



IMC-100A Series

10/100Tx to 100Fx Industrial Media Converter



Version 1.0

User Manual

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FCC Notice

This equipment has been tested and found to comply with the limits for a Class-A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

CE Mark Warning

This is a Class-A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Industrial Ethernet Media Converters

Industrial Grade Unmanaged Ethernet Media Converters

User Manual

Version 1.0 (November 2015)

This manual supports the following models:

- | | |
|----------------------|----------------------|
| • IMC-100A-M(-T) | • IMC-100A-WA-M(-T) |
| • IMC-100A-S3(-T) | • IMC-100A-WB-M(-T) |
| • IMC-100A-S5(-T) | • IMC-100A-WA-S2(-T) |
| • IMC-100A-ST-M(-T) | • IMC-100A-WB-S2(-T) |
| • IMC-100A-ST-S3(-T) | |

This document is the current official release manual. Please check our website (www.antaira.com) for any updated manual or contact us by e-mail (support@antaira.com).

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1. Overview

Antaira Technologies' IMC-100A series is an industrial grade unmanaged Ethernet media converter featuring a simple plug-and-play operation to quickly convert between Ethernet and fiber optics. The IMC-100A series supports fast Ethernet speeds of 100Mbps, featuring 1*10/100Tx Ethernet port and 1*100Fx fiber port. This unit is an ideal solution for applications looking to convert between an RJ45 Ethernet connection and a fiber connection.

Antaira's IMC-100A series is IP30 rated and DIN-rail mountable. This product series supports a low voltage power input range of 12~48VDC. Also, there are two operating temperature models for either a standard temperature range (STD: -10°C to 70°C) or an extended temperature range (EOT: -40°C to 75°C). It also provides Ethernet and fiber optic connectivity for outdoor or harsh industrial environment applications, such as, security surveillance, ITS-traffic monitoring systems, oil/gas and mining, facility management for power/utility, water wastewater treatment plants, and lastly, automated production lines in factory automation.

1.1 Key Features

- System Interface/Performance
 - RJ-45 ports support the auto MDI function
 - Embedded 1*10/100Tx and 1*100Fx
 - Store-and-forward switching architecture
- Power Input
 - DC 12~48V redundant power, with a 6-pin removal terminal block
- Operating Temperature
 - Standard operating temperature model: -10°C ~ 70°C
 - Extended operating temperature model (-T): -40°C ~ 80°C
- Case/Installation
 - IP-30 protection
 - DIN-Rail and wall mount design

1.2 Package Contents

- 1 – IMC-100A Series Media Converter: 10/100Tx to 100Fx Industrial Media Converter
- 1 - Product CD
- 2 - Wall mounting brackets and screws

1.3 Safety Precaution

Attention: If the DC voltage is supplied by an external circuit, please use a protection device on the power supply input. The industrial Ethernet media converter's hardware specs, ports, cabling information, and wiring installation will be described within this user manual.

2. Hardware Description

2.1 Physical Dimensions

Figure 2.1, below, shows the physical dimensions of Antaira Technologies' IMC-100A series: 10/100Tx to 100Fx industrial media converter.

