

IMC-P101 Series Quick Installation Guide

Moxa PoE Media Converter

Version 4.2, February 2022

Technical Support Contact Information
www.moxa.com/support

MOXA[®]

© 2022 Moxa Inc. All rights reserved.

P/N: 1802001015015



Overview

The IMC-P101 Series is an Ethernet-to-fiber-optic media converter. It provides Ethernet media conversion from 10/100 BaseT(X) to 100 BaseFX (SC/ST connectors). These media converters are classified as power source equipment (PSE), and when used in this way, the IMC-P101 Series provides up to 30 watts to powered devices (PD). The IMC-P101 Series can be used to power IEEE 802.3at compliant powered devices (PD), eliminating the need for additional wiring, and supports IEEE 802.3/802.3u/802.3x with 10/100M, full/half-duplex, and MDI/MDI-X auto-sensing to provide a total solution for your industrial Ethernet network.

The IMC-P101 Series includes the following models:

- **IMC-P101-M-SC:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, multi-mode port with SC connector, 0 to 60°C operating temperature.
- **IMC-P101-M-ST:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, multi-mode port with ST connector, 0 to 60°C operating temperature.
- **IMC-P101-S-SC:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, single-mode port with SC connector, 0 to 60°C operating temperature.
- **IMC-P101-S-ST:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, single-mode port with ST connector, 0 to 60°C operating temperature.
- **IMC-P101-M-SC-T:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, multi-mode port with SC connector, -40 to 75°C operating temperature.
- **IMC-P101-M-ST-T:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, multi-mode port with ST connector, -40 to 75°C operating temperature.
- **IMC-P101-S-SC-T:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, single-mode port with SC connector, -40 to 75°C operating temperature.
- **IMC-P101-S-ST-T:** PoE Industrial 10/100BaseT(X)-to-100BaseFX media converter, single-mode port with ST connector, -40 to 75°C operating temperature.

NOTE Throughout this Hardware Installation Guide, we often use **IMC** as an abbreviation for Moxa Industrial Media Converter:
IMC = Moxa Industrial Media Converter

Patent

http://www.moxa.com/doc/operations/Moxa_Patent_Marking.pdf

Package Checklist

Moxa PoE Media Converter is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

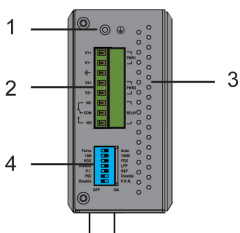
- IMC-P101 Series media converter.
- Quick installation guide (printed).
- Warranty card.

Features

- 10/100BaseT(X) Auto-Negotiation and Auto-MDI/MDI-X.
- IEEE 802.3af/at, PoE+ standards.
- Power failure by relay output.
- Provides up to 30 W of power to powered devices (PD).
- Support store-and-forward mode and pass-through mode.
- -40 to 75°C operating temperature range (T models).
- Redundant dual VDC power inputs.

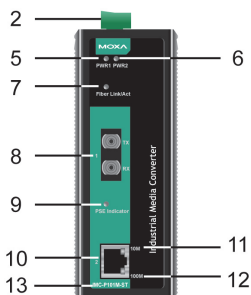
Panel Layout of the IMC-P101 Series

Top Panel View

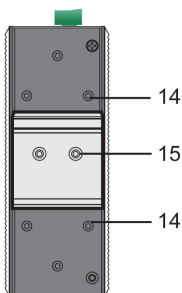


1. Grounding screw
2. Terminal block for power input PWR1/PWR2
3. Heat dissipation vents and relay output
4. DIP switch
5. Power input PWR1 LED
6. Power input PWR2 LED
7. Fiber Link/Active LED
8. 100BaseFX (ST/SC connector) Port
9. PSE Indicator LED
10. 10/100BaseT(X)
11. TP port 10 Mbps LED
12. TP port 100 Mbps LED
13. Model Name
14. Screw hole for wall mounting kit
15. DIN-rail mounting kit

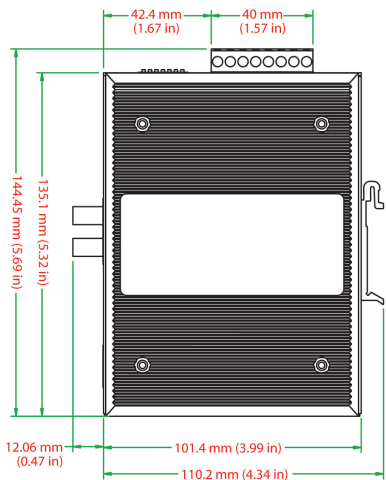
Front Panel View (IMC-P101-M-ST)



