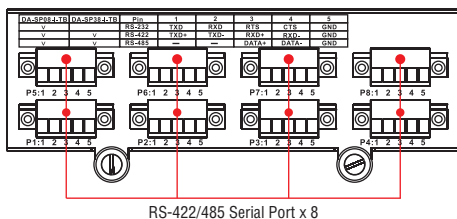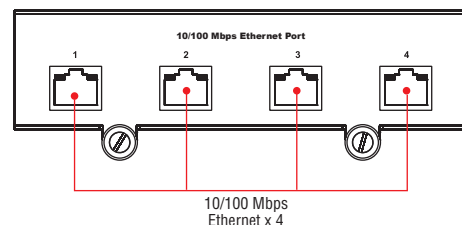
DA-SP08-I-TB/DA-SP08-I-EMC4-TB

RS-232/422/485 Serial Port x 8

DA-SP08-DB/DA-SP08-I-DB/DA-SP08-I-EMC4-DB

RS-232/422/485 Serial Port x 8

DA-SP38-I-TB

RS-422/485 Serial Port x 8

DA-LN04-RJ

10/100 Mbps Ethernet x 4

DA-SW08-RJ

10/100 Mbps Ethernet Switch

1 2 3 4 5 6 7 8

10/100 Mbps Switch Port x 8

DA-UPCI-DK

Universal PCI Expansion Slot

DA-FX04-MM-ST-T

⚠ WARNING
HOT SURFACE DO NOT TOUCH!
Before touching it, special attention or protection is necessary.

100 Mbps Fiber Port

LAN1   LAN2   LAN3   LAN4
TX   RX   TX   RX   TX   RX   TX   RX

Fiber LAN Port x 4

DA-IRIGB-4DIO-PCI104-EMC4

IRIG-B   DI/DO
                Channels

PCI-104 Connector
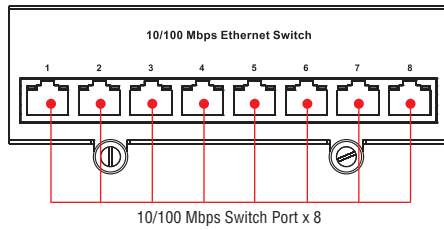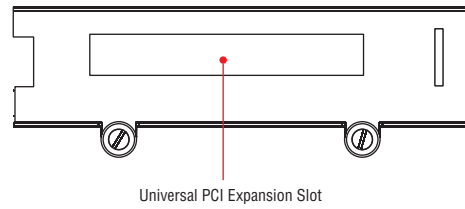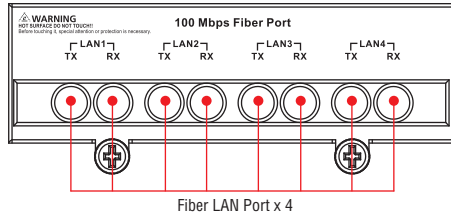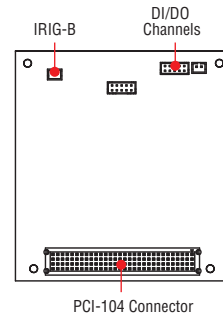
: DA-IRIGB-4DIO-PCI104-EMC4 Hardware Specifications

Hardware
Communication Controller: FPGA Cyclone V
Form Factor: PCI/104

Time Code Input
IRIG-B: Based on the IRIG STANDARD 200-04 and IEEE 1344

Precision and Accuracy
Accuracy (Time Synchronization): ±1 µs
Accuracy (Free Running): ±500 ms @ 24 hr

Input Signals
Single Level:
• Open: High
• Short to GND:> Low
• Level Input: 5 to 12 V
Differential Level:
• D+ - D- > 0.2 V, RXD is High
• D+ - D- < -0.2 V, RXD is Low
• Level Input: 5 V

Interface
IRIG-B: 2-pin wafer to DB9
DI/DO: 10-pin wafter to DB9

Protection
ESD Protection: 8 kV contact, 15 kV Air ESD protection
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 µs waveform
Insulation: 500 V

