IFS MCR300-1T-2S User Manual

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Intended use Use this product only for the purpose it was designed for; refer to the data sheet and user documentation for details. For the latest product information, contact your local supplier or visit us online at www.interlogix.com.

Certification CE N4131

FCC compliance 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

You are cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

ACMA compliance **Notice!** 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.

Canada This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme á la norme NMB-003du Canada.

European Union directives **2004/108/EC (EMC Directive):** Hereby, UTC Climate Controls & Security Corporation, Inc. declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2004/108/EC.

Contact Information For contact information, see www.interlogix.com or www.utcfssecurityproducts.eu.

TABLE OF CONTENTS

1. Introduction

1.1 Checklist

Check the contents of your package for following parts:

- MCR300-1T-2S
- User's Manual x 1
- 5V / 2.5A AC-DC Power Adapter x 1

If any of these pieces are missing or damaged, please contact your dealer immediately, if possible, retain the carton including the original packing material, and use them against to repack the product in case there is a need to return it to us for repair.

MCR300-1T-2S is with two vacant SFP module slots. The 1000Base-X SFP module is not bundled with in the package

1.2 Product Description

The MCR300-1T-2S is 3-Port Gigabit, one TP and dual SFP Media Converter which supports conversion between 10/100/1000Base-T and 1000Base-SX/LX network, which is SFP connector with single-mode or multi-mode media as required. The Ethernet signal allows different types of SFP transceiver to connect easily, efficiently and inexpensively.

The MCR300-1T-2S Gigabit Media Converter can be used as a stand-alone unit or as a slide-in module to the IFS Media Converter Chassis (**MCR300** rack chassis). This media chassis can assist in providing DC power for MCR300-1T-2S Gigabit Media Converter to maintain the fiber-optic network at one centralized location. With the 3-Port Switch mode, they work in high performance Store and Forward mechanism, and can prevent packet loss with IEEE 802.3x Flow Control (Full-Duplex) and Back Pressure (Half-Duplex).

Via the build-in DIP-switch, the MCR300-1T-2S can be configured as 3-Port Ethernet switch or 2-Port Redundant media converter. With the 3-Port Switch mode, it can operate Store-and-Forward mechanism with high performance, with the 2-Port redundant mode, it provides redundancy of link for highly critical Ethernet applications. The redundant-mode supports auto-recover function. If the destination port of a packet is link down, it forwards the packet to the other port of the backup pair.

As the MCR300-1T-2S Media Converter fully complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T and IEEE 802.3z 1000Base-LX / SX, the Gigabit media conversion installation is quite quick and easy by simple plugging and playing feature.

With 1000Base-SX / LX SFP ports, the MCR300-1T-2S is with high reliability and flexibility to extend the distance up to 550m, 10km, or longer. It depends on the 1000Base-SX / LX SFP transceiver modules.

1.3 Product Features

■ Standard

- Comply with IEEE 802.3 10Base-T
- Comply with IEEE 802.3u 100Base-TX
- Comply with IEEE 802.3ab 1000Base-T
- Comply with IEEE 802.3z 1000Base-SX / LX
- IEEE 802.3x Full-Duplex Flow-Control, Back-Pressure in Half-Duplex eliminate packets loss

■ Interface

- Dual 1000Base-SX / LX SFP Fiber-Optic Slots
- One 10/100/1000Base-T Copper, auto MDI/MDIX function
- Auto-Negotiation for 10/100/1000Base-T; Half-duplex or Full-duplex for 10Mbps and 100Mbps, full-duplex for 1000Mbps
- Supports maximum frame size up to 1522 bytes
- IEEE 802.1Q Tag VLAN Transparent, Multicast pass through

■ Redundancy

- Link status auto-detect and redundant on Dual ports with same connector type
- Only Primary-Port is active at a time, the Backup-Port is blocked
- While Primary-Port link fail occurrences, the traffic swaps to Backup-Port automatically
- Once the Primary-Port status backs to link up, the traffic swaps from Backup-Port to Primary-Port
- Hardware fiber port redundant