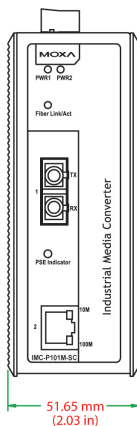
Rear Panel View



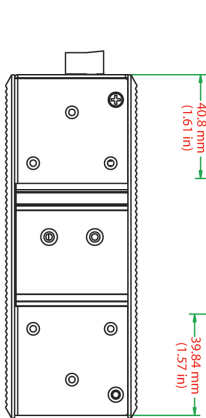
Mounting Dimensions



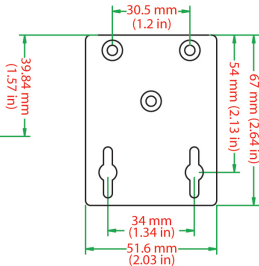
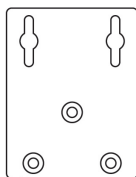
Side View



Front View



Rear View



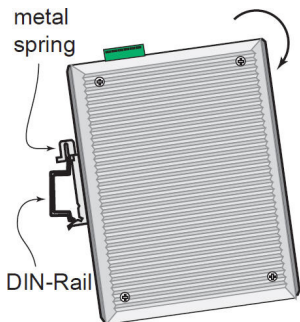
Panel Mounting Kit (Optional)

DIN-rail Mounting

The aluminum DIN-rail attachment plate should be fixed to the back panel of the IMC when you take it out of the box. If you need to reattach the DIN-rail attachment plate to the IMC, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

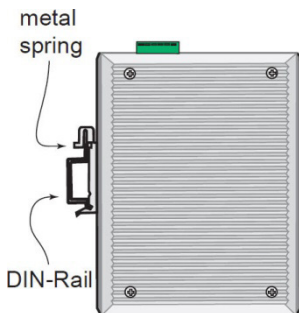
STEP 1:

Insert the top of the DIN-rail into the slot just below the stiff metal spring.



STEP 2:

The DIN-rail attachment unit will snap into place as shown below.



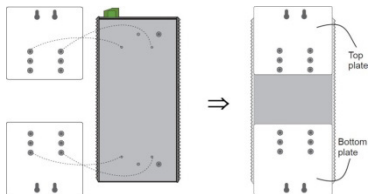
To remove the Moxa Industrial Media Converter from the DIN-rail, simply reverse Steps 1 and 2 above.

Wall Mounting (Optional)

For some applications, you will find it convenient to mount the Moxa PoE Media Converter on the wall, as illustrated below.

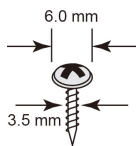
STEP 1:

Remove the aluminum DIN-rail attachment plate from the Moxa PoE Media Converter, and then attach the wall mount plates, as shown in the diagrams below.



STEP 2:

Mounting the Moxa PoE Media Converter on the wall requires 4 screws. Use the IMC, with wall mount plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.

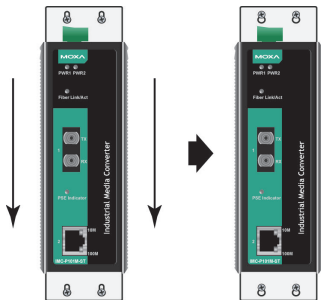


NOTE Test the screw head and shank size by inserting the screw into one of the keyhole shaped apertures of the Wall Mounting Plates, before it is screwed into the wall.

Do not screw the screws in all the way—leave a space of about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

STEP 3:

Once the screws are fixed in the wall, insert the four screw heads through the large openings of the keyhole-shaped apertures, and then slide Moxa PoE Media Converter downwards, as indicated below. Tighten the four screws for added stability.



Grounding the Moxa Industrial Media Converter

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

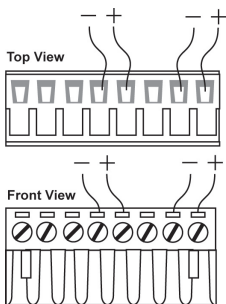


ATTENTION

This product is intended to be mounted to a well-grounded mounting surface such as a metal panel.

Wiring the Redundant Power Inputs

The top five contacts of the 8-contact terminal block connector on the IMC's top panel are used for the IMC's two DC inputs. Top and front views of one of the terminal block connectors are shown here.



STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals.

STEP 2: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the IMC's top panel.



ATTENTION

One individual conductor in a clamping point with a wire size of 28 to 12 AWG and a torque value of 4.5 lb-in should be used.



ATTENTION

Before connecting the IMC to DC power inputs, make sure the DC power source voltage is stable.

