

## Preface

This hardened media converter provides an affordable solution for rugged and outdoor environments, transportation roadside cabinets, industrial floor operations, multi-tenant dwellings, or Fiber To The Home (FTTH) applications. It is the media converter of choice for harsh environments with space constraints. It is capable of operating at temperature extremes of -40° F to 165° F (-40° C to +74° C).

### Plug-and-Play Solution:

The Signamax 065-1800 series hardened media converter is a plug-and-play media converter with a compact case size. There is no complicated software set up required.

This manual describes how to install and use the Signamax 065-1800 series hardened media converters with the Link Fault Signaling (LFS) function.

The converters introduced here provide one channel of media conversion between 10/100BaseT/TX and 100BaseFX connections.

These converters fully comply with IEEE802.3 10BaseT and IEEE802.3u 100BaseTX/FX standards.

In this manual, you will find:

- Product overview
- Features of the 065-1800 series media converters
- Illustrative LED functions
- Installation instructions
- Specifications

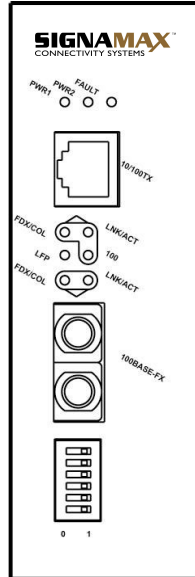
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## Introduction

The media converter provides one channel for media conversion between 10/100BaseTX and 100BaseFX with the link-fault-pass-through function. This hardened fiber optic solution is perfectly fitted in the industrial applications or rugged environment.

## Product Overview



## Product Features

- Meets NEMA TS1/TS2 Environmental requirements such as temperature, shock, and vibration for traffic control equipment
- Meets IEC61000-6-2 EMC Generic Standard Immunity for industrial environment
- One-channel media conversion between 10/100BaseT/TX and 100BaseFX
- Fiber media allows:
  - Multimode fiber using SC, ST, VF-45, MT-RJ or LC connector
  - Singlemode fiber using SC or ST connector
  - WDM single-fiber (bi-directional) transceiver: Singlemode WDM fiber using SC connector:
    - A type: WDM single-fiber (bi-direction) transceiver transmits with 1310nm wavelength and receives with 1550nm wavelength
    - B type: WDM single-fiber (bi-direction) transceiver transmits with 1550nm wavelength and receives with 1310nm wavelength
- Auto negotiation of speed and duplex mode on TX port

- Auto MDIX on TX port
- One DIP switch for configuring Link Fault Signaling (LFS), fixed speed, full/half duplex, and link down alarm
- Store-and-forward mechanism
- Non-blocking full wire-speed forwarding rate
- Supports broadcast storm filtering
- Back-pressure & IEEE802.3x compliant flow control
- Alarms for power and port link down failure by relay output
- Redundant 1.5 A / 24 V DC Terminal Block power inputs; models available with a 3A / 12 V DC jack and a factory-provided 100-240 V AC external power supply
- Supports DIN-rail or panel mounting installation
- Front panel status LEDs

### **Packing List**

When you unpack this product's package, you will find the items listed below. Please inspect the contents, and report any apparent damage or missing items immediately to our authorized reseller.

The Signamax 065-1800 series Hardened Media Converter  
User's Manual on CD-ROM  
Signamax 065-1800 series Hardened Media Converter Quick Installation Guide  
AC to DC Power Adaptor and Power Cable (optional 12 V DC powered models only)

## One-Channel Media Converter

### Ports

The Signamax 065-1800 series Hardened Media Converter provides one TX port and one FX port. For the FX port, it provides options of: Multimode fiber using SC, ST, VF-45, MT-RJ or LC connector, or Singlemode fiber using SC or ST connector, or WDM fiber using single SC connector. For the TX port, it uses an RJ-45 connector, auto-MDIX, and auto-negotiates 10/100 Mbps speed and full-duplex or half-duplex modes.

### Port Settings

Port settings are made easily by means of a DIP (Dual Inline Package) switch at the front panel of the hardened media converter. Default DIP switch settings:



### DIP switch

There are six pins on the DIP switch for port settings. Refer to the table below for more details.

