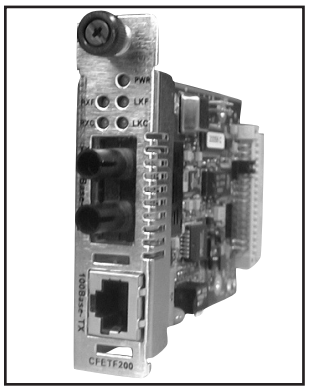
Printed in the U.S.A. **33234.J**

TRANSITION NETWORKS



User's Guide

CFETF10xx-205

Slide-in-Module Media Converter

- ***Fast Ethernet***
- ***Copper to Fiber***
- ***100Base-TX to 100Base-FX***

Transition Networks CFETF10xx-205 series Fast Ethernet 100Base-TX to 100Base-FX media converters connect 100Base-TX twisted-pair copper cable to multimode or single mode 100Base-FX fiber-optic cable. The CFETF10xx-205 is also designed to be installed in a *PointSystem*™ chassis.

Part Number	Port One - Copper 100Base-TX	Port Two - Duplex Fiber-Optic 100Base-FX
CFETF1011-205	RJ-45 100 m *(328 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)**
CFETF1013-205	RJ-45 100 m *(328 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)**
CFETF1014-205	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)**
CFETF1015-205	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 40 km *(24.9 miles)**
CFETF1016-205	RJ-45 100 m *(328 ft)**	SC, 1310 nm single mode 60 km (*32.3 miles)**
CFETF1017-205	RJ-45 100 m *(328 ft)**	SC, 1550 nm single mode 80 km *(49.7 miles)**
CFETF1018-205	RJ-45 100 m *(328 ft)**	MT-RJ, 1300 nm multimode 2 km *(1.2 miles)**
CFETF1019-205	RJ-45 100 m *(328 ft)**	LC, 1310 nm single mode 20 km *(12.4 miles)**
CFETF1039-205	RJ-45 100 m *(328 ft)**	LC, 1300 nm multimode, 2 km *(1.2 miles)**

The CFETF1029-2xx model is the single mode, single fiber version of the media converter. For more information, see the CFETF1029-2xx user's guide #33244 at: www.transition.com.

* Typical maximum cable distance. Actual distance is dependent upon the physical characteristics of the network installation.

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CFETF10xx-205

Part Number	Port One - Copper 100Base-TX	Port Two - Duplex Fiber-Optic 100Base-FX
CFETF1017-351	RJ-45 100 m *(328 ft)**	SC, 1510 nm single mode, CWDM 80km *(49.7.miles)**
CFETF1017-353	RJ-45 100 m *(328 ft)**	SC, 1530 nm single mode, CWDM 80km *(49.7.miles)**
CFETF1017-355	RJ-45 100 m *(328 ft)**	SC, 1550 nm single mode, CWDM 80km *(49.7.miles)**
CFETF1017-357	RJ-45 100 m *(328 ft)**	SC, 1570 nm single mode, CWDM 80km *(49.7.miles)**

* Typical maximum cable distance. Actual distance is dependent on the physical characteristics of the network. (TX) = transmit (RX) = receive

Compliance Information

CISPR22/EN55022 Class A & B + EN55024
CE Mark

FCC Regulations

This equipment has been tested and found to comply with the limits for a Class A & B 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 the user's own expense.

Canadian Regulations

This digital apparatus does not exceed the Class A & B limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A & B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.

Der Anschluss dieses Gerätes an ein öffentlickes Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.

Contact Us

Technical Support

Technical support is available 24 hours a day.
US and Canada: 1-800-260-1312
International: 00-1-952-941-7600

Transition Now

Chat live via the Web with Transition Networks Technical Support.
Log onto www.transition.com and click the Transition Now link.

Web-Based Seminars

Transition Networks provides seminars via live web-based training.
Log onto www.transition.com and click the Learning Center link.

E-Mail

Ask a question anytime by sending an e-mail to our technical support staff.
techsupport@transition.com

Address

Transition Networks
10900 Red Circle Drive Minnetonka, MN 55343, U.S.A.
telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

TRANSITION NETWORKS

Declaration of Conformity

Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.
Model:	CFETF10xx-205 Series Media Converters
Part Number(s):	CFETF1011-205, CFETF1013-205, CFETF1014-205, CFETF1015-205, CFETF1016-205, CFETF1017-205, CFETF1018-205, CFETF1019-205, CFETF1039-205
Regulation:	EMC Directive 89/336/EEC

Purpose: To declare that the *CFETF10xx-205* to which this declaration refers is in conformity with the following standards.

