



IMC Industrial Media Converter

User Manual

Version v1.1

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I. Packing List

Each IMC product shipped to customers contains standard accessories shown below. Please check carefully after receiving our product and contact the sales personnel of InHand in case of any loss or damage is found.

Besides, InHand can also provide customers with optional accessories according to different onsite conditions. Please refer to the optional accessory list for details.

Standard accessories

Accessory	Quantity	Description
IMC	1	IMC Industrial Media Converter
Product datasheet	1	Optical disk
Product warranty card	1	Warranty period is one year
DIN-Rail	1	For DIN-Rail mounting

Optional accessories

Accessory	Quantity	Description
Power adapter	1 piece	220VAC--24VDC power adaptor
Optical patchcord	1m	Used for test by client

II. Product Introduction

1.1 Overview

IMC series is a kind of high-performance Industrial media converter specially developed for industrial application by InHand Networks. The IMC provides an exchange infrastructure that is firm, easy to use and safe. The IMC has adopted an industrial design which complies with the industrial specification, simplified the deployment, management and exchange of the industrial network, and provided excellent network safety based on an open standard. The IMC is an ideal tool for supporting industrial Ethernet which can be easily deployed to industries of wind energy, distribution network automation, substation, factory automation, intelligent transportation system (ITS) and other severe environments.

1.2 Product Feature

- It supports IEEE802.3/802.3u/802.3x
- It supports automatic negotiation
- As well as 100M full/half-duplex MDI/MDI-X self-adaptation

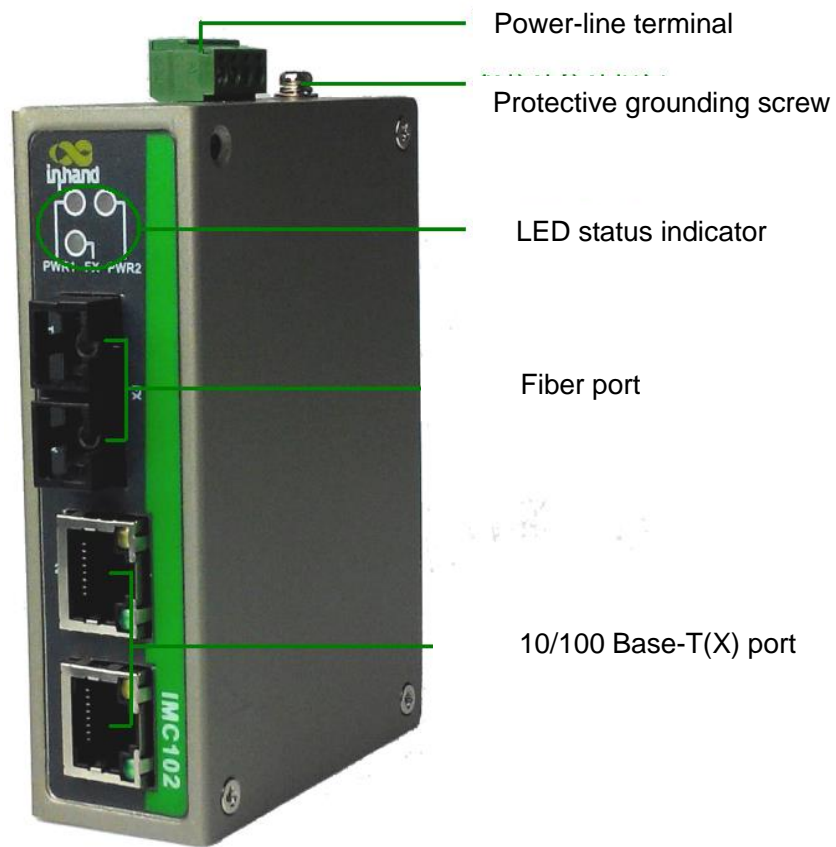
1.3 Point-to-Point Networking Mode

The topological graph is shown in Fig. 1-1. Intercommunication for the two sets of PCs shown as below can be realized by users.