(W x D x H) is 30mm x 99mm x 140mm

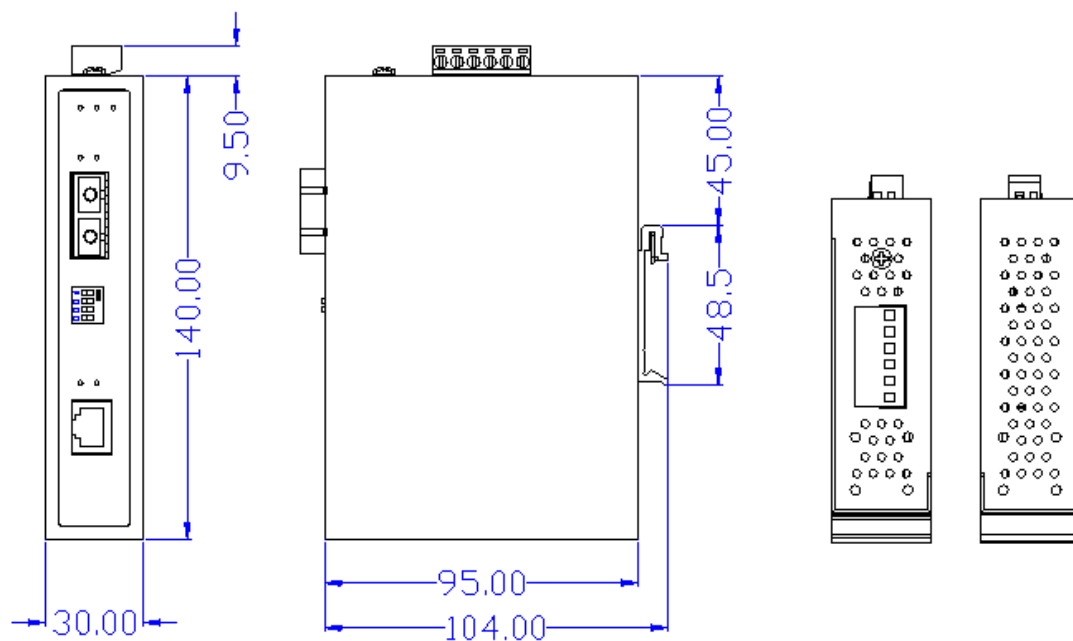


Figure 2.1

IMC-100A Series Physical Dimensions

2.2 Front Panel

The front panel of the IMC-100A series: 10/100Tx to 100Fx industrial media converter (*Figure 2.2*).

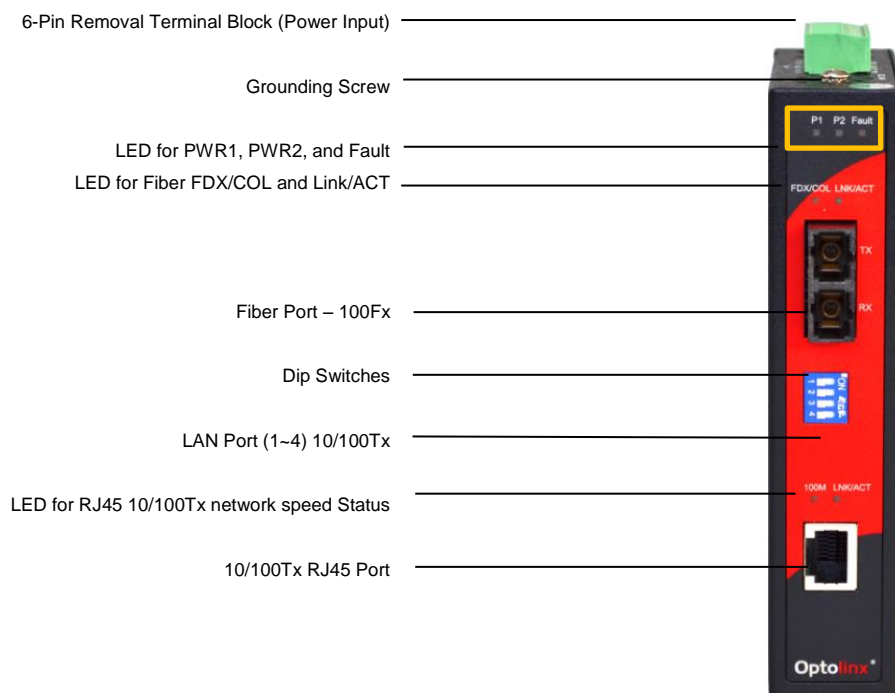


Figure 2.2
Front Panel of the IMC-100A Series

2.3 Top View

Figure 2.3, below, shows the top panel of the IMC-100A series media converter that is equipped with one 6-pin removal terminal block connector for dual DC power inputs (12~48VDC).

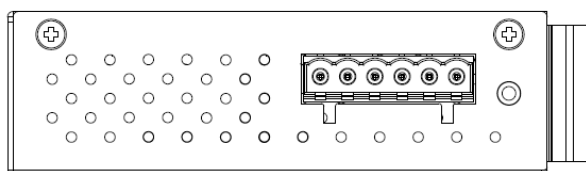


Figure 2.3
Top Panel View of IMC-100A Series

2.4 LED Indicators

There are LED light indicators located on the front panel of the industrial Ethernet media converter that display the power status and network status. Each LED indicator has a different color and has its own specific meaning, see below in *Table 2.1*.