■ Mechanical

- External 5V / 2A DC power supply
- LED indicators for easy network diagnose
- DIP Switch for 3-Port operation with Gigabit Switch mode or Redundant mode
- Compact in size, easy installation
- Can be installed on IFS's 19" Media Converter Chassis (**MCR300**)
- Wall mounting and DIN-Rail Supported

1.4 Product Specification

Model		**MCR300-1T-2S**
Hardware Specification		
Hardware Version		2
Ports	**Copper**	1 x 10/100/1000Base-T port
	Fiber	2 x 1000Base-X SFP slots
Cable	**Twisted-Pair**	10Base-T: 2-Pair UTP CAT. 3,4,5, up to 100 meters 100Base-TX: 2-Pair UTP CAT. 5, 5e up to 100 meters 1000Base-T: 4-Pair UTP CAT. 5e,6 up to 100 meters
	Fiber-Optic Cable	50/125μm or 62.5/125μm multi-mode fiber cable, up to 220 & 550 meters 9/125μm single-mode cable, provide long distance for 10 /20 /30 /60 /70km (vary on SFP module)
LED Display		**System**: One Power LED (**Green**) **Fiber Port**: Two LNK/ACT LED (**Green**) **TP Port** : One Speed LED (**Green**) , One LNK/ACT LED (**Orange**)
Switch Processing Scheme		Store and Forward
Fabric		6Gbps
Throughput (packet per second)		4.4pps
Maximum Packet Size		1522 Bytes
Flow Control		Back pressure for Half-Duplex. IEEE 802.3x Pause Frame for Full-Duplex
Power Requirement		5V DC, 2A max.
Power Consumption		5.4 Watts / 18.5 BTU per hour max.
Dimension (W x D x H)		94 x 70 x 26mm
Weight		191g (device only)
Standard Conformance		
EMI Safety		FCC Class B, CE
Operating environment		0 ~ 50 Degree C
Storage environment		-10 ~ 70 Degree C
Operating Humidity		5 ~ 95%, Relative Humidity, non-condensing
Storage Humidity		5 ~ 95%, Relative Humidity, non-condensing
Standard Compliance		IEEE 802.3 10Base-T IEEE 802.3u 100Base-TX IEEE 802.3ab 1000Base-T IEEE 802.3z 1000Base-SX/LX IEEE 802.3x Flow Control

2. Hardware Description

This product provides three different running speeds – 10Mbps, 100Mbps and 1000Mbps in the same Gigabit Media Converter and automatically distinguishes the speed of incoming connection.

This section describes the functionalities of MCR300-1T-2S components and guides how to install it on the desktop or shelf. Basic knowledge of networking is assumed. Please read this chapter completely before continuing.

2.1 Product Outlook

The MCR300-1T-2S overview showed as below:

