

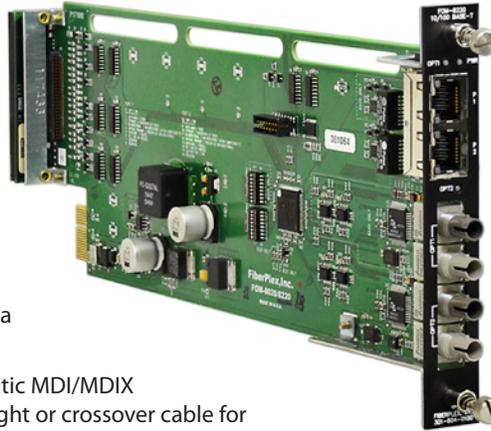
# FOM-8020 and FOM-8220

FIBER OPTIC MODULE



## Description

The FOM-8020 is single port card that provides electrical-to-optical conversions for 10BASE-T and 100BASE-TX Ethernet communications. It has one RJ-45 and one fiber optic transceiver. For a dual port card with two RJ-45's and two fiber optic transceivers, the FOM-8220 can be used, which is basically two FOM-8020, but on one card. The two ports on the FOM-8220 are independent of each other and may be operated at different data rates.



Both cards incorporate a manual and an automatic MDI/MDIX function, which allows users to use either a straight or crossover cable for all LAN configurations. This can be extremely useful to users who are unaware of cable types and can also save time on network configurations. For applications where security requirements dictate that there be no physical means of establishing a bi-directional link, the cards can be set to uni-directional Ethernet for one way communication.

In addition, the FOM-8020 and FOM-8220 offers much longer transmission distances than traditional copper wiring. Ethernet Cat5 cabling is limited to a maximum distance of 100m, but multimode optics on the card can extend the distance to 2km, while singlemode optics can further extend the distances up to 80km. A typical link consists of two FOM-8020, one at each end of the network, with a fiber optic cable between them as shown under "TYPICAL APPLICATION".