LED	Color	Description	
P1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
P2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
Fault	Red	On	Power input 1 or 2 is inactive
		Off	Power input 1 and 2 are both functional, or no power inputs
Fiber Port	Yellow Green	FDX/COL	Solid: Full Duplex Mode Flashing: Packet Collision
		Link/ACT	Networking is active
		Off	Not connected to network
RJ45 Ethernet Port	Green	100M	Linked to network at 100Mbps
		LINK/ACT	Networking is active
		Off	Not connected to network

Table 2.1

LED Indicators for IMC-100A Series

2.5 Ethernet Ports

■ RJ-45 Ports

RJ-45 Ports (Auto MDI/MDIX): The RJ-45 port is auto-sensing for 10/100Base-T, or 100Base-Tx device connections. Auto MDI/MDIX means that the media converter can connect to another switch or workstation without changing the straight-through or crossover cabling. See the figures shown below for the straight-through and crossover cabling schematics.

■ RJ-45 Pin Assignments (Table 2.2)

Pin Number	Assignment
1	Rx+
2	Rx-
3	Tx+
6	Tx-

Table 2.2

RJ45 Pin Assignments

Note: The “+” and “-” signs represent the polarity of the wires that make up each wire pair.

The RJ45 port on this industrial Ethernet media converter supports automatic MDI operations. Users can use straight-through cables (*Figure 2.4 & Figure 2.5*) for all network connections to PCs, servers, and other switches or hubs. With a straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3 and 6 at the other end of the cable. The table below (*Table 2.3*) shows the 10BASE-T/100BASE-TX/1000BASE-T MDI port pin outs.

Pin MDI-X	Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)

Table 2.3
Ethernet Signal Pin Outs

The following figures show the cabling schematics for straight-through and crossover cables.

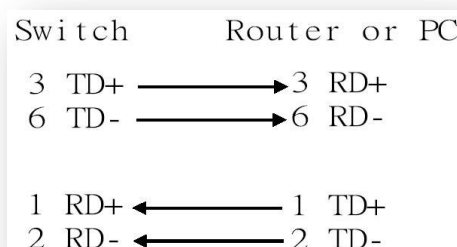


Figure 2.4
Straight-Through Cables Schematic

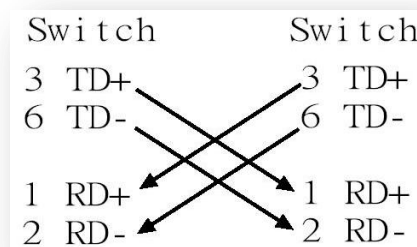


Figure 2.5
Crossover Cables Schematic

2.6 Cabling

- Twisted-pair segments can be connected with an unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. The cable must comply with the IEEE 802.3u 100Base TX standard (e.g. Category 5, 5e, or 6). The cable between the equipment and the link partner (media converter, switch, hub, workstation, etc.) must be less than 100 meters (328 ft.) long.

2.7 Wiring the Power Inputs

Please follow the steps below to insert the power wire.

1. Insert the positive and negative wires into the PWR1 (V1+, V1-) and PWR2 (V2+, V2-) contacts on the terminal block connector as shown below in *Figure 2.6*.

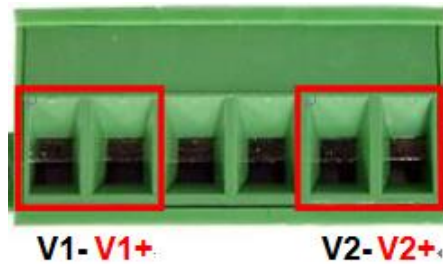


Figure 2.6

Power Terminal Block

2. Tighten the wire-clamp screws to prevent the wires from loosening, as shown below in *Figure 2.7*.

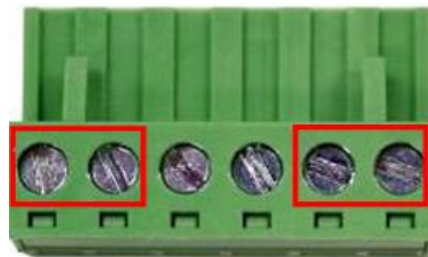


Figure 2.7

Power Terminal Block

****Note:**

- Only use copper conductors, 60/75°C, tighten to 5 lbs.
 - The wire gauge for the terminal block should range between 18~20 AWG.
-

2.8 Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of the terminal block connector as shown in *Figure 2.8*. By inserting the wires, it will detect the fault status including any power failures and form a normal open circuit. An example is shown in *Figure 2.8*.

