



IFS MC250-4T/ Series User Manual

Copyright	© 2012 UTC Fire & Security Company. All rights reserved.
Trademarks and patents	Interlogix, IFS MC250-4T Series, the IFS Brand and logo are trademarks of UTC Fire & Security. Other trade names used in this document may be trademarks or registered trademarks of the manufacturers or vendors of the respective products.
Manufacturer	UTC Fire & Security Americas Corporation, Inc. 2955 Red Hill Avenue, Costa Mesa, CA 92626-5923, USA
Version	This document applies to IFS MC250-4T Series version 1.0.
Certification	  N4131
FCC compliance	<p>Class A: 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</p>
ACMA compliance	<p>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.</p>
European Union directives	<p>2004/108/EC (EMC directive): Hereby, UTC Fire & Security declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2004/108/EC</p>



2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

**Contact
information**

www.utcfireandsecurity.com or
www.interlogix.com

Customer support

www.interlogix.com/customer-support

Contents

Overview 1

Package Contents 1

Product Features 2

Product Description 4

Front Panel 5

LED Indicators 6

Converter Top Panel 6

Wiring the Power Inputs 6

Wiring the Fault Alarm Contact 7

Mounting Installation 8

Installation Steps 12

Switch Operation 13

Troubleshooting 16

Specifications 18

Compatible SFP Modules 20

RJ45 Pin Assignments 20

Contacting Technical Support 22

Overview

The Industrial Ethernet Media converter MC250-4T series, fully complies with IEEE 802.3 10Base-T, IEEE 802.3u 100Base-TX, IEEE 802.3ab 1000Base-T and IEEE 802.3z 1000Base-SX / LX, the media conversion is quick and easy with simple Plug and Play installation. The MC250-4T series Industrial Ethernet Media converter also supports flow control and back pressure in half-duplex to eliminate packets loss.

Package Contents

Check the contents of your package for the following parts:

- MC250-4T series module x1
- User's Manual x1
- DIN Rail Kit x 1
- Wall Mount Kit x 1

If any of these items are missing or damaged, please contact your distributor or IFS sales rep immediately. If possible, retain the original carton and packaging material in case of need to return the product for repair/replacement.

Product Features

Physical Port

Model Name	Ports		Fiber Optical Interface	
	Copper	Optical	Mode	Distance
MC250-4T/1FM	4 x 10/100Base-TX	1 x 100Base-FX	Mutil-mode	2km
MC250-4T/1FS			Single-mode	15km
MC250-4T/2S		2 x 100Base-FX	Multi / Single Mode Depends on SFP Module	

Layer 2 Features

- Complies with IEEE 802.3, IEEE 802.3u 10/100Base-TX, 100Base-FX
- Supports Auto-negotiation and 10/100Mbps Half/Full duplex mode for each copper port
- High performance store and forward architecture, broadcast storm control, runt/CRC filtering eliminates erroneous packets to optimize the network bandwidth
- Prevents packet loss with back pressure (Half-Duplex) and IEEE 802.3x PAUSE frame flow control (Full-Duplex)
- Backplane (Switching Fabric):
- MC250-4T/1FM - /1FS: 1Gbps
- MC250-4T/2S: 1.2Gbps
- Integrated address look-up engine, support 2K absolute MAC addresses
- 1Mbit on-chip Frame Buffer
- Automatic address learning and address aging
- CSMA/CD Protocol

Industrial Case / Installation

- IP-30 Metal case / Protection
- DIN Rail and Wall Mount Design
- 12 to 48V DC, redundant power with polarity reverse protect function and removable connector terminal block for master and slave power
- -40 to 75 Degree C operating temperature range

Product Description

The MC250-4T series are 4-Port 10/100Mbps + 1 or 2 100FX Fiber Port Industrial Fast Ethernet media converters with non-blocking wire-speed performance and are equipped in a slim IP-30 metal endclosure for easy deployment in demanding industrial environments.

With a 1/1.2Gbps internal switching fabric, these Industrial Fast Ethernet Switches can handle extremely large amounts of data in a secure topology linking to a backbone or high capacity servers.

