

# IMC-P101

## Quick Installation Guide

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**Moxa PoE Media Converter**

**Edition 3.0, August 2016**

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**P/N: 1802001015012**



## 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 15.4 watts to powered devices (PD). The IMC-P101 series can be used to power IEEE 802.3af 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](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.

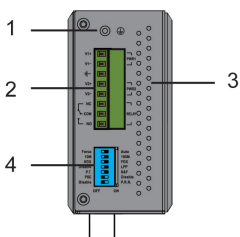
- IMC-P101 series media converter.
- Quick Installation Guide (printed).
- Warranty Card.

## Features

- 10/100BaseT(X) Auto-Negotiation and Auto-MDI/MDI-X.
- IEEE 802.3af compliant PoE.
- Power failure by relay output.
- Provides up to 15.4W 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.

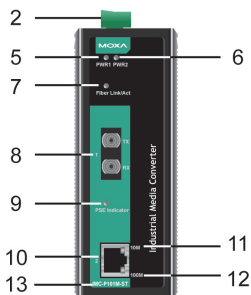
## Panel Layout of the IMC-P101 Series

### Top Panel View

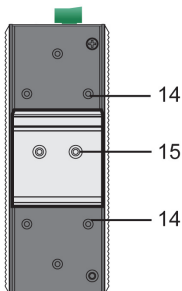


1. Grounding screw
2. Terminal block for power input PWR1/PWR2
3. Heat dissipation vents and relay output
4. DIP switch
5. Power input PWR1 LED
6. Power input PWR2 LED
7. Fiber Link/Active LED
8. 100BaseFX (ST/SC connector) Port
9. PSE Indicator LED
10. 10/100BaseT(X)
11. TP port 10 Mbps LED
12. TP port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

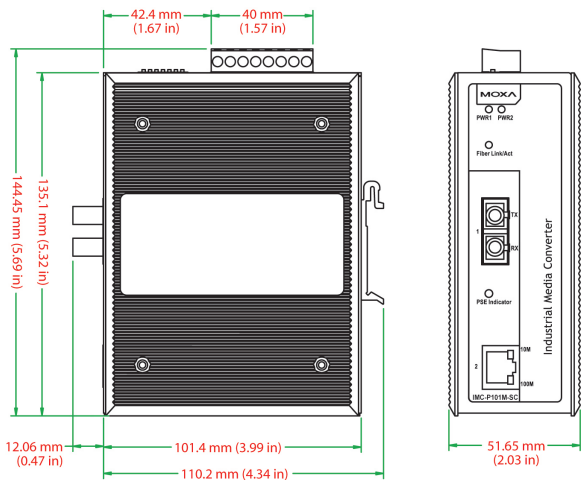
### Front Panel View (IMC-P101-M-ST)



### Rear Panel View

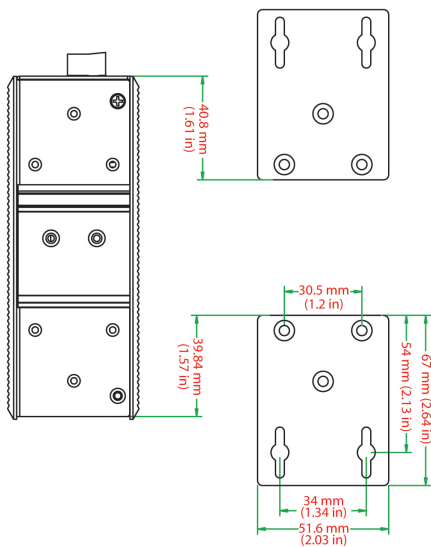


# Mounting Dimensions



Side View

FrontView



Rear View

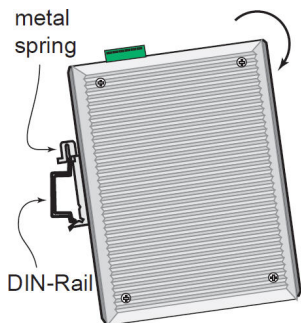
Panel Mounting Kit (Optional)

## 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.

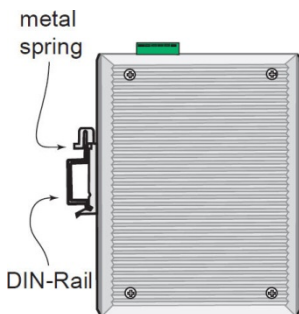
### STEP 1:

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.