Digital Input
Input Channels: 3, source type
Input Voltage: 0 to 30 VDC
Digital Input Levels for Dry Contacts:
• Logic level 0: Close to GND
• Logic level 1: Open
Digital Input Levels for Wet Contacts:
• Logic level 0: +3 V max.
• Logic level 1: +10 V to +30 V (source to DI)
Isolation: 3 kV optical isolation
Connector Type: DB9 male

Digital Output
Output Channels: 4, sink type
Output Current: Max. 200 mA per channel
On-state Voltage: 24 VDC nominal, open collector to 30 V
Isolation: 3 kV optical isolation
Connector Type: Male

Operating Systems
Windows: Windows 7E
Linux: Debian 7

Physical Characteristics
Dimensions: 90 x 96 mm (3.54 x 3.78 in)

Environmental Limits
Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: Up to 2000 m

Standards and Certifications
EMC: CE, FCC
EMI: EN 55032, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS:
IEC 61000-4-2 ESD: Contact 8 kV; Air 15 kV
IEC 61000-4-3 RS: 10 V/m (80 MHz to 1 GHz)
IEC 61000-4-4 EFT: Signal 4 kV
IEC 61000-4-5 Surge: Signal 4 kV
IEC 61000-4-6 CS: 10 V
IEC 61000-4-8
Green Product: RoHS, CRoHS, WEEE

MOXA®

DA-SP08-DB, DA-SP08-I-DB, DA-SP08-I-TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 15 kV for all signals
Isolation: 2 kV digital isolation (DA-SP08-I-DB and DA-SP08-I-TB only)

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 290 g (0.64 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)
MTBF (mean time between failures): 1,753,143 hrs

DA-SP08-I-EMC4-DB/TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-232/422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 8 kV contact, 15 kV air
Surge Protection: 2 kV line-to-line and 4 kV line-to-ground surge protection, 8/20 μs waveform
Insulation: 500 V
Isolation: 2 kV digital isolation
Pull low/high: 1k/150k, jumper selectable
Termination Resistor: 120 ohms, jumper selectable

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark

Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-232: TxD, RxD, RTS, CTS, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 500 g (1.11 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)
MTBF (mean time between failures): 1,753,143 hrs

DA-SP38-I-TB Hardware Specifications

Serial Interface
Serial Standards: 8 RS-422/485 ports, software selectable (DB9 male or terminal block connector)
ESD Protection: 15 kV for all signals
Isolation: 2 kV digital isolation

Serial Communication Parameters
Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC® (automatic data direction control) for RS-485

Baudrate: 50 bps to 921.6 kbps (supports non-standard baudrates; see user's manual for details)

Serial Signals
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Physical Characteristics
Weight: 245 g (0.54 lb)
Dimensions: 130 x 150 x 42 mm (5.12 x 5.91 x 1.65 in)

DA-LN04-RJ Hardware Specifications

Ethernet Interface
LAN: 4 auto-sensing 10/100 Mbps ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Physical Characteristics
Weight: 198 g (0.44 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

DA-SW08-RJ Hardware Specifications

Ethernet Interface
LAN: 8 auto-sensing 10/100 Mbps unmanaged Ethernet switch ports (RJ45)
Magnetic Isolation Protection: 1.5 kV built-in

Physical Characteristics
Weight: 200 g (0.44 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

DA-UPCI-DK Hardware Specifications

Universal PCI Expansion Adatper
PCI Slots: 1
Interface Bus: 32-bit Universal PCI (3.3 V and 5 V)

Physical Characteristics
Weight: 195 g (0.43)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)
MTBF (mean time between failures): 11,053,266 hrs

DA-FX04-MM-ST-T Hardware Specifications

Fiber Interface
Number of Ports: 4 (100BaseFX)
Fiber Mode: Multi-mode
Connector Type: ST
Optical Wavelength: 0 to 2 km, 1310 nm (62.5/125 μm, 500 MHz*km)
Min-TX Output: -20 dBm
Max-TX Output: -14 dBm
RX Sensitivity: -34 dBm