DIP switch No.	0	1
1	Disable Link Fault Signaling	Enable Link Fault Signaling
2	Enable auto-negotiation for TX port	Enable forced mode for TX port
3	TX port forced to 100 Mbps	TX port forced to 10 Mbps
4	TX port forced to full duplex mode	TX port forced to half duplex mode
5	FX port forced to full duplex mode	FX port forced to half duplex mode
6	Disable link down alarm	Enable link down alarm

- First, disconnect the converter from the power. Then toggle Pin 2 of the DIP switch to position 1 to enable the forced mode for TX port.
- <NOTE> Pin 2 must be toggled to position 1 prior to manually setting speed and duplex mode.
- Toggle Pin 3 to position 0 to force the TX port to the speed of 100 Mbps, or toggle Pin 3 to position 1 for 10 Mbps speed.
- Toggle Pin 4 to position 0 to force the TX port to full duplex mode, or toggle Pin 4 to position 1 for half duplex mode.
- Toggle Pin 5 to position 0 to force the FX port to full duplex mode, or toggle Pin 5 to position 1 for half duplex mode.
- Toggle Pin 1 to position 0 to disable Link Fault Signaling (LFS).

- Toggle Pin 6 to position 0 to disable the link down alarm.
- Reconnect the converter to the power supply. The new setting(s) will then take effect.

## Front Panel & LEDs

### LED Indicators

The LED indicators give you instant feedback on the status of the converter:

LEDs	State	Indication
FAULT	Steady	Power or ports function abnormally
	Off	Power and ports function normally
PWR1 PWR2	Steady	Power on PWR stands for POWER
	Off	Power off
100 (Mbps)	Steady	Connection speed is 100 Mbps
	Off	Connection speed is 10 Mbps
LFS	Steady	Link Fault Signaling function enabled
	Off	Link Fault Signaling function disabled
LNK/ACT	Steady	A valid network connection established LNK stands for LINK
	Flashing	Transmitting or receiving data ACT stands for ACTIVITY
	Off	Neither valid network connection established nor transmitting/receiving data.
FDX/COL	Steady	Connection in full duplex mode FDX stands for FULL-DUPLEX
	Flashing	Collision occurred COL stands for COLLISION
	Off	Connection in half-duplex mode

### Link Fault Signaling (LFS)

Connect the FX ports of two Media Converters, A and B, through the fiber optic cable.

Link Fault of the FX port:

A Link Fault condition will be sensed on the TX port whenever the media converter detects a Link Fault condition on the FX port. Thus, the 100, LNK/ACT, and FDX/COL LEDs of the media converter would be off.

Link Fault of the TX port of Media Converter A:

**Media Converter A:** A Link Fault condition will be sensed on the FX port whenever the media converter detects a Link Fault condition on the TX port. Thus, the 100, LNK/ACT, and FDX/COL LEDs of the TX port of the Media Converter A would be off.

**Media Converter B:** A Link Fault condition indication will be sent to the FX port of the Media Converter B. Then, a Link Fault condition will be sensed on the TX port of the Media Converter B whenever the Media Converter B detects a Link Fault condition on the FX port. Thus, the 100, LNK/ACT, and FDX/COL LEDs of the Media Converter B would be off.

Link Fault on the FX port						
		TX Port			FX Port	
LEDs	PWR	100	LNK/ACT	FDX/COL	LNK/ACT	FDX/COL
Media Converter A	ON	OFF	OFF	OFF	OFF	OFF
Media Converter B	ON	OFF	OFF	OFF	OFF	OFF
Link Fault on the TX port of Media Converter A						
		TX Port			FX Port	
LEDs	PWR	100	LNK/ACT	FDX/COL	LNK/ACT	FDX/COL
Media Converter A	ON	OFF	OFF	OFF	ON	ON
Media Converter B	ON	OFF	OFF	OFF	OFF	OFF

## Installation

This chapter gives step-by-step installation instructions for the Converter.

### Selecting a Site for the Equipment

As with any electric device, you should place the equipment where it will not be subjected to extreme temperatures, humidity, or electromagnetic interference. Specifically, the site you select should meet the following requirements:

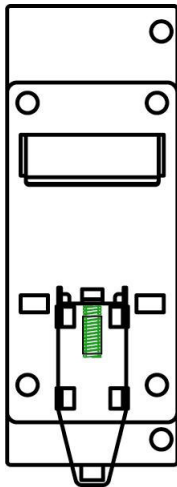
- The ambient temperature should be between -40° to 165° Fahrenheit (-40° to +74° Celsius).
- The relative humidity should be less than 95 percent, non-condensing.
- Surrounding electrical devices should not exceed the electromagnetic field (RF) standards for IEC 801-3, Level 2 (3V/M) field strength.
- Make sure that the equipment receives adequate ventilation. Do not block the ventilation holes of the equipment.
- The power outlet should be within 6 feet (1.8 meters) of the product.

### DIN Rail Mounting

Fix the DIN rail attachment plate to the back panel of the media converter.

Installation: Place the media converter on the DIN rail from above using the slot. Push the front of the media converter toward the mounting surface until it audibly snaps into place.

Removal: Pull out the lower edge and then remove the media converter from the DIN rail.



