CSM-200 Series

Hardware Installation Guide

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Overview

Introduction

The CSM-200 series is an Ethernet to optical fiber media converter and is part of the NRack System. It provides Ethernet media conversion from 10/100 BaseT(X) to 100 BaseFX (SC or ST connectors), and can be installed in every chassis of the NRack System.

The CSM-200 Series includes the following models:

- **CSM-200-1213:** 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode ST connector.
- **CSM-200-1214:** 10/100BaseT(X) to 100BaseFX slide-in module media converter, multi-mode SC connector.
- **CSM-200-1218:** 10/100BaseT(X) to 100BaseFX slide-in module media converter, single-mode SC connector.

Installation

The CSM-200 media converter slide-in module can be hot-swapped, which means the chassis doesn't need to be powered off or removed during installation. Align the slide-in module with the chassis installation slot so that the panel fastener screw is at the top of the module, and carefully slide the slide-in module into the slot while aligning the module's circuit board with the installation guide.

Ensure that the slide-in module is firmly seated inside the chassis. Push in and rotate the attached panel fastener screw clockwise to secure the module to the chassis.

Why Convert Ethernet to Fiber?

Fiber communication not only extends the communication distance, but also provides many advantageous features.

- **IMMUNITY FROM ELECTRICAL INTERFERENCE:**
  Fiber is not affected by electromagnetic interference or radio frequency interference. It provides a clean communication path and is immune to cross-talk.

- **INSULATION:**
  Optical fiber is an insulator; the glass fiber eliminates the need for using electric currents as the communication medium.

- **SECURITY:**
  Fiber cannot be tapped by conventional electric means and is very difficult to tap into optically. Furthermore, radio and satellite communication signals can be captured easily for decoding.

- **RELIABILITY & MAINTENANCE:**
  Fiber is immune to adverse temperature and moisture conditions, does not corrode or lose its signal, and is not affected by short circuits, power surges, or static electricity.

Features

- LFP(Link Fault Pass-through) and FEF(Far End Fault)
- Two different operation modes
  - ➢ Store-and-Forward
  - ➢ Pass Through
- Auto negotiation
- Support TS-1000 ver. 2
- Support Turbo Ring 2
- Plug and Play
- Hot-swap

Package Checklist

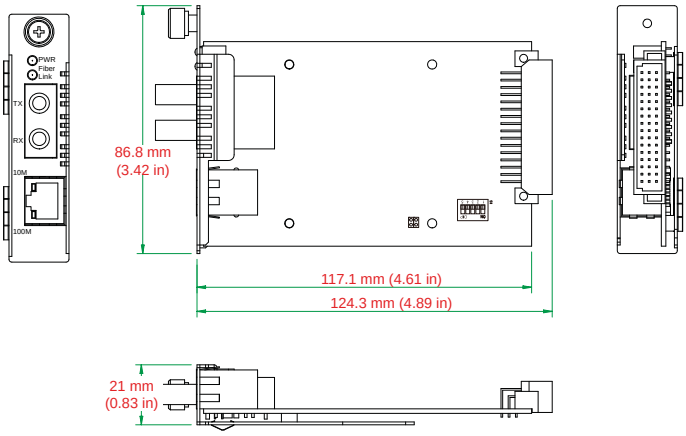
Moxa's CSM-200 Series is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- CSM-200 Series
- Hardware Installation Guide
- Warranty Card

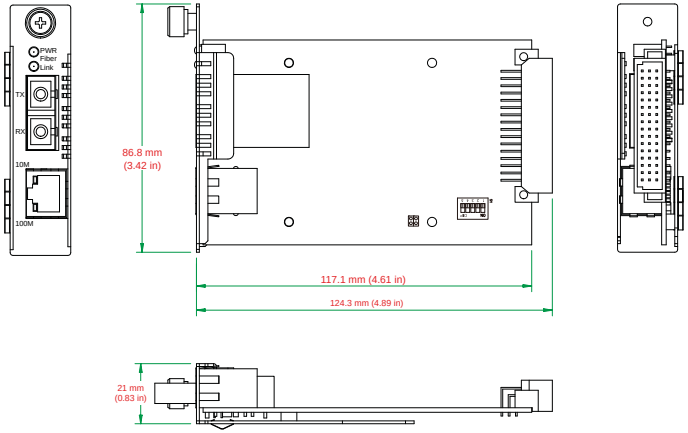
NOTE: *Please notify your sales representative if any of the above items are missing or damaged.*

Dimensions

CSM-200-1213



CSM-200-1214/CSM-200-1218



ATTENTION

Electrostatic Discharge Warning!