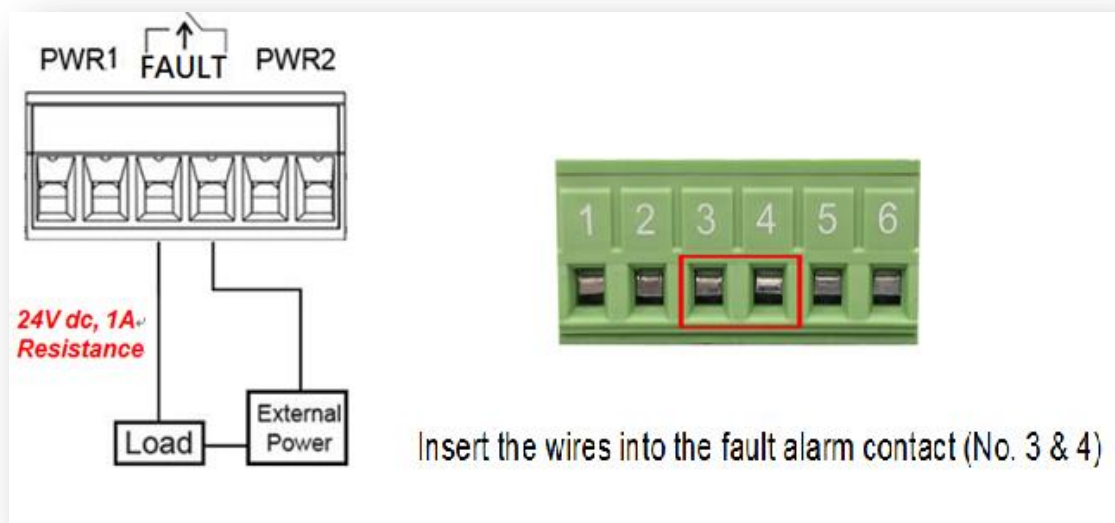


Figure 2.8

Wiring the Fault Alarm Contact

- **Note:**
- The wire gauge for the terminal block should range between 12 ~ 24 AWG.
 - If only using one power source, jumper Pin 1 to Pin 5 and Pin 2 to Pin 6 to eliminate the power fault alarm.

3. Mounting Installation

3.1 DIN-Rail Mounting

The DIN-Rail is pre-installed on the industrial Ethernet media converter from the factory. If the DIN-Rail is not on the industrial Ethernet media converter, please refer to *Figure 3.1* to learn how to install the DIN-Rail on the media converter.

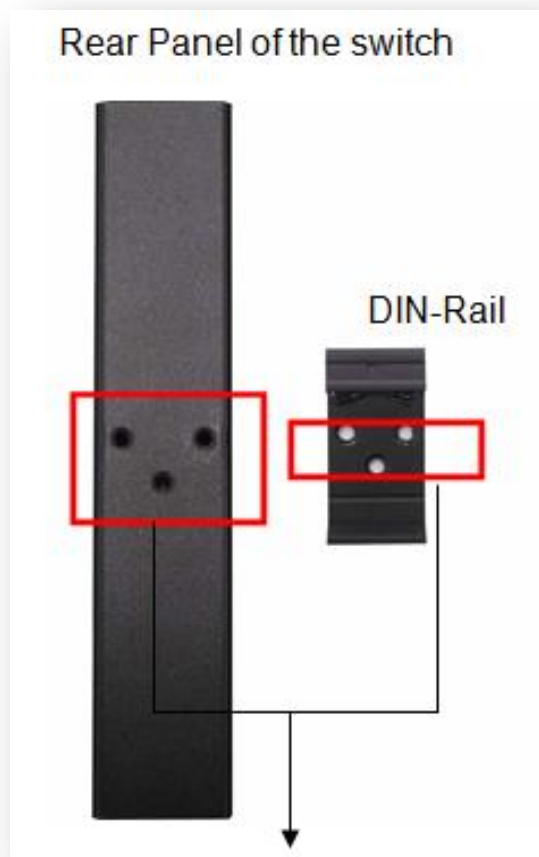


Figure 3.1

The Rear Side of the Media Converter and DIN-Rail Bracket

Follow the steps below to learn how to hang the industrial Ethernet media converter.

1. Use the screws to install the DIN-Rail bracket on the rear side of the industrial Ethernet media converter.
2. To remove the DIN-Rail bracket, do the opposite from step 1.
3. After the DIN-Rail bracket is installed on the rear side of the media converter, insert the top of the DIN-Rail on to the track as shown below in *Figure 3.2*.