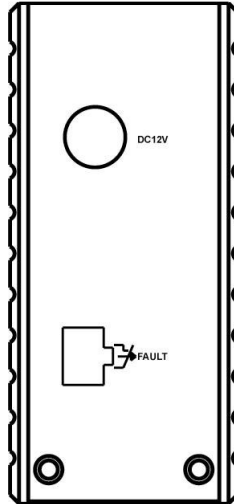
## Connecting to Power

Redundant 1.5 A 24 V DC power inputs or 3 A 12 V DC Jack:

### **3 A 12 V DC Jack**

**Step 1:** Connect the supplied AC to DC power adapter to the receptacle on the topside of the media converter.

**Step 2:** Connect the power cord to the AC to DC power adapter and attach the plug into a standard AC outlet with the appropriate AC voltage.

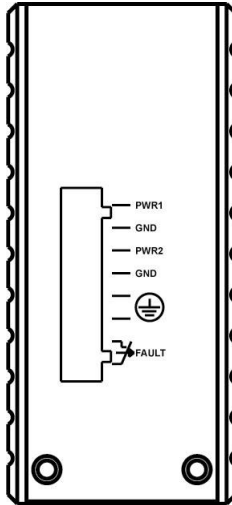


### **Redundant 1.5 A 24 V DC Power Inputs**

There are two pairs of 1.5 A 24 V DC power source connectors that can be used to power this device. You only need to have one power source connected to operate the media converter.



**Step 1:** Connect the DC power cord to the pluggable terminal block on the media converter, and then plug it into a standard DC outlet.

**Step 2:** In order to shut down the media converter, disconnect the power cord.



**Alarms for Power and Port Failure**

Step 1: There are two pins on the terminal block are used for power failure detection. It provides the normally closed output when the power source is active. Use this as a dry contact application to send a signal for power failure detection.

Terminal Assignment	
PWR 1	Power Input 1 (+10 ~ +48 V DC)
GND	Power Ground
PWR 2	Power Input 2 (+10 ~ +48 V DC)
GND	Power Ground
	Earth Ground
 FAULT	1. The relay opens if PWR 1 or PWR 2 fails 2. The relay opens if a Link Fault is detected (if Link Fault Signaling has been Enabled)

**Special note:**  
The relay output is normal open position when there is no power to the media converter. Please do not connect any power source to this terminal to prevent the shortage to your power supply.

## Specifications

<b>Applicable Standards</b>	IEEE 802.3 10BaseT IEEE 802.3u 100BaseTX & 100BaseFX
<b>Fixed Ports</b>	1 TX port, 1 FX port
<b>Speed</b>	10BaseT 100BaseTX/FX
	10/20Mbps for half/full-duplex
	100/200Mbps for half/full-duplex
<b>Switching Method</b>	Store-and-Forward
<b>Forwarding rate</b>	14,880/148,800pps for 10/100 Mbps
<b>Cable</b>	10BaseT 100BaseTX 100BaseFX
	2-pair UTP/STP Cat. 3, 4, 5 up to 100m 2-pair UTP/STP Cat. 5 up to 100m MMF (50 or 62.5µm), SMF (9 or 10µm)
<b>LED Indicators</b>	Per Unit- (4 LEDs): PWR1, PWR2, FAULT, LFP
	Per Port- TX (3 LEDs): LNK/ACT, FDX/COL, 100 FX (2 LEDs): LNK/ACT, FDX/COL
<b>Dimensions</b>	W50 × D110 × H136 mm
<b>Weight</b>	0.6 Kg
<b>Power</b>	DC Jack: 3A 12VDC, External AC/DC required Terminal Block: 1.5A 24VDC, 10-48VDC
<b>Power Consumption</b>	4.8W Max.
<b>Operating Temperature</b>	-40 °C ~ 74 °C
<b>Storage Temperature</b>	-45 °C ~ 93 °C
<b>Humidity</b>	10 ~ 95%, non-condensing
<b>Safety</b>	UL 60950, EN60950, IEC 60950, IEC 61000-6-2
<b>Emissions</b>	FCC Part 15, Class A CE: EN55022 (CISPR22 Class A) EN55024 (CISPR24 Class A)

### Standards

ESD Standard (IEC 61000-4-2)

Radiated FRI Standards (IEC 61000-4-3)

Burst Standards (IEC 61000-4-4)

Surge Standards (IEC 61000-4-5)

Induced RFI Standards (IEC 61000-4-6)

Magnetic Field Standards (IEC 61000-4-8)

Voltage Dips Standards (IEC 61000-4-11)

Environmental Test Compliance:

Vibration Resistance (IEC 60068-2-6)

Shock (IEC 60068-2-27)

Free Fall (IEC 60068-2-32)

NEMA TS1/2 Environmental requirements for traffic control equipment

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