To protect the product from damage due to electrostatic discharge, we recommend wearing a grounding device when handling your CSM-200 slide-in modules.

Communication Connections

The CSM-200 Series has one 10/100BaseT(X) Ethernet port, and one 100BaseFX (SC or ST type connector) fiber port.

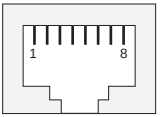
10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) Ethernet ports located on CSM-200 are used to connect to Ethernet-enabled devices.

Below we show pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports, and also show cable wiring diagrams for straight-through and cross-over Ethernet cables.

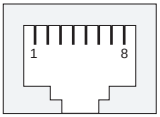
RJ45 (8-pin, MDI) Port Pinouts

Pin	Signal
1	Tx+
2	Tx-
3	Rx+
6	Rx-

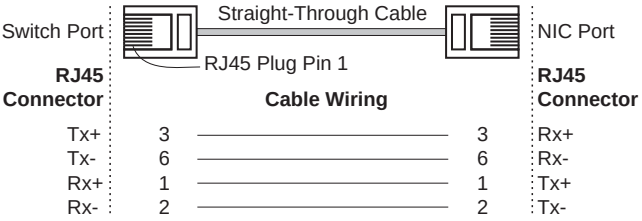


RJ45 (8-pin, MDI-X) Port Pinouts

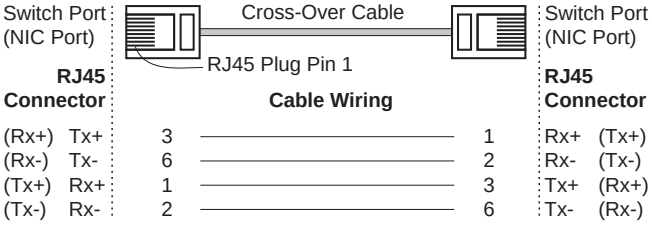
Pin	Signal
1	Rx+
2	Rx-
3	Tx+
6	Tx-



RJ45 (8-pin) to RJ45 (8-pin) Straight-Through Cable Wiring



RJ45 (8-pin) to RJ45 (8-pin) Cross-Over Cable Wiring

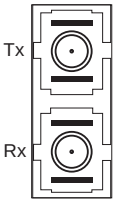


100BaseFX Fiber Port Connection

The concept behind the SC port and cable is quite straightforward. Suppose you are connecting devices I and II. Contrary to electrical signals, optical signals do not require a circuit in order to transmit data. Consequently, one of the optical lines is used to transmit data from device I to device II, and the other optical line is used transmit data from device II to device I, for full-duplex transmission.

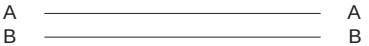
All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you are making your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A and B-to-B, as shown below, or A1-to-A2 and B1-to-B2).

SC-Port Pinouts



SC-Port to SC-Port Cable Wiring

Cable Wiring



ST-Port Pinouts

ST-Port to ST-Port Cable Wiring

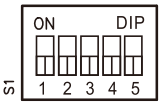
Cable Wiring

ATTENTION

This is a Class 1 Laser/LED product. Do not stare into the Laser Beam.

Switch Settings

There is 1 set of DIP switches on the board. The following figure and table give the settings for the 5-connector DIP switch.



DIP	Function	ON	OFF
1	Auto Negotiation	Enable	Disable
2	Force TP Speed	100 M	10 M
3	Force TP Duplex	Full Duplex	Half Duplex
4	Link Fault Pass Through	Enable	Disable
5	Operating Mode	Store-and-Forward	Pass Through

NOTE

1. All the DIP settings default to “ON”.
2. When configured for Pass Through mode, the Ethernet port and fiber port should transmit at 100 Mbps, which is equivalent to full duplex mode.

LED Indicators

There are 2 LEDs on the front bracket of the CSM-200 slide-in modules.