Figure 3.2

Insert the Media Converter on the DIN-Rail

4. Lightly pull down the bracket on to the rail as shown below in *Figure 3.3*.

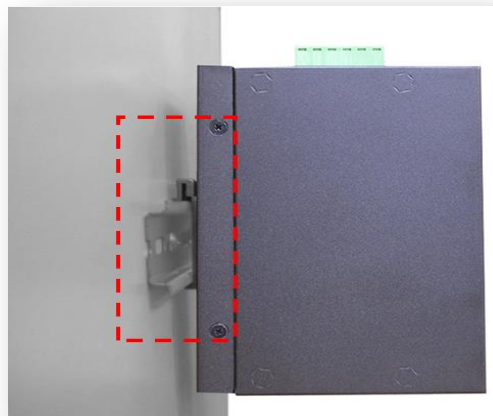


Figure 3.3

Stabilize the Media Converter on the DIN-Rail

5. Check if the bracket is mounted tightly on the rail.
6. To remove the industrial Ethernet media converter from the rail, do the opposite from the above steps.

3.2 Wall Mounting

Follow the steps below to mount the industrial Ethernet media converter using the wall mounting bracket as shown below in *Figure 3.4*.

1. Remove the DIN-Rail bracket from the industrial media converter by loosening the screws.
2. Place the wall mounting brackets on the top and bottom of the industrial media converter.
3. Use the screws to screw the wall mounting bracket on the industrial media converter.
4. Use the hook holes at the corners of the wall mounting bracket to hang the industrial Ethernet media converter on the wall.
5. To remove the wall mount bracket, do the opposite from the steps above.

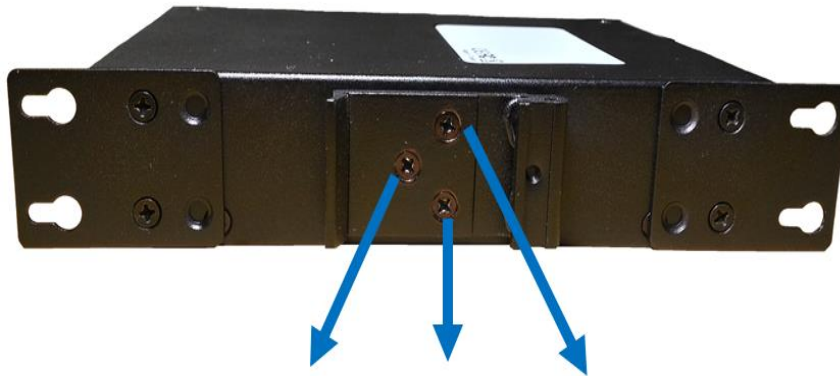


Figure 3.4

Remove DIN-Rail Bracket from the Media Converter

Below, in *Figure 3.5* are the dimensions of the wall mounting bracket.

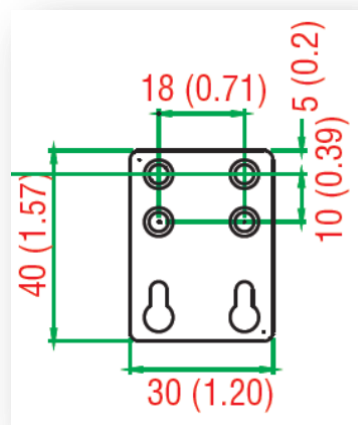


Figure 3.5

Wall Mounting Bracket Dimensions

4. Hardware Installation

4.1 Installation Steps

This section will explain how to install Antaira Technologies' IMC-100A (T) series: 10/100Tx to 100Fx industrial media converter.