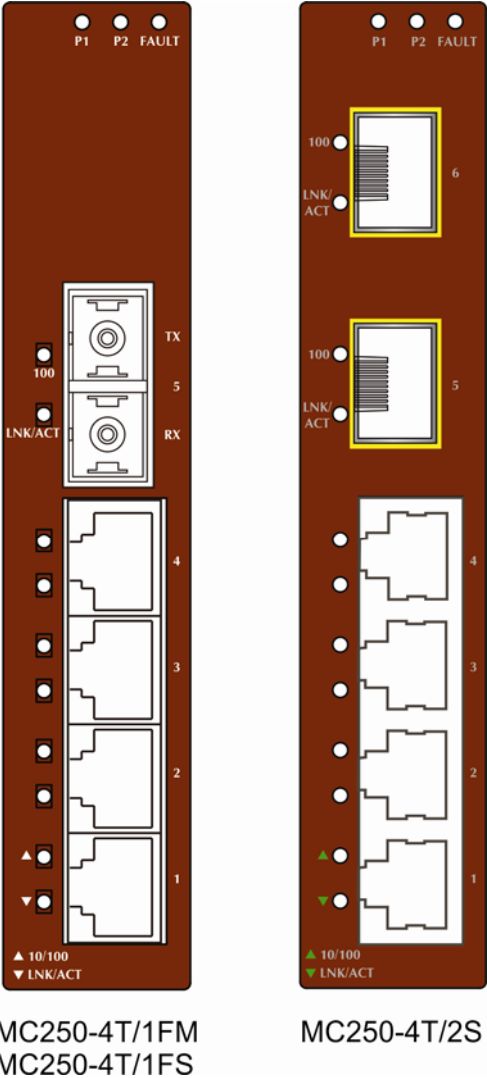
The Industrial Fast Ethernet Switch has 2K MAC address table and offers wire-speed packets transfer performance without risk of packet loss. The stable throughput of the device makes it ideal for most network environments.

All RJ-45 copper interfaces support 10/100Mbps Auto-negotiation for optimal speed detection through RJ-45 Category 5, 4 or 3 cables standard for Auto-MDI/MDI-X that can detect the type of connection to any Ethernet device without requiring special straight or crossover cables.

The Flow Control function allows supported routers and servers to directly connect to the industrial media converter for fast, reliable data transfer.

Front Panel

The figure below shows the MC250-4T/1FM-1FS and the MC250-4T/2S.

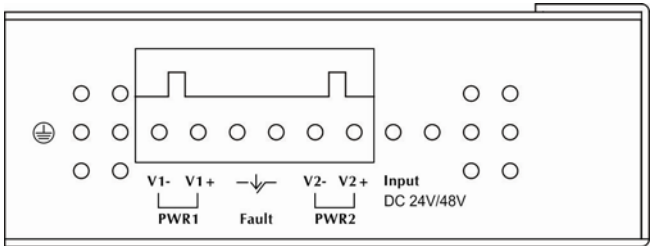


LED Indicators

LED	Color	Function	
P1	Green	Lit: indicates that power 1 has power.	
P2	Green	Lit: indicates that power 2 has power.	
FAULT	Green	Lit: indicates that either power 1 or power 2 has no power.	
100	Green	Fiber Optical	Lit: indicates that the Fiber port is successfully connected to the network at 100Mbps.
10/100	Green	Copper	Lit: indicates that the Switch is successfully connected to the network at 100Mbps. Off: indicates that the Switch is successfully connected to the network at 10Mbps.
LNK/ACT	Green	Fiber Optical	Lit: indicates that the link through that port is successfully established.
		Copper	Blink: indicates that the Switch is actively sending or receiving data over that port.

Converter Top Panel

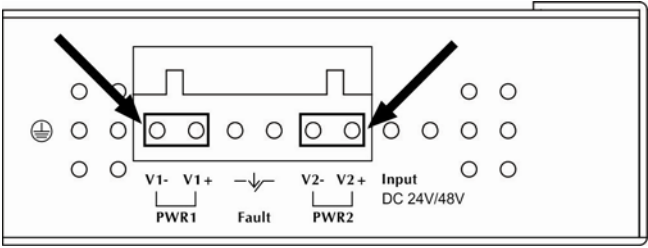
The top panel of the Industrial Media Converter consists of one terminal block connector with two DC power inputs.



