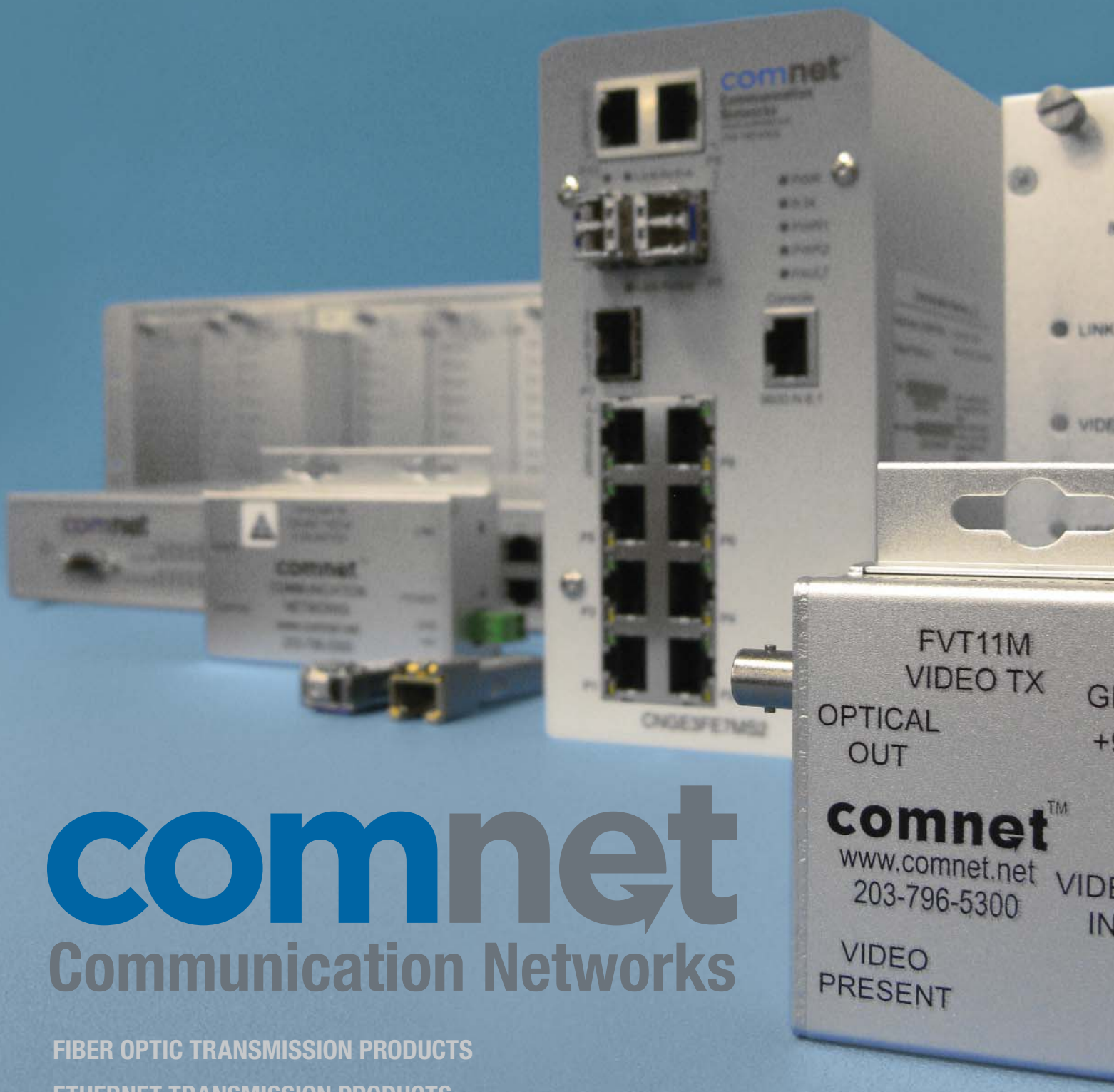
FIBER OPTIC CONNECTIVITY & COMMUNICATION NETWORK SOLUTIONS




# comnet
## Communication Networks

FIBER OPTIC TRANSMISSION PRODUCTS

ETHERNET TRANSMISSION PRODUCTS

CATALOG | VOL I NO 3 | JANUARY 2010

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3 CORPORATE DRIVE | DANBURY, CT 06810 | USA | 203.796.5300 | TOLL FREE 1.888.678.9427 | INFO@COMNET.NET
8 TURNBERRY PARK ROAD | GILDERSOME, MORLEY | LEEDS, LS27 7LE, UK | +44 (0)113 307 6400 | INFO-EUROPE@COMNET.NET

## COMPANY PROFILE

*ComNet Offices*

*‹ World Headquarters*
*Danbury, CT USA*

*ComNet Europe, Ltd. ›*
*Leeds, UK*


Communication Networks (ComNet) is a manufacturer of Fiber Optic communication products. Headquartered in Danbury, Connecticut, USA and with offices in the United Kingdom, ComNet focuses on providing innovative communications networking solutions to the Security Market and Intelligent Transportation System Markets. Our product line consists of fiber optic video, data and audio transmission products in addition to a broad Ethernet product line. All ComNet products are designed to the specific requirements for the security market with applications including Controlled Access, Intrusion, Burglar and Fire Alarms and CCTV Surveillance systems as well as ITS applications such as Closed-loop traffic signalization and video detection systems, roadside CCTV surveillance, electronic toll collection and variable message signs.

ComNet is the reincarnation of International Fiber Systems under the direction of George Jay Lichtblau. ComNet returns to the business ethics, customer support, engineering and quality that were characteristic of IFS prior to being sold to GE in 2003.

ComNet is comprised of many of the most talented former IFS and Fiber Options employees. That talent allows ComNet to perform at a higher level. Every engineer at ComNet has over 10 years experience designing complex fiber optic and electronic circuits. Our technical support and sales personnel have over 10 years experience working with complex networks, using both fiber optic and IP compatible transmission equipment.

The product line presented here is the result of that talent and experience and is far advanced from what is currently available. That's why ComNet backs all our products with a lifetime warranty.

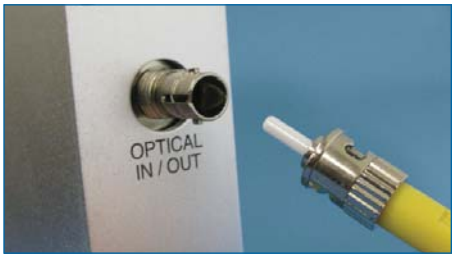
## TABLE OF CONTENTS

## INNOVATION BY DESIGN

ComNet is a manufacturer of precision-engineered analog and digital fiber optic transmission and communications networking products designed to withstand the rigors of harsh and difficult industrial applications. ComNet is establishing the standard for the next generation of fiber optic and copper-media, communications equipment with technological innovation few companies competing in this market can match.

**ComFit – Card-Cage or Stand-Alone Interchangeability**
ComNet fiber optic products are designed for use in either our card cage or stand-alone use right out of the box. This solution eliminates ordering the wrong mounting configuration, and reduces installation problems. Saves time, money and installation delays.

**Single Fiber Design**
Many ComNet products require the use of only one optical fiber, whereas most competitive products use a two-fiber design. The use of a single fiber simplifies your overall system design, significantly reduces the cost of installation and enhances overall system reliability.

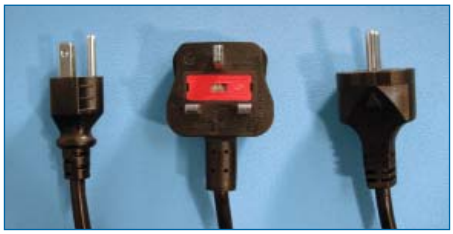



**Laser Technology for Superior Performance**
ComNet uses Laser-based transmission technology in all but our entry-level fiber optic products. Laser-based transmission offers many benefits, including:
- Greater optical transmission distance
- Higher reliability, particularly over extended temperature/out-of-plant operation

**Designed and Manufactured in the USA**
ComNet products are designed and manufactured in our 25,000 square foot facility in Danbury, Connecticut.

### Worldwide Operability

The ComNet Card Cage Rack System is equipped with a self-contained power supply that provides operation with any input voltage from 90 to 264 VAC, 50/60 Hz. Any possibility of ordering an incorrect power supply with the wrong operating voltage is completely eliminated.



### Environmentally Hardened

ComNet products set the standard for reliability when installed in the most difficult operating environments. All ComNet equipment is designed to operate over the ambient temperature range of -40°C to +75°C.

### Independently Tested

ComNet products are certified by an independent test laboratory to exceed the environmental requirements of NEMA TS-1/TS-2 and the CALTRANS Specification for Traffic Signal Control Equipment. These requirements include ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection.

### Broad-Range Compatibility

ComNet video with serial data and data transmission products are transparent to data encoding, so they're designed for broad-range compatibility with most major system manufacturers.

American Dynamics BOSCH COHU Honeywell

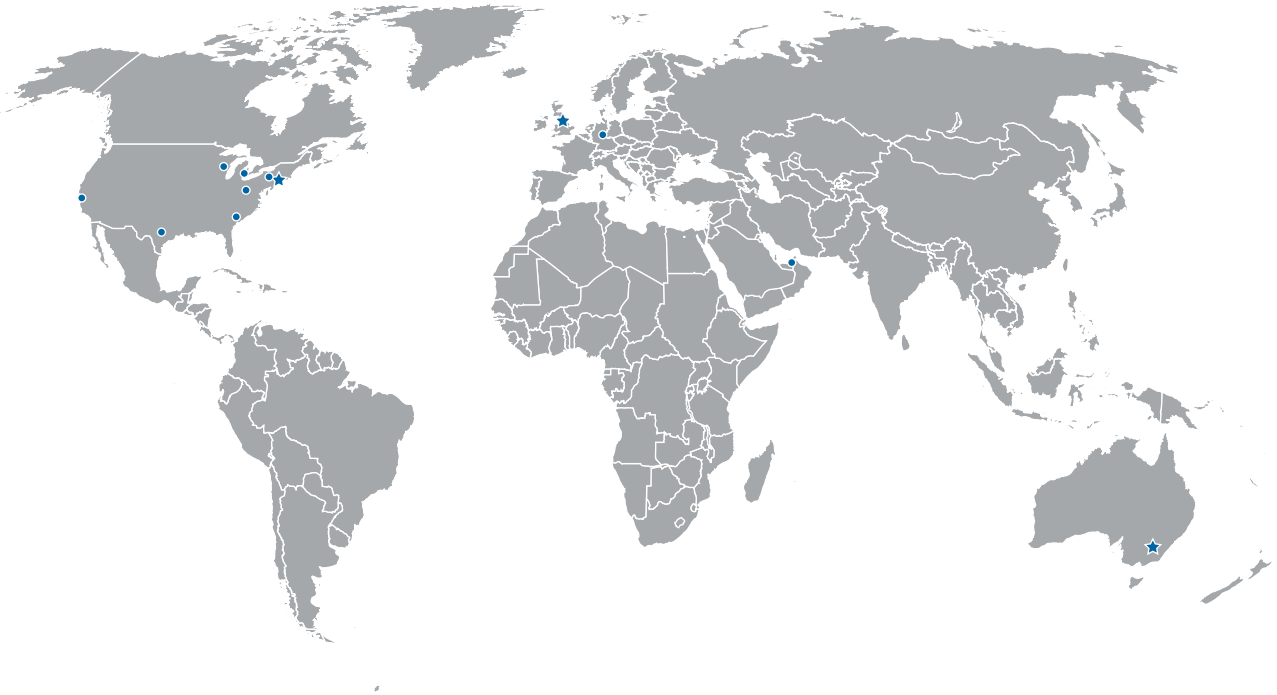
Panasonic PELCO VICON

### Lifetime Warranty

We're so confident in the long-term reliability of our products that we back them with a Lifetime Warranty.

LIFETIME WARRANTY

## WORLDWIDE OFFICES




### WORLDWIDE HEADQUARTERS

ComNet
3 Corporate Drive
Danbury, CT 06810 USA
T: 203.796.5300
F: 203.796.5303
Tech Service: 888.678.9427
sales@comnet.net

### EUROPEAN HEADQUARTERS

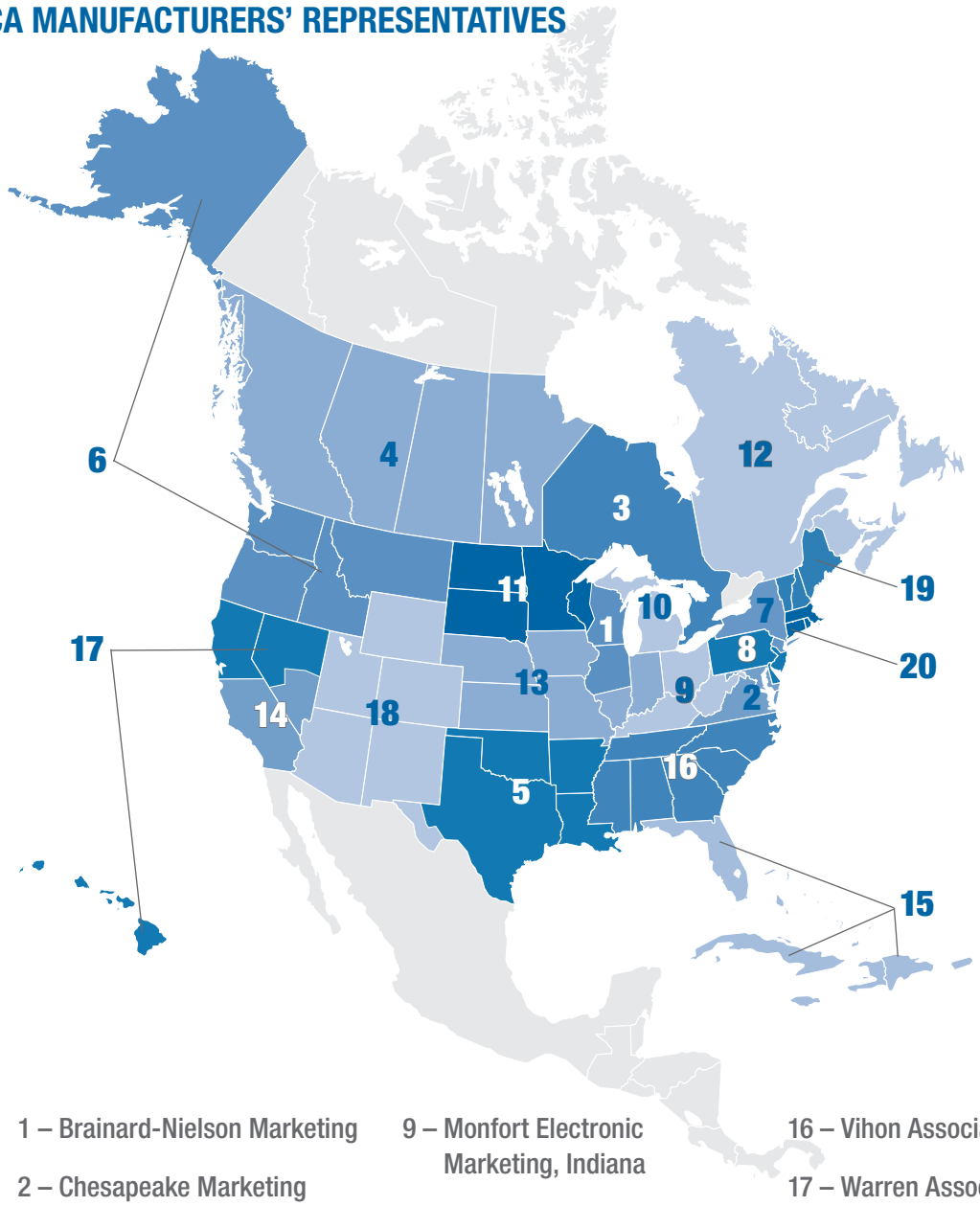
ComNet Europe Ltd.
8 Turnberry Park Road
Gildersome, Morley
Leeds, LS27 7LE, UK
T: +44 (0)113 307 6400
F: +44 (0)113 253 7462
info-europe@comnet.net


### WORLDWIDE LOCATIONS

NEW YORK SOUTH CAROLINA PENNSYLVANIA MICHIGAN WISCONSIN TEXAS

GERMANY SOUTH AMERICA MIDDLE EAST AUSTRALIA

## NORTH AMERICA MANUFACTURERS' REPRESENTATIVES




1 – Brainard-Nielson Marketing

2 – Chesapeake Marketing

3 – Contact North

4 – Core Products

5 – First Line Associates

6 – GP Marketing

7 – Langbaum Associates, NY

8 – Midlantic Marketing LLC

9 – Monfort Electronic Marketing, Indiana

10 – Monfort Electronic Marketing, Michigan

11 – Multi-tech Reps

12 – Novytec Marketing, Inc.