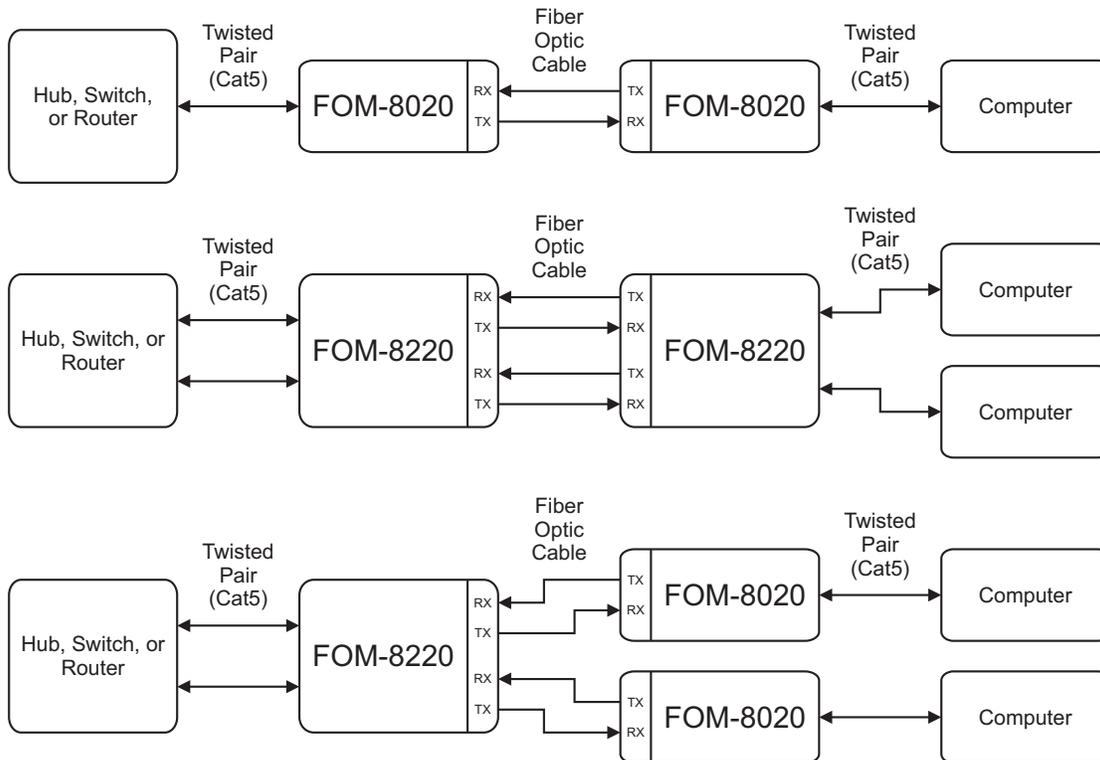
## Ethernet

**10BASE-T to 10BASE-FL**  
**100BASE-T to 100BASE-FX**

## Features

- Data Rates: 10 Mbps and 100 Mbps
- Compliant with: IEEE 802.3
- Automatic MDI/MDIX function. The card will automatically determine the correct pinouts for the transmit and receive pairs on the RJ-45. Therefore, users can use either a straight or crossover cable.
- Compatible with Aviom's proprietary A-NET® audio distribution system.

## Typical Application



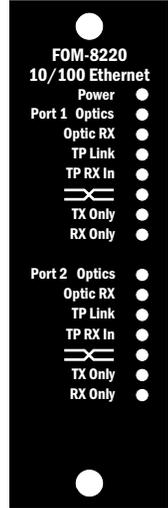
# FOM-8020 and FOM-8220

FIBER OPTIC MODULE

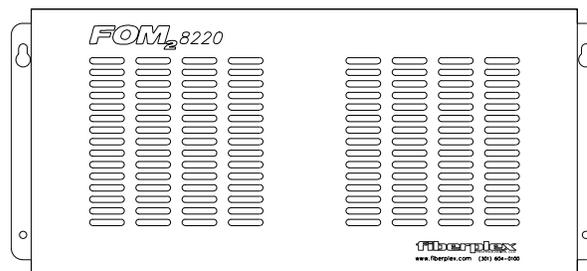
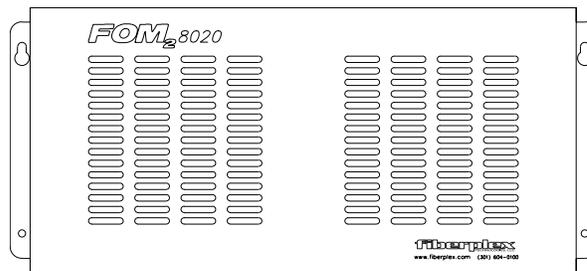
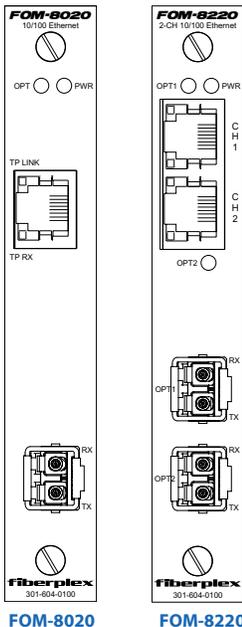