Wiring the Power Inputs

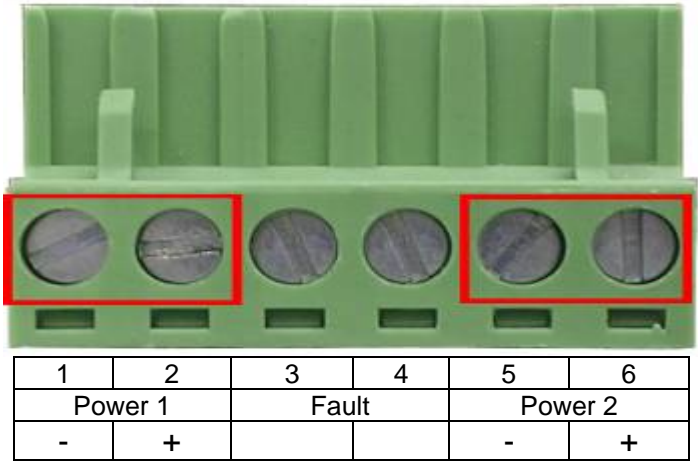
The 6-contact terminal block connector on the top panel of the MC250-4T is used for two DC redundant powers inputs. Please follow the steps below to insert the power wires.

1. Insert positive / negative DC power wires into the contacts 1 and 2 for POWER 1, or 5 and 6 for POWER 2.



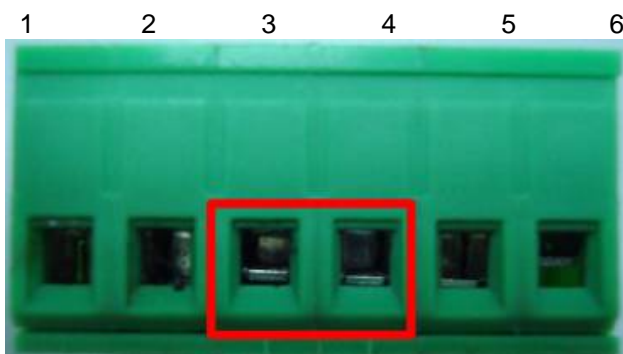
V1- V1+ V2- V2+

2. Tighten the wire-clamp screws to prevent the wires from disconnecting.



Wiring the Fault Alarm Contact

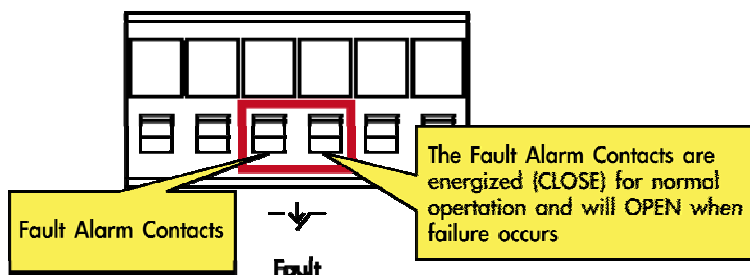
The fault alarm contacts are in the middle of the terminal block connector as the picture shows below. Inserting the wires, the MC250-4T will detect the fault status of the power failure and then forms an open circuit. The following illustration shows an application example for wiring the fault alarm contacts.



Insert the wires into the fault alarm contacts

Note: The wire gauge for the terminal block should be in the range between 12 ~ 24 AWG.

The alarm relay circuit accepts up to 30V, max. 3A currents.



Mounting Installation

This section describes how to mount the MC250-4T and make connections to it. Please read the following sections and perform the procedures in the order presented.

Note: In the installation steps below, this Manual uses the IFS 8 Port Industrial Gigabit Switch, GE-DSGH-8, as an example. However, the steps for any IFS Industrial Switch & Industrial Media Converter are similar.

Mounting to a DIN-Rail

The DIN-Rail kit comes assembled on the MC250-4T out of the box. Please refer to following figures to hang the MC250-4T on a DIN-Rail.



1. Lightly press down and push the bottom of the DIN-Rail connector mount into the track.



2. Check that the DIN-Rail connector mount is tightly mounted on the track.
3. Please refer to following procedures to remove the MC250-4T from the track.



4. Lightly press down and pull the bottom of DIN-Rail connector mount to remove it from the track.

Mounting to a Wall

To install the MC250-4T on the wall, please follows the instructions described below.

