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.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Port One - Copper 100Base-TX</th>
<th>Port Two - Duplex Fiber-Optic 100Base-FX</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFETF1011-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>ST, 1300 nm multimode 2 km (1.2 miles)*</td>
</tr>
<tr>
<td>CFETF1013-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>SC, 1300 nm multimode 2 km (1.2 miles)*</td>
</tr>
<tr>
<td>CFETF1014-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>SC, 1310 nm single mode 20 km (12.4 miles)*</td>
</tr>
<tr>
<td>CFETF1015-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>SC, 1310 nm single mode 40 km (24.9 miles)*</td>
</tr>
<tr>
<td>CFETF1016-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>SC, 1310 nm single mode 60 km (37.3 miles)*</td>
</tr>
<tr>
<td>CFETF1017-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>SC, 1550 nm single mode 80 km (49.7 miles)*</td>
</tr>
<tr>
<td>CFETF1018-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>MT-RJ, 1300 nm multimode 2 km (1.2 miles)*</td>
</tr>
<tr>
<td>CFETF1019-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>LC, 1310 nm single mode 20 km (12.4 miles)*</td>
</tr>
<tr>
<td>CFETF1039-205</td>
<td>RJ-45 100 m (328 ft)*</td>
<td>LC, 1300 nm multimode, 2 km (1.2 miles)*</td>
</tr>
</tbody>
</table>

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

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### 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 öffentliches Telekommunikationsnetz in den EG-Mitgliedsstaaten verstösst gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsend einrichtungen 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.

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**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
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

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 FocalPoint interface.

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

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

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.

<table>
<thead>
<tr>
<th>Standards</th>
<th>IEEE 802.3™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Rate</td>
<td>100 Mb/s</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3.4” x 5.0” x 0.87” (86 x 185 x 22 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>3 oz (91 g) (approximate)</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>3.5 watts, 200 mA @ 13.9 VDC</td>
</tr>
<tr>
<td>MTBF</td>
<td>382,956 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 1,456,260 hours (Bellcore7 V5.0)</td>
</tr>
<tr>
<td>Environment</td>
<td>*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.</td>
</tr>
<tr>
<td></td>
<td>Warranty</td>
</tr>
</tbody>
</table>

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.
- **RFX** 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**

<table>
<thead>
<tr>
<th>CFETF1029-2xx</th>
<th>1300 nm multimode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Optic Transmitter Power:</td>
<td>min: -19.0 dBm max: -14.0 dBm</td>
</tr>
<tr>
<td>Fiber Optic Receiver Sensitivity:</td>
<td>min: -30.0 dBm max: -14.0dBm</td>
</tr>
<tr>
<td>Link Budget:</td>
<td>11 dB</td>
</tr>
<tr>
<td>CFETF1017-351</td>
<td>1510 nm multimode</td>
</tr>
<tr>
<td>Fiber Optic Transmitter Power:</td>
<td>min: -5.0 dBm max: 0.0 dBm</td>
</tr>
<tr>
<td>Fiber Optic Receiver Sensitivity:</td>
<td>min: -34.0 dBm max: -3.0 dBm</td>
</tr>
<tr>
<td>Link Budget:</td>
<td>29 dB</td>
</tr>
<tr>
<td>CFETF1017-353</td>
<td>1530 nm multimode</td>
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<tr>
<td>Link Budget:</td>
<td>29 dB</td>
</tr>
<tr>
<td>CFETF1017-355</td>
<td>1550 nm multimode</td>
</tr>
<tr>
<td>Fiber Optic Transmitter Power:</td>
<td>min: -5.0 dBm max: 0.0 dBm</td>
</tr>
<tr>
<td>Fiber Optic Receiver Sensitivity:</td>
<td>min: -34.0 dBm max: -3.0 dBm</td>
</tr>
<tr>
<td>Link Budget:</td>
<td>29 dB</td>
</tr>
<tr>
<td>CFETF1017-357</td>
<td>1570 nm multimode</td>
</tr>
<tr>
<td>Fiber Optic Transmitter Power:</td>
<td>min: -5.0 dBm max: 0.0 dBm</td>
</tr>
<tr>
<td>Fiber Optic Receiver Sensitivity:</td>
<td>min: -34.0 dBm max: -3.0 dBm</td>
</tr>
<tr>
<td>Link Budget:</td>
<td>29 dB</td>
</tr>
</tbody>
</table>

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 21 CFR1040.11.
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

<table>
<thead>
<tr>
<th>Model</th>
<th>Fiber Optic Transmitter Power</th>
<th>Fiber Optic Receiver Sensitivity</th>
<th>Link Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFETF1011-205</td>
<td>min: -19.0 dBm</td>
<td>max: -14.0 dBm</td>
<td>11.0 dB</td>
</tr>
<tr>
<td>CFETF1013-205</td>
<td>min: -19.0 dBm</td>
<td>max: -14.0 dBm</td>
<td>11.0 dB</td>
</tr>
<tr>
<td>CFETF1014-205</td>
<td>min: -15.0 dBm</td>
<td>max: -8.0 dBm</td>
<td>16.0 dB</td>
</tr>
<tr>
<td>CFETF1015-205</td>
<td>min: -8.0 dBm</td>
<td>max: -2.0 dBm</td>
<td>26.0 dB</td>
</tr>
<tr>
<td>CFETF1016-205</td>
<td>min: -5.0 dBm</td>
<td>max: 0.0 dBm</td>
<td>29.0 dB</td>
</tr>
<tr>
<td>CFETF1017-205</td>
<td>min: -5.0 dBm</td>
<td>max: 0.0 dBm</td>
<td>29.0 dB</td>
</tr>
<tr>
<td>CFETF1018-205</td>
<td>min: -9.0 dBm</td>
<td>max: -14.0 dBm</td>
<td>14.5 dB</td>
</tr>
<tr>
<td>CFETF1019-205</td>
<td>min: -15.2 dBm</td>
<td>max: -8.0 dBm</td>
<td>17.3 dB</td>
</tr>
</tbody>
</table>

**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 link.

**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

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**Cable Specifications**

**Copper Cable**

**Category 5:** (minimum requirement)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge</td>
<td>24 to 22 AWG</td>
</tr>
<tr>
<td>Attenuation</td>
<td>22.0 dB /100m @ 100 MHz</td>
</tr>
<tr>
<td>Maximum Cable Distance</td>
<td>100 meters</td>
</tr>
</tbody>
</table>

- 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.

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![Diagram of Straight-Through and Crossover Cable Connections](image_url)