Fig. 1-1 Point-to-Point Networking Topological Graph

III. Panel Introduction



Warning

Though IMC series products have various panel types, they were installed in the same way. The specific panel condition shall be subject to the object.

IV. Installation

4.1 Safety Precautions

This product has an excellent and reliable performance within the scope of design and use, but manmade harm or sabotages on the equipment should be avoided. Please read the manual carefully and keep it properly for future reference.

- Do not put the equipment in a place that is close to water sources or of high humidity.
- Do not put anything on the power cable. Instead, they should be put away from the cable.
- In order to avoid fire hazard, do not tie a knot on the cable or wrap it.
- The power cable and other equipment's connection fittings should be firmly connected. Besides, they should be checked regularly.
- Please keep the optical fiber socket and the plug clean. Do not look at the cross section of the optical fiber directly when the equipment is working.
- Please keep the equipment clean and use soft cotton cloth to wipe it when necessary.
- Please do not repair the equipment by yourself except for those are explicitly indicated in the manual.

Please immediately cut off the power supply and contact our company under the following conditions.

- Water enters the equipment;
- The equipment has fallen and broken or the equipment case has cracks;
- The equipment works abnormally or the performance displayed has totally changed;
- The equipment generates odor, smog or noise.

4.2 Installation Requirements

- Power supply requirement: 24VDC(12~48VDC), please pay attention to the voltage grade of the power supply.
- Environment requirement: working temperature -40°C~85°C, storage temperature -40°C~85°C, relative humidity 5%~95% (condensation-free).
- Grounding resistance requirement: <math><5\Omega</math>.
- Check if the optical cable has been properly laid or if the optical fiber splice is proper according to the configuration requirement in the contract.
- Avoid direct sunlight, keep away from thermal source or area with intensive electromagnetic interference.
- IMC IMC is installed on the industrial guide rail.
- Check if there are cables and splices needed by installation.

4.3 Installation Method and Steps

4.3.1 Guide Rail Type Installation

Step I: Press the clamp spring of the IMC on the guide rail of the equipment cabinet in a properly inclined way. Shown in Fig. 4-1.