Communication Connections

IMC-P101 models have 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 port located on the IMC's front panel is used to connect to Ethernet-enabled devices.

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

10/100Base T(x) RJ45 Pinouts

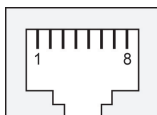
MDI Port Pinouts

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

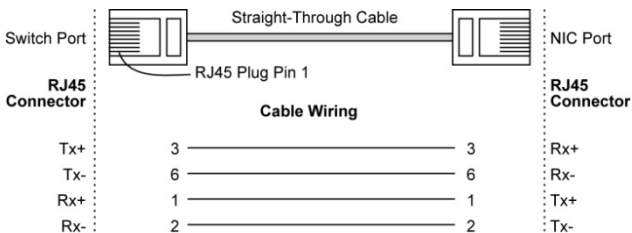
MDI-X Port Pinouts

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

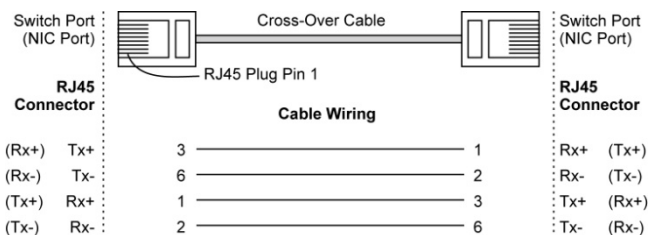
8-pin RJ45



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



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



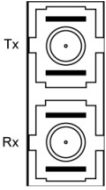
100BaseFX Ethernet Port Connection

The concept behind the SC port and cable is quite straightforward. Suppose you are connecting devices I and II. Unlike 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 to transmit data from device II to device I, for full-duplex transmission.

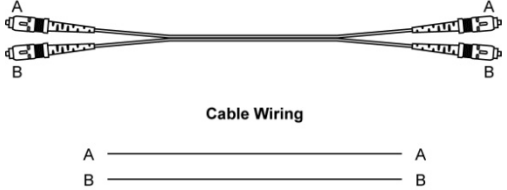
All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of

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



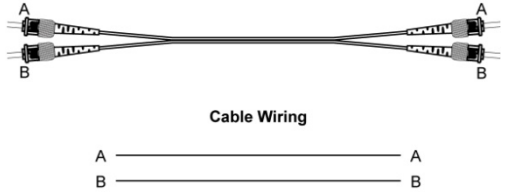
SC-Port to SC-Port Cable Wiring




ST-Port Pinouts



ST-Port to ST-Port Cable Wiring



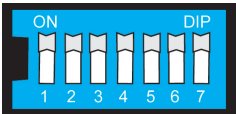


ATTENTION
This is a Class 1 Laser/LED product. Do not stare into the Laser Beam.

Redundant Power Inputs

Both power inputs can be connected simultaneously to live DC power sources. If one power source fails, the other live source acts as a backup, and automatically supplies all of the Moxa Industrial Media Converter's power needs.

DIP Switch Setting



DIP No.	Function	ON	OFF
1	Auto Negotiation	Enable*	Disable
<p>"ON": Enables "Auto Negotiation" function, the speed and duplex states for each port link segment are automatically configured using the highest performance interoperation mode.</p> <p>"OFF": Disables "Auto Negotiation" function, the speed and duplex states depend on the manual setting configuration.</p>			
2	Force TP Speed	100Mbps*	10Mbps
<p>(Only when Auto Negotiation is disabled)</p> <p>"ON": Forces 100Mbps on Ethernet port.</p> <p>"OFF": Forces 10Mbps on Ethernet port.</p>			

DIP No.	Function	ON	OFF
3	Force TP Duplex	Full Duplex*	Half Duplex
(Only when Auto Negotiation is disabled) "ON": Forces Full Duplex on Ethernet port. "OFF": Forces Half Duplex on Ethernet port.			
4	Link Fault Pass Through	Enable*	Disable
"ON": Enables "Link Fault Pass Through", the link status on the TX port will inform the FX port of the same device and vice versa. "OFF": Disables "Link Fault Pass Through", the link status on the TX port will not inform the FX port.			
5	Operating Mode	Store-and-Forward*	Pass Through
"ON": Selects "Store-and-Forward" mode, begins to forward a packet to a destination port after an entire packet is received. The latency depends on the packet length. "OFF": Selects "Pass-through" mode, operates with the minimum latency. Both transceivers are interconnected via internal MIIs and the internal switch engine and data buffer are not used. Note: With "Pass-through" mode enabled, the Ethernet port and fiber port should transmit at 100 Mbps, which is equivalent to full duplex mode.			
6	PSE	Disable	Enable*
PSE: Power Source Equipment. "ON": Disables "PSE", IMC-P101 Series do NOT provide power to PD (Powered Device). "OFF": Enables "PSE", IMC-P101 Series provides power to PD (Powered Device).			
7	P.R.R.	Enable	Disable*
P.R.R.: Power Remote Reset "ON": Enables "P.R.R" function, when fiber port link down 3 seconds and "PSE" setting is enabled, IMC-P101 Series STOP providing power to PD (Power Device) which means the PD power will turn OFF. After 1 second later, IMC-P101 Series start to continue provide power to PD, and then the PD power turn back ON for reset PD. "OFF": Disables "P.R.R" function, no reset PD function.			