13 – Rancilio Associates, Inc.

14 – SNR

15 – SpecPoint of Florida

16 – Vihon Associates

17 – Warren Associates, California

18 – Warren Associates, Utah

19 – Langbaum Associates, NH

20 – Langbaum Associates, MA

## UNITED STATES MANUFACTURERS' REPRESENTATIVES

Chesapeake Marketing
1401 Abingdon Rd.
Abingdon, MD 21009
Tel: 410-612-9640
Fax: 410-612-9644
sales@chesapeakemarketing.com
www.chesapeakemarketing.com

Brainard-Nielson Marketing
180 Crossen Avenue
Elk Grove Village, IL 60007
Tel: 847-734-8400
Fax: 847-734-8633
paul@bnmsales.com
www.bnmsales.com

First Line Associates
915 Glen Meadow Ct
Garland, TX 75040
Tel: 214-769-8295
ejblue@firstlineassocs.com
www.firstlineassocs.com

GP Marketing
14955 NE 95th St
Redmond, WA 98052
Tel: 425-576-8825
Toll Free: 877-590-8005
Fax: 425-889-1677
Sales@gpmkt.com
www.gpmkt.com

Langbaum Associates, NY
950 Route 45
Pomona, NY 10970
Tel: 845-362-1141
Fax: 845-362-7740
alangbaum@ILAsales.com
www.ILAsales.com

Langbaum Associates, NH
148 Pendleton Road
Laconia, NH 03246
Tel: 603-860-3900
Fax: 603-366-2586
info@ILAsales.com
www.ILAsales.com

Langbaum Associates, MA
226 Boston Road
Palmer, MA 01069
Tel: 603-660-3649
Fax: 413-289-9656
info@ILAsales.com
www.ILAsales.com

Midlantic Marketing LLC
118 Common Court
Chadds Ford, PA 19317
Tel: 610-361-0500
Fax: 610-361-0520
Sales@midlantic.net
www.midlantic.net

Monfort Electronic Marketing, Indiana
6136 S. Belmont Ave.
Indianapolis, IN 46217
Tel: 317-782-8877
Fax: 317-782-8805
info@monfortcorp.com
www.monfortcorp.com

Monfort Electronic Marketing, Michigan
1032 Woodlawn Avenue
Grand Haven, MI 49417
Pete Blodgett
Cell: 616-406-3419
www.monfortcorp.com

## UNITED STATES MANUFACTURERS' REPRESENTATIVES, CONT'D

**Multi-tech Reps**
2021 East Hennepin Avenue, Suite 405
Minneapolis, MN 55413
Tel: 763-398-2000
Fax: 763-398-2001
sales@multitechreps.com
www.multitechreps.com

**Rancilio Associates, Inc.**
11159 South Towne Square, Unit C
PO Box 28869
St. Louis, MO 63123
Tel: 314-845-0202
Fax: 314-845-0330
Dan Rancilio, drancilio@aol.com

**SNR**
4315 East Lowell St., Suite E
Ontario, CA 91761
Tel: 909-390-8812
Fax: 909-390-8816
Dennis@professionalsalesinc.com
www.professionalsalesinc.com

**SpecPoint of Florida**
1050 Northfield Ct, Suite 250
Roswell, GA 30076
Tel: 770-518-1120
Fax: 770-518-0234
mballast@specpoint.com
www.specpointfl.com

**Vihon Associates**
11285 Elkins Rd.
Building H, Suite 4
Roswell, GA 30076
Tel: 770-667-7879
Fax: 770-667-5354
vihonga@vihon.com
www.vihon.com

**Warren Associates, California**
290 Rickenbacker Circle, Suite 400
Livermore, CA 94550
Tel: 925-449-9000
Fax: 925-449-8648
sales@warrenrep.com
www.warrenrep.com

**Warren Associates, Utah**
770 East 9000 South Suite A
Sandy, UT 84094
Cell: 801-448-2977
Fax: 801-649-4437
sales@warrenrep.com
www.warrenrep.com

## CANADA MANUFACTURERS' REPRESENTATIVES

Contact North
1550 Meyerside Drive, Unit #1
Mississauga, Ontario Canada
L5T 1V4
John Day
Office: (905) 702 9771
Toll Free: (877) 991 2536
Fax: 905 564 7335
jday@contactnorth.com
www.contactnorth.com

Core Products
9-2611 37th Avenue NE
Calgary, Alberta Canada
T1Y 5V7
Tel: 604-476-2213
Fax: 604-676-2246
Darren@coreproducts.ca
www.coreproducts.ca

Novytec Marketing Inc.
6955, Taschereau, Bureau 110
Brossard, Québec Canada
J4Z 1A7
Tel: 514-990-6111
Fax: 514-990-6111
ylebel@novytec.ca
www.novytec.ca

## SOUTH AMERICA MANUFACTURERS' REPRESENTATIVES

SpecPoint of Florida
1050 Northfield Ct, Suit 250
Roswell, GA 30076
Tel: 770-518-1120
Fax: 770-518-0234
mballast@specpoint.com
www.specpointfl.com

## COMNET MANUFACTURERS' REPRESENTATIVES BY STATE/PROVINCE

| | |
|---|---|
| ALABAMA | Vihon Associates |
| ALBERTA | Core Products |
| ALASKA | GP Marketing |
| ARIZONA | Warren Associates |
| ARKANSAS | First Line Associates |
| BRITISH COLOMBIA | Core Products |
| CALIFORNIA (935XX & Below) | SNR |
| CALIFORNIA (936XX & Above) | Warren Associates |
| CARIBBEAN | SpecPoint of Florida |
| COLORADO | Warren Associates |
| CONNECTICUT | Langbaum Associates, MA |
| DELAWARE | Midlantic Marketing LLC |
| DISTRICT OF COLUMBIA | Chesapeake Marketing |
| FLORIDA | SpecPoint of Florida |
| GEORGIA | Vihon Associates |
| HAWAII | Warren Associates |
| IDAHO | GP Marketing |
| ILLINOIS (600XX-619XX, 623XX, 625XX-627XX) | Brainard-Neilson Marketing |
| ILLINOIS (620XX-622XX,624XX, 628XX, 629XX) | Rancilio Associates, Inc. |
| INDIANA | Rancilio Associates, Inc. |
| IOWA | Rancilio Associates, Inc. |
| KANSAS | Rancilio Associates, Inc. |
| KENTUCKY | Monfort Electronic Marketing |
| LABRADOR | Novytec Marketing, Inc. |

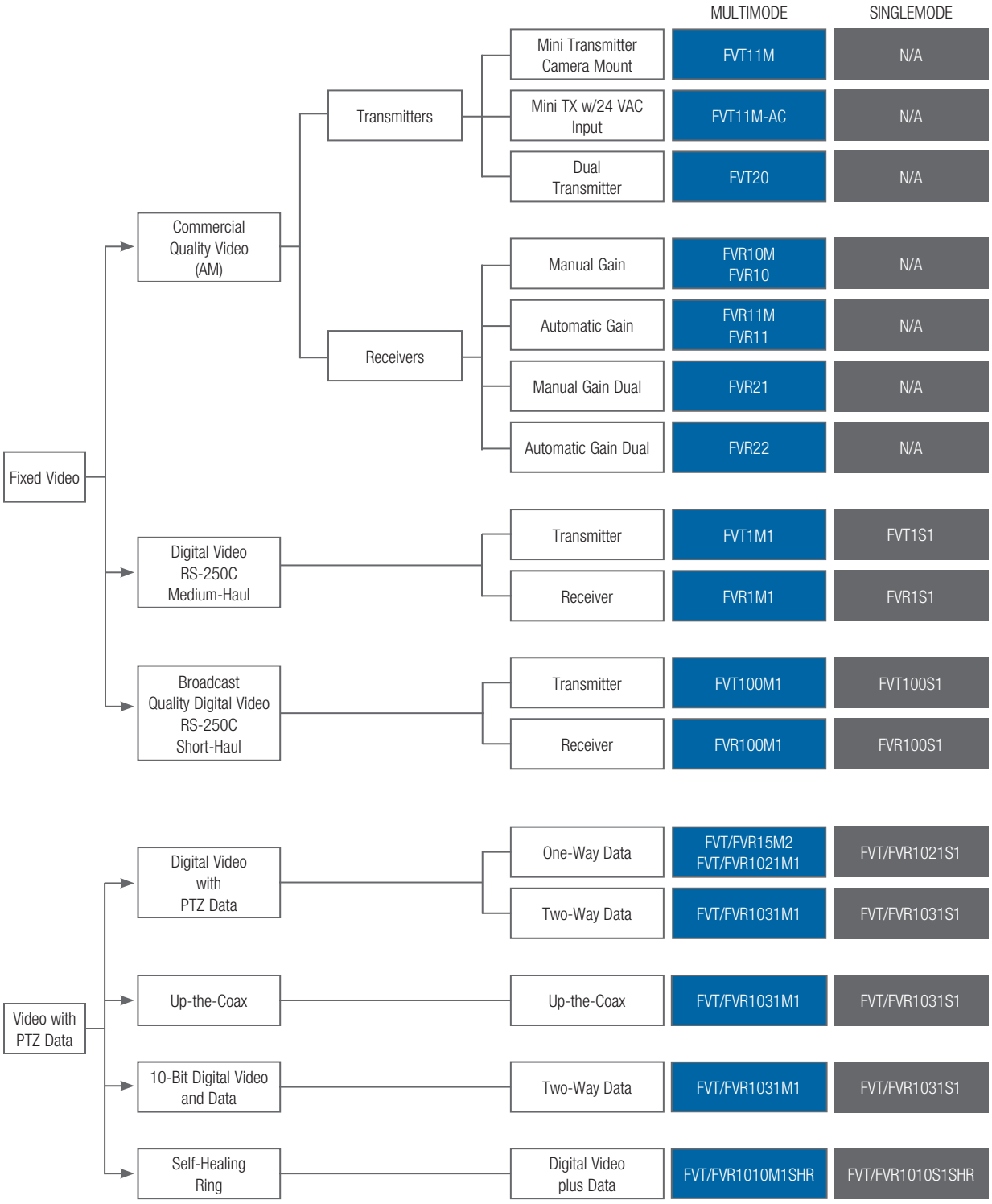
## COMNET MANUFACTURERS' REPRESENTATIVES BY STATE/PROVINCE, CONT'D

| | |
|---|---|
| LOUISIANA | First Line Associates |
| MAINE | Langbaum Associates, NH |
| MANITOBA | Core Products |
| MARYLAND | Chesapeake Marketing |
| MASSACHUSETTS | Langbaum Associates, MA |
| MICHIGAN | Monfort Electronic Marketing |
| MINNESOTA | Multi-tech Reps |
| MISSISSIPPI | Vihon Associates |
| MISSOURI | Rancilio Associates, Inc. |
| MONTANA | GP Marketing |
| NEBRASKA | Rancilio Associates, Inc. |
| NEVADA (893XX & Above) | Warren Associates |
| NEVADA (889XX-891XX) | SNR |
| NEW BRUNSWICK | Novytec Marketing, Inc. |
| NEWFOUNDLAND | Novytec Marketing, Inc. |
| NEW HAMPSHIRE | Langbaum Associates, NH |
| NEW JERSEY (Excluding 080XX-087XX), 070XX | Langbaum Associates |
| NEW JERSEY (080XX-087XX) | Midlantic Marketing LLC |
| NEW MEXICO | Warren Associates |
| NEW YORK | Langbaum Associates, NY |
| NORTH CAROLINA | Vihon Associates |
| NORTH DAKOTA | Multi-tech Reps |
| NOVA SCOTIA | Novytec Marketing, Inc. |
| OHIO | Monfort Electronic Marketing |

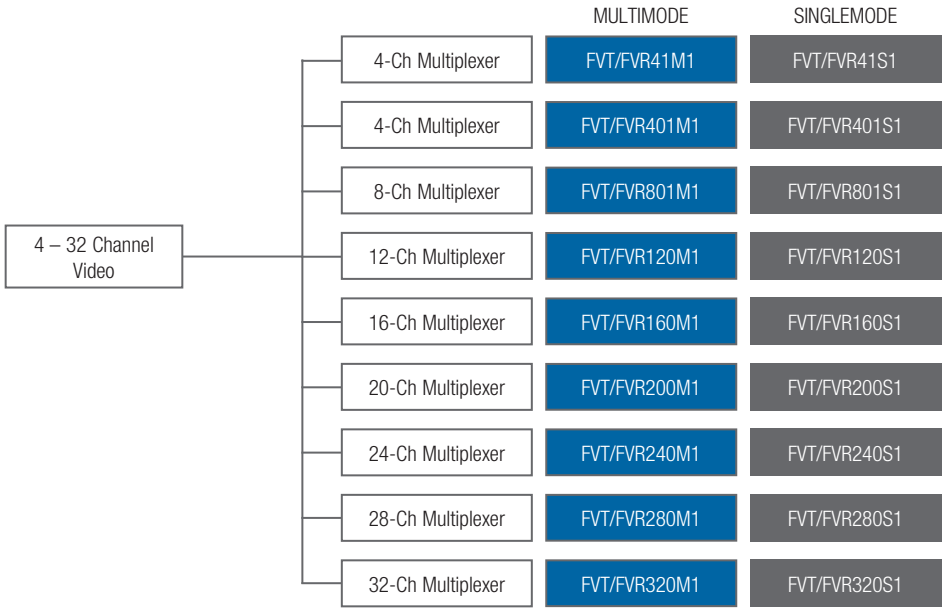
## COMNET MANUFACTURERS' REPRESENTATIVES BY STATE/PROVINCE, CONT'D