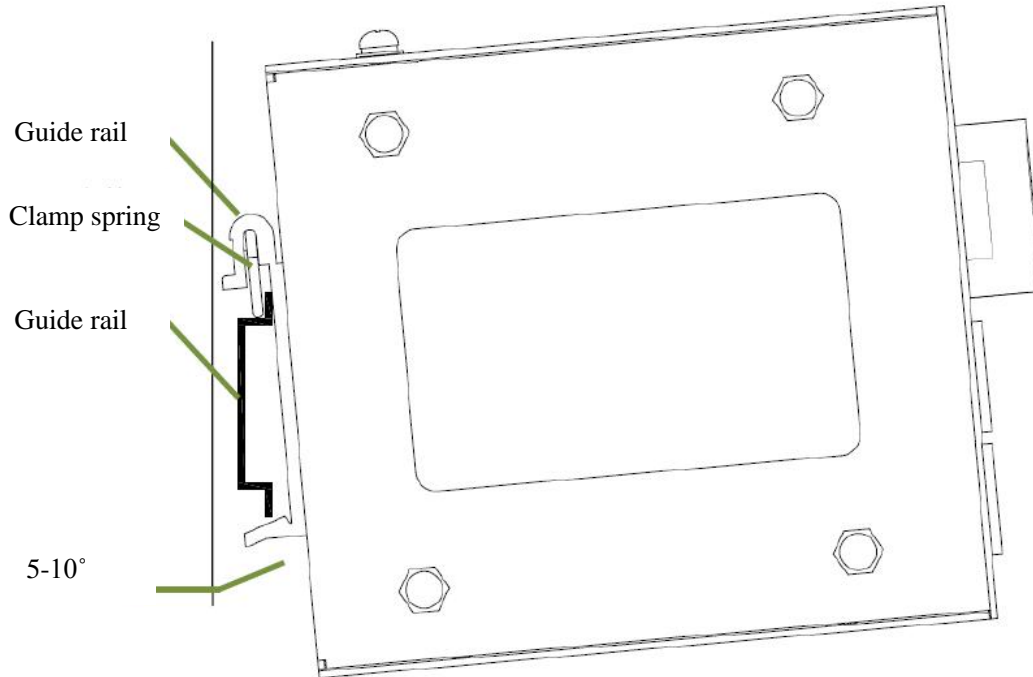


Fig. 4-1 Guide Rail Type Installation

Step II: Press the IMC in a 60° angle on the guide rail of the equipment cabinet by force and buckle it. The effect diagram for installation is shown in Fig. 4-2.

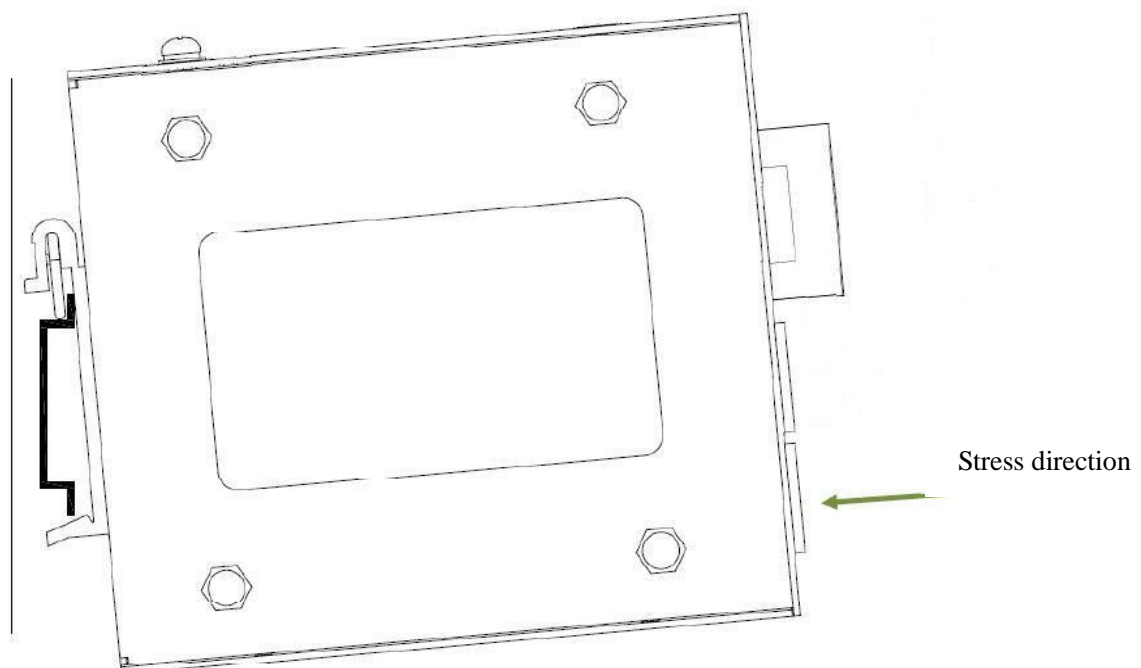


Fig. 4-2 Guide Rail Type Installation

4.3.2 Guide Rail Type Disassembly

The specific procedures are shown as follows:

Step I: Press the equipment to make the bottom of the equipment off the DIN rail. Shown by arrow 1 in Fig. 4-3.

Step II: Turn the equipment in the direction shown in arrow 2 and move the equipment bottom outwards simultaneously. Lift the equipment after the bottom is off the DIN rail. i.e. the equipment can be taken off from the DIN rail.