Physical Characteristics
Weight: 495 g (1.10 lb)
Dimensions: 132 x 150 x 42 mm (5.20 x 5.91 x 1.65 in)

Environmental Limits
Operating Temperature: -40 to 70°C (-40 to 158°F)

Standards and Certifications
EMC: EMC Level 4, ESD Level 4, criteria A

Software Functions
IEEE 1588 or IP Teaming Selectable (Default =IP Teaming): Supports 4 modes
AFT: Adapter Failover Teaming
SFT: Switch Fault Tolerance
ALB: Adapter Failover and Load Balancing
Link Aggregation: supported

Compatibility Chart for Peripheral Expansion Modules and Embedded Computers

All expansion modules can be used on any of Moxa's embedded computers that come with the peripheral expansion slots. Refer to the following chart.

Module Models	DA-682A	DA-710	DA-683	DA-681A
DA-SP08-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP38-I-TB 8-port Serial Module (RS-422/485)	✓	✓	✓	–
DA-LN04-RJ 4-port LAN Module (10/100 Mbps)	✓	✓	✓	–
DA-SW08-RJ 8-port Switch Module (10/100 Mbps)	✓	✓	✓	–
DA-UPCI-DK PCI Module	✓	✓	✓	–
DA-FX04-MM-ST-T 4-port Fiber LAN Module (100 Mbps)	✓	✓	✓	–
DA-SP08-I-EMC4-DB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-SP08-I-EMC4-TB 8-port Serial Module (RS-232/422/485)	✓	✓	✓	–
DA-IRIGB-4DIO-PCI104-EMC4 Time Synchronization Module	✓	✓	✓	✓

Ordering Information

Available Models
DA-IRIGB-4DIO-PCI104-EMC4: 1 IRIG-B signal input port, 3 digital inputs, 4 digital outputs
DA-SP08-I-DB: 8-port RS-232/422/485 serial module with DB9 connector and digital isolation
DA-SP08-DB: 8-port RS-232/422/485 serial module with DB9 connector
DA-SP08-I-TB: 8-port RS-232/422/485 serial module with terminal block connector and digital isolation
DA-SP38-I-TB: 8-port RS-422/485 serial module with terminal block connector and digital isolation
DA-SW08-RJ: 8-port 10/100 Mbps unmanaged switch module
DA-LN04-RJ: 4-port 10/100 Mbps LAN module
DA-UPCI-DK: Universal PCI development kit
DA-FX04-MM-ST-T: 4-port (100BaseFX) fiber LAN module with multi-mode, ST connector, supports IP Teaming
DA-SP08-I-EMC4-DB: 8-port RS-232/422/485 serial module with DB9 connector, digital isolation, and capable of withstanding EMS Level 4 environments
DA-SP08-I-EMC4-TB: 8-port RS-232/422/485 serial module with terminal block connector, digital isolation, and capable of withstanding EMS Level 4 environments

Model Name	Serial Ports		Isolation	Switch	LAN		Connector Type				PCI
	RS-232/422/485	RS-232/485	2 kV Digital	10/100 Mbps	10/100 Mbps (RJ45)	Fiber 100 Mbps (ST)	DB9	RJ45	Terminal Block	ST	3.3/5 V
DA-SP08-I-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-DB	8	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-TB	8	–	✓	–	–	–	–	–	✓	–	–
DA-SP38-I-TB	–	8	✓	–	–	–	–	–	✓	–	–
DA-SW08-RJ	–	–	–	8	–	–	–	✓	–	–	–
DA-LN04-RJ	–	–	–	–	4	–	–	✓	–	–	–
DA-UPCI-DK	–	–	–	–	–	–	–	–	–	–	✓
DA-FX04-MM-ST-T	–	–	–	–	–	✓	–	–	–	✓	–
DA-IRIGB-4DIO-PCI104-EMC4	–	–	–	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-DB	8	–	✓	–	–	–	✓	–	–	–	–
DA-SP08-I-EMC4-TB	8	–	✓	–	–	–	–	–	✓	–	–