

Introduction

The IMC-P111-M12 series which consists of the IMC-P111FX-M12 and the IMC-P111P-M12 models. This is a cost-effective solution for converting between 10/100Base-T(X) and 100Base-FX interfaces, allowing you to extend communication distances using optical fiber. Designed for power substations and rolling stock, the series is fully compliant with the requirement of IEC 61850-3 and IEEE 1613 and provides an Ethernet port in M12 connector. With MDI/MDIX auto detection support, you don't need to use crossover wires. The device provides a wide operating temperature range from -40 ~ 85°C and accepts a wide voltage range power inputs, so it is suitable for harsh operating environments.

Package Contents

The IMC-P111-M12 series is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

Contents	Pictures	Number
IMC-P111P-M12/ IMC-P111FX-SS-M12/ IMC-P111FX-MM-M12		X 1
DIN-rail Kit		X 1
Wall-mount Kit		X 1
QIG		X 1

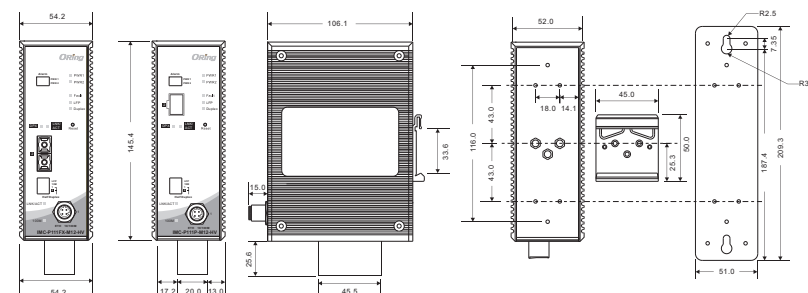
Preparation

Before you begin installing the device, make sure you have all of the package contents available and a PC with Microsoft Internet Explorer 6.0 or later, for using web-based system management tools.

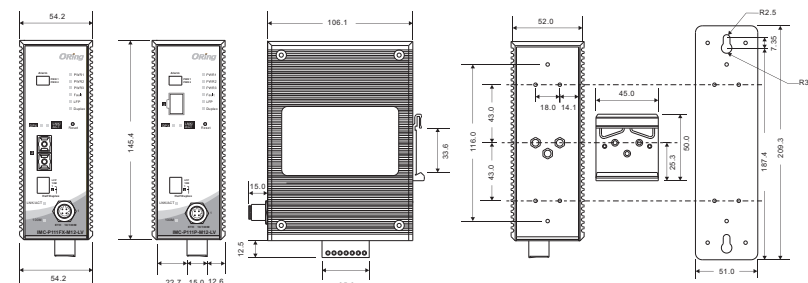
Safety & Warnings

- Elevated Operating Ambient:** If installed in a closed environment, make sure the operating ambient temperature is compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
- Reduced Air Flow:** Make sure the amount of air flow required for safe operation of the equipment is not compromised during installation.
- Mechanical Loading:** Make sure the mounting of the equipment is not in a hazardous condition due to uneven mechanical loading.
- Circuit Overloading:** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Dimension



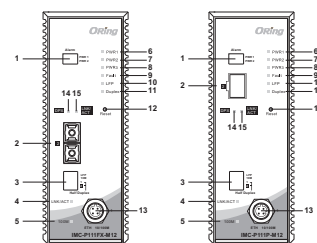
IMC-P111-M12-HV Series



IMC-P111-M12-LV Series

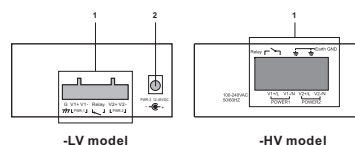
Panel Layouts

Front View



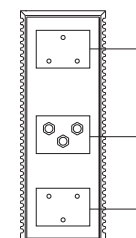
1. DIP switch for power alarm relay output
2. Fiber port (SC connector for IMC-P111FX; SFP for IMC-P111P)
3. DIP switch for mode selections of LAN port
4. LNK/ACT LED for LAN port
5. 100Mbps indicator
6. PWR1 LED
7. PWR2 LED
8. PWR3 LED (-LV model only)
9. Fault indicator
10. LFP indicator
11. Duplex LED for LAN port
12. Reset button
13. 10/100Base-T(X) LAN port
14. Duplex LED for fiber port
15. LNK/ACT LED for fiber port

Top View



1. Terminal blocks: PWR1, PWR2, Relay, Ground wire
2. PWR3 (-LV model only)

Rear View



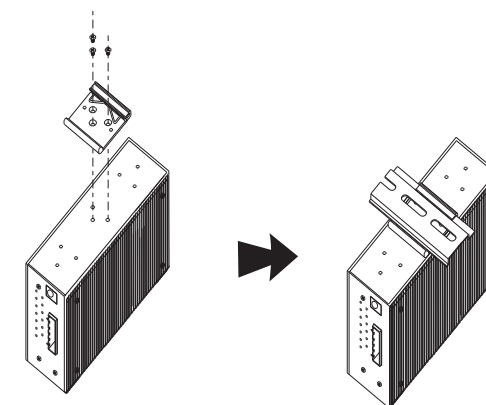
1. Din-rail screw holes
2. Wall-mount screw holes

Installation

Use the mounting kits attached with the package and follow the steps below to install the switch to a rail or to the wall.