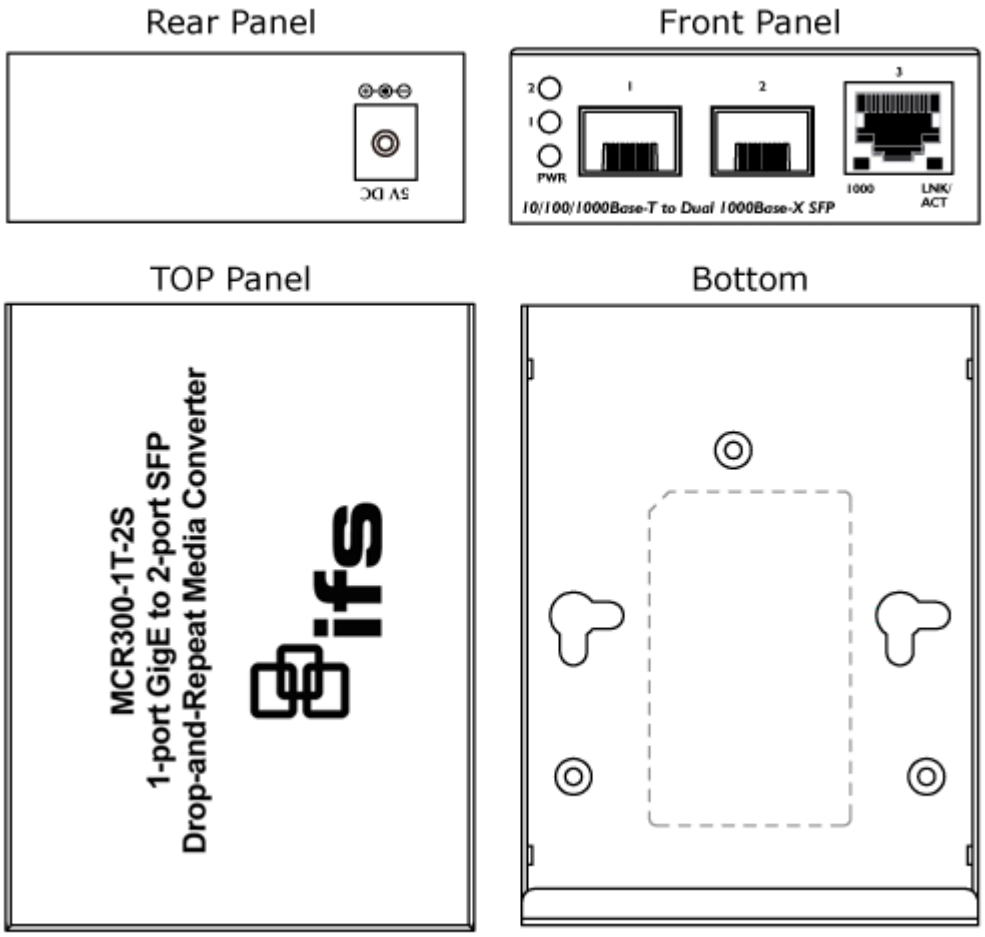


Figure 2-1-1: MCR300-1T-2S Overview

2.2 Front Panel

The Front Panel of the Gigabit Media Converter consists of two 1000Base-X SFP slots and one Auto-Sensing 10/100/1000Mbps Ethernet RJ-45 Port. Figure 2 shows a front panel of Gigabit Media Converter.

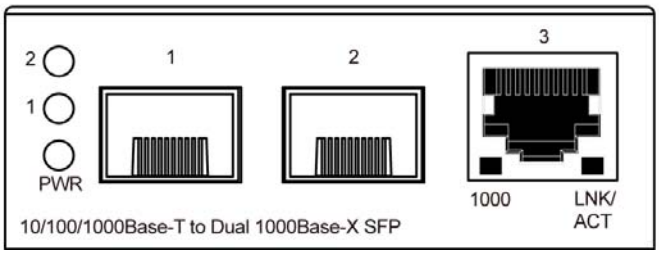


Figure 2-2-1: MCR300-1T-2S Front Panel

2.2.1 LED Indicators

■ **System**

LED	Color	Function
PWR	**Green**	Lit: Power on.

■ **1000Base-SX/LX SFP Slots**

LED	Color	Function	
1	**Green**	**Lit**	Indicate that the fiber optical port is link up.
		Blink	Indicate that the converter is actively sending or receiving data over that port.
		Off	Indicate that the fiber optical port is link down.
2	**Green**	**Lit**	Indicate that the fiber optical port is link up.
		Blink	Indicate that the converter is actively sending or receiving data over that port.
		Off	Indicate that the fiber optical port is link down.

■ **10/100/1000Base-T Port**

LED	Color	Function	
LNK/ACT	**Orange**	**Lit**	Indicate that the copper port is link up.
		Blink	Indicate that the converter is actively sending or receiving data over that port.
		Off	Indicate that the copper port is link down.
1000	**Green**	**Lit**	Indicate that the copper port is operating at **1000Mbps**.
		Off	Indicate that the copper port is **link down** or **10/100Mbps**.