1. Loosen the screws to remove the DIN Rail from the Media Converter.



2. Place the wall mount plate on the rear panel of the MC250-4T.



3. Assemble the wall mount plate on the MC250-4T.
4. Use the hook holes at the corners of the wall mount plate to hang the MC250-4T on the wall.

Installation Steps

Step 1: Unpack the Industrial Fast Ethernet Switch.

Step 2: Check the DIN-Rail is screwed on the Industrial Fast Ethernet Switch. (Please refer to DIN-Rail Mounting section for DIN-Rail installation. If you want to wall mount the Industrial Fast Ethernet Switch, then please refer to Wall Mount Plate Mounting section for wall mount plate installation.

Step 3: To hang the Industrial Fast Ethernet Switch on the DIN-Rail track or wall, please refer to the Mounting Installation section.

Step 4: Power on the Industrial Fast Ethernet Switch. (Please refer to the Wiring the Power Inputs section for power input) The power LED on the Industrial Fast Ethernet Switch will illuminate. Please refer to the LED Indicators section for meaning of LED lights.

Step 5: Prepare the twisted-pair, straight through Category 5 cable for Ethernet connection.

Step 6: Insert one side of Category 5 cables into the Industrial Fast Ethernet Switch Ethernet port (RJ-45 port) and the other side to the network devices Ethernet port (RJ-45 port), ex: Switch, PC or Server. The UTP port (RJ-45) LED on the Industrial Fast Ethernet Switch will illuminate when the cable is connected with the network device. Please refer to the LED Indicators section for LED light meaning.

Step 7: Insert fiber cable from the MC250-4T series to the fiber network. The TX and RX or the SFP modules for MC250-4T/2S, must be paired at both ends. The optical port LED on the Industrial Fast Ethernet Switch will illuminate when the cable is connected to the network device. Please refer to the LED Indicators section for the LED descriptions.

Step 8: When all connections are set and the LEDs are illuminated without any issues the installation is completed.

Switch Operation

Address Table

The Industrial Fast Ethernet Switch is implemented with an address table. This address table is composed of many entries. Each entry is used to store the address information of a node in the network, including MAC address, Port No., and etc. This information comes from the learning process of the Industrial Fast Ethernet Switch.

Learning

When one packet comes from any port of Industrial Fast Ethernet switch, the Industrial Fast Ethernet Switch will record the source address, port no. and the other related information in address table. This information will be used to decide either forwarding or filtering for future packets.

Forwarding & Filtering

When one packet comes from a port of the Industrial Fast Ethernet Switch, it will also check the destination address besides the source address learning. The Industrial Fast Ethernet Switch will lookup the address-table for the destination address. If not found, this packet will be forwarded to all the other ports except the port which this packet comes in. And these ports will transmit this packet to the network it is connected to. If found, and the destination address is located at a different port that this packet comes in, the Industrial Fast Ethernet Switch will forward this packet to the port where this destination address is located according to the information from address table. But, if the destination address is located at the same port where this packet comes in, then this packet will be filtered.

Store-and-Forward

Store-and-Forward is one type of packet-forwarding techniques. A Store-and-Forward Industrial Switch stores the incoming frames in an internal buffer and checks for any error from the frames before transmission. No error packets occurrence, it is the best choice when a network needs efficiency and stability.

The Industrial Fast Ethernet Switch scans the destination address from the packet-header, searches the routing table provided for the incoming port and forwards the packet, only if required. The fast forwarding makes the switch attractive for connecting servers directly to the network, thereby increasing throughput and availability. However, the switch is most commonly used to segment existing hubs, which nearly always improves overall performance. An Ethernet Switching can be easily configured in any Ethernet network environment to significantly boost bandwidth using conventional cabling and adapters.

Due to the learning function of the Industrial Fast Ethernet Switch, the source address and corresponding port number of each incoming and outgoing packet are stored in a routing table. This information is subsequently used to filter packets whose destination address is on the same segment as the source address. This confines network traffic to its respective domain, reducing the overall load on the network.

The Industrial Fast Ethernet Switch performs "Store-and-Forward" therefore, no error packets occur. More reliably, it reduces the re-transmission rate. No packet loss will occur.