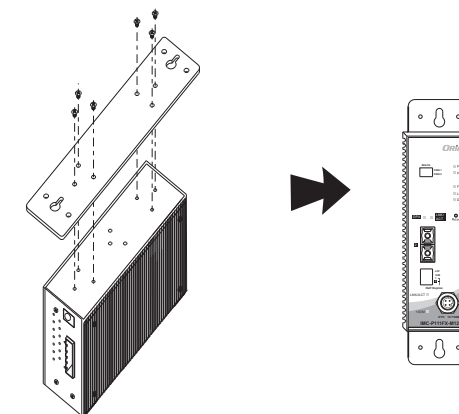
DIN-rail Installation

- Step 1:** Slant the switch and screw the Din-rail kit onto the back of the switch, right in the middle of the back panel.
- Step 2:** Slide the switch onto a DIN-rail from the Din-rail kit and make sure the switch clicks into the rail firmly.



Wall-mounting

- Step 1:** Screw the wall-mount kit (in the package) onto the back of the switch. A total of six screws are required, as shown below.
- Step 2:** Use the switch, with wall mount plates attached, as a guide to mark the correct locations of the wall-mounting screws.
- Step 3:** Insert a screw head through the large part of the keyhole-shaped aperture on the plate, and then slide the switch downwards. Tighten the screw for added stability.



- Instead of screwing the screws in all the way, it is advised to leave a space of about 2mm to allow room for sliding the switch between the wall and the screws.

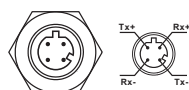
Network Connection

The switch has one 10/100Base-T(X) Ethernet port in the form of M12 connector. Depending on the link type, the switch uses CAT 3, 4, 5.5e UTP cables to connect to network devices (PCs, servers, switches, routers, or hubs). Please refer to the following table for cable specifications.

Cable Types and Specifications:

Cable	Type	Max. Length	Connector
10BASE-T	Cat. 3, 4, 5 100-ohm	UTP 100 m (328 ft)	4-pin female M12 D-coding connector
100BASE-TX	Cat. 5 100-ohm UTP	UTP 100 m (328 ft)	4-pin female M12 D-coding connector

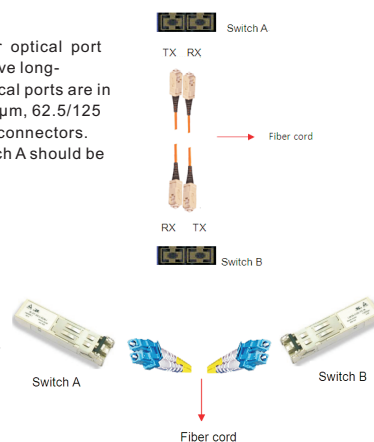
M12/4P Pin Definition



Pin No.	Description
#1	RD+
#2	TD+
#3	RD-
#4	TD-

Fiber Cables

The IMC-P111FX-M12 provides one fiber optical port that can connect to other devices to achieve long-distance data transmission. The fiber optical ports are in multi-mode (0 to 2 km, 1310 nm in 50/125 μm, 62.5/125 μm) and single-mode (9/125 μm) with SC connectors. Please remember that the TX port of Switch A should be connected to the RX port of Switch B.



The IMC-P111P-M12 comes with a SFP fiber optical port. The fiber optical ports are in multi-mode (0 to 2km, 1310 nm with 50/125 μm, 62.5/125 μm fiber) and single-mode with LC connectors. Please remember that the TX port of Switch A should be connected to the RX port of Switch B.

DIP Switch Function

Mode Select

DIP-Switch	Position	Description
1	ON	LFP mode enable
	OFF	LFP mode disable
2	ON	Ethernet speed 10Mbps
	OFF	Ethernet speed 10/100Mbps Auto-negotiate
3	ON	Ethernet Half-duplex
	OFF	Ethernet Full/Half-duplex Auto-negotiate
4	ON	Fiber Half-duplex
	OFF	Fiber Full-duplex

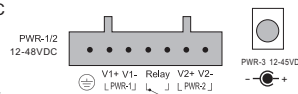
Power Alarm

DIP-1	DIP-2	Description
OFF	OFF	Power failure relay alarm disabled
ON	OFF	PWR-1 failure, relay alarm enabled
OFF	ON	PWR-2 failure, relay alarm enabled
ON	ON	PWR-1 or PWR-2 failure, relay alarm enabled

Wiring

-LV model Power inputs

The switch provides three DC inputs. The 12~48VDC power supply is on 7-pin terminal block, along with the grounding screw and relay output, and the 12~45VDC is on a power jack. Follow the steps below to wire power cables on the terminal block.