Installation Steps

1. Unpack the industrial Ethernet media converter from the original packing box.
2. Check if the DIN-Rail bracket is screwed on the industrial Ethernet media converter.
 - If the DIN-Rail is not screwed on the industrial Ethernet media converter, please refer to the **DIN-Rail Mounting** section for DIN-Rail installation.
 - If it is required to wall mount the industrial Ethernet media converter, please refer to the **Wall Mounting** section for wall mounting installation.
3. To hang the industrial Ethernet media converter on a DIN-Rail or wall, please refer to the **Mounting Installation** section.
4. Power on the industrial Ethernet media converter and then the power LED light will turn on.
 - For the help on how to wire power, please refer to the **Wiring the Power Inputs** section.
 - Please refer to the **LED Indicators** section for LED light indication.
5. Prepare the twisted-pair, straight-through category 5 cable for Ethernet connection.
6. Insert one side of the RJ-45 cable into the media converters Ethernet port and on the other side into the networking device's Ethernet port, e.g. switch PC or server.
 - The Ethernet port's (RJ-45) LED on the industrial Ethernet media converter will turn on when the cable is connected to the networking device.
 - Please refer to the **LED Indicators** section for LED light indication.
7. When all connections are set and the LED lights all show normal, the installation is complete.

5. Network Application

This segment provides an example of an industrial Ethernet media converter application (*Figure 5.1*).



Figure 5.1
Networking Application Example

6. Trouble Shooting

- Always verify the right power cord or adapter is being used. Never use a power supply or adapter with a non-compliant DC output voltage or it will burn the equipment.
- Select the proper UTP or STP cable in order to construct the network. Use an unshielded twisted-pair (UTP) or shield twisted-pair (STP) cable for RJ-45 connections: 100Ω Category 5e for 10/100/1000Mbps. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).
- **Diagnosing LED Indicators:** To assist in identifying problems, the media converter can be easily monitored with the LED indicators which help to identify if any problems exist.
 - Please refer to the LED Indicators section for LED light indication.
- If the power indicator LED does not turn on when the power cord is plugged in, the user may have a problem with the power cord. Check for loose power connections, power losses or surges at the power outlet.
 - Please contact Antaira for technical support service, if the problem still cannot be resolved.
- If the industrial media converter LED indicators are normal and the connected cables are correct but the packets still cannot transmit, please check the system's Ethernet devices' configuration or status.

7. Technical Specifications

Table 7.1 has the technical specifications for Antaira Technologies' IMC-100A series: 10/100Tx to 100Fx industrial media converter.

Standards	IEEE 802.3	10Base-T 10Mbit/s Ethernet
	IEEE 802.3u	100Base-Tx, 100Base-Fx, Fast Ethernet
	IEEE 802.3x	Back pressure flow control
Technology	Protocol	CSMA/CD
	Data Process	Store and Forward
	Transfer Rate	14,880 pps for 10Base-T Ethernet port 148,800 pps for 100Base-TX Fast Ethernet port
	Transmission Distance	Up to 100M (Fast Ethernet)
	Transmission Speed	Up to 100Mbps
Port Interface	Ethernet (RJ45) Port	1*10/100Tx auto negotiation speed, full/half duplex mode, and auto MDI connection
	Fiber Port	1*100Fx
	LED Indicator	Per unit: Power1(Green), Power2(Green), Fault(Red) Per port: Link/Activity (Green)
	Network Cable	10BaseT: 2-pair UTP/STP Cat.3,4,5 cable EIA/TIA-568 100-ohm (100m) 100BaseTX: 2-pair UTP/STP Cat.5 cable EIA/TIA-568 100-ohm (100m)
Mechanical Characteristics	Housing	Metal IP30 protection
	Dimension	30 x 140 x 95 mm
	Weight	Unit Weight: 0.95 lbs. Shipping Weight: 1.4 lbs.
	Mounting	DIN-Rail Mounting, wall-mounting (optional)
Power Requirement	Input Voltage	12~48VDC Redundant Input
	Power Connection	1 removable 6-contact terminal block
	Fault Output	1 Relay output
	Power Consumption	3 Watts
Environmental Limits	Operating Temperature	Standard: -10 to 70°C (14 to 158F) EOT: -40 to 75°C (-40 to 167F)
	Operating Humidity	5% to 95% (Non-Condensing)
	Storage Temperature	-40 to 85°C (-40 ~ 185F)
Regulatory Approvals	EMI	FCC Class A IEC61000-4-2/3/4/5/6/8 IEC61000-6-2 IEC61000-6-4
	Stability Testing	IEC60068-2-32 (Free fall) IEC60068-2-27 (Shock) IEC60068-2-6 (Vibration)
	Safety	UL, CE, FCC

Table 7.1

IMC-100A Series Technical Specifications

Antaira Customer Service and Support

(Antaira US Headquarter) + 844-268-2472

(Antaira Europe Office) + 48-22-862-88-81

(Antaira Asia Office) + 886-2-2218-9733

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