

# 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



## 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 peripheral 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.

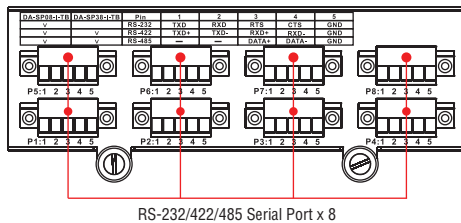
In addition, a 4-port LAN module, 8-port switch module, and 4-port fiber LAN module are available for setting up industrial communication applications with Ethernet-based devices. A universal PCI development kit is also available for PCI-based devices for expanding industrial applications at a reasonable 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.

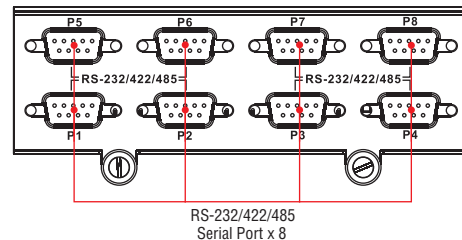
All modules are designed to offer the greatest flexibility for setting up applications and performing industrial tasks. In particular, users can swap out modules quickly and easily.

## Appearance

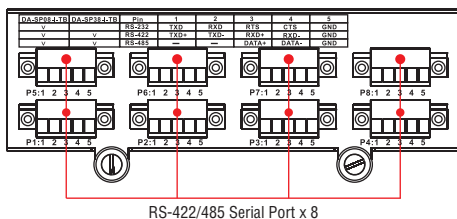
### DA-SP08-I-TB/DA-SP08-I-EMC4-TB



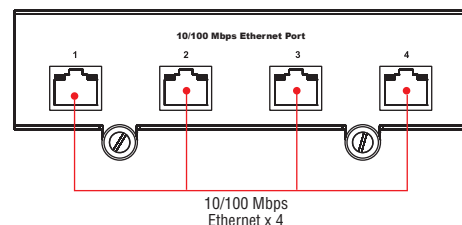
### DA-SP08-DB/DA-SP08-I-DB/DA-SP08-I-EMC4-DB



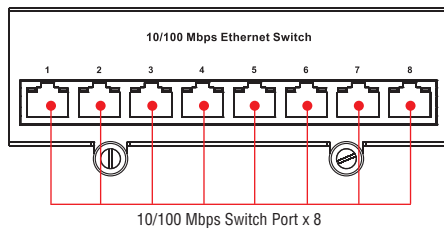
### DA-SP38-I-TB



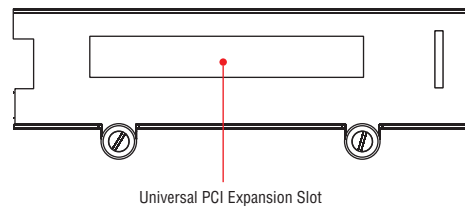
### DA-LN04-RJ



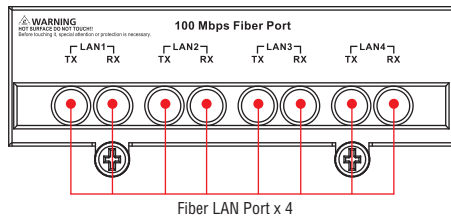
### DA-SW08-RJ



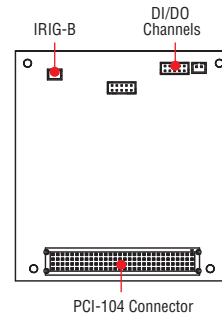
### DA-UPCI-DK



### DA-FX04-MM-ST-T



### DA-IRIGB-4DIO-PCI104-EMC4



## 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 wafer 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

## 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  $\mu$ s 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 Adapter

**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	–	✓	–	–	–	–	–	✓	–	–