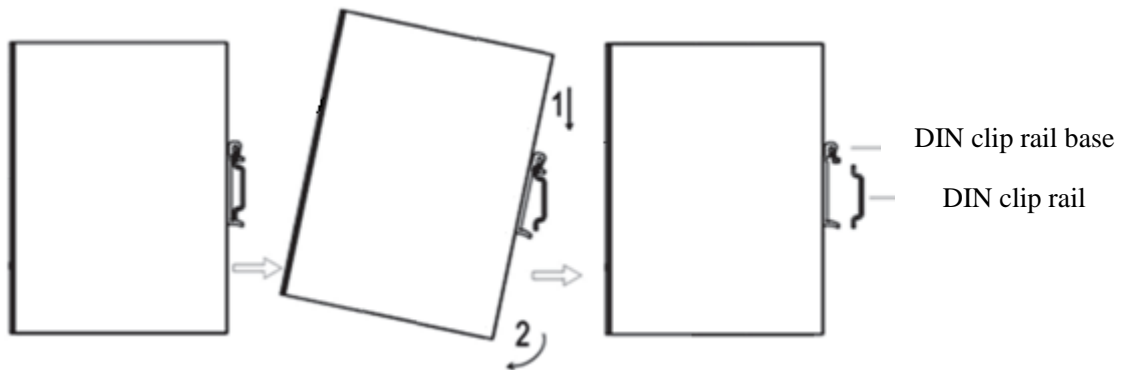


Fig. 4-3 Guide Rail Type Disassembly

4.4 Protective Ground Wiring

The complete equipment is provided with a metal shielding case, so the protective grounding wire on the engineering site should be connected to the grounding hole of the complete equipment.

To improve the anti-interference capability of the IMC, the IMC must be grounded by connecting the grounding cable onto the grounding screw of the IMC according to the working environment. Shown in Fig. 4-4. The connection method is shown below:

Step I: Remove the grounding screw.

Step II: Connect the grounding ring of the cabinet's grounding wire onto the grounding screw.

Step III: Tighten the grounding screw.



Fig. 4-4 Grounding Screw

4.5 Power Supply Wiring

IMC is provided with a 12V~48V dual power supplies (one is used as the main power supply and the other is as a standby) for D.C. supply. The connection mode of the IMC is of terminal connection. The power supply wire of the adapter should be connected to the terminal before use.

Installation method: Take down the terminal from the IMC and loosen the locking screw on the terminal. Then, insert the power supply cable into the terminal before tightening the screw.

The schematic diagram of the front panel is shown in Fig. 4-5.



Fig. 4-5 Power Supply Terminal

4.6 Optical Fiber Wiring

4.6.1 Optical Fiber Wiring

The panel of the IMC is equipped with different types of optical interfaces, including FC, SC, and ST interfaces. All the optical interfaces perform transceiving in a dual mode. Different types of optical interfaces require optical fiber splices of the corresponding types.

- FC splice: It is a round and spiral metal head with independent transceiving.



- SC splice: It has a plastic and square splice with independent transceiving.



- ST splice: It is a round and spiral metal head with independent transceiving.



Warning

- When connecting the optical fiber, please gently insert the optical fiber splice into the optical interface. Do not insert or pull the optical fiber splice with force.
 - The optical fiber is in the single module type or the multiple module type, so users can make a configuration that fits the actual condition. The multiple module optical fiber is often used for short-distance transmission and it is orange in colour; the single module optical fiber is often used for long-distance transmission and it is yellow in colour.
-

4.6.2 Bundling of Optical Fiber

For laying of optical fiber out of equipment cabinet, optical fiber shall be protected by plastic ripple tube from damage. Optical fiber in protection tube shall not be twined with one another with the corner made into a circular arc. Label marks at both ends of optical fiber shall be clear, whose meanings shall correctly indicate corresponding serial number and relation between equipment cabinet and equipment cabinet and between row and row.

After plug-in, optical fiber shall be bundled up. Optical fiber or cables near plugs shall be bundled up in order as shown in Fig. 4-6 with them not twined with one another and strapped with ribbons which shall be in the same line. Cables shall be straight and vertical to the ground.