Auto-negotiation

The TP ports on the Industrial Fast Ethernet Switch have built-in "**Auto-negotiation**". This technology automatically sets the best possible bandwidth when a connection is established with another network device (usually at Power On or Reset). This is done by detecting the modes and speeds at the second of

both device is connected and capable of, both 10Base-T and 100Base-TX devices can connect with the port in either Half- or Full-Duplex mode.

Troubleshooting

This chapter contains information to help you solve issues. If the Industrial Fast Ethernet Switch is not functioning properly, make sure the Industrial Fast Ethernet Switch was set up according to instructions in this manual.

The Link LED is not lit

Solution:

Check the cable connection of the Industrial Fast Ethernet Switch.

Performance is bad

Solution:

Check the speed duplex mode of the partner device. The Industrial Fast Ethernet Switch is operating at Auto-negotiation mode by default and if the partner is set to half duplex, then the performance will become bad.

Link LED is light, but the traffic is irregular

Solution:

Check that the attached device is not set to dedicate full duplex. Some devices use a physical or software switch to change duplex modes. Auto-negotiation may not recognize this type of full-duplex setting.

Why does the Industrial Fast Ethernet Switch not connect to the network?

Solution:

Check every port LED on the Industrial Fast Ethernet Switch.

Try another port on the Industrial Fast Ethernet Switch to make sure the cable is installed properly while make sure the cable is the right type

Turn off the power and turn on the power again after a while.

Specifications

Model		MC250-4T/1FM		MC250-4T/1FS	
Hardware Specification					
Copper	Ports	4 x 10/100Base-TX, Auto-negotiation, Auto-MDI/MDI-X			
	Cable	10Base-T : 2-pair UTP Cat. 3, 4, 5 cable (100meters, max.) 100Base-TX : 2-pair UTP Cat. 5, 5e, 6 cable (100meters, max.)			
Fiber Optical	Port	1 x 100Base-FX			
	Cable	50/125μm fiber 62.5/125μm fiber		9/125μm fiber	
	Mode	Multi-mode		Single-mode	
	Distance	2km		15km	
Dimensions (W x D x H)		135mm x 97mm x 32mm			
Weight		436g			
Power Requirement		12~48V DC, Redundant power with polarity reverse protection function			
Power Consumption / Dissipation		13.7 Watts / 46BTU			
Installation		DIN Rail Kit and Wall Mount Ear			
Switch Specification					
Switch Processing Scheme		Store-and-Forward			
Address Table		2K entries			
Buffer		1Mbit			
Flow Control		Back pressure for Half duplex, IEEE 802.3x Pause Frame for Full duplex			
Switch Fabric		1Gbps			
Throughput (Packet Per Second)		0.74Mpps @ 64Bytes			
Standards Conformance					
Standards Compliance		IEEE 802.3 Ethernet, 10Base-T IEEE 802.3u Fast Ethernet, 100Base-TX, 100Base-FX IEEE 802.3x Full-duplex Flow control			
Stability testing		IEC60068-2-32(Free Fall) IEC60068-2-27(Shock) IEC60068-2-6(Vibration)			

Temperature	Operating: -40~75 Degree C Storage: -40~85 Degree C
Humidity Operating	Operating: 5% to 90%, Storage: 5% to 90% (Non-condensing)
Regulation Compliance	FCC Part 15 Class A, CE

Model		M250-4T/2S
Hardware Specification		
Copper	Ports	4 x 10/100Base-TX, Auto-negotiation, Auto-MDI/MDI-X
	Cable	10Base-T : 2-pair UTP Cat. 3, 4, 5 cable (100meters, max.) 100Base-TX : 2-pair UTP Cat. 5, 5e, 6 cable (100meters, max.)
Fiber Optical	Port	2 x 100Base-FX
	Cable	Multi-Mode: 50/125μm fiber 62.5/125μm fiber
	Mode	Single-Mode: 9/125μm fiber
	Distance	Depend on SFP Module
Dimensions (W x D x H)		135mm x 97mm x 32mm
Weight		442g
Power Requirement		12~48V DC, Redundant power with polarity reverse protection function
Power Consumption / Dissipation		16 Watts / 54BTU
Installation		DIN Rail Kit and Wall Mount Ear
Switch Specification		
Switch Processing Scheme		Store-and-Forward
Address Table		2K entries
Buffer		1Mbit
Flow Control		Back pressure for Half duplex, IEEE 802.3x Pause Frame for Full duplex
Switch Fabric		1.2Gbps
Throughput (Packet Per Second)		0.89Mpps @ 64Bytes