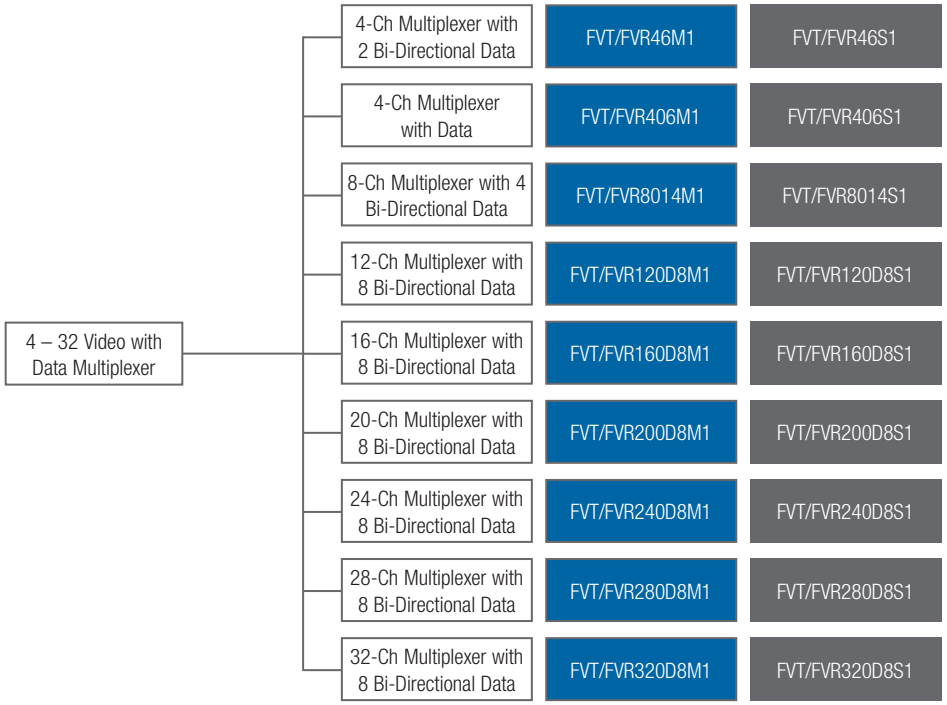
| | |
|---|---|
| OKLAHOMA | First Line Associates |
| ONTARIO (Excluding Municipalities of Belleville, Brockville, Cornwall, Kingston, Ottawa, Pembroke and Peterborough) | Contact North |
| OREGON | GP Marketing |
| PENNSYLVANIA | Midlantic Marketing LLC |
| PRINCE EDWARD ISLAND | Novytec Marketing, Inc. |
| QUEBEC | Novytec Marketing, Inc. |
| RHODE ISLAND | Langbaum Associates, MA |
| SASKATCHEWAN | Core Products |
| SOUTH AMERICA | SpecPoint of Florida |
| SOUTH CAROLINA | Vihon Associates |
| SOUTH DAKOTA | Multi-tech Reps |
| TENNESSEE | Vihon Associates |
| TEXAS (Excluding 798XX-799XX, 885XX & El Paso) | First Line Associates |
| TEXAS (El Paso) | Warren Associates |
| UTAH | Warren Associates |
| VERMONT | Langbaum Associates, NH |
| VIRGINIA | Chesapeake Marketing |
| WASHINGTON | GP Marketing |
| WEST VIRGINIA | Monfort Electronic Marketing |
| WISCONSIN (530XX-539XX, 541XX-545XX, 549XX) | Brainard-Neilson Marketing |
| WISCONSIN (540XX, 546XX, 547XX, 548XX) | Multi-tech Reps |
| WYOMING | Warren Associates |

## VIDEO SELECTION GUIDE

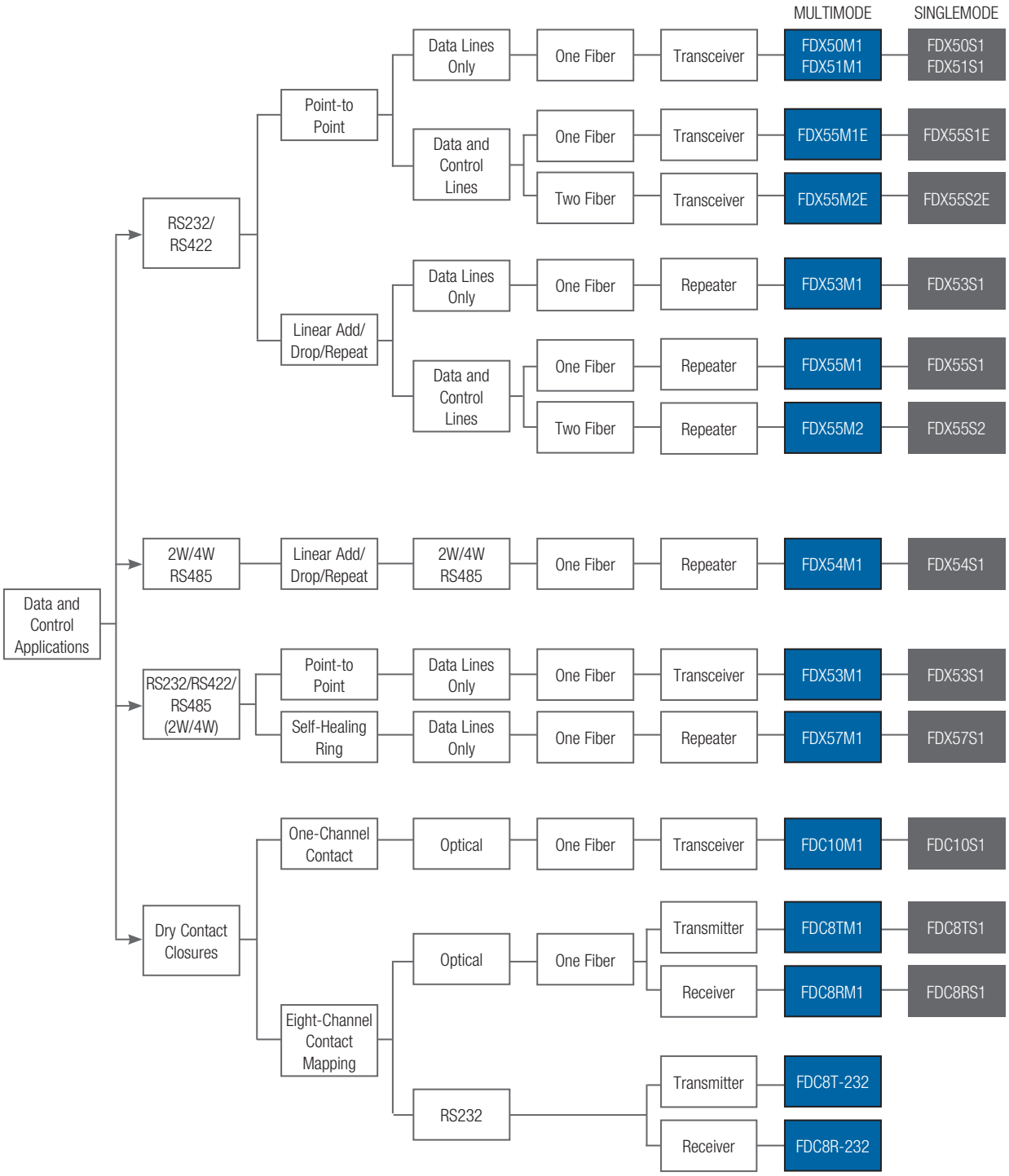


## VIDEO SELECTION GUIDE

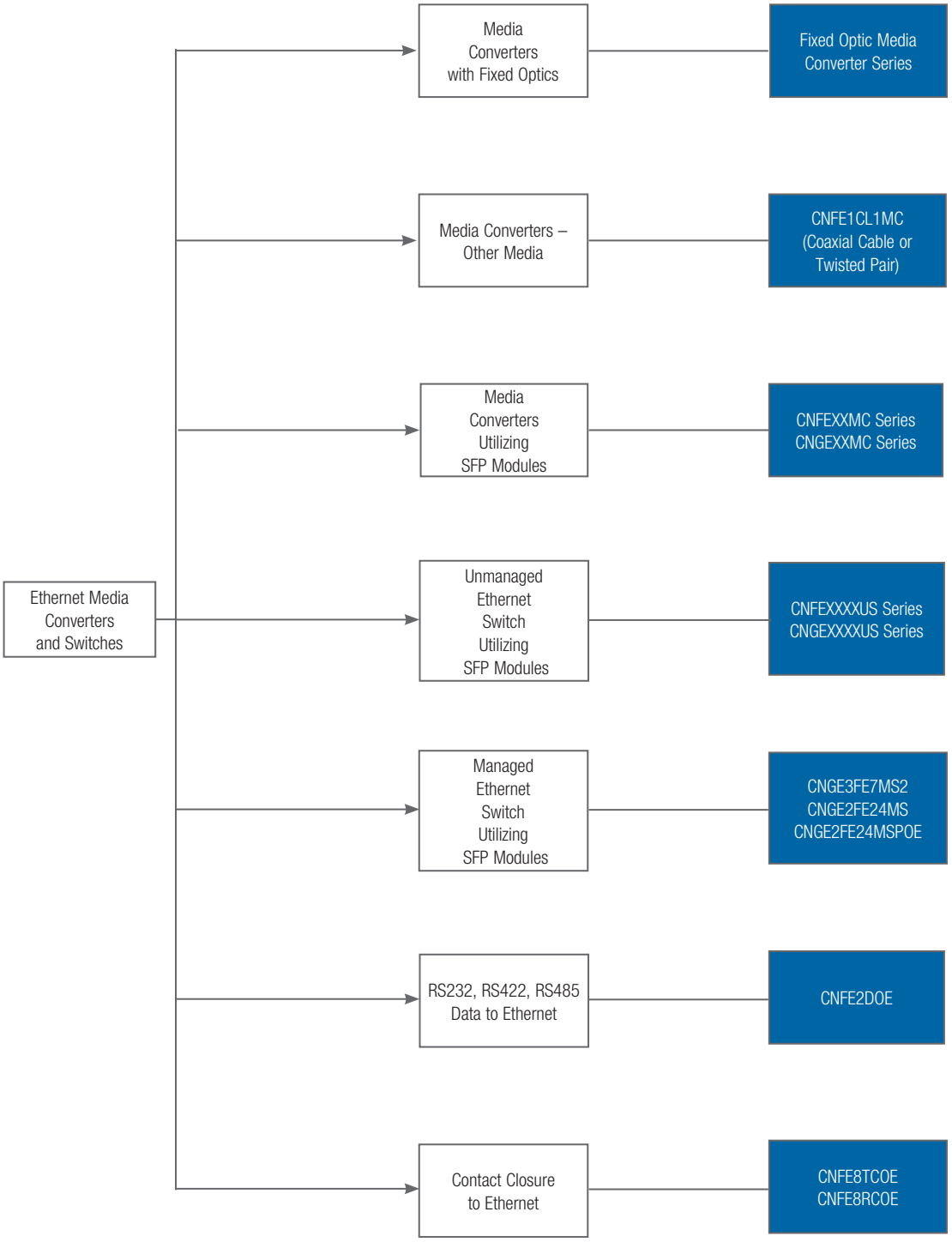


## DATA SELECTION GUIDE



## ETHERNET SELECTION GUIDE



## PRODUCT INDEX

## PRODUCT INDEX, CONT'D

## PRODUCT INDEX, CONT'D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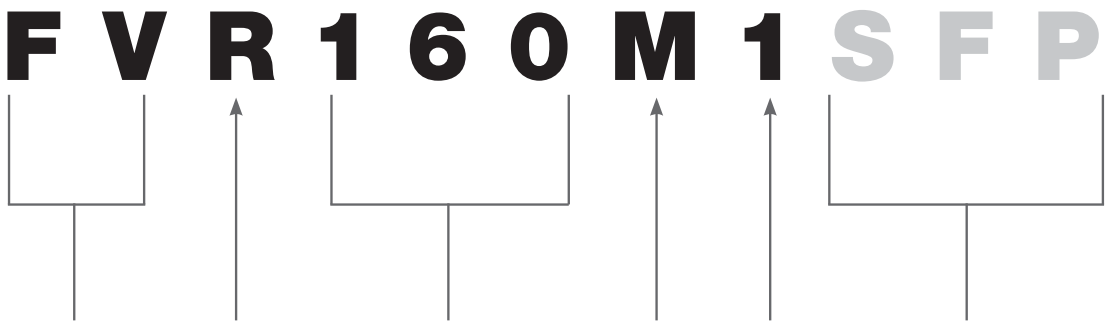
VIDEO 2
VIDEO 3
VIDEO 4
POWER
FVR1
VIDEO
RX
OPTICAL
VIDEO 1
comnet
COMMUNICATION NETWORKS
www.comnet.net
203-796-5300
S M
FVT11M
VIDEO TX
OPTICAL
OUT
GND
+9V
comnet
www.comnet.net
203-796-5300
VIDEO
IN
VIDEO
PRESENT

## VIDEO PRODUCT NUMBERING GUIDE*



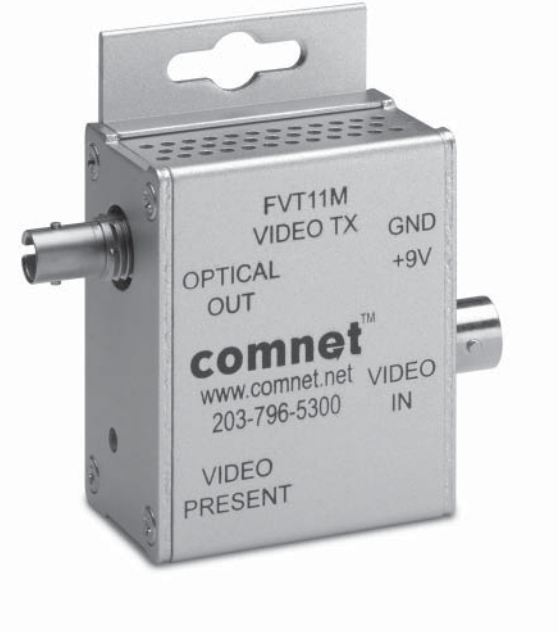

## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

# single mini video transmitter






## Applications

- CCTV (Fixed Video)

## Description

The ComNet™ FVT11M video mini-transmitter supports transmission of a fixed video signal using AM modulation on one multimode fiber optic cable. The FVT11M video transmitter is compatible with the FVR11M, FVR10M, FVR21, and FVR22 receivers. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. The transmitter incorporates a bi-color (Red/Green) indicating LED for monitoring proper system operation.

