CSM-400 Series
Quick Installation Guide

Version 1.2, June 2021

Technical Support Contact Information
www.moxa.com/support

P/N: 1802004002011

Overview

Introduction

The CSM-400 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 it can be installed in every chassis of the NRack System.

The CSM-400 Series includes the following models:

- **CSM-400-1213:** 10/100BaseT(X)-to-100BaseFX slide-in management module converter, multimode ST connector
- **CSM-400-1214:** 10/100BaseT(X)-to-100BaseFX slide-in management module converter, multimode SC connector
- **CSM-400-1218:** 10/100BaseT(X)-to-100BaseFX slide-in management module converter, single-mode SC connector
- **CSM-400-1224:** 10/100BaseT(X)-to-100BaseFX slide-in management module converter, WDM-A single-mode SC connector
- **CSM-400-1225:** 10/100BaseT(X)-to-100BaseFX slide-in management module converter, WDM-B single-mode SC connector

Installation

The CSM-400 media converter slide-in module can be hot-swapped, which means the chassis does not 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)
- Supports store-and-forward and pass-through modes
- Auto negotiation for copper port
- Supports IEEE 802.3AH OAM protocol
- Plug and Play
- Hot-swap
- IP-based remote management
- Supports WDM type modules

NOTE When you enable the LFP function of the CSM-400 series of media converters to use on the TRC-2190, you must choose the CSM-200/400 product for use at a remote site to make sure the LFP function can successfully use this function.

Package Checklist

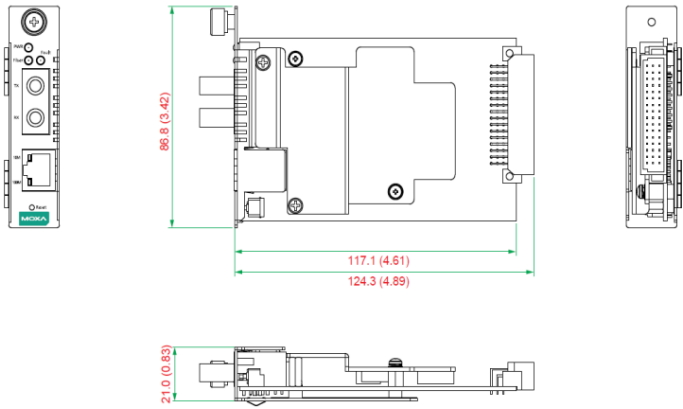
Moxa's CSM-400 Series is shipped with the following items.

- CSM-400 Series
- Quick installation guide (printed)
- Warranty card

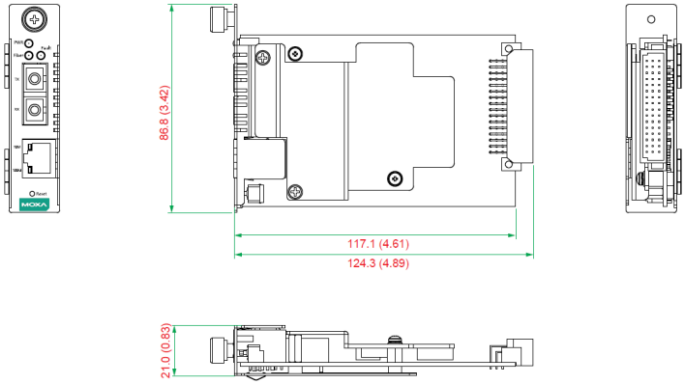
NOTE Please notify your sales representative if any of the above items are missing or damaged.

Dimensions

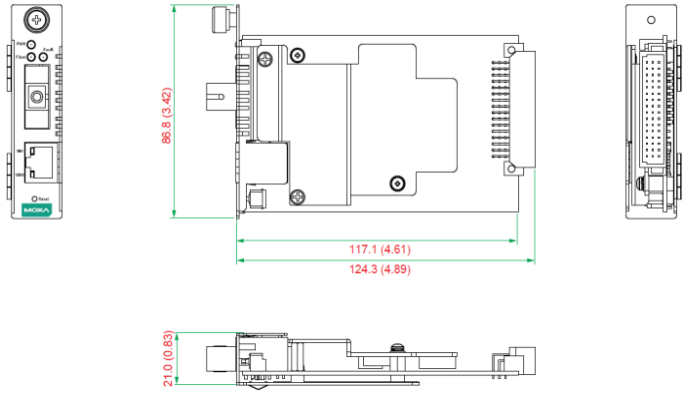
CSM-400-1213



CSM-400-1214/CSM-400-1218



CSM-400-1224/CSM-400-1225



Electrostatic Discharge Warning!