## LED Indicators

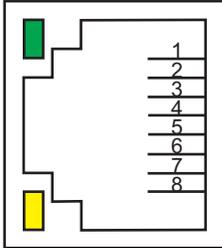
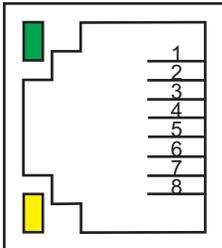
Label	Color	Description
Power	Green	The power supplies on the card are operating properly.
	Red	The power supplies on the card are not regulating the correct voltages or there is an open fuse on the card. Unplug the power from the card for 30 seconds and then plug it in again so that the fuse on the card has time to reset. If the Power led is still red or not a constant green, replace the card.
Optics	Green	100BASE-SX or 100BASE-FX optical link has been established.
	Yellow	10BASE-FL optical link has been established.
	Red	No optical link pulses detected on the RX optic or the optical level is too low to be detected. Check that the opposite card has power and that the fiber optic cables are properly connected. The TX optic from one end of the network connects to the RX optic at the opposite end as shown under "TYPICAL APPLICATION".
	Flashing Red	No SFP module detected inside the cage. Check if the SFP module has been fully inserted into the cage.
Optic RX	Yellow	Optical receive data is being detected.
TP Link	Green	100BASE-TX twisted pair link has been established.
	Yellow	10BASE-T twisted pair link has been established.
	Off	No twisted pair link pulses detected. Check if the switch settings are in the correct position . If the switch is set to "Auto-MDIX", the card will detect the link partner's transmit and receive pairs on the RJ-45 and determine the correct pinout. If the transmit and receive pairs are reversed, the card will internally swap both pairs to establish a link. Therefore, either a straight or crossover cable can be used. If the switch is set to "Fixed" and twisted pair link can not be established, then flip the "Straight/Crossover" switch to the opposite setting to reverse the pinouts. For more information see the RJ-45 pinout tables.
TP RX In	Yellow	Twisted pair receive data is being detected.
	Orange	Crossover pinout has been detected on the RJ-48C.
	Off	Straight pinout has been detected on the RJ-48C.
TX Only	Orange	The card is set to Optical Transmit Uni-Directional mode. Data will be received by the RJ-45 and transmitted to the fiber optic output. All data received by the fiber optic input is ignored. The RJ-45 does not transmit any data except for link pulses required to establish a twisted pair link.
RX Only	Yellow	The card is set to Optical Receive Uni-Directional mode. Data will be received by the fiber optic input and transmitted out to the RJ-45. All data received by the RJ-45 is ignored except for the link pulses required to establish a twisted pair link. The fiber optic output is turned off in this setting.



## Back Panel Line Drawings



## Switch Settings

Switch	Label	Description																											
1 or 9	Auto-MDIX	The card will automatically determine the correct pinouts for the transmit and receive pairs on the RJ-45. If the transmit and receive pairs are reversed, the card will internally swap both pairs to establish a link. Therefore, either a straight or crossover cable can be used.																											
	Fixed	The card manually sets the RJ-45 pinouts to "Straight" or "Crossover".																											
2 or 10	Straight	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>TP Link</p>  <p>TP RX</p> </div> <div style="text-align: center;"> <p>RJ-45 straight pinout</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Direction</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1</td><td>In</td><td>Receive +</td></tr> <tr><td>2</td><td>In</td><td>Receive -</td></tr> <tr><td>3</td><td>Out</td><td>Transmit +</td></tr> <tr><td>4</td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td></tr> <tr><td>6</td><td>Out</td><td>Transmit -</td></tr> <tr><td>7</td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td></tr> </tbody> </table> </div> </div> <p>This switch is only applicable when the channel is set to "Fixed". It allows users to manually set the RJ-45 pinout, and is not intended to imply that all straight cables will establish a link in this setting. If a link can not be established with the "Straight" setting, then use the "Crossover" setting to reverse the pinouts.</p>	Pin	Direction	Description	1	In	Receive +	2	In	Receive -	3	Out	Transmit +	4			5			6	Out	Transmit -	7			8		
	Pin	Direction	Description																										
1	In	Receive +																											
2	In	Receive -																											
3	Out	Transmit +																											
4																													
5																													
6	Out	Transmit -																											
7																													
8																													
Crossover	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>TP Link</p>  <p>TP RX</p> </div> <div style="text-align: center;"> <p>RJ-45 crossover pinout</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Direction</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>1</td><td>Out</td><td>Transmit +</td></tr> <tr><td>2</td><td>Out</td><td>Transmit -</td></tr> <tr><td>3</td><td>In</td><td>Receive +</td></tr> <tr><td>4</td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td></tr> <tr><td>6</td><td>In</td><td>Receive -</td></tr> <tr><td>7</td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td></tr> </tbody> </table> </div> </div> <p>This switch is only applicable when the channel is set to "Fixed". It allows users to manually set the RJ-48C pinout, and is not intended to imply that all crossover cables will establish a link in this setting. If a link can not be established with the "Crossover" setting, then use the "Straight" setting to reverse the pinouts.</p>	Pin	Direction	Description	1	Out	Transmit +	2	Out	Transmit -	3	In	Receive +	4			5			6	In	Receive -	7			8			
Pin	Direction	Description																											
1	Out	Transmit +																											
2	Out	Transmit -																											
3	In	Receive +																											
4																													
5																													
6	In	Receive -																											
7																													
8																													
3 or 11	Bi-Directional	Duplex communication is allowed in both directions on the RJ-45 and the optics.																											
	Uni-Directional	Simplex communication is allowed in only one direction on the RJ-45 and the optics.																											
4 or 12	Optical Transmit	This switch is only applicable when the channel is set to "Uni-Directional". It allows data to be received by the RJ-45 and transmitted to the fiber optic output. All data received by the fiber optic input is ignored. The RJ-45 does not transmit any data except for link pulses required to establish a twisted pair link.																											
	Optical Receive	This switch is only applicable when the channel is set to "Uni-Directional". It allows data to be received by the fiber optic input and transmitted out to the RJ-45. All data received by the RJ-45 is ignored except for the link pulses required to establish a twisted pair link. The fiber optic output is turned off in this setting.																											
5 or 13	Auto-Neg	Auto-Negotiation allow devices that are capable of different data rates and different duplex modes to choose the twisted pair link in the following order: 1) Full Duplex, 100Mbps 2) Half Duplex, 100Mbps 3) Full Duplex, 10Mbps 4) Half Duplex, 10Mbps																											
	Forced	Only one data rate is available. Either 10Mbps or 100Mbps.																											
6 or 14	10	This switch is only applicable when the channel is set to "Forced". Only 10Mbps data rate is available. Duplex is selected by the link partner.																											
	100	This switch is only applicable when the channel is set to "Forced". Only 100Mbps data rate is available. Duplex is selected by the link partner.																											
16	LED Test	Front and rear panel LEDs will flash through a sequence of red, orange, yellow, and green.																											