2.3 Rear Panel

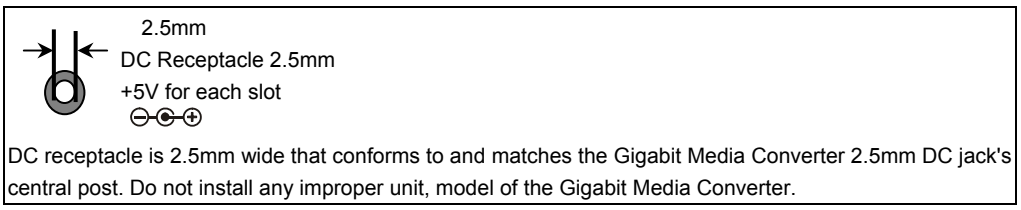
The rear panel of the Gigabit Media Converter indicates one DC jack, which accepts input power with 5V DC 2A.

Figure 2-3-1: One DC jack for DC power input

Power Notice:

Power Information: the power jack of MCR300-1T-2S is with 2.5mm in the central post and required +5VDC power input. It will conform to the bundled AC-DC adapter and IFS's Media Chassis. Should you have the issue to make the power connection, please contact your local sales representative?

Please keep the AC-DC adapter as spare parts when your MCR300-1T-2S is installed to a Media Chassis.



DC receptacle is 2.5mm wide that conforms to and matches the Gigabit Media Converter 2.5mm DC jack's central post. Do not install any improper unit, model of the Gigabit Media Converter.

The device is a power-required device, it means, it will not work till it is powered. If your networks should active all the time, please consider using UPS (Uninterrupted Power Supply) for your device. It will prevent you from network data loss or network downtime. In some area, installing a surge suppression device may also help to protect your Gigabit Media Converter from being damaged by unregulated surge or current to the converter or the power adapter.

2.4 Side View

The side panel of the Gigabit Media Converter indicates One DIP switch for set 3-Port switch mode or 2-Port Redundant mode, **"ON"** for operate at 2-Port Redundant mode. And **"OFF"** to operate at 3-Port switch mode.

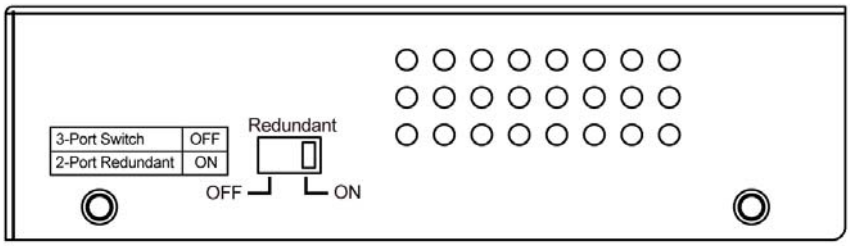


Figure 2-4-1: MCR300-1T-2S Side Panel

Redundancy Overview

The MCR300-1T-2S provides rapid fiber redundancy of link for highly critical Ethernet applications. The redundant-mode supports auto-recover function. If the destination port of a packet is link down, it forwards the packet to the other port of the backup pair. The following figure shows the redundant function.