CISPR 22: 1997+A1:2000; EN 55022:1998 A1:2000 Class A & B; EN 55024:1998; FCC Part 15 Subpart B; EN 61000-2-3:1995 A14:2000, EN 61000-3-3:1995; 21 CFR subpart J

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

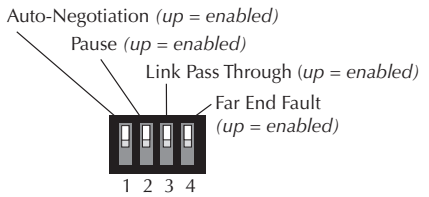
Stephen Anderson, Vice-President of Engineering — May, 2008 Date

Installation

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the 4-position switch and the jumpers. Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.

Set the 4-Position Switch

- The 4-position switch is located on the circuit board.
- Use a small flat-blade screwdriver to set the recessed switches.



1. **Auto-Negotiation**
   up = Advertises 100 Mb/s Full-Duplex and Half-Duplex *(only during Auto-Negotiation)*.
   down = Disables Auto-Negotiation. Operates at 100 Mb/s in the mode *(either full- or half-duplex)* of the attached device.

2. **Pause**
   (Applies ONLY *if switch "1" is up* AND *the media converter is connected to auto negotiating device(s) capable of Pause Control Frame.)*
   up = Allows negotiation of Pause Control Frame.
   down = Does not allow negotiation of Pause Control Frame.

3. **Link Pass-Through**
   up = Enables Link Pass-Through.
   down = Disables Link Pass-Through.

4. **Far-End Fault**
   up = Enables Far-End Fault.
   down = Disables Far-End Fault.

Set the hardware/software Jumper

- The header for the jumper is located on the circuit board labeled "H" hardware mode and "S" software mode.
- Use small needle-nose pliers to remove and position the jumper.

Hardware The four DIP switches control the function of the board in hardware mode. You can only view status via the Web or Focal Point interface.

Hardware Mode

Software Software controls the function of the board. The DIP switches do not function in software mode.

Software Mode

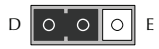
Installation -- Continued

Set the AutoCross™ Jumper

When the AutoCross feature is activated, it allows either straight-through or crossover cables to be used when connecting to 100Base-TX devices. AutoCross determines the characteristics of the connection and automatically configures the unit to link up, regardless of the cable configuration.

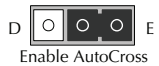
- The jumper is located on the circuit board labeled "D" and "E".
- Use small needle-nose pliers to remove and position the jumper.

Disable Either straight-through or crossover twisted-pair copper cable must be installed, according to the site requirements.



Disable AutoCross

Enable The media converter connects automatically to either straight-through or crossover twisted-pair copper cable.



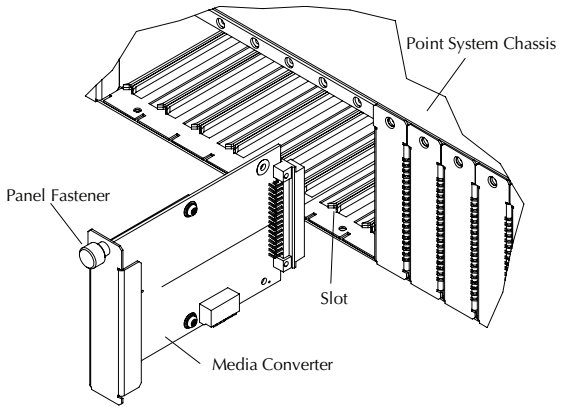
Enable AutoCross

NOTE: AutoCross is enabled by default." Transition networks recommends leaving the jumper in the "enable" position.

Install the media converter

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing the CFETF10xx-205 media converter. Failure to observe this caution could result in damage to or failure of, the media converter.

1. Carefully slide the media converter into the slot, aligning it with the slot guides.
2. Ensure that the converter is firmly seated into the slot.
3. Push in and rotate the attached panel fastener screw clockwise to secure the converter to the chassis.



Troubleshooting

If the media converter fails, isolate and correct the failure by determining the answers to the following questions and then taking the indicated action:

1. Is the PWR LED on the media converter illuminated?
   NO
   - Is the media converter installed properly in the chassis?
   - Is the power cord properly installed in the chassis and at the external power source?
   - Does the external power source provide power?
   - Contact Technical Support: 1-800-260-1312 *(Int'l: 00-1-952-7600)*.