## Specifications

		Min	Typ	Max
Power Requirement	Voltage Range (V)	20	24	34
	Supply Current (mA)	-	200	-
Environmental	Storage Temperature (°C)	-40	-	85
	Operating Temperature (°C)	0	-	50
Interface Connector				RJ-45 (x4)

## Physical Specifications

	Length	Width	Height	Weight
Card Dimensions	11.25 in (286 mm)	0.80 in (20 mm)	5..25 in (133 mm)	2 lb (0.9 kg)

## Optical Characteristics - All

Order Suffix	Fiber	Fiber Type*	Max Dist (km)	λ (nm)	Bandwidth Typ (dB)	Loss (dB)	Connector
T12	Multimode	OM2	1.88	850	15.5	10.14	ST
L12	Multimode	OM2	1.88	850	14.5	10.14	LC
T5B	Singlemode	OS1, OS2	20	1310	20	12.5	ST
L5B	Singlemode	OS1, OS2	20	1310	13.5	12.5	LC
C	SFP Cage with no Optical Module Installed						

## Accessories

<b>RMC-5000</b>	16 slot, 7.5" high (5U), 19" wide rack mount chassis Includes one PSM-5000 AC power supply
<b>RMC-5000D</b>	16 slot, 7.5" high (5U), 19" wide rack mount chassis Includes one PSM-5048 DC power supply
<b>PSM-5000</b>	RMC-5000 AC redundant power supply, 90-250 VAC input, 250W
<b>PSM-5048</b>	RMC-5000 DC redundant power supply, 35-56 VDC input, 250W
<b>SAC-1AC</b>	Single slot stand-alone chassis, 90-250 VAC or 120-370 VDC input, 15W
<b>SAC-1DC</b>	Single slot stand-alone chassis, DC input

## Ordering Information

FOM - 8020 -

### Optical Interface:

T12 = multimode, 850nm, 2km, ST  
 L12 = multimode, 850nm, 2km, LC  
 T5B = singlemode, 1300nm, 20km, LC  
 L5B = singlemode, 1300nm, 20km, LC  
 C = SFP cage, no optical module

*Other Optical interfaces available on our custom Catalog*

FOM - 8220 -

### Optical Interface:

T12 = multimode, 850nm, 2km, ST  
 L12 = multimode, 850nm, 2km, LC  
 T5B = singlemode, 1300nm, 20km, LC  
 L5B = singlemode, 1300nm, 20km, LC  
 C = SFP cage, no optical module

*Other Optical interfaces available on our custom Catalog*

**For special applications that require custom units, please call FiberPlex for more information.**