## Features

- AM Video Transmission
- NTSC, PAL, SECAM compatible
- Full color compatibility
- No in-field electrical or optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Video Present indicator
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT11M | 1 | Multimode 62.5/125µm |

# single mini video transmitter



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB |

### WAVELENGTH

| | |
|---|---|
| FVT11M | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATOR*

- Video Present

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | 8-15 VDC @ 80 mA |
| Max. RG59 Cable Length: | 750 ft. |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 2.3 × 1.6 × 1.1 in., (5.7 × 4.1 × 2.8 cm) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

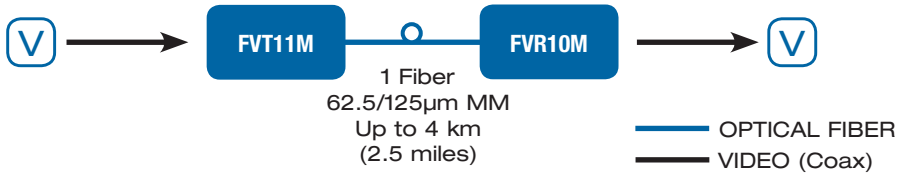
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT11M | Mini Video Transmitter (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

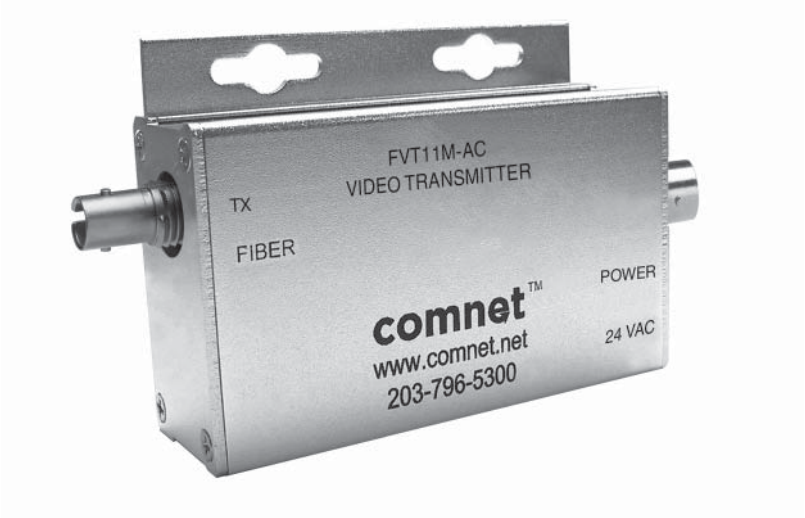
**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# single mini video transmitter
# 24VAC transformer isolated






## Applications

- CCTV (Fixed Video)

## Description

The ComNet™ FVT11MAC video mini-transmitter supports transmission of a fixed video signal using AM modulation on one multimode fiber optic cable. The FVT11MAC video transmitter is compatible with the FVR11M, FVR10M, FVR21, and FVR22 receivers. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. The transmitter incorporates a bi-color (Red/Green) indicating LED for monitoring proper system operation.

## Features

- AM Video Transmission
- NTSC, PAL, SECAM compatible
- Full color compatibility
- No in-field electrical or optical adjustments required
- Power: 24 VAC electrically isolated from case and BNC
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Power indicator
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT11MAC | 1 | Multimode 62.5/125µm |

# single mini video transmitter
# 24VAC transformer isolated



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB |

### WAVELENGTH

| | |
|---|---|
| FVT11MAC | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATOR*

- Power

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | 22-27 VAC @ 100 mA |
| Max. RG59 Cable Length: | 750 ft. |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 4.5 × 2.5 × 1.1 in., (11.4 × 6.4 × 2.8 cm) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

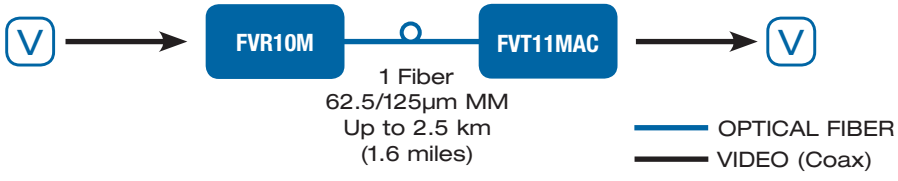
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT11MAC | Mini Video Transmitter (850 nm) | 1 | Multimode 62.5/125µm | 10 dB | 2.5 km (1.6 miles) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | |

**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# dual video transmitter




## Applications

- CCTV (Fixed Video)

## Description

The ComNet™ FVT20 dual video transmitter supports two independent AM video signals in one module on two independent multimode fiber optic cables. The module is not a multiplexer. The module is ideal for CCTV installations and can be used to double the fixed video capacity of the C1 rack for up to 28 independent video channels per card cage. The FVT20 video transmitter is compatible with the FVR11M, FVR10M, FVR21, and FVR22 receivers. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. The transmitter incorporates a bi-color (Red/Green) indicating LED for monitoring proper system operation. These units are interchangeable between stand-alone or card mount configurations.

## Features

- AM Video Transmission
- NTSC, PAL, SECAM compatible
- Full color compatibility
- No in-field electrical or optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Bi-Color (Red/Green) Video Present indicator
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT20 | 2 | Multimode 62.5/125µm |

# dual video transmitter



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB |

### WAVELENGTH

| | |
|---|---|
| FVT11M | 850 nm, Multimode |

### NUMBER OF FIBERS

2

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATOR*

- Video Present (Ch. 1)
- Video Present (Ch. 2)

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15VDC @ 130 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT20 | Dual Video Transmitter (850 nm) | 2 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

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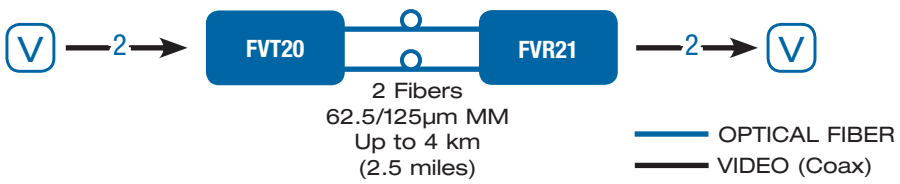

# single video receiver with manual gain control




## Description

The ComNet™ FVR10 video receiver detects an AM video signal on one multimode optical fiber. The receiver utilizes Manual Gain Control and is compatible with the ComNet FVT11M and the FVT20 transmitters. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV (Fixed Video)

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Manual Gain Control
- Full color compatibility
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) indicator to monitor system performance
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR10 | 1 | Multimode 62.5/125µm |

# single video receiver with manual gain control



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk |
| Bandwidth: | 5 Hz - 10 MHz* |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB Attn. |
| | >60 dB @ 7 dB Attn. |

### WAVELENGTH

| | |
|---|---|
| FVR10 | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS†

- Video Present

† LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 60 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

* At 6 dB Attenuation

‡ May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVR10 | Video Receiver (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

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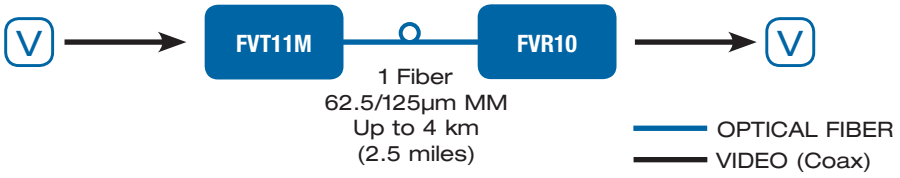
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# single mini video receiver with manual gain control




## Description

The ComNet™ FVR10M video receiver detects an AM video signal on one multimode fiber optic cable. The receiver utilizes Manual Gain Control and is compatible with the ComNet FVT11M and the FVT20 transmitters. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are only available in stand-alone configurations.

## Applications

- CCTV (Fixed Video)

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Manual Gain Control
- Full color compatibility
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) indicator to monitor system performance
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR10M | 1 | Multimode 62.5/125µm |

# single mini video receiver with manual gain control



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk |
| Bandwidth: | 5 Hz - 10 MHz* |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB Attn.<br>>60 dB @ 7 dB Attn. |

### WAVELENGTH

| | |
|---|---|
| FVR10M | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS†

- Video Present

† LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | 8-15 VDC @ 60 mA |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 4.0 × 3.7 × 1.0 in.,<br>(10.4 × 9.5 × 2.7 cm ) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

* At 6 dB Attenuation

‡ May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVR10M | Mini Video Receiver (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

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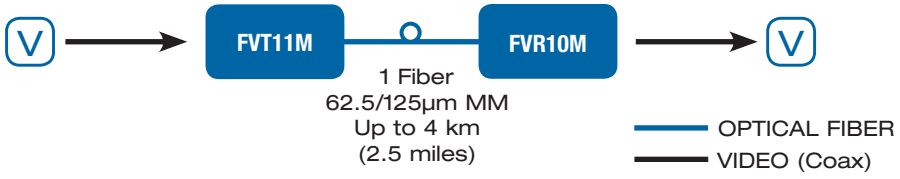

# single video receiver with automatic gain control (agc)




## Description

The ComNet™ FVR11 video receiver detects an AM video signal on one multimode fiber optic cable. The receiver utilizes Automatic Gain Control (AGC) and is compatible with the ComNet FVT11M and the FVT20 transmitters. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV (Fixed Video)

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Full range Automatic Gain Control (AGC)
- Voltage transient protection on all power and signal input output lines provides unconditional protection from power surges and other voltage transient events.
- Full color compatibility
- No in-field electrical or optical adjustments required
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Bi-Color (Red/Green) Video Present indicator
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR11 | 1 | Multimode 62.5/125µm |

# single video receiver with automatic gain control (agc)



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk (AGC controlled) |
| Bandwidth: | 5 Hz - 10 MHz* |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB Attn. |
| | >60 dB @ 7 dB Attn. |

### WAVELENGTH

| | |
|---|---|
| FVR11 | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS†

- Video present

† LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 60 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

* At 6 dB Attenuation

‡ May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVR11 | AGC Video Receiver (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

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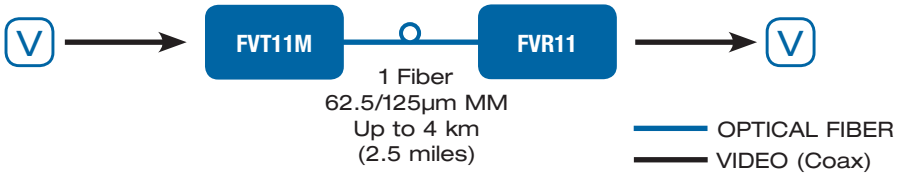


# single mini video receiver with automatic gain control (agc)




## Description

The ComNet™ FVR11M video receiver detects an AM video signal on one multimode fiber optic cable. The receiver utilizes Automatic Gain Control (AGC) and is compatible with the ComNet FVT11M and the FVT20 transmitters. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are only available in stand-alone configurations.

## Applications

- CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR11M | 1 | Multimode 62.5/125µm |

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Full range Automatic Gain Control (AGC)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Full color compatibility
- No in-field electrical or optical adjustments required
- Bi-Color (Red/Green) Video Present indicator
- Lifetime Warranty

# single mini video receiver with automatic gain control (agc)



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk (AGC controlled) |
| Bandwidth: | 5 Hz - 10 MHz* |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB Attn.<br>>60 dB @ 7 dB Attn. |

### WAVELENGTH

| | |
|---|---|
| FVR11M | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS†

- Video Present

† LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | 8-15 VDC @ 60 mA |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 4.0 × 3.7 × 1.0 in.,<br>(10.4 × 9.5 × 2.7 cm) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

‡ May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

* At 6 dB Attenuation

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

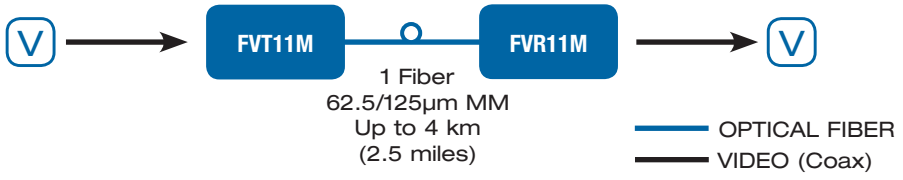
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE§ |
|---|---|---|---|---|---|
| FVR11M | AGC Mini Video Receiver (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

§ Distance may be limited by optical dispersion.

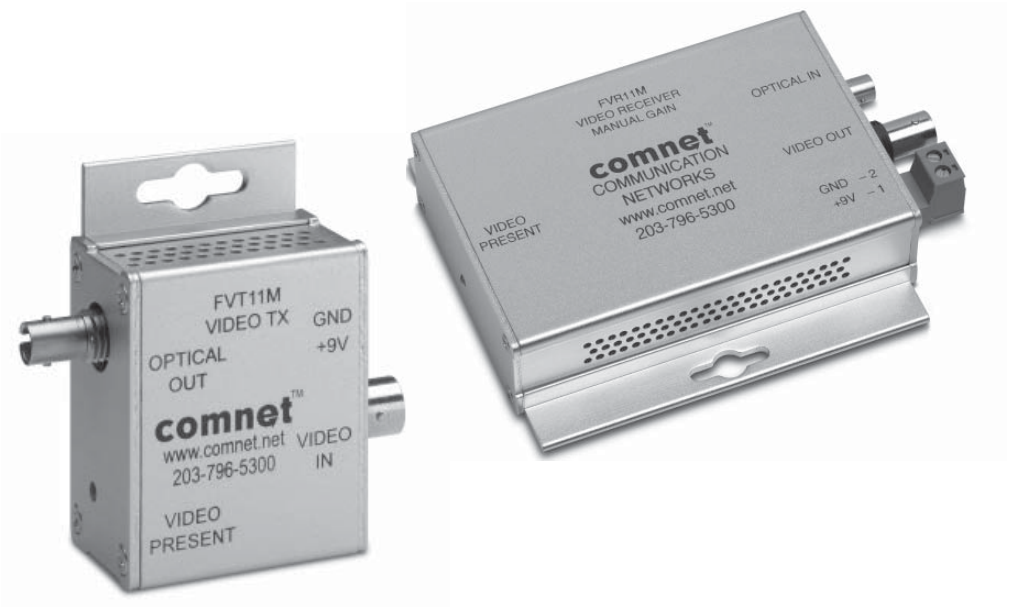
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



mini video transmitter and receiver with (agc)






## Description

The ComNet™ FVT11M video mini-transmitter and FVR11M video mini-receiver supports transmission and reception of a fixed video signal using AM modulation on one multimode fiber optic cable. The FVT11M video transmitter is compatible with the FVR11M, FVR10M, FVR21, and FVR22 receivers. The FVR11M utilizes Automatic Gain Control (AGC) and is compatible with the ComNet FVT11M and the FVT20 transmitters. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. The transmitter and receiver incorporate bi-color (Red/Green) indicating LED's for monitoring proper system operation.