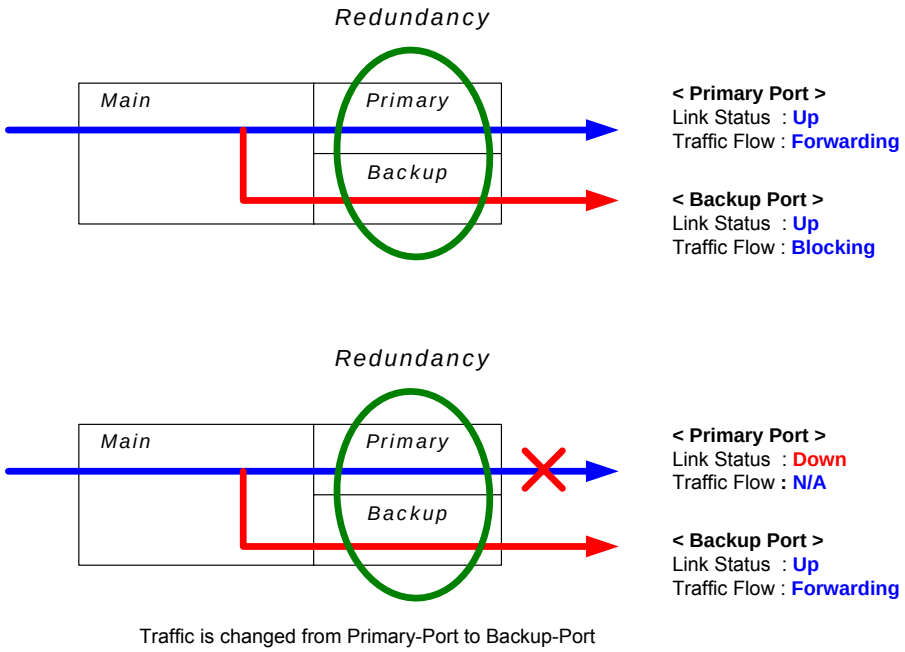


Figure 2-4-2: Redundancy Behavior Topology

- Link status auto detect and redundant on Dual ports with same connector type.
- Only Primary-Port is active at a time, the Backup-Port is blocked.
- While Primary-Port link fail occur, the traffic swap to Backup-Port automatically.
- Once the Primary-Port status back to link up, the traffic swap from Backup-Port to Primary-Port.

2.5 Install the Media Converter

This section describes how to install your Gigabit Media Converter and make connections to the Gigabit Media Converter. Please read the following topics and perform the procedures in the order being presented. The hardware installation of Gigabit Media Converter do not need software configuration. To install your Gigabit Media Converter on a desktop or shelf, simply complete the following steps.

2.5.1 Stand-alone Installation

The MCR300-1T-2S is with high reliability and flexibility to extend the distance up to 550m and 10 /20 /30 /60 / 70km. It depends on the 1000Base-SX / LX SFP transceiver modules; the SFP transceiver is hot-pluggable and hot-swappable. You can plug-in and out the transceiver to / from any SFP port without having to power down the Gigabit Media Converter.

To install a MCR300-1T-2S stand-alone, on a desktop or shelf, simply complete the following steps:

Step 1: Turn off the power of the device/station in a network to which the MCR300-1T-2S will be attached.

Step 2: Ensure that there is no activity in the network.

Step 3: Slot in the 1000Base-X SFP module. Make sure both side of the SFP transceiver are with the same media type, for example: 1000Base-SX / 550m multi-mode to 1000Base-SX / 550m multi-mode, 1000Bas-LX / 10km single mode to 1000Base-LX / 10km single mode.

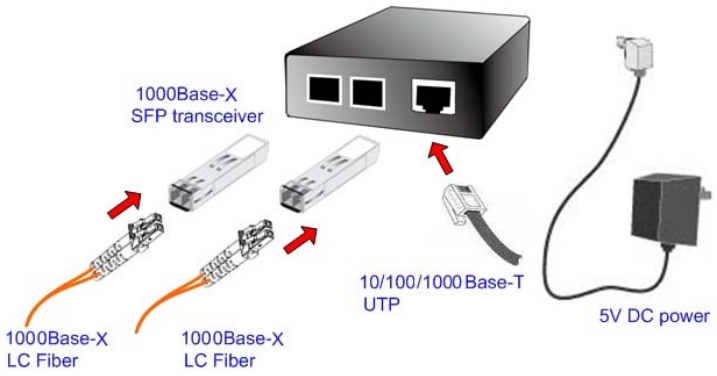


Figure 2-5-1: MCR300-1T-2S Gigabit Media Converter Stand Alone Installation

Step 4: Connect the fiber cable. Attach the duplex LC connector on the network cable into the SFP transceiver.