   YES
   - Proceed to step 2.
2. Is the LKC LED on the media converter illuminated?
   NO
   - Check the twisted-pair cables for proper connection.
   - Contact Technical Support: 1-800-260-1312 *(Int'l: 00-1-952-7600)*.

   YES
   - Proceed to step 3.
3. Is the LKF LED on the media converter illuminated?
   NO
   - Check the fiber cables for proper connection.
   - Verify that the TX and RX cables on the media converter are connected to the RX and TX ports, respectively, on the other device.
   - Contact Technical Support: 1-800-260-1312 *(Int'l: 00-1-952-7600)*.

   YES
   - Proceed to step 4.
4. Is the RXC LED on the media converter flashing?
   NO
   - If there is no activity on the 100Base-TX port, proceed to step 5.
   - If there is activity on the 100Base-TX port, disconnect and reconnect the 100Base-TX cable to restart the initialization process.
   - Restart the workstation to restart the initialization process.
   - Contact Technical Support: 1-800-260-1312 *(Int'l: 00-1-952-7600)*.

   YES
   - Proceed to step 5.
5. Is the RXF LED on the media converter flashing?
   NO
   - If there is activity on the 100Base-FX port, disconnect and reconnect the 100Base-FX cable to restart the initialization process.
   - Verify that the TX and RX cables on the media converter are connected to the RX and TX ports, respectively, on the other device.
   - Restart the workstation to restart the initialization process.
   - Contact Technical Support: 1-800-260-1312 *(Int'l: 00-1-952-7600)*.

   YES
   - Contact Technical Support: 1-800-260-1312 (Int'l: 00-1-952-7600).

Technical Specifications

For use with Transition Networks Model CFETF10xx-205 or equivalent.

Standards	IEEE 802.3™	
Data Rate	100 Mb/s	
Dimensions	3.4" x 5.0" x 0.87" *(86 x 185 x 22 mm)*	
Weight	3 oz *(91 g) (approximate)*	
Power Consumption	3.5 watts, 200 mA @ 13.9 VDC	
MTBF	382,956 hours *(MIL217F2 V5.0) (MIL-HDBK-217F)* 1,456,260 hours (Bellcore7 V5.0)	
Environment	Tmra*:	0 to 60°C *(32 to 140°F)*
	Storage Temp:	-20 to 85°C *(-4 to 185°F)*
	Humidity	5 to 95%, non condensing
	Altitude	0 to 10,000 feet
Warranty	Lifetime	

*Manufacturer's rated ambient temperature: Tmra range for the CFETF10xx-205 media converter depends on the physical characteristics and the installation configuration of the PointSystem™ chassis, in which the module will be installed.

The information in this user's guide is subject to change. For the most up-to-date information on the CFETF10xx-205 media converter, view the user's guide on-line at: www.transition.com

This product is certified by the manufacturer to comply with DHHS Rule 21/CFR, Subchapter J applicable at the date of manufacture.

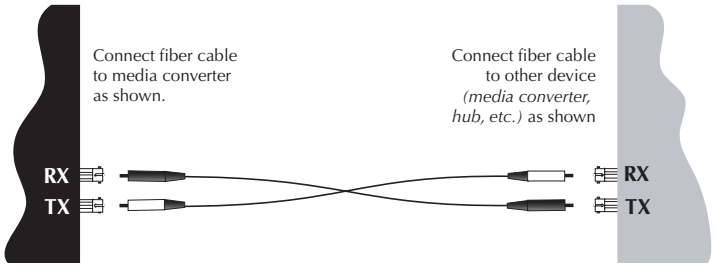
CAUTION: Visible and invisible laser radiation when open. Do not stare into the beam or view directly with optical instruments.