## Applications

- CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT11M<br>FVR11M | 1 | Multimode<br>62.5/125µm |

## Features

- AM Video Transmitter and Receiver
- NTSC, PAL, SECAM compatible
- The receiver utilizes Automatic Gain Control (AGC)
- Full color compatibility
- No in-field electrical or optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Video Present indicator
- Lifetime Warranty

# mini video transmitter and receiver with (agc)



## specifications

### VIDEO

| | |
|---|---|
| Video Input TX: | 1 volt pk-pk (75 ohms) |
| Video Output RX: | 1 volt pk-pk (AGC controlled) |
| Bandwidth: | 5 Hz - 10 MHz* |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB |

### WAVELENGTH

| | |
|---|---|
| FVT11M, FVR11M | 850 nm, Multimode |

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS†

- Video Present (TX)
- Video Present (RX)

† LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power TX: | 8-15 VDC @ 80 mA |
| Power RX: | 8-15 VDC @ 60 mA |
| Max. RG59 Cable Length: | 750 ft. |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| FVT11M Surface Mount: | 2.3 × 1.6 × 1.1 in., (5.7 × 4.1 × 2.8 cm) |
| FVR11M Surface Mount: | 4.0 × 3.7 × 1.0 in., (10.4 × 9.5 × 2.7 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

* At 6 dB Attenuation

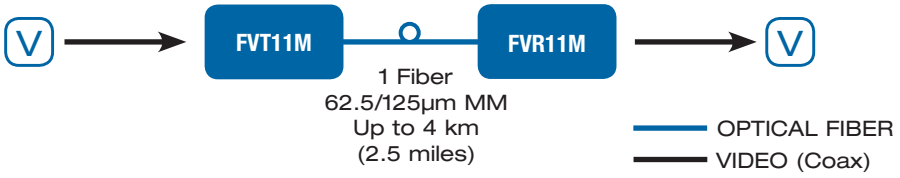
‡ May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT11M | Mini Video Transmitter (850 nm) | 1 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |
| FVR11M | AGC Mini Video Receiver (850 nm) | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | |

**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



## 8-bit digital video




## Description

The ComNet™ FVT/FVR1 series video transmitter/ receiver supports the transmission of medium-haul quality 8-bit digital video over one multimode or single mode optical fiber. This module is universally compatible with major CCTV camera manufacturers. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1M1<br>FVR1M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT1S1<br>FVR1S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- RS-250C Medium-Haul quality 8-Bit Digital Video Transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Full Color Compatibility
- NTCIP Compatible
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Distances up to 33 miles (54 km) without repeaters
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/ low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 8-bit digital video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >60 dB @ Maximum Optical Loss Budget |

### WAVELENGTH

1310 nm

### NUMBER OF FIBERS

| | |
|---|---|
| FVT1M1/FVR1M1 | 1 |
| FVT1S1/FVR1S1 | 1 |

### LED INDICATORS*

- Optical
- Video

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

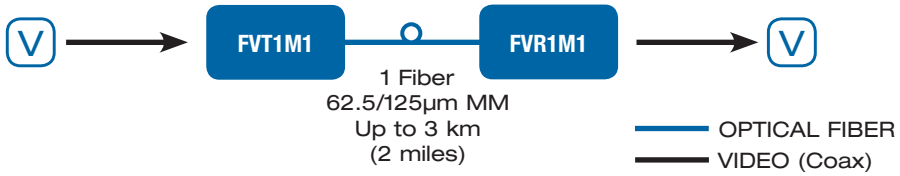
† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1M1 | Video Transmitter/Data Transceiver (1310 nm) | 1 | Multimode 62.5/125µm | 10 dB | 3 km (2 miles) | 1 |
| FVR1M1 | Video Receiver/Data Transmitter (1310 nm) | | | | | |
| FVT1S1 | Video Transmitter/Data Transceiver (1310 nm) | 1 | Single Mode 9/125µm | 18 dB | 54 km (33 miles) | 1 |
| FVR1S1 | Video Receiver/Data Transmitter (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.



# broadcast quality 10-bit digital video transmitter and receiver




## Description

The ComNet™ FVT/FVR100 series video transmitter and video receiver units utilize 10-bit digital encoding and decoding for true broadcast-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of video over one multimode or single mode optical fiber, and are ideal for use in unconditioned roadside or out-of-plant installations. As the level of video performance is so high, the FVT/FVR 100 series is ideally suited to networks employing multiple physical layers where video degradation may be a problem. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT100M1<br>FVR100M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT100S1<br>FVR100S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission
- Exceeds all requirements for RS-250C short-haul transmission: True broadcast video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Wide optical dynamic range: optical attenuators are never required
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# broadcast quality 10-bit digital video transmitter and receiver



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### WAVELENGTH
1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS
1

### OPTICAL EMITTER
Laser Diode

### LED INDICATORS*
FVT Transmitter:
- Optical
- Video Input Sync Presence

FVR Receiver:
- Optical
- Video Output Sync Presence

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

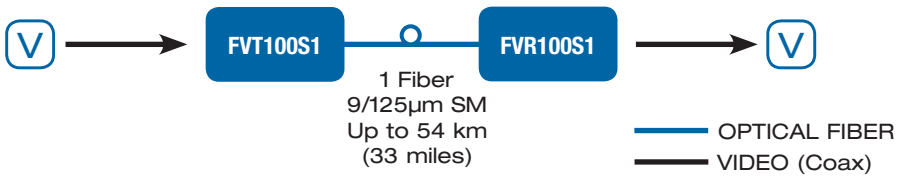
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT100M1<br>FVR100M1 | Video Transmitter (1310 nm)<br>Video Receiver (1310 nm) | 1 | Multimode 62.5/125µm | 10 dB | 3 km (2 miles) | 1 |
| FVT100S1<br>FVR100S1 | Video Transmitter (1310 nm)<br>Video Receiver (1310 nm) | 1 | Single Mode 9/125µm | 18 dB | 54 km (33 miles) | 1 |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.



10-bit digital video




## Description

The ComNet™ FVT/FVR1001 series video transmitter/receiver supports the transmission of short-haul quality 10-bit digital video over one multimode or single mode optical fiber. This module is universally compatible with major CCTV camera manufacturers. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1001M1<br>FVR1001M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT1001S1<br>FVR1001S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- 10-bit Digital Video Transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Full Color Compatibility
- Exceeds RS-250C Short-Haul quality
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Integrated WDM for greater product reliability
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Distances up to 69 km (43 miles) without repeaters
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-Swappable Modules
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 10-bit digital video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1V pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >67 dB @ Maximum Optical Loss Budget |

### WAVELENGTH

1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS

| | |
|---|---|
| FVT/FVR1001M1 | 1 |
| FVT/FVR1001S1 | 1 |

### LED INDICATORS*

- Optical
- Video
- Power

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

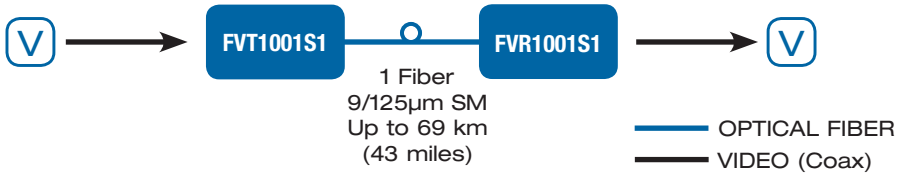
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C† |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)‡ |

† Included Power Supply operating temperature range is 0 - +40˚ C.
‡ May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE§ | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1001M1 | Video Transmitter (1310 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR1001M1 | Video Receiver (1310 nm) | | | | | |
| FVT1001S1 | Video Transmitter (1310 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR1001S1 | Video Receiver (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

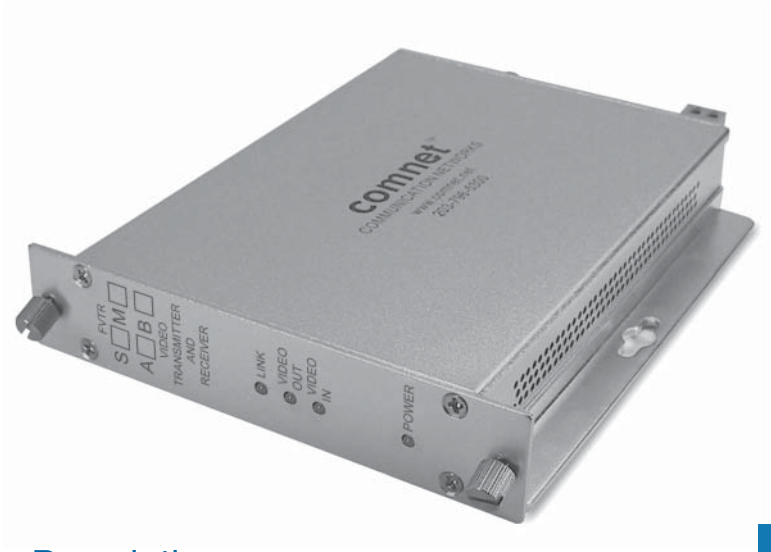
NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
§Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10-bit digital bi-directional video or sync






## Description

The ComNet™ FVTR(M)(S)1 series video transmitter/receiver supports the transmission of short-haul quality 10-bit digital bi-directional video or sync over one multimode or single mode optical fiber. This module is universally compatible with major CCTV camera manufacturers. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVTRM1A<br>FVTRM1B | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVTRS1A<br>FVTRS1B | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit Digital Video Transmission
- Bi-directional Video or Sync
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Full Color Compatibility
- Exceeds RS-250C Short-Haul quality
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Integrated WDM for greater product reliability
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Distances up to 30 miles (48 km) without repeaters
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 10-bit digital bi-directional video or sync



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >67 dB @ Maximum Optical Loss Budget |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

| | |
|---|---|
| FVTRM1 | 1 |
| FVTRS1 | 1 |

### LED INDICATORS*

- Video Present
- Power
- Optical

* LEDS: RED = “No Activity” GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

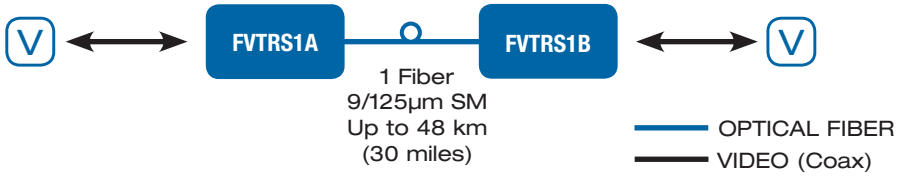
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C [1] |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVTRM1A | Video Transmitter (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVTRM1B | Video Receiver (1310/1550 nm) | | | | | |
| FVTRS1A | Video Transmitter (1310/1550 nm) | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 1 |
| FVTRS1B | Video Receiver (1310/1550 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
[1] Included Power Supply operating temperature range is 0 - +40˚ C.
**Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# dual am video receiver with manual gain control




## Description

The ComNet™ FVR21 dual video receiver detects two independent AM video signals in one module on two independent multimode fiber optic cables. The module is not a multiplexer. The module is ideal for CCTV installations and the rack mount version can be used to double the fixed video capacity of the C1 rack for up to 28 independent video channels per card cage. The modules utilize Manual Gain Control. The receiver is compatible with the ComNet™ FVT11M and the FVT20 dual video transmitter. Plug-and-play design ensures ease of installation. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR21 | 2 | Multimode 62.5/125µm |

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Manual Gain Control
- Two independent receivers in one model
- Full color compatibility
- Can be used to double the fixed video capacity of a C1 card cage
- Plug-and-Play design for ease of installation
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Video Present indicating LED's to monitor system performance
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# dual am video receiver with manual gain control



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB typical<br>54 dB minimum |

### WAVELENGTH

| | |
|---|---|
| FVR21 | 850 nm, Multimode |

### NUMBER OF FIBERS

2

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS*

- Video Present (Ch. 1)
- Video Present (Ch. 2)

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 130 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable<br>Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in.,<br>(15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

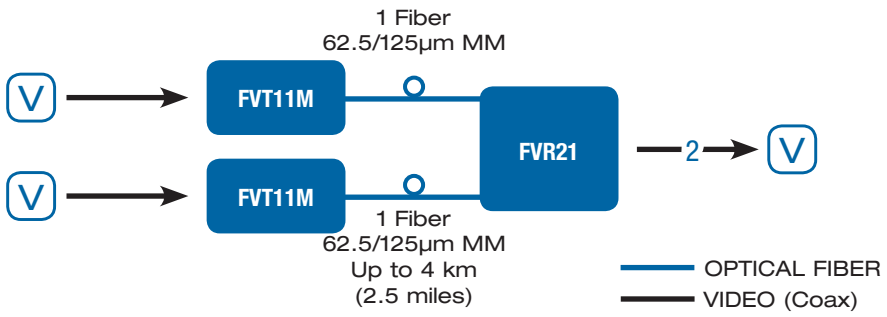
AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVR21<br>(FVR21 is compatible with the FVT11M and FVT20) | Dual Video Receiver (850 nm) | 2 | Multimode<br>62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# dual independent am video receiver with automatic gain control (agc)




## Description

The ComNet™ FVR22 dual video receiver detects two independent AM video signals in one module on two independent multimode fiber optic cables. The module is not a multiplexer. The module is ideal for smaller CCTV installations and the rack mount version can be used to double the fixed video capacity of the C1 rack for up to 28 independent video channels per card cage. The modules utilize Automatic Gain Control (AGC). The receiver is compatible with the ComNet FVT11M and the FVT20 dual video transmitter. Plug-and-play design ensures ease of installation. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVR22 | 2 | Multimode 62.5/125µm |

## Features

- AM Video Receiver
- NTSC, PAL, SECAM compatible
- Full range Automatic Gain Control (AGC)
- Two independent receivers in one model
- Full color compatibility
- Can be used to double the fixed video capacity of a C1 card cage
- Plug-and-Play design for ease of installation
- No in-field electrical or optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) indicating LED to monitor system performance
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# dual independent am video receiver with automatic gain control (agc)



## specifications

### VIDEO

| | |
|---|---|
| Video Output: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 60 dB typical<br>54 dB minimum |

### WAVELENGTH

| | |
|---|---|
| FVR22 | 850 nm, Multimode |

### NUMBER OF FIBERS

2

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### LED INDICATORS*

- Video Present (Ch.1)
- Video Present (Ch. 2)

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 120 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable<br>Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in.,<br>(15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

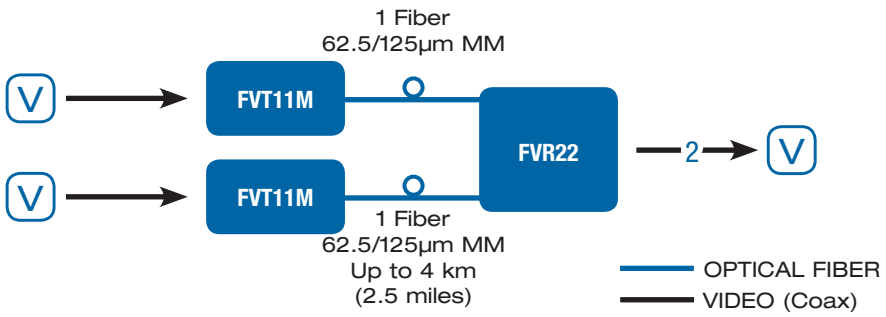
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVR22 | AGC Dual Video Receiver (850 nm) | 2 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 2-channel digital video multiplexer
# 10-bit digital/short-haul



## Description

The ComNet™ FVT/FVR2001 multiplexer simultaneously transmits two channels of video over one optical fiber utilizing state-of-the-art 10-bit digital encoding and decoding for high-quality video transmission that meets the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- High-Performance CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT2001M1<br>FVR2001M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT2001S1<br>FVR2001S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital video transmission: transmits 2 real-time color video signals on one optical fiber
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Wide optical dynamic range: optical attenuators are never required
- NTCIP compatible
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Automatic resettable solid-state current limiters
- Interchangeable between stand-alone or rack mount use – ComFit
- Hot-swappable rack modules
- Lifetime Warranty

# 2-channel digital video multiplexer
# 10-bit digital/short-haul



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 2 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH
1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS
1

### LED INDICATORS
FVT Transmitter Unit:
- Video Input Sync Presence for Each Video Channel
- Link
- Power

FVR Receiver Unit:
- Video Output Sync Presence for Each Video Channel
- Link
- Power

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

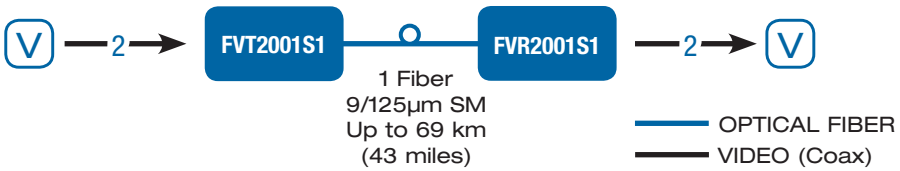
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT2001M1 | 2-Channel Video Transmitter (1310 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR2001M1 | 2-Channel Video Receiver (1310 nm) | | | | | |
| FVT2001S1 | 2-Channel Video Transmitter (1310 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR2001S1 | 2-Channel Video Receiver (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.