(*): **Default DIP switch setting.**



ATTENTION

After changing the DIP switch setting, you will need to power off and then power on the IMC-P101 to activate the new setting.

LED Indicators

The front panel of Moxa Industrial Media Converter contains several LED indicators. The function of each LED is described in the table below.

LED	Color	State	Description
PWR1	Green	ON	Power is being supplied to power input PWR1
		OFF	Power is not being supplied to power input PWR1

LED	Color	State	Description
PWR2	Green	ON	Power is being supplied to power input PWR2
		OFF	Power is not being supplied to power input PWR2
Fiber Link/Act	Green	ON	Fiber port is active.
		Blinking	Data is being transmitted or received.
		OFF	Fiber port is inactive.
PSE Indicator	Green	ON	PSE is enabled.
		2 Flash	PoE current overloading
		5 Flash	Detected invalid discovery signature resistance
		OFF	No PoE power output
10M	Yellow	ON	Ethernet port 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps.
		OFF	Ethernet port 10 Mbps link is inactive.
100M	Green	ON	Ethernet port 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps.
		OFF	Ethernet port 100 Mbps link is inactive.

Specifications

Technology			
Standards	IEEE 802.3 for 10BaseT, IEEE 802.3u for 100BaseT(X), 100BaseFX IEEE 802.3at for Power-over-Ethernet		
Interface			
RJ45 ports	10/100BaseT(X)		
Fiber ports	100BaseFX (SC, ST connectors available)		
LED Indicators	PWR1, PWR2, Fiber Link/Act, 10/100M (Ethernet port), PSE Indicator		
DIP Switches:			
Dip No.	Function	ON	OFF
1	Auto Negotiation	Enable*	Disable
2	Force TP Speed	100Mbps*	10Mbps
3	Force TP Duplex	Full Duplex*	Half Duplex
4	Link Fault Pass Through	Enable*	Disable
5	Operating Mode	Store-and-Forward*	Pass-Through
6	PSE	Disable	Enable*
7	P.R.R. (PD Remote Reset)	Enable	Disable*
*Default DIP switch setting.			
Alarm Contact	One relay output with current carrying capacity of 1A @ 24 VDC		
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	Metal	
Dimensions (W x H x D)	144.45 x 110.2 x 51.65 mm (5.69 x 4.34 x 2.03 in)	
Weight	Product only: 525 g Packaged: 710 g	
Installation	DIN-rail mounting, Wall Mounting (optional kit)	
Environmental Limits		
Operating Temperature	Standard Models: 0 to 60°C (32 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)	
Storage Temperature	-40 to 85°C (-40 to 185°F)	
Ambient Relative Humidity	5 to 90% (non-condensing)	
Power Requirements		
Input Voltage	12 to 57 VDC, redundant inputs	
Power Consumption	3.6 A @ 12 VDC	
Connection	Removable terminal block	
Overload Current Protection	5 A	
Regulatory Approvals		
Safety	UL 508, EN 62368	
EMI	FCC Part 15, CISPR 32 class A	
EMS	EC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 3 V/m IEC 61000-4-4 EFT: Power: 4 kV; Signal: 4 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 150 KHz to 80 MHz: 3 to 1 V IEC 61000-4-8 PFMF	
Shock	IEC 60068-2-27	
Free Fall	IEC 60068-2-31	
Vibration	IEC 60068-2-6	
Warranty		
Warranty Period	5 years	
Details	See www.moxa.com/warranty	

NOTE Altitudes up to 2000 m



CAUTION

This product is intended to be supplied by a Listed Power Adapter or DC power source marked "L.P.S." (or "Limited Power Source"), rated 12-57 VDC, 3.6 A minimum, T_{ma} = 75°C minimum.



CAUTION

Use of the controls or adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

NOTE Complies with 21 CFR 1040.10 and 1040.11, except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

CLASS 1 LASER PRODUCT