Step 5: Attach fiber cable from the MCR300-1T-2S to the fiber network. TX, RX must be paired at both ends.

Step 6: Connect the 5V DC power adapter to the MCR300-1T-2S and verify that the Power LED lights up.

Step 7: Turn on the power of the device/station; the LINK LED should light when all cables are well attached.

Note

1. It is recommends using IFS **S30** series SFP modules for the Gigabit Media Converter. If you insert a SFP transceiver that is not supported, the Gigabit Media Converter will not recognize it. Please check appendix or go visit our WEB site for details specification information.
2. To prevent from optic acceptor malfunction, check the both wires / transmitter before power on the converter.
3. To remove the SFP module, please remove the fiber connectors in advanced and push the belt or letch of the module. Pull out the module with violent may damage the module and the Gigabit Media Converter.

■ **Approved IFS SFP Transceivers**

The MCR300-1T-2S Gigabit Media Converter supports both Single mode and Multi-mode SFP transceiver. The following list of approved IFS SFP transceivers is correct at the time of publication:

UTC Model	SFP Description
S30-1SLC/A-10	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1310nm/1550nm, 10km , A End
S30-1SLC/A-20	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1310nm/1550nm, 20km, A End
S30-1SLC/A-60	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1310nm/1550nm, 60km, A End
S30-1SLC/B-10	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1550nm/1310nm, 10km , B End
S30-1SLC/B-20	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1550nm/1310nm, 20km, B End
S30-1SLC/B-60	SFP, LC Connector, Single Mode, Gigabit, 1 fiber, 1550nm/1310nm, 60km, B End
S30-2MLC	SFP, LC Connector, Multi Mode, Gigabit, 2 fiber,850nm/850nm, 550m
S30-2MLC-2	SFP, LC Connector, Multi Mode, Gigabit, 2 fiber,1310nm/1310nm, 2km
S30-2SLC-10	SFP, LC Connector, Single Mode, Gigabit, 2 fiber,1310nm/1310nm, 10km
S30-2SLC-30	SFP, LC Connector, Single Mode, Gigabit, 2 fiber,1310nm/1310nm, 30km
S30-2SLC-70	SFP, LC Connector, Single Mode, Gigabit, 2 fiber,1550nm/1550nm, 70km
S30-RJ	SFP, RJ-45, Gigabit, 100m

2.5.2 Media Chassis Installation

To install the Gigabit Media Converter in a **19-inch** width standard rack, follow the instructions described below.

Step 1: Place your Gigabit Media Converter on a hard flat surface, with the front panel positioned towards your front side.

Step 2: Carefully slide in the module until it is fully and firmly fitted into the slot of the chassis, the Power LED of the Gigabit Media Converter will turns ON.

Figure 2-5-2: Insert a Gigabit Media Converter into an available slot

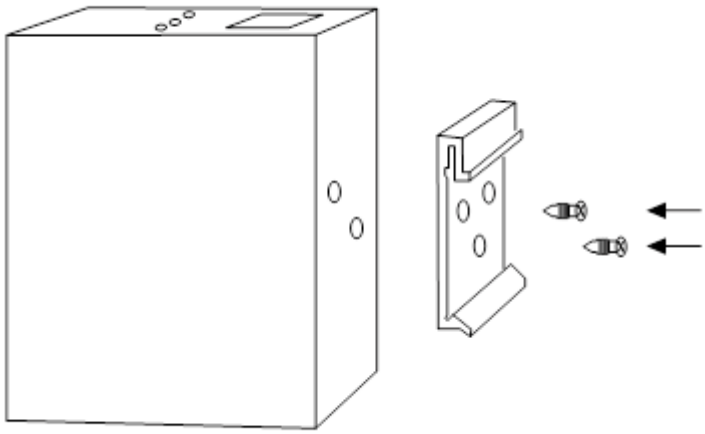
1. Never push the converter into the slot with violent, it could damage the chassis.

2. The Media Converter Chassis supports hot-swap; there is no need to turn off the whole chassis before slide in the new converter.