CAUTION: Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Installation -- Continued

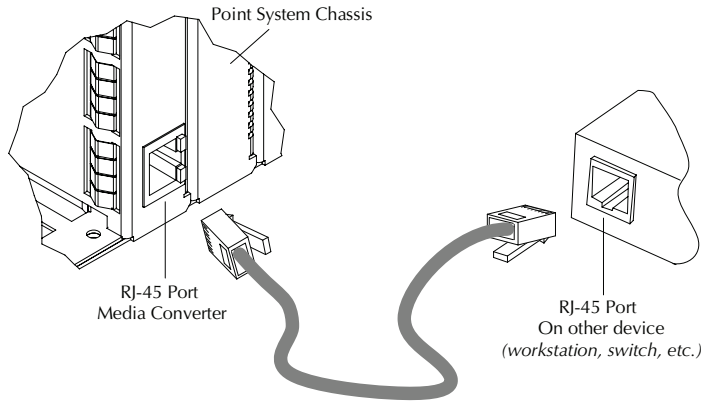
Connect the Fiber Cable

1. Locate a 100Base-FX compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the CFETF10xx-205 media converter as described:
   - Connect the male **TX** cable connector to the female **TX** port.
   - Connect the male **RX** cable connector to the female **RX** port.
3. Connect the fiber cables to the other device *(another media converter, hub, etc.)* as described:
   - Connect the male **TX** cable connector to the female **RX** port.
   - Connect the male **RX** cable connector to the female **TX** port.



Connect the Twisted-Pair Copper Cable

1. Locate or build 100Base-TX compliant cables, with male RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the CFETF10xx-205 media converter.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the other device *(switch, workstation, etc.)*.

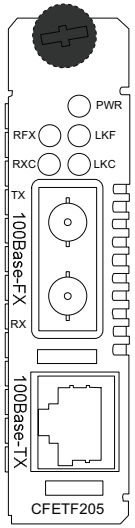


Operation

Status LEDs

The CFETF10xx-205 media converter is designed to operate without user intervention. Use the status LEDs to monitor the media converter operation in the network.

PWR	On	Connection to external power.
LKF	On	The fiber link has been established.
LKC	On	The copper link has been established.
RXF	Flashing	The fiber link is receiving data.
RXC	Flashing	The copper link is receiving data.



Product Features

Auto-Negotiation

The Auto-Negotiation feature allows the CFETF10xx-205 media converter to automatically configure itself to achieve the best possible mode of operation over a link. The media converter broadcasts its speed *(100 Mb/s)* and duplex capabilities *(full or half)* to the other devices and negotiates the best mode of operation. Auto-Negotiation allows quick and easy installation because the optimal link is established automatically. No user intervention is required.

A scenario where the media converter is linked to a non-negotiating device, disable Auto-Negotiation. In this instance, the mode of operation will drop to the least common denominator between the two devices *(e.g., 100 Mb/s, half-duplex)*. Disabling this feature enables forcing the connection to the best mode of operation.

Half-Duplex Network (512-Bit Rule)

In a half-duplex network, the maximum cable lengths are determined by the round trip delay limitations of each Fast Ethernet collision domain. *(A collision domain is the longest path between any two terminal devices, e.g., a terminal, switch, or router.)*

The 512-Bit Rule determines the maximum length of cable permitted by calculating the round-trip delay in bit-times (BTU) of a particular collision domain. If the result is less than or equal to 512 BTU, the path is good.

For more information on the 512-Bit Rule, see the white paper titled "*Collision Domains*" on the Transition Networks website at: www.transition.com

Cable Specifications -- Continued

CFETF1029-2xx 1300 nm multimode
Fiber Optic Transmitter Power: min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity: min: -30.0 dBm max: -14.0 dBm
Link Budget: 11 dB

CFETF1017-351 1510 nm multimode
Fiber Optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber Optic Receiver Sensitivity: min: -34.0 dBm max: -3.0 dBm
Link Budget: 29 dB

CFETF1017-353 1530 nm multimode
Fiber Optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber Optic Receiver Sensitivity: min: -34.0 dBm max: -3.0 dBm
Link Budget: 29 dB

CFETF1017-355 1550 nm multimode
Fiber Optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber Optic Receiver Sensitivity: min: -34.0 dBm max: -3.0 dBm
Link Budget: 29 dB

CFETF1017-357 1570 nm multimode
Fiber Optic Transmitter Power: min: -5.0 dBm max: 0.0 dBm
Fiber Optic Receiver Sensitivity: min: -34.0 dBm max: -3.0 dBm
Link Budget: 29 dB

The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

Cable Specifications

The physical characteristics must meet or exceed IEEE 802.3™ specifications.