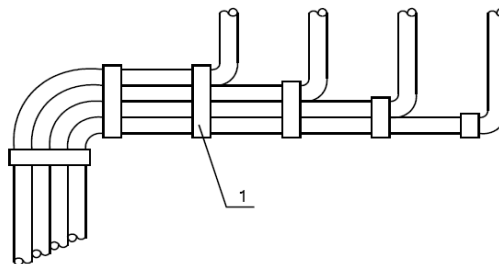
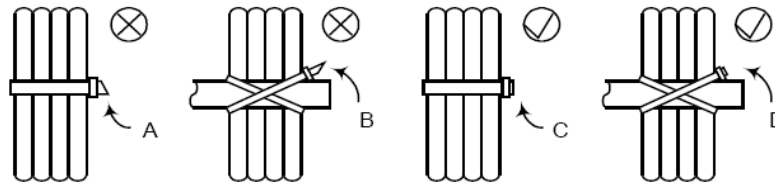


Fig. 4-6 Bundling of Optical Fiber

For use, ribbons of different specifications shall be used for different conditions. Ribbons connected with two or more ribbons shall not be used, or the strength will be reduced after bundling. After strapping, the unwanted parts of ribbons shall be cut off from the junction with no spine at the junction as shown in Fig. 4-7. As shown in the drawing, the strapping form marked with \checkmark is correct, while the strapping form marked with \otimes is wrong. (just as in the following drawing)



There are spines at position A and B.
Position C and D are smooth and neat.

Fig. 4-7 The Requirements of Strapping of Ribbon

When optical fiber or cables are bundled up, the space between ribbons shall be 3~4 times as long as the diameter of cable bundle.

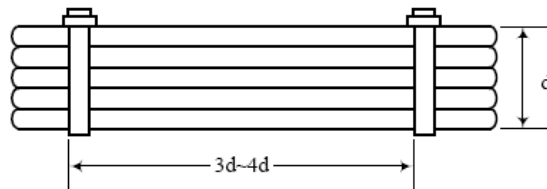


Fig. 4-8 Strapping of Ribbon when Bunched

When bunched optical fiber or cables turns a corner, ribbons shall be strapped in the position as shown in the Fig. 4-9 to avoid broken inner core due to excessive stress at the turning of optical fiber or cables.

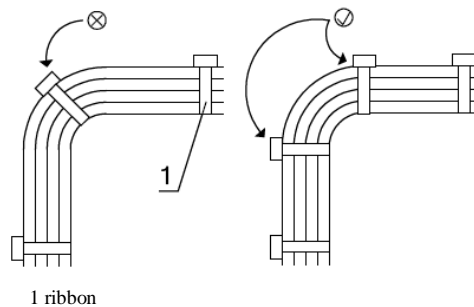


Fig. 4-9 Sketch Map for Turning of Ribbon when Bunched

The optical fiber or cables in equipment cabinet should be laid in the pattern shown in Fig. 4-10.

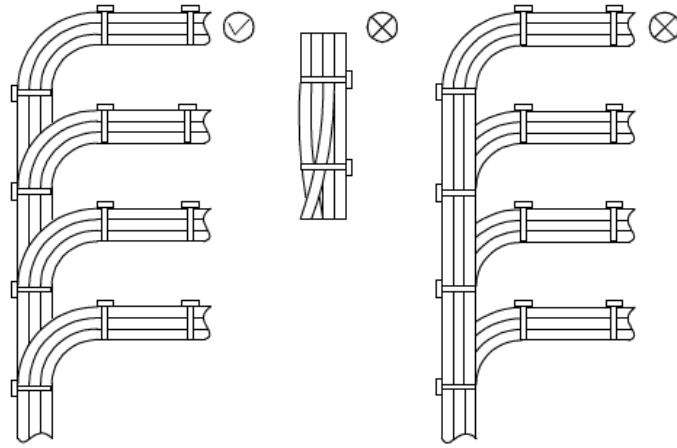


Fig. 4-10 Laying of Optical Fiber or Cables in Equipment Cabinet

V. Inspection after Installation

5.1 Inspection for installation of IMC

the following aspects of rack mounting technology should be inspected:

- The IMC shall be installed as required by relevant design papers.
- IMC shall be installed horizontally and vertically with the deviation no more than 2 mm.
- Whether IMC is installed firmly.
- Whether the racks are deformed during installation.