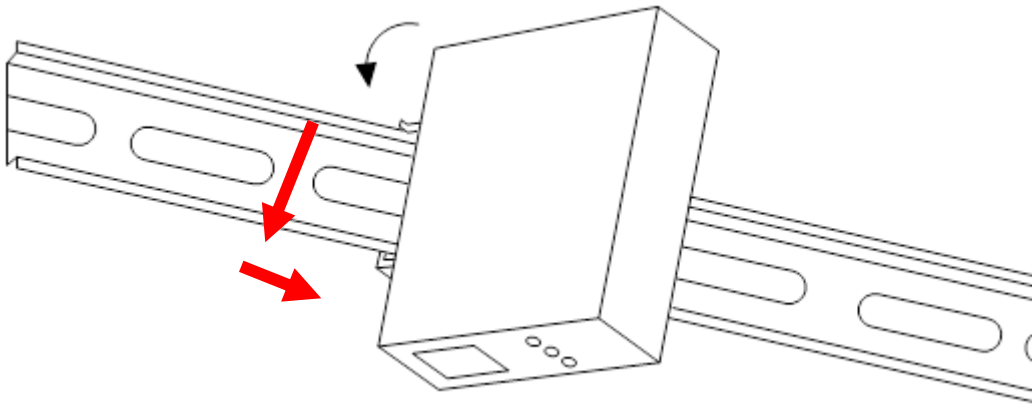
2.5.3 Optional DIN-Rail Installation

There are two DIN-Rail holes on the left side of the MCR300-1T-2Sthat allows it can be easily installed with DIN-Rail mounting. The IFS optional DIN-Rail mounting Kit – RKE-DIN can be order separately. When need to replace the wall mount application with DIN-Rail application on the MCR300-1T-2S, please refer to following figures to screw the DIN-Rail on the GT-1205A. To hang the MCR300-1T-2S, follow the below steps:

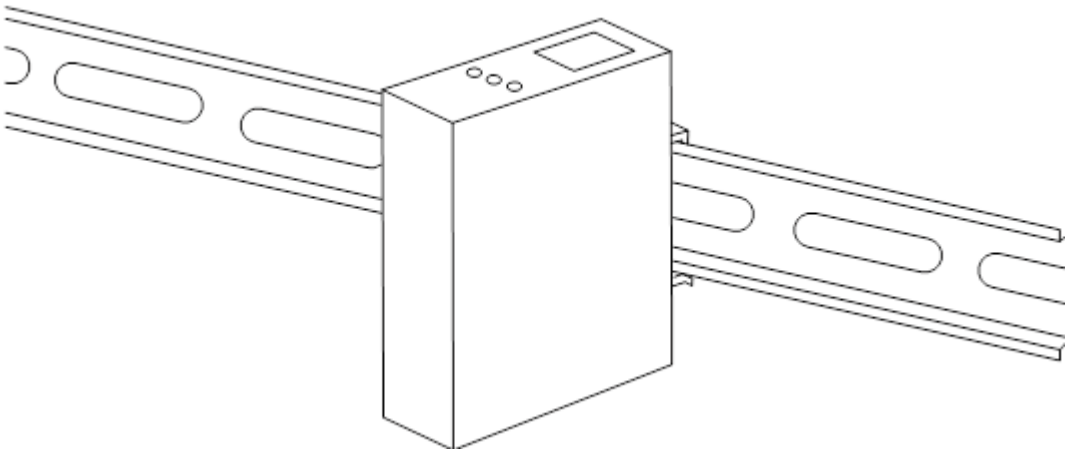
Step 1: screw the DIN-Rail on the MCR300-1T-2S



Step 2: Lightly press push the DIN-Rail into the track.



Step 3: Check the DIN-Rail is tightly on the track.



You must use the screws supplied with the mounting brackets. Damage caused to the parts by using incorrect screws would invalidate your warranty.