Standards Conformance	
Standards Compliance	IEEE 802.3 Ethernet, 10Base-T IEEE 802.3u Fast Ethernet, 100Base-TX, 100Base-FX IEEE 802.3x Full-duplex Flow control
Stability testing	IEC60068-2-32(Free Fall) IEC60068-2-27(Shock) IEC60068-2-6(Vibration)
Temperature	Operating: -40~75 Degree C Storage: -40~85 Degree C
Humidity Operating	Operating: 5% to 90%, Storage: 5% to 90% (Non-condensing)
Regulation Compliance	FCC Part 15 Class A, CE

Compatible SFP Modules

Fast (100Mbps)											
Part No.	PHY Type	# of Fibers	Fiber Type	Connector	TX Wavelength	RX Wavelength	Max. Distance	Power (dBm)	RX Sen. (dBm)	Power Budget	Operating Temperature
100Base-FX											
S20-2MLC-2	100Base-FX	2	Multi-mode	LC	1310nm	1310nm	2km	-20 ~ -14	-32	12	0 ~ 50°C
S25-2MLC-2	100Base-FX	2	Multi-mode	LC	1310nm	1310nm	2km	-20 ~ -14	-32	12	-40 ~ 75°C
100Base-LX											
S20-2SLC-20	100Base-LX	2	Single mode	LC	1310nm	1310nm	20km	-15 ~ -8	-34	19	0 ~ 50°C
S25-2SLC-20	100Base-LX	2	Single mode	LC	1310nm	1310nm	20km	-15 ~ -8	-34	19	-40 ~ 75°C
100Base-BX											
S20-1SLC/A-20	100Base-BX20-U	1	Single mode	LC	1310nm	1550nm	20km	-14 ~ -8	-32	18	0 ~ 50°C
S20-1SLC/B-20	100Base-BX20-D	1	Single mode	LC	1550nm	1310nm	20km	-14 ~ -8	-32	18	0 ~ 50°C

When connecting to other Ethernet equipment such as a Router, Bridge, Switch, or Hub, please refer to that device's Technical Manual.

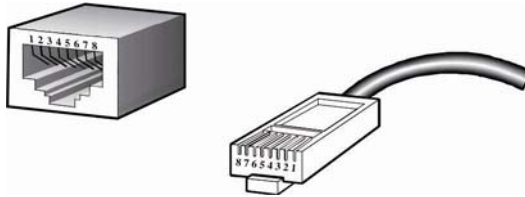
RJ45 Pin Assignments

10/100Mbps, 10/100Base-TX

RJ-45 Connector pin assignment		
Contact	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	

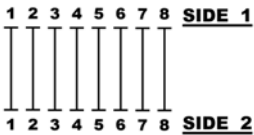
6	Rx - (receive)	Tx - (transmit)
7, 8	Not used	

RJ45 Cable Drawing



The following figure shows the pin allocation and color of a straight cable, and connection of a crossover cable.

Straight Cable



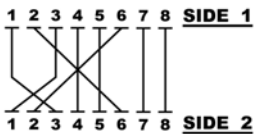
SIDE 1

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

SIDE 2

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

Cross Over Cable



SIDE 1

- 1 = White/Orange
- 2 = Orange
- 3 = White/Green
- 4 = Blue
- 5 = White/Blue
- 6 = Green
- 7 = White/Brown
- 8 = Brown

SIDE 2

- 1 = White/Green
- 2 = Green
- 3 = White/Orange
- 4 = Blue
- 5 = White/Blue
- 6 = Orange
- 7 = White/Brown
- 8 = Brown

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

Contacting Technical Support

Contact technical support if you encounter any difficulties during this installation. Please make sure you have the requested diagnostic or log files ready before you contact us by phone or go to www.interlogix.com/customer-support.

Technical Support

Europe, Middle East and Africa

W Select *Contact Us* at www.utcssecurityproducts.eu

North America

T +1 855.286.8889

E techsupport@interlogix.com

Australia

E techsupport@interlogix.au