# 4-channel digital video multiplexer




## Description

The ComNet™ FVT/FVR41 multiplexer simultaneously transmits four channels of video over one optical fiber utilizing state-of-the-art digital encoding and decoding for high-quality video transmission. These environmentally hardened units are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- High-Performance CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT41M1<br>FVR41M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT41S1<br>FVR41S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- Digital video transmission, transmits 4 real-time color video signals on one optical fiber
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Wide optical dynamic range: optical attenuators are never required
- NTCIP compatible
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Automatic resettable solid-state current limiters
- Lifetime Warranty

# 4-channel digital video multiplexer



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 63 dB Typical |

### WAVELENGTH

1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

- Video Present
- Optical Carrier Detect
- Power

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

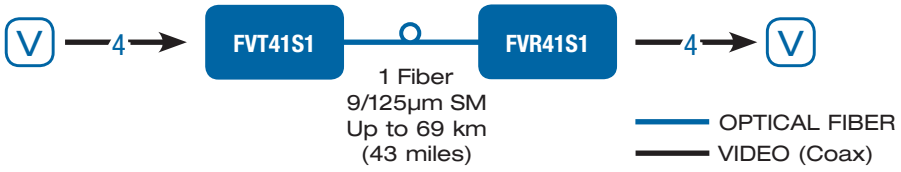
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT41M1 | 4-Channel Video Transmitter (1310 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR41M1 | 4-Channel Video Receiver (1310 nm) | | | | | |
| FVT41S1 | 4-Channel Video Transmitter (1310 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR41S1 | 4-Channel Video Receiver (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.



# 4-channel digital video multiplexer
# 10-bit digital/short-haul




## Description

The ComNet™ FVT/FVR401 multiplexer simultaneously transmits four channels of video over one optical fiber utilizing state-of-the-art 10-bit digital encoding and decoding for high-quality video transmission that meets the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- High-Performance CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT401M1<br>FVR401M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT401S1<br>FVR401S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital video transmission: transmits 4 real-time color video signals on one optical fiber
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Wide optical dynamic range: optical attenuators are never required
- NTCIP compatible
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Automatic resettable solid-state current limiters
- Lifetime Warranty

# 4-channel digital video multiplexer
# 10-bit digital/short-haul



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1V pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

FVT Transmitter Unit:
- Video Input Sync Presence for Each Video Channel
- Power

FVR Receiver Unit:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 x 5.3 x 1.1 in., (15.5 x 13.5 x 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

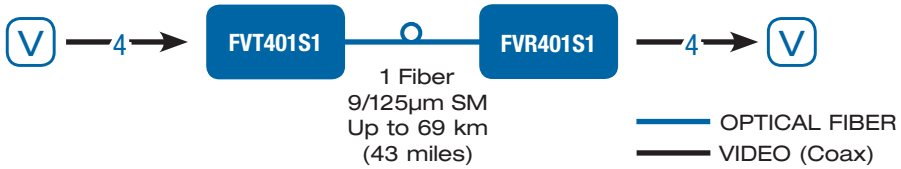
† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT401M1 | 4-Channel Video Transmitter (1310 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR401M1 | 4-Channel Video Receiver (1310 nm) | | | | | |
| FVT401S1 | 4-Channel Video Transmitter (1310 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR401S1 | 4-Channel Video Receiver (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.



# 8-channel 10-bit digital video




## Description

The ComNet™ FVT/FVR801 video transmitter and video receiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of eight independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- High-Performance CCTV (Fixed Video)

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT801M1<br>FVR801M1 | 1 (1310 nm) | Multimode 62.5/125µm |
| FVT801S1<br>FVR801S1 | 1 (1310 nm) | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 8 real-time color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 8-channel 10-bit digital video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 8 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH
1310 nm, Multimode and Single Mode

### NUMBER OF FIBERS
1

### LED INDICATORS*
FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

* LEDS: RED = “No Activity” GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

### OPTICAL EMITTER
Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 5W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

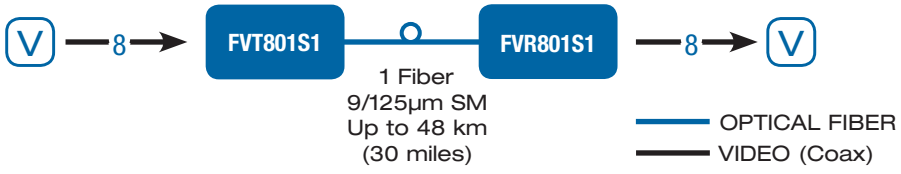
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE§ | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT801M1 | Video Transmitter (1310 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR801M1 | Video Receiver (1310 nm) | | | | | |
| FVT801S1 | Video Transmitter (1310 nm) | 1 | Single Mode 9/125µm | 16 dB‡ | 48 km (30 miles) | 2 |
| FVR801S1 | Video Receiver (1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
‡ Add “HP” for 23 dB. § Distance may be limited by optical dispersion.



# 8 10-bit digital video channels using small form-factor pluggable (SFP) optical modules




## Description

The ComNet™ FVT/FVR80SFP series optical video link provides eight 10-bit medium-haul quality digital video channels, using optical small form factor pluggable modules (SFP).

Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

## Features

- Up to 8 10-bit digital video channels
- Uses interchangeable SFPs for fiber type, distance and connector
- Exceeds all requirements for RS-250C medium haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 8 10-bit digital video channels using small form-factor pluggable (SFP) optical modules



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7º |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### WAVELENGTH

SFP (Small Form-Factor Pluggable) dependent

### NUMBER OF FIBERS[1]

SFP (Small Form-Factor Pluggable) dependent

### OPTICAL EMITTER

SFP (Small Form-Factor Pluggable) dependent

### LED INDICATORS

| FVT Transmitter Unit: | FVR Receiver Unit: |
|---|---|
| - Fiber Status | - Fiber Status |
| - Video Input Sync Presence | - Video Output Sync Presence |
| - Power | - Power |

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | SFP modules |
| Power: | Terminal Block |
| Video: | BNC |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

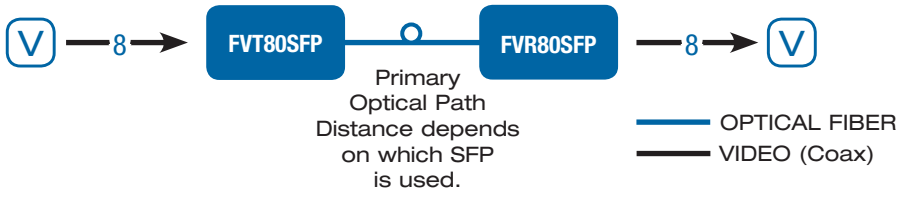
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

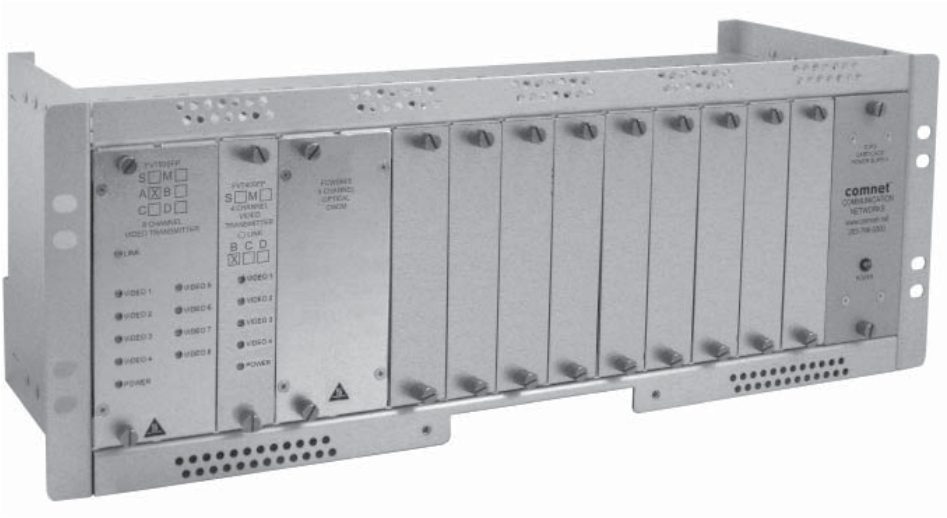
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 12-channel digital video 10-bit digital/short-haul video



V
12



## Description

The ComNet™ FVT/FVR120 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 12 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT120(M)1<br>FVR120(M)1 | 1 | Multimode<br>62.5/125µm |
| FVT120(S)1<br>FVR120(S)1 | 1 | Single Mode<br>9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 12 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 12-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 12 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

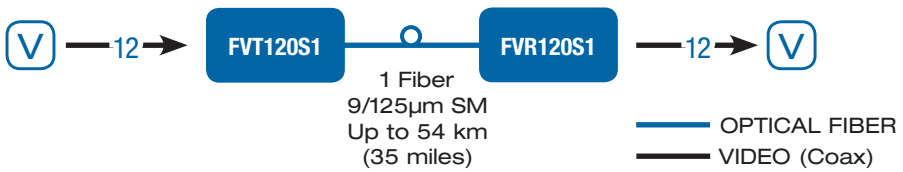
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

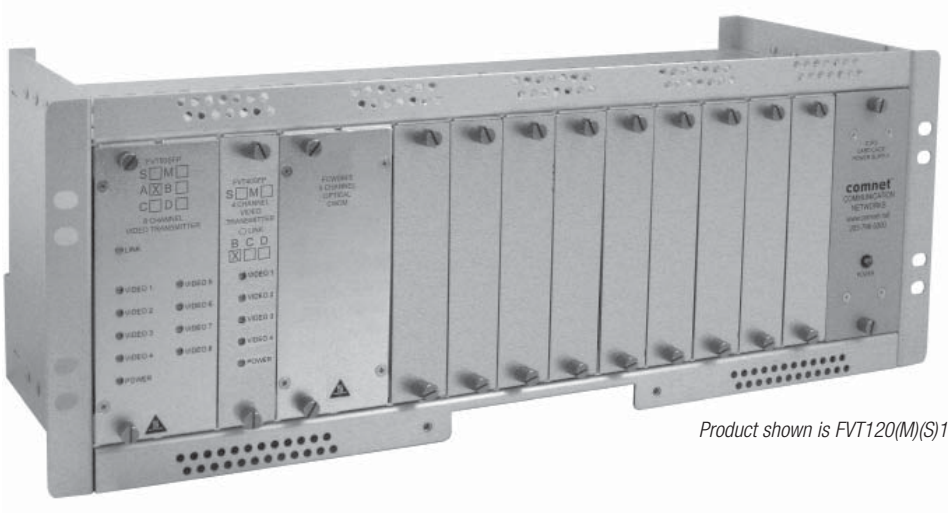
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT120(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR120(M)1 | Video Receiver | | | | |
| FVT120(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR120(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 16-channel digital video 10-bit digital/short-haul video





*Product shown is FVT120(M)(S)1*

## Description

The ComNet™ FVT/FVR160 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 16 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT160(M)1<br>FVR160(M)1 | 1 | Multimode 62.5/125µm |
| FVT160(S)1<br>FVR160(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 16 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 16-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 16 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

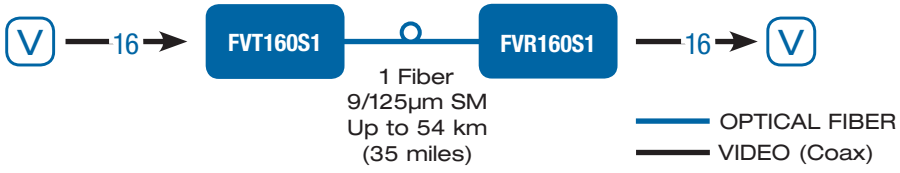
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

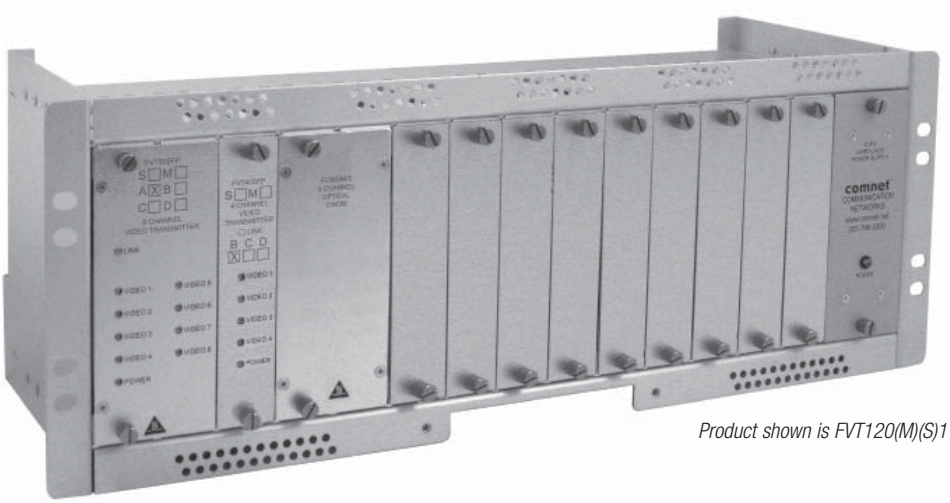
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT160(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR160(M)1 | Video Receiver | | | | |
| FVT160(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR160(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 20-channel digital video 10-bit digital/short-haul video



*Product shown is FVT120(M)(S)1*

V 20



## Description

The ComNet™ FVT/FVR200 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 20 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT200(M)1<br>FVR200(M)1 | 1 | Multimode 62.5/125µm |
| FVT200(S)1<br>FVR200(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 20 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 20-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 20 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

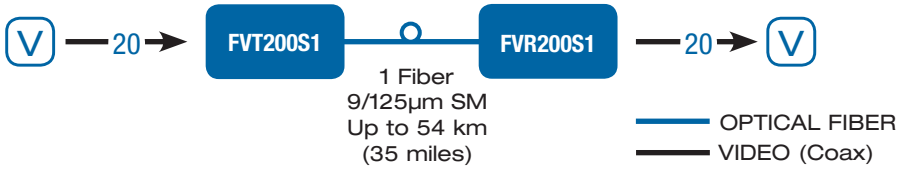
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