Appendix A Networking Connection

A.1 Data RJ-45 Pin Assignments - 1000Mbps, 1000Base-T

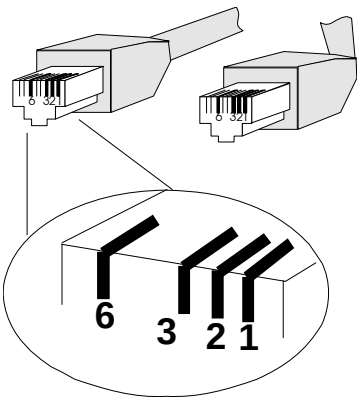
PIN NO	MDI	MDI-X
1	BI_DA+	BI_DB+
2	BI_DA-	BI_DB-
3	BI_DB+	BI_DA+
4	BI_DC+	BI_DD+
5	BI_DC-	BI_DD-
6	BI_DB-	BI_DA-
7	BI_DD+	BI_DC+
8	BI_DD-	BI_DC-

Implicit implementation of the crossover function within a twisted-pair cable, or at a wiring panel, while not expressly forbidden, is beyond the scope of this standard.

A.2 10/100Mbps, 10/100Base-TX

RJ-45 Connector pin assignment		
PIN NO	MDI Media Dependant Interface	MDI-X Media Dependant Interface-Cross
1	Tx + (transmit)	Rx + (receive)
2	Tx - (transmit)	Rx - (receive)
3	Rx + (receive)	Tx + (transmit)
4, 5	Not used	
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

The standard cable, RJ-45 pin assignment



The standard RJ-45 receptacle/connector

There are 8 wires on a standard UTP/STP cable and each wire is color-coded. The following shows the pin allocation and color of straight cable and crossover cable connection:

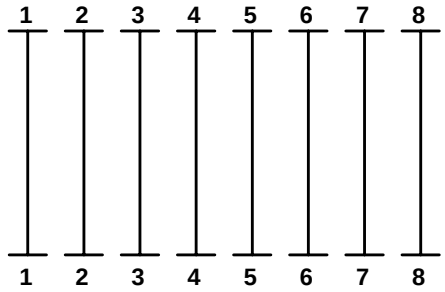
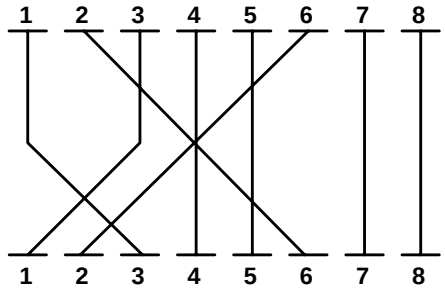
Straight Cable		SIDE 1	SIDE2
	SIDE 1 SIDE 2	1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown	1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown
Crossover Cable		**SIDE 1**	**SIDE2**
	SIDE 1 SIDE 2	1 = White / Orange 2 = Orange 3 = White / Green 4 = Blue 5 = White / Blue 6 = Green 7 = White / Brown 8 = Brown	1 = White / Green 2 = Green 3 = White / Orange 4 = Blue 5 = White / Blue 6 = Orange 7 = White / Brown 8 = Brown

Figure A-1: Straight-Through and Crossover Cable

Please make sure your connected cables are with same pin assignment and color as above picture before deploying the cables into your network.

A.3 Fiber-Optic Cable Connection Parameter

The wiring details are as below:

Cables:

Standard	Fiber Type	Cable Specification
1000Base-SX(850nm)	Multi-mode	50/125µm or 62.5/125µm
1000Base-LX(1300nm)	Multi-mode	50/125µm or 62.5/125µm
	Single-mode	9/125µm

Wiring Distances:

Standard	Fiber	Diameter (micron)	Modal Bandwidth (MHz * km)	Max. Distance (meters)
1000Base-SX	MM	62.5	100	220
		62.5	200	275
		50	400	500
		50	500	550
1000Base-LX	MM	62.5	5	550
		50	4	
		50	5	
	SM	9	N/A	5000*