LED	Color	State	Function
PWR	Green	On	Power is being supplied to power input.
		Off	Power is **not** being supplied to power input.
Fiber Link	Green	On	FX port’s 100 Mbps is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	100BaseFX port is inactive.
10M (TP)	Yellow	On	TP port’s 10 Mbps is active.
		Blinking	Data is being transmitted at 10 Mbps.
		Off	TP port’s 10 Mbps link is inactive.
100M (TP)	Green	On	TP port’s 100 Mbps is active.
		Blinking	Data is being transmitted at 100 Mbps.
		Off	TP Port’s 100 Mbps is inactive.

Auto MDI/MDI-X Connection

The Auto MDI/MDI-X function allows users to connect the Moxa CSM-200's 10/100BaseTX ports to any kind of Ethernet device, without needing to determine the type of Ethernet cable being used for the connection.

This means that you can use either a straight-through cable or cross-over cable to connect the CSM-200 Series to Ethernet devices.

Dual Speed Functionality and Switching

The Moxa CSM-200's 10/100 Mbps RJ45 Ethernet port auto negotiates with the connected device for the fastest data transmission rate supported by both devices. All models of the CSM-200 Series are plug-and-play devices, so that software configuration is not required at installation, or during maintenance. The half/full duplex mode for the RJ45 Ethernet ports is user dependent and changes (by auto-negotiation) to full or half duplex, depending on which transmission speed is supported by the attached device.

Auto-Negotiation and Speed Sensing

All of the CSM-200's RJ45 Ethernet ports independently support auto-negotiation for 10BaseT and 100BaseTX transmission speeds, with operation according to the IEEE 802.3u standard.

This means that some nodes could be operating at 10 Mbps, while at the same time other nodes are operating at 100 Mbps.

Auto-negotiation takes place when an RJ45 cable connection is made, and then each time a LINK is enabled. Moxa's CSM-200 advertises its capability for using either 10 Mbps or 100 Mbps transmission speeds, with the device at the other end of the cable expected to advertise similarly. Depending on what type of device is connected, this will result in agreement to operate at a speed of either 10 Mbps or 100 Mbps.

If a Moxa CSM-200 RJ45 Ethernet port is connected to a non-negotiating device, it will default to 10 Mbps speed and half-duplex mode, as required by the IEEE 802.3u standard.

Specifications

Technology

Standards	IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X), 100BaseFX

Interface

RJ45 ports	10/100BaseT(X)
Fiber ports	100BaseFX (SC/ST connector)
LED Indicators	PWR, Fiber Link, 10/100M(TP port)

Optical Fiber

	100BaseFX	
	Multi-mode	**Single-mode**
Wavelength	1300 nm	1310 nm
Max. TX	-10 dBm	0 dBm
Min. TX	-20 dBm	-5 dBm
RX Sensitivity	-32 dBm	-34 dBm
Link Budget	12 dB	29 dB
Typical Distance	5 km a 4 km b	40 km c
Saturation	-6 dBm	-3 dBm

a. 50/125 μm, 800 MHz*km fiber optic cable
b. 62.5/125 μm, 500 MHz*km fiber optic cable
c. 9/125 μm, 3.5 PS/(nm*km) fiber optic cable

Physical Characteristics

Housing	SPCC
Dimensions	86.8 x 124.3 x 21 mm (3.42 x 4.89 x 0.83 in)
Weight	Product only: CSM-1213: 115 g (0.25 lb) CSM-1214/1218: 125 g (0.28 lb) Packaged: CSM-1213: 170g (0.37 lb) CSM-1214/1218: 180g (0.40 lb)

Environmental Limits

Operating Temperature	0 to 60°C (32 to 142°F)
Storage Temperature	-20 to 75°C (-4 to 158°F)
Humidity	5 to 95 % RH

Power Requirements

Input Voltage	12 VDC
Power Consumption	180 mA @ 12 VDC

Regulatory Approvals

CE	Class A
FCC	Part 15 sub part B class A

EMS	EN61000-4-2 (ESD), Criteria A, Level 4
	EN61000-4-3 (RS), Criteria A, Level 2
	EN61000-4-4 (EFT), Criteria A, Level 3
	EN61000-4-5 (Surge), Criteria A, Level 3
	EN61000-4-6 (CS), Criteria A, Level 2
	En61000-4-8 (PFMF), Criteria A, Level 3
Freefall	IEC 60068-2-32

Warranty

Warranty Period	5 years

Details: See www.moxa.com/warranty

Technical Support Contact Information

www.moxa.com/support

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