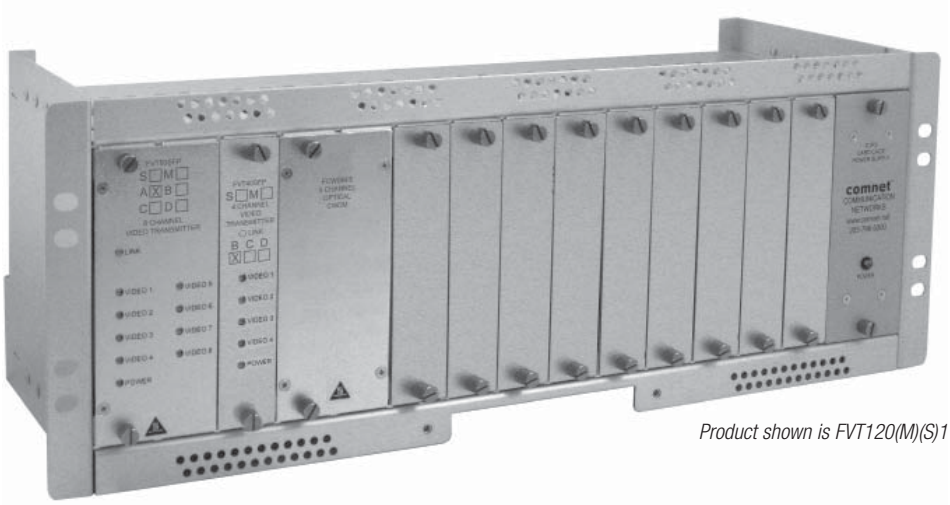
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT200(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR200(M)1 | Video Receiver | | | | |
| FVT200(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR200(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 24-channel digital video 10-bit digital/short-haul video





*Product shown is FVT120(M)(S)1*

## Description

The ComNet™ FVT/FVR240 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 24 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT240(M)1<br>FVR240(M)1 | 1 | Multimode 62.5/125µm |
| FVT240(S)1<br>FVR240(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 24 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 24-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 24 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

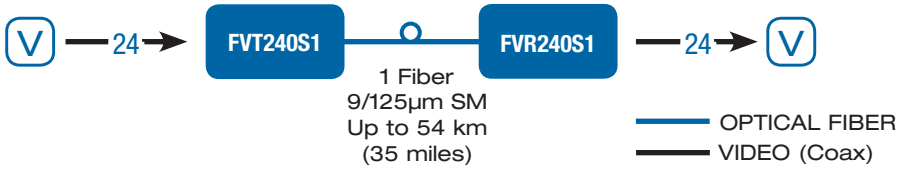
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

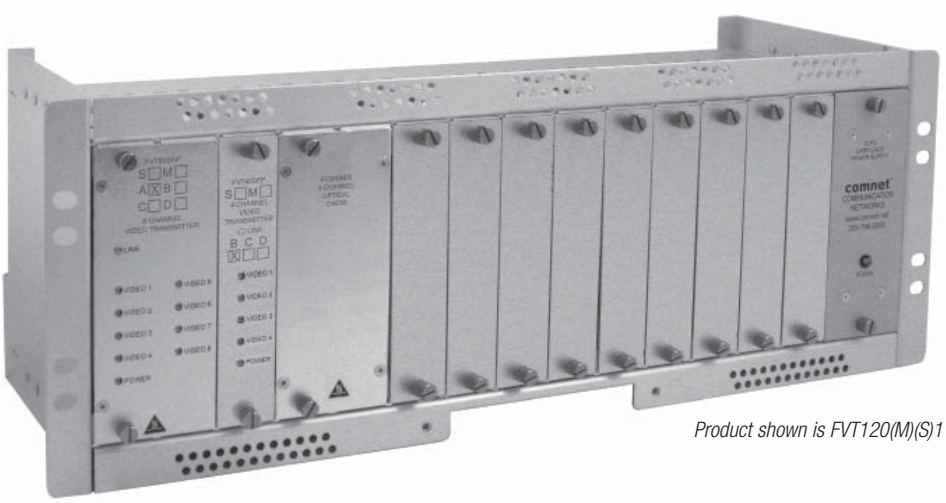
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT240(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR240(M)1 | Video Receiver | | | | |
| FVT240(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR240(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 28-channel digital video 10-bit digital/short-haul video



*Product shown is FVT120(M)(S)1*

V 28



## Description

The ComNet™ FVT/FVR280 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 28 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT280(M)1<br>FVR280(M)1 | 1 | Multimode 62.5/125µm |
| FVT280(S)1<br>FVR280(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 28 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 28-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 28 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

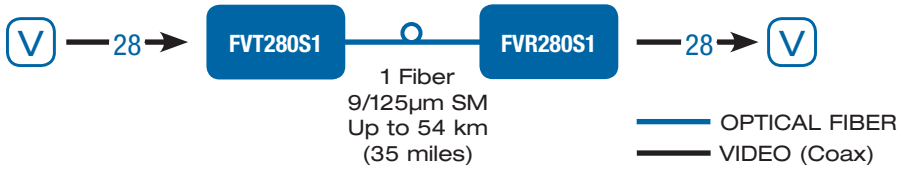
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

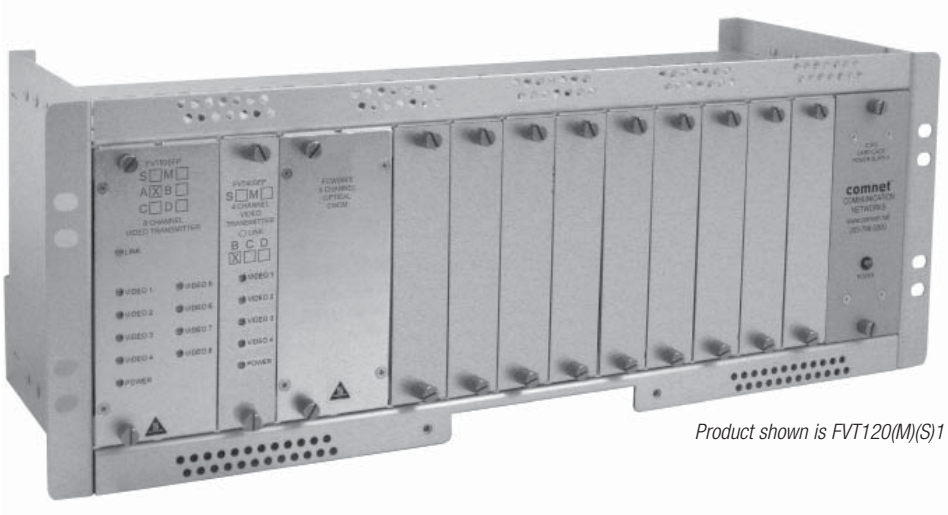
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT280(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR280(M)1 | Video Receiver | | | | |
| FVT280(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR280(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 32-channel digital video 10-bit digital/short-haul video





*Product shown is FVT120(M)(S)1*

## Description

The ComNet™ FVT/FVR320 series video transmitter and video receiver utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 32 independent video channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

## Applications

- High-Performance CCTV Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT320(M)1<br>FVR320(M)1 | 1 | Multimode 62.5/125µm |
| FVT320(S)1<br>FVR320(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 32 real-time/full frame color video signals
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 32-channel digital video 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 32 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter:
- Video Input Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

FVR Video Receiver:
- Video Output Sync Presence for Each Video Channel
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

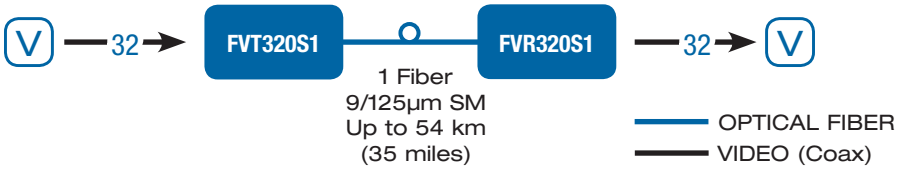
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

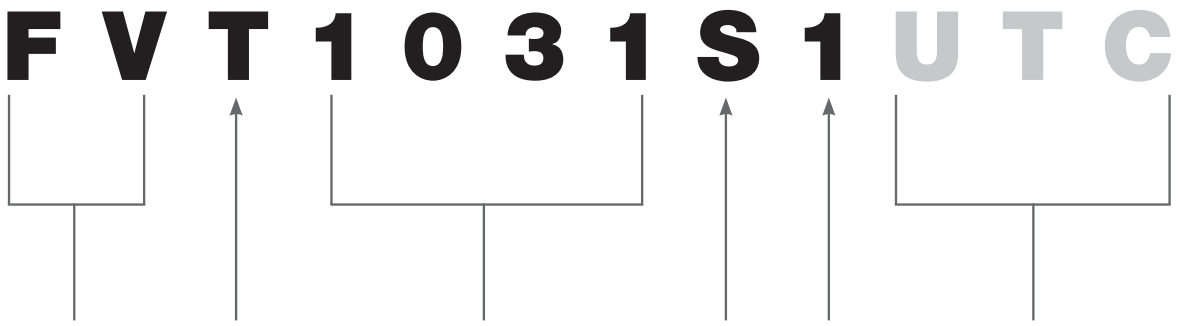
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT320(M)1 | Video Transmitter | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR320(M)1 | Video Receiver | | | | |
| FVT320(S)1 | Video Transmitter | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR320(S)1 | Video Receiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.




FVR109
S M
VIDEO
RECEIVER
+
2 WAY DATA
ON
1
2
LINK
VIDEO
DATA
POWER
FVR4014
S M
4 CH DIG VIDEO REC
+ 4 CH BI-DIR DATA
1
12
ON
LINK
VIDEO 1
VIDEO 2
VIDEO 3
VIDEO 4
POWER
DATA
1
2
3
4

## VIDEO & DATA PRODUCT NUMBERING GUIDE*




**Media and Signal Type**
F = Fiber
V = Video

**Unit**
T = Transmitter
R = Receiver

**Product Series**
May include additional letters:
D = Data
A = Audio
E = Ethernet
C = Contact Closure

**Mode**
S = Single
M = Multi

**Fibers Required**
1 = Single Fiber
2 = Two Fibers

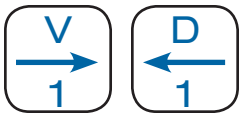
**Additional Feature**
UTC = Up-the-Coax
M = Mini
SHR = Self-Healing Ring

## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

video with return data




## Description

The ComNet™ FVT/FVR15M2 series video and data transceiver supports the simultaneous transmission of video and return data over two multimode optical fibers. The module is universally compatible with all major CCTV camera manufacturers and supports RS232 and RS422 data interfaces and all major data protocols. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV with one-way PTZ Camera Control
- CCTV with Remote Signalization

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT15M2<br>FVR15M2 | 2 (850 nm) | Multimode<br>62.5/125µm |

## Features

- AM Video Transmission
- NTSC, PAL, or SECAM compatible
- Full Color Compatibility
- NTCIP Compatible
- Supports RS232 or RS422 Data interfaces
- Transparent to data encoding/compatible with major CCTV camera manufacturers
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Distances up to 1.5 miles (2.5 km) without repeaters
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# video with return data



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB ATTN. |

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422, Manchester, biphase |
| Data Rate: | DC-115 Kbps (NRZ) |

### WAVELENGTH

850 nm

### NUMBER OF FIBERS

| | |
|---|---|
| FVT/FVR15M2 | 2 |

### LED INDICATORS*

- Video Present
- Transmit Data
- Receive Data

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Data: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 250 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Heat Generation: | 10 BTU |
| Relative Humidity: | 0% to 95% (non-condensing)† |

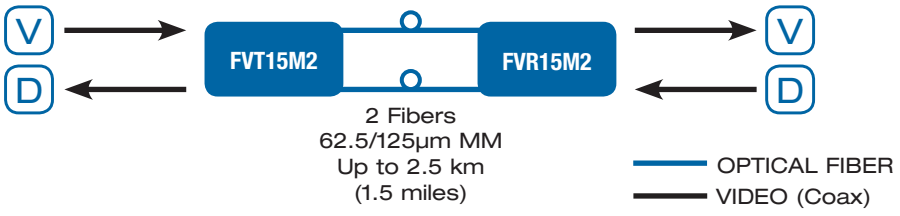
† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

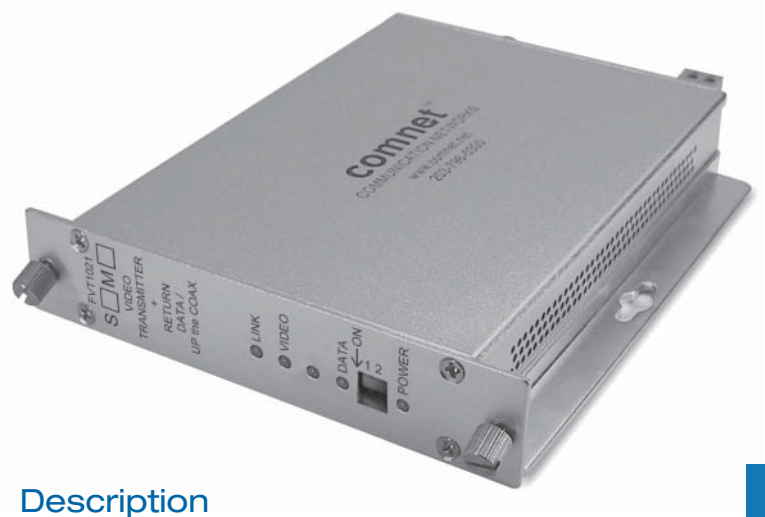
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT15M2 | Video Transmitter/Data Receiver (850 nm) | 2 | Multimode 62.5/125µm | 10 dB | 2.5 km (1.5 miles) | 1 |
| FVR15M2 | Video Receiver/Data Transmitter (850 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10-bit digital video with return data and up-the-coax data




V 1

D 1



## Description

The ComNet™ FVT/FVR1021 series video transmitter/receiver and data transceiver supports the simultaneous transmission of short-haul quality 10-bit digital video and return data or up-the-coax data over one multimode or single mode optical fiber. This module is universally compatible with major CCTV camera manufacturers and supports RS-232 and RS-422 data interfaces as well as up-the-coax data. The FVT/FVR1021 allows the user to choose return or up-the-coax data through a switch on the unit. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV with one-way PTZ Camera Control
- CCTV with Remote Signalization

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1021M1<br>FVR1021M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT1021S1<br>FVR1021S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit Digital Video Transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Full Color Compatibility
- Exceeds RS-250C Short-Haul quality
- Supports RS-232 and RS-422 data interfaces
- Supports Manchester, bi-phase and “Up-the-Coax” Data
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Integrated WDM for greater product reliability
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Distances up to 69 km (43 miles) without repeaters
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 10-bit digital video with return data and up-the-coax data



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422, Manchester, bi-phase and UTC (Up-the-Coax) data |
| Data Rate: | DC-115 Kbps (NRZ) |
| Bit Error Rate (BER): | <1 in $10^{-9}$ @ Maximum Optical Loss Budget |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

| | |
|---|---|
| FVT/FVR1021M1 | 1 |
| FVT/FVR1021S1 | 1 |

### LED INDICATORS*

- Video Present
- Power
- Data Present
- Optical

* LEDS: RED = “No Activity” GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

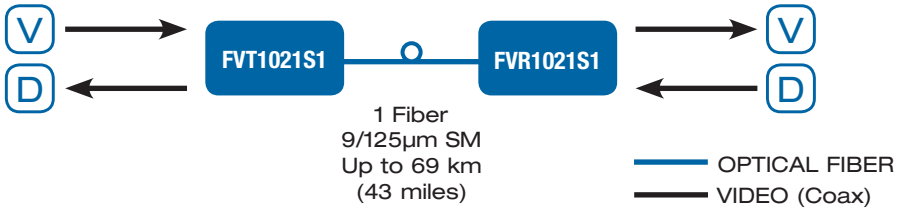
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C[1] |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1021M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR1021M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT1021S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR1021S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
[1] Included Power Supply operating temperature range is 0 – +40˚ C.
**Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10-bit digital video with bi-directional and up-the-coax data