5.2 Inspection for Laying of Communication Cables

The following aspects of the laying of communication cables should be inspected:

- All cables including power supply cables and communication cables shall be laid separately.
- The turning of cables shall be uniform and smooth with external bending arc vertical or horizontal in a line.
- Tail fiber of optical cable in equipment cabinet shall be bundled up properly without extrusion. The tail fiber out of equipment cabinet shall be protected by casing.
- The installation positions of channel and slot position of cable shall be in conformity with the requirements of construction drawing with the left-right deviation no more than 50 mm.
- For channel laying, cables shall be bundled up with bunched cables close to one another and the appearance straight and neat.
- The plug-in of all cables shall be firm without fall-off caused by natural gravity and etc.
- Both ends of all cables shall be posted with labels for maintenance.

5.3 Inspection for Power Line

The following aspects of laying the power line should be inspected:

- Wires used as power line and ground line of IMC shall be free of junctions in the middle.
- During the connection of power supply terminal of IMC, positive and negative electrode of power supply shall be correct; the connection shall be firm; and the contact of terminal is favourable.
- Whether IMC is installed firmly.
- During laying, in principle, ground line and power line shall be separate from other cables. For the laying in equipment cabinet, they shall be bundled up separately instead of being bundled up into a bundle.

5.4 Inspection for Protective Ground Line

Wires used as protective ground line shall be free of junctions in the middle with the joint ground resistance $< 5\Omega$.

VI. First Power-on

(1) Before the equipment is powered on, check the equipment again.

- Ensure that power line and ground line are connected correctly.
- Ensure that supply voltage is in conformity with the requirement of equipment.

(2) After check, turn on the power supply system of equipment and power on the equipment.

(3) See function description table 6-1 of indicator light for the correct state of equipment after being powered on.

Table 6-1 Function Description of Indicator Light

Name of Indicator Light	State of Indicator Light	State of Equipment
Power light		
PWR1/PWR2	On	IMC is on.
	Off	IMC is out of power supply
100M Optical Port Indicator Light		
FX	On	Optical port is connected
	Flash	With data passing
	Off	Optical port is disconnected

Appendix Term List

Term	Definition
Self-adaption	A feature with appropriate mode configured automatically aiming at speed, duplex and flow control.
Bandwidth	Information capacity transmitted by information channel. E.g. The bandwidth of Fast Ethernet is 100Mbps.
Baud rate	A term indicating signalling rate. The definition is that change times of state of electrical or optic transmission medium within a second.
Network bridge	An equipment running on the second layer of OSI seven layer model. It can connect local area network or network segment that uses the same protocol and automatically learn network address and network configuration.
Broadcast	A data package is sent to all equipment on the network.
Broadcast storm	A situation caused by network bridge ring that endlessly transmit broadcast frame or multicast frames on network bridge.
Full duplex	Set up point-to-point connection between nodes on local area network with IMC adopted and allow both of them to simultaneously receive and transmit data package.
Half duplex	The communication of two nodes can only move in one direction at the same time with simultaneous bidirectional movement not allowed.
MDI	MDI (Medium Dependent Interface), a port connected with other equipment with Ethernet port used as receiving end.

InHand Networks

InHand Networks provides reliable, secured and intelligent M2M solution for electric power, industrial automation, commercial and medical devices. Recognized by world class customers and partners. Proven by a large install base. Expanding with intensive investments in research and development. Enduring for long-term support.

InHand Networks has become leader in industrial grade network technology by providing industrial cellular routers, industrial Ethernet switches, wireless sensor network devices and cloud based M2M platforms.

Connecting devices, enabling services.



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