Fiber Cable

Bit Error Rate:	<10-9
Single mode fiber *(recommended)*:	9 µm
Multimode fiber *(recommended):*	62.5/125 µm
Multimode fiber *(optional)*:	100/140, 85/140, 50/125 µm
CFETF1011-205	1300 nm multimode
Fiber Optic Transmitter Power:	min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm max: -14.0 dBm
Link Budget:	11.0 dB
CFETF1013-205	1300 nm multimode
Fiber Optic Transmitter Power:	min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm max: -14.0 dBm
Link Budget:	11.0 dB
CFETF1014-205	1310 nm single mode
Fiber-optic Transmitter Power:	min: -15.0 dBm max: -8.0 dBm
Fiber-optic Receiver Sensitivity:	min: -31.0 dBm max: -8.0 dBm
Link Budget:	16.0 dB
CFETF1015-205	1310 nm single mode
Fiber-optic Transmitter Power:	min: -8.0 dBm max: -2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	26.0 dB
CFETF1016-205	1310 nm single mode
Fiber-optic Transmitter Power:	min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	29.0 dB
CFETF1017-205	1550 nm single mode
Fiber-optic Transmitter Power:	min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	29.0 dB
CFETF1018-205	1300 nm multimode
Fiber Optic Transmitter Power:	min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -33.5 dBm max: -14.0 dBm
Link Budget:	14.5 dB
CFETF1019-205	1310 nm single mode
Fiber-optic Transmitter Power:	min: -15.2 dBm max: -8.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.5 dBm max: -3.0 dBm
Link Budget:	17.3 dB

Operation -- Continued

Full-Duplex Network

In a full-duplex network, maximum cable lengths are determined by the type of cables used. See page 1 *(front cover)* for available CFETF10xx-205 models.

The 512-Bit Rule does not apply in a full-duplex network.

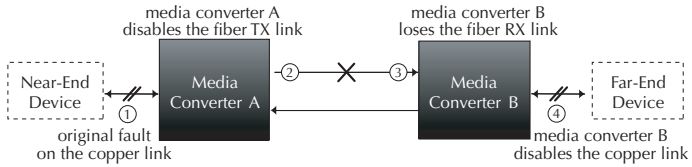
Pause Control Frame

The pause control feature can improve network performance by allowing one end of the link to signal the other to discontinue frame transmission for a set period of time to relieve buffer congestion.

NOTE: If the pause control feature is present on ALL network devices attached to the media converter(s), enable the pause control feature on the media converter(s). Otherwise, disable this feature.

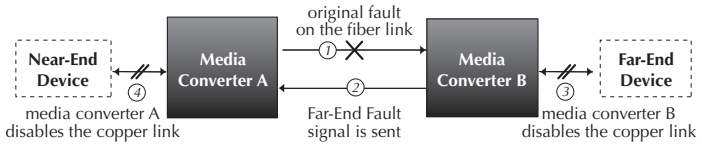
Link Pass-Through

When the Link Pass-Through feature is activated, it allows the media converter to monitor both the fiber and copper RX *(receive)* ports for loss of signal. In the event of a loss of an RX signal (1), the media converter will automatically disable the TX *(transmit)* signal (2), thus, "passing through" the link loss (3). The far-end device is notified automatically of the link loss (4), which prevents the loss of valuable data transmitted unknowingly over an invalid.



Far-End Fault

When a fault occurs on an incoming fiber link (1), the media converter transmits a Far-End Fault signal on the outgoing fiber link (2). In addition, the Far-End Fault signal also activates the Link Pass-Through, which in turn disables the link on the copper portion of the network (3) and (4).



Operation -- Continued

SUMP

See the on-line documentation that comes with Transition Networks *FocalPoint*™ software for applicable commands and usage.

Use SUMP at an attached terminal or at a remote location to monitor the following media converter activities:

- Media-converter power
- Copper link and fiber link status
- Twisted-pair cable length
- Hardware switch settings
- Fault condition

Also, use SUMP to enter network commands that:

- Enable/disable full-/half-duplex
- Enable/disable Link Pass-Through (LPT)
- Enable/disable Far-End Fault (FEF)
- Enable/disable Pause
- Enable/disable AutoCross
- Power down the media converter

Cable Specifications

Copper Cable

Category 5: *(minimum requirement)*

Gauge	24 to 22 AWG
Attenuation	22.0 dB /100m @ 100 MHz
Maximum Cable Distance	100 meters

- Straight-through or crossover twisted-pair cable may be used.
- Shielded twisted-pair or unshielded twisted-pair may be used.
- Pins 1&2 and 3&6 are the two active pairs in an Ethernet network .
- Use only dedicated wire pairs for the active pins:
  (e.g., blue/white & white/blue, orange/white & white/orange, etc.)
- Do not use flat or silver satin wire.