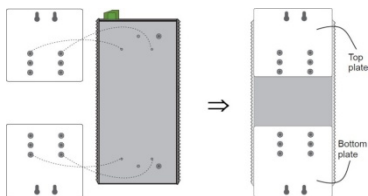
To remove the Moxa Industrial Media Converter from the DIN-Rail, simply reverse Steps 1 and 2 above.

## Wall Mounting (Optional)

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

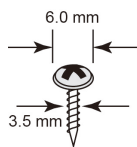
### STEP 1:

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.

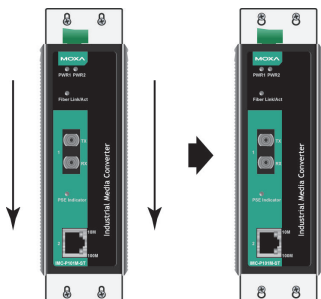


**NOTE** Test the screw head and shank size by inserting the screw into one of the keyhole shaped apertures of the Wall Mounting Plates, before it is screwed into the wall.

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.

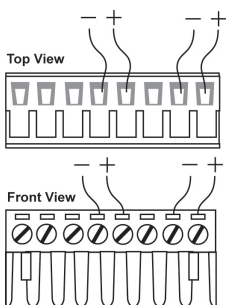


### ATTENTION

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

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

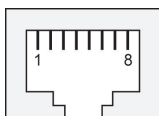
**MDI Port Pinouts**

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

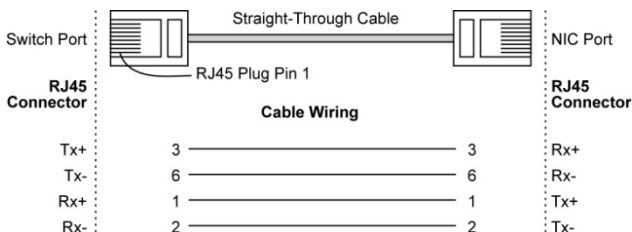
**MDI-X Port Pinouts**

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

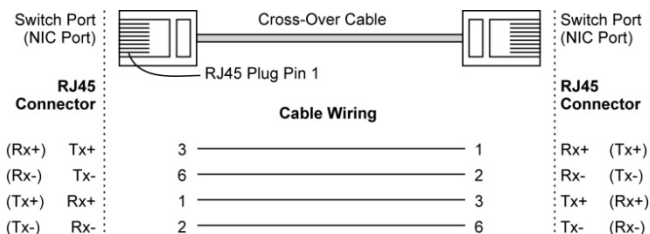
**8-pin RJ45**



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



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



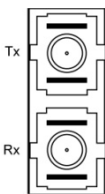
## 100BaseFX Ethernet Port Connection

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.

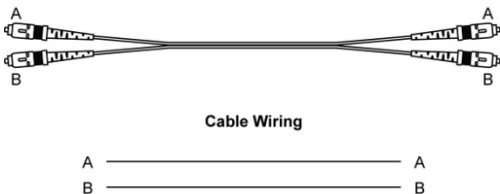
All you need to remember is to connect the Tx (transmit) port of device I to the Rx (receive) port of device II, and the Rx (receive) port of device I to the Tx (transmit) port of device II. If you are making your own cable, we suggest labeling the two sides of the same line with the same letter (A-to-A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