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

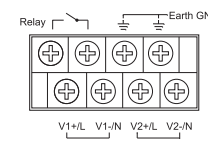
STEP 2: To keep the wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the connector.

-LV model Relay contact

The relay contact on the terminal block allow you to form fail close circuits. The relay contact will respond to user-configured events according to the setting.

-HV model Power inputs

The switch supports dual redundant power supplies, Power Supply 1 (PWR1) and Power Supply 2 (PWR2). The connections for PWR1, PWR2 and the RELAY are located on the front panel along with LAN ports. Follow the steps below to wire power cables.



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

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

Relay contact

The switch provides fail close options relay circuits on the terminal block connector which respond to user-configured events.

Grounding

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

Configurations

After installing the switch, the green power LED should turn on. Please refer to the following table for LED indication.

LED	Color	Status	Description
PW1	Green	On	DC power module 1 activated
PW2	Green	On	DC power module 2 activated
PW3	Green	On	DC power module 3 activated (-LV model only)
LNK/ACT	Green	On	Port is linked
		Blinking	Transmitting data
Duplex/Collision	Amber	On	Port is operating in full duplex mode
		Off	Port is operating in half duplex mode and no collision occurs
LFP	Amber	On	LFP function failed
		Off	LFP function disabled
Fault	Amber	On	Errors occur

Specifications

ORing Media Converter Model	IMC-P111FX-MM-SC-M12	IMC-P111FX-SS-SC-M12	IMC-P111P-M12
Physical Ports			
10/100 Base-T(X) Ports in M12 Auto MDI/MDIX	1 (M12 D-coded)	1 (M12 D-coded)	1 (M12 D-coded)
Fiber Ports Number	1	1	-
Fiber Ports Standard	100Base-FX	100Base-FX	-
Fiber Mode	Multi-mode	Single-mode	-
Fiber Diameter (μm)	62.5/125 μm 50/125 μm	9/125 μm	-
Fiber Optical Connector	SC	SC	-
Typical Distance (Km)	2 Km	30 Km	-
Wavelength (nm)	1310 nm	1310 nm	-
Max. Output Optical Power (dbm)	-14 dbm	-8 dbm	-
Min. Output Optical Power (dbm)	-23.5 dbm	-15 dbm	-
Max. Input Optical Power (Saturation)	0 dbm	0 dbm	-
Min. Input Optical Power (Sensitivity)	-31 dbm	-34 dbm	-
Link Budget (db)	7.5 db	19 db	-
100Base-FX SFP port	-	-	1

Technology	
Ethernet standards	IEEE 802.3 for 10Base-T, IEEE 802.3u for 100Base-TX and 100Base-FX, IEEE 802.3x for Flow control
Processing	Store-and-Forward
DIP-Switch setting	DIP-Switch 1 for LFP mode selection : (ON) enable / (OFF) disable DIP-Switch 2 for Ethernet speed selection : (ON) 10Mbps / (OFF) 10/100Mbps Auto-negotiate DIP-Switch 3 for Ethernet full/half duplex selection : (ON) Half-Duplex / (OFF) Full/Half-Duplex Auto-negotiate DIP-Switch 4 for fiber full/half duplex selection : (ON) Half-Duplex / (OFF) Full Duplex
Alarm DIP-Switch	
DIP-Switch 1	Power-1 failed warning : (ON) enable, (OFF) disable
DIP-Switch 2	Power-2 failed warning : (ON) enable, (OFF) disable
Power	
-LV Model Input Power	Triple DC inputs. 12-48VDC on 7-pin terminal block, 12-45VDC on power jack
-HV Model Input Power	Dual 100~240VAC power inputs on 8-pin terminal block
Power consumption(Typ.)	-LV model : 12 Watts, -HV model : 100VAC/4.8Watts, 240VAC/5.8 Watts -LV model : 12 Watts, -HV model : 100VAC/4.8Watts, 240VAC/5.8 Watts -LV model : 12 Watts, -HV model : 100VAC/4.8Watts, 240VAC/5.8 Watts
Overload current protection	Present
Reverse polarity protection	Present on terminal block
Physical Characteristic	
Enclosure	IP-30
Dimension (W x D x H)	54.1(W) x 106.1(D) x 145.4(H) mm (2.13 x 4.18 x 5.72 inch.)
Weight (g)	-LV model : 691 g -HV model : 833 g -LV model : 681 g -HV model : 823 g
Environmental	
Storage Temperature	-40 to 85°C (-40 to 185°F)
Operating Temperature	-40 to 85°C (-40 to 185°F)
Operating Humidity	5% to 95% Non-condensing
Regulatory Approvals	
Power Automation	IEC 61850-3, IEEE 1613
EMI	FCC Part 15, CISPR (EN55022) class A
EMS	EN61000-4-2 (ESD), EN61000-4-3 (RS), EN61000-4-4 (EFT), EN61000-4-5 (Surge), EN61000-4-6 (CS), EN61000-4-8, EN61000-4-11
Shock	IEC60068-2-27
Free Fall	IEC60068-2-32
Vibration	IEC60068-2-6
Safety	EN60950-1
Warranty	5 years

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