To protect the product from damage due to electrostatic discharge, we recommend wearing a grounding device when handling your CSM-400 slide-in modules.

Communication Connections

The CSM-400 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-400 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 crossover Ethernet cables.

10/100BaseT(X) RJ45 Pinouts

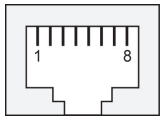
MDI Port Pinouts

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

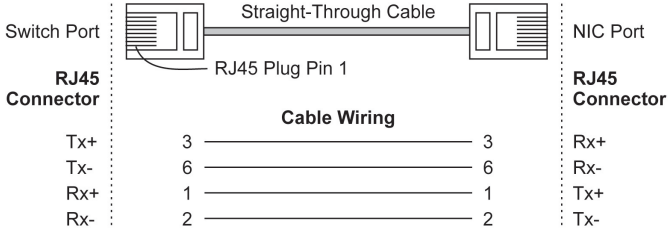
MDI-X Port Pinouts

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

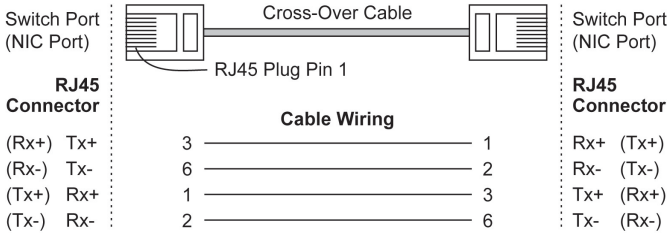
8-pin RJ45



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



RJ45 (8-pin) to RJ45 (8-pin) Crossover Cable Wiring



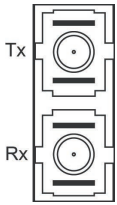
100BaseFX Fiber Port Connection

The concept behind the fiber 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.

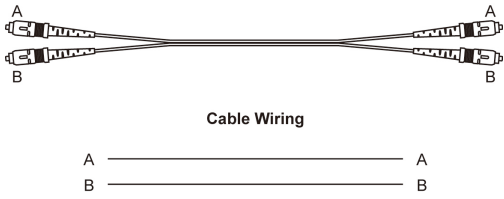
All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II.

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).

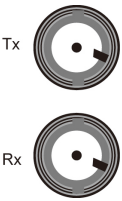
SC-Port Pinouts



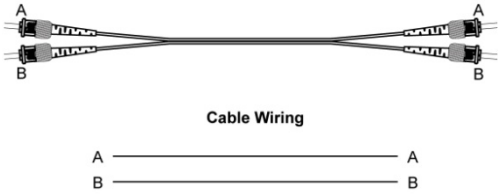
SC-Port to SC-Port Cable Wiring



ST-Port Pinouts



ST-Port to ST-Port Cable Wiring



ATTENTION

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

LED Indicators

There are two LEDs on the front bracket of the CSM-400 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.
Fault	Red	On	LED is on and the CSM-400 is booting up, or a power error condition exists
		Blinking	Indicates and IP conflict, or the DHCP server did not respond properly
		Off	LED is off and the CSM-400 is functioning normally; a power error condition does not exist
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-400'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 crossover cable to connect the CSM-400 Series to Ethernet devices.

Dual Speed Functionality and Switching

The Moxa CSM-400'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-400 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-400'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-400 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-400 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-400-1213/1214/1218 : 115 g (0.25 lb) CSM-400-1224/1225 : 125 g (0.28 lb) Packaged: CSM-400-1213/1214/1218 : 170 g (0.37 lb) CSM-400-1224/1225 : 180 g (0.40 lb)
Environmental Limits	
Operating Temperature	Standard Models: -20 to 55°C (-4 to 131°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature	-40 to 85°C (-40 to 185°F)
Humidity	5 to 95 % RH
Power Requirements	
Input Voltage	12 VDC
Power Consumption	220 mA @ 12 VDC max.
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