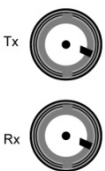
## SC-Port Pinouts



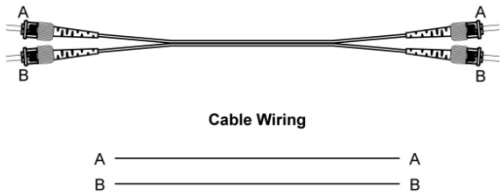
## SC-Port to SC-Port Cable Wiring



## ST-Port Pinouts



## ST-Port to ST-Port Cable Wiring



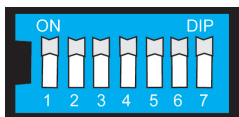
## ATTENTION

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>  |                  |              |             |
| 3  | Force TP Duplex  | Full Duplex* | Half Duplex |
| <p>(Only when Auto Negotiation is disabled)</p> <p>"ON": Forces Full Duplex on Ethernet port.</p> <p>"OFF": Forces Half Duplex on Ethernet port.</p>   |                  |              |             |

| DIP No.   | Function                | ON                 | OFF          |
|---|-------------------------|--------------------|--------------|
| 4   | Link Fault Pass Through | Enable*            | Disable      |
| <p>"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.</p> <p>"OFF": Disables "Link Fault Pass Through", the link status on the TX port will not inform the FX port.</p>   |                         |                    |              |
| 5   | Operating Mode          | Store-and-Forward* | Pass Through |
| <p>"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.</p> <p>"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.</p> <p>Note: With "Pass Through" mode enabled, the Ethernet port and fiber port should transmit at 100 Mbps, which is equivalent to full duplex mode.</p> |                         |                    |              |
| 6   | PSE                     | Disable            | Enable*      |
| <p>PSE: Power Source Equipment.</p> <p>"ON": Disables "PSE", IMC-P101 series do NOT provide power to PD (Powered Device).</p> <p>"OFF": Enables "PSE", IMC-P101 series provides power to PD (Powered Device).</p>   |                         |                    |              |
| 7   | P.R.R.                  | Enable             | Disable*     |
| <p>P.R.R.: Power Remote Reset</p> <p>"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.</p> <p>"OFF": Disables "P.R.R" function, no reset PD function.</p>   |                         |                    |              |

**(\*): 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 |
| 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.                         |

| LED           | Color  | State    | Description                              |
|---------------|--------|----------|--|
| PSE Indicator | Green  | ON       | PSE is enabled.                          |
|               |        | 1 Flash  | Low Signature Resistance                 |
|               |        | 2 Flash  | High Signature Resistance                |
|               |        | 5 Flash  | Power overload Fault                     |
|               |        | 9 Flash  | Power Management Allocation Exceeded     |
| 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 802.3af 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.<br>(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 <sup>a</sup><br>4 km <sup>b</sup> | 40 km <sup>c</sup> |
| Saturation  | -6 dBm                                 | -3 dBm             |
| a. 50/125 μm, 800 MHz*km fiber optic cable<br>b. 62.5/125 μm, 500 MHz*km fiber optic cable<br>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<br>(5.69 x 4.34 x 2.03 in) |
| Weight                 | Product only: 525g<br>Packaged: 710g                 |
| 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               | 48VDC (46 to 57 VDC with PoE, 18 to 72 VDC without PoE), redundant inputs |
| Power Consumption           | 430mA@48VDC (max.)  |
| Connection                  | Removable terminal block  |
| Overload Current Protection | 1.6 A (protects against two signals shorted together)                     |
| Reverse Polarity Protection | Present   |

## Regulatory Approvals

|           |  |
|-----------|--|
| Safety    | UL508  |
| EMI       | FCC Part 15, CISPR (EN55022) class A   |
| EMS       | IEC 61000-4-2 Edition 1.2: 2001-04(Level 4)<br>EN 61000-3-3: 1995 + A1: 2001<br>IEC 61000-4-3: 2002+A1: 2002(Level 3)<br>IEC 61000-4-4: 2004(Level 4)<br>IEC 61000-4-5 Edition 1.1: 2001-04(Level 3)<br>IEC 61000-4-6 Edition 2.1: 2004-11(Level 3)<br>IEC 61000-4-8 Edition 1.1: 2001-03(Level 3)<br>IEC 61000-4-11 Second Edition: 2004-03 |
| Shock     | IEC 60068-2-27   |
| Free Fall | IEC 60068-2-32   |
| Vibration | IEC 60068-2-6  |

## Warranty

|                 |  |
|-----------------|--|
| Warranty Period | 5 years<br>Details: See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a> |
|-----------------|--|