V 1

D 1



## Applications

- High-Performance CCTV with PTZ Control

## Description

The ComNet™ FVT/FVR1031 series video transmitter/receiver and data transceiver supports simultaneous transmission of short-haul quality 10-bit digital video, bi-directional data and up-the-coax data over one multimode or single mode optical fiber. The module is universally compatible with major CCTV camera manufacturers and supports RS-232, RS-422 and 2 or 4-wire RS-485 data interfaces, and most major data protocols as well as up-the-coax data. The FVT/FVR1031 allows the user to choose bi-directional data or up-the-coax data through a switch on the unit. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1031M1<br>FVR1031M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT1031S1<br>FVR1031S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit digitally encoded video transmission
- Exceeds all requirements for RS-250C short-haul transmission: True broadcast video performance
- Supports RS-232, RS-422 or RS-485 (2 or 4-wire) data interfaces
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-Swappable Modules
- Distances up to 43 miles (69 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 10-bit digital video with bi-directional and up-the-coax data



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Format: | RS-232, RS-422, 2 or 4-wire RS-485 w/ Tri-State, Manchester, bi-phase and up-the-coax data |
| Data Rate: | DC-115 Kbps (NRZ) |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

1

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

FVT Transmitter/Data Transceiver Unit:
- Video Input Sync Presence
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Receiver/Data Transceiver Unit:
- Video Output Sync Presence
- Received Data
- Transmitted Data
- Optical Carrier Detect

### CONNECTORS

| | |
|---|---|
| Optical: | ST (Standard)<br>SC or FC (Optional) |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 x 5.3 x 1.1 in., (15.5 x 13.5 x 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

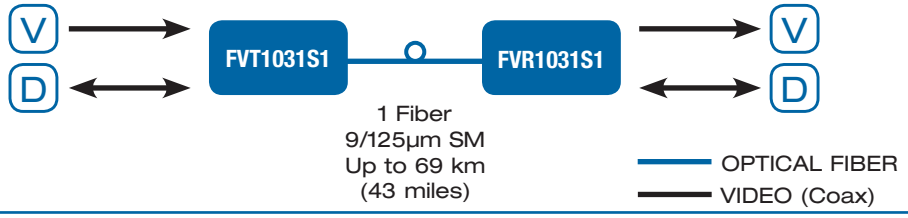
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT · E322911 · N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1031M1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVR1031M1 | Video Receiver/Data Transceiver | | | | | |
| FVT1031S1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| FVR1031S1 | Video Receiver/Data Transceiver | | | | | |
| Accessories Options | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory)<br>Add '/SC' for SC Connectors<br>Add '/FC' for FC Connectors | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion. **Check with control system manufacturer for distance limits on up-the-coax systems.**
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10-bit digital video with 1 bi-directional data channel/ dual optical port redundant point-to-point configuration + 8 contact closures

V 1 | D 1 | CC 8



## Description

The ComNet™ FVT/FVR107 series of optical video links provides 10-bit digital video, 10 Mhz bandwidth, short haul video quality, one bi-directional data channel and a dual optical port redundant Point-to-Point topology plus eight contact closures and two alarm relays.
The redundant Point-to-Point topology using the dual optical ports provide fail safe operation in the event of loss of one fiber. Each optical port uses wavelength division multiplexing (WDM) to both transmit and receive on one optical fiber.
Microprocessor-based logic sends the contact information in packets that are ordered and encoded, ensuring extremely robust transmission. Packets that are garbled, packets out of sequence, and transmission bit errors will not cause random changes of state on the contact relays. Also, the mechanical latching relays maintain their state even when the unit loses power.
The data channel supports RS232, RS422 and 2 wire and 4 wire RS485. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT107M1<br>FVR107M1 | 2 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT107S1<br>FVR107S1 | 2 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital video transmission
- Bi-directional data channel supports RS232, RS422 or RS485 (2 or 4-wire) interfaces.
- Eight SPST latching relays (with individual LED indicators)
- Microprocessor-based logic and latching relays in receiver unit eliminate random contact closure status in the event of loss of link or loss of prime operating power.
- Two separate alarm relay outputs indicate when a fiber link is lost and which optical port.
- Dual optical port Redundant Point-to-Point (RPP) configuration
- Exceeds all requirements for RS-250C short-haul video transmission: True broadcast video performance
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 10-bit digital video with 1 bi-directional data channel/ dual optical port redundant point-to-point configuration + 8 contact closures



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W), UTC (Up-the-Coax) |
| Data Format: | NRZ, NRZI Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### CONTACT CLOSURE

| | |
|---|---|
| Input/Output Channels: | 8 |
| Input Contacts: | Normally Open |
| Output Contacts: | 1.0A @ 30 VDC, Normally Open |
| Response Time: | 25 msec maximum |

### FIBER ALARM RELAYS

| | |
|---|---|
| Contact Rating: | 0.10A @ 30VDC, Normally Closed |
| Fiber Loss: | Port A, Port B<br>Port A or Port B (System Fault FVR Only) |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

2

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

| Transmitter/Data Transceiver: | Receiver/Data Transceiver: |
|---|---|
| - Link A and B | - Link A and B |
| - Video Input | - Video Output |
| - Activity Data | - Activity Data |
| - Power | - Power |
| - Contact Status (x8) | - Contact Status (x8) |

### CONNECTORS

| | |
|---|---|
| Optical: | 2 ST connectors for the Dual Port configuration |
| Power: | Terminal Block |
| Video: | BNC |
| Data: | Terminal Block |
| Contact Closure: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

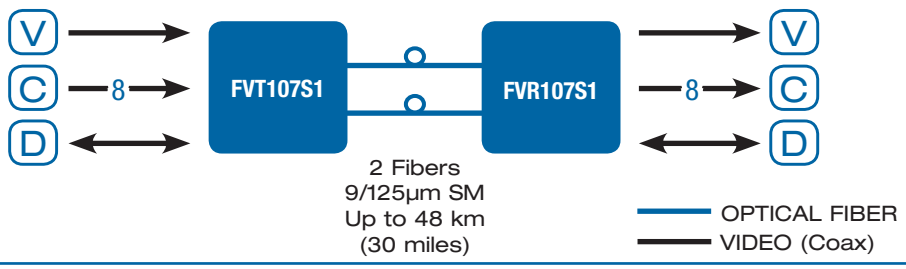
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

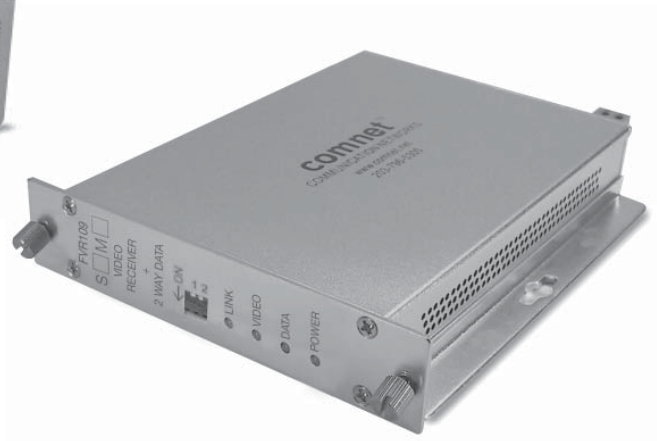
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT107M1 | Video Transmitter/Data Transceiver | 2 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR107M1 | Video Receiver/Data Transceiver | | | | | |
| FVT107S1 | Video Transmitter/Data Transceiver | 2 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 2 |
| FVR107S1 | Video Receiver/Data Transceiver | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 10-bit digital video with one bi-directional data channel


V 1 D 1



## Description

The ComNet™ FVT/FVR109 series is a video transmitter/receiver and data transceiver that supports the simultaneous transmission of short haul quality 10-bit EIA RS-250C digital video and bi-directional data over one multimode or single mode optical fiber. The module is universally compatible with major CCTV camera manufacturers and supports RS232, RS422 and 2 or 4-wire RS485 data interfaces and most data protocols. It also supports "up-the-coax" data transmission from all major manufacturers.

## Applications

- High-Performance CCTV with PTZ Control

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT109M1M<br>FVT109M1<br>FVR109M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT109S1M<br>FVT109S1<br>FVR109S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital video transmission
- 1 bi-directional data channel
- Exceeds all requirements for RS-250C short-haul transmission: True broadcast video performance
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- FVT/FVR109(M)(S)1 is a hot-swappable rack module
- FVT/FVR109(M)(S)1 is interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 10-bit digital video with one bi-directional data channel



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W), UTC (Up-the-Coax) |
| Data Format: | NRZ, NRZI Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

1

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

| Transmitter/Data Transceiver: | Receiver/Data Transceiver: |
|---|---|
| - Link | - Link |
| - Transmitted Video | - Received Video |
| - Transmitted/Received Data | - Received/Transmitted Data |

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | 1 ST connector |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 350 mA |
| Rack Mount: | From Rack |
| Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) - Mini | 3.3 × 2.5 × 1.1 in., (8.4 × 6.4 × 2.8 cm) |
| Size (in./cm) (L×W×H) - Full Size | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

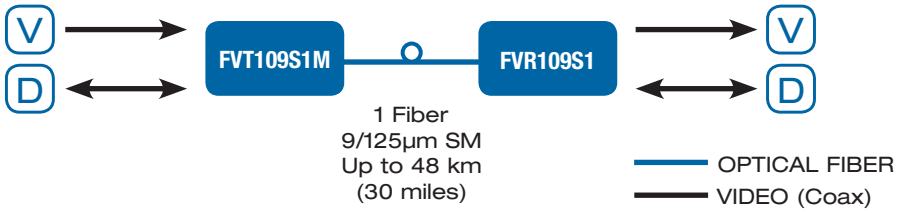
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT109M1M | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) |
| FVT109M1 | Video Transmitter/Data Transceiver | | | | |
| FVR109M1 | Video Receiver/Data Transceiver | | | | |
| FVT109S1M | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) |
| FVT109S1 | Video Transmitter/Data Transceiver | | | | |
| FVR109S1 | Video Receiver/Data Transceiver | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion. **Check with control system manufacturer for distance limits on up-the-coax systems.**



# 10-bit digital video with one bi-directional data channel + 1 10/100 Mbps fast Ethernet port

V 1 D 1 E 1



## Description

The ComNet™ FVT/FVR10D1E series video transmitter/receiver and data transceiver and the FVT10D1EM mini transmitter and data transceiver support the simultaneous transmission of short haul quality 10-bit EIA RS-250C digital video with one bi-directional data channel plus one 10/100 Mbps fast Ethernet port. The modules are universally compatible with major CCTV camera manufacturers and supports RS232, RS422 and 2 or 4-wire RS485 data interfaces and most data protocols. It also supports “up-the-coax” data transmission from most major manufacturers.

## Applications

- Surveillance Systems with Control
- Hybrid Ethernet Systems

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT10D1EMM<br>FVT10D1EM<br>FVR10D1EM | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT10D1ESM<br>FVT10D1ES<br>FVR10D1ES | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital video transmission
- One bi-directional data channel
- One 10/100 BASE-T/TX fast Ethernet port
- IEEE 802.3 compliant
- Automatic MDI/MDI-X crossover
- Exceeds all requirements for RS-250C short-haul transmission: True broadcast video performance
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Certified to the requirements of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- FVT/FVR10D1E(M)(S) is a hot-swappable rack module
- FVT/FVR10D1E(M)(S) is interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 10-bit digital video with one bi-directional data channel + one 10/100 Mbps fast Ethernet port



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W), UTC (Up-the-Coax) |
| Data Format: | NRZ, NRZI Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### ETHERNET

| | |
|---|---|
| Data Interface: | 10/100 BASE-T/TX |
| Data Rate: | 10/100 Mbps<br>Full Duplex |

| | |
|---|---|
| WAVELENGTH | 1310/1550 nm, MM and SM |
| NUMBER OF FIBERS | 1 |
| OPTICAL EMITTER | Laser Diode |

### LED INDICATORS

| Transmitter/Data Transceiver: | Receiver/Data Transceiver: |
|---|---|
| - Link | - Link |
| - Transmitted Video | - Received Video |
| - Transmitted/Received Data | - Received/Transmitted Data |
| - Ethernet Activity | - Ethernet Activity |

### CONNECTORS

| | |
|---|---|
| Optical: | 1 ST connector |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 |
| Small-Size Data: | Terminal Block |
| Ethernet: | RJ45 |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 350 mA |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) - Mini | 4.1 × 3.7 × 1.1 in., (10.4 × 9.4 × 2.8 cm) |
| Size (in./cm) (L×W×H) - Full Size | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

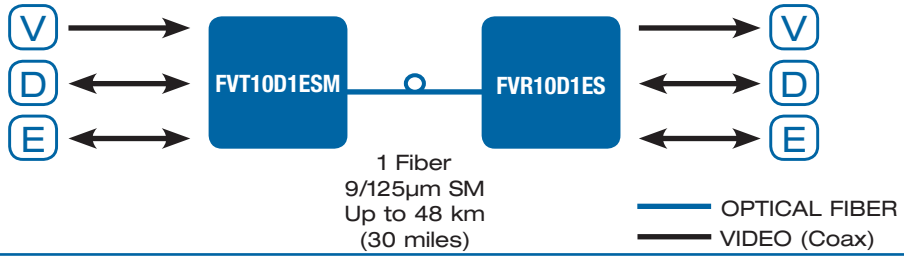
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT10D1EMM | Mini-Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) |
| FVT10D1EM | Video Transmitter/Data Transceiver | | | | |
| FVR10D1EM | Video Receiver/Data Transceiver | | | | |
| FVT10D1ESM | Mini-Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) |
| FVT10D1ES | Video Transmitter/Data Transceiver | | | | |
| FVR10D1ES | Video Receiver/Data Transceiver | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended. Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J. In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

**Distance may be limited by optical dispersion. **Check with control system manufacturer for distance limits on up-the-coax systems.**



# 10-bit digital bi-directional video or video sync + bi-directional data


V 1 D 1



## Description

The ComNet™ FVTRD(M)(S)1 series video transmitter/receiver and data transceiver supports simultaneous transmission of short-haul quality 10-bit bi-directional digital video or video sync plus bi-directional data over one multimode or single mode optical fiber. The module is universally compatible with major CCTV camera manufacturers and supports RS232, RS422 and 2 or 4-wire RS485 data interfaces, and most major data protocols. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- High-Performance CCTV with PTZ Control

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVTRDM1A<br>FVTRDM1B | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVTRDS1A<br>FVTRDS1B | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 10-bit digital bi-directional video transmission or video sync + bi-directional data
- Exceeds all requirements for RS-250C short-haul transmission: True broadcast video performance
- Supports RS232, RS422 or RS485 (2 or 4-wire) data interfaces
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 10-bit digital bi-directional video or video sync + bi-directional data



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422, 2 or 4-wire RS485 w/Tri-State, Manchester and bi-phase |
| Data Rate: | DC-115 Kbps (NRZ) |
| WAVELENGTH | 1310/1550 nm, MM and SM |
| NUMBER OF FIBERS | 1 |
| OPTICAL EMITTER | Laser Diode |

### LED INDICATORS

| FVT Transmitter/Data Transceiver Unit: | FVR Receiver/Data Transceiver Unit: |
|---|---|
| - Video Input Sync Presence | - Video Output Sync Presence |
| - Received Data | - Received Data |
| - Transmitted Data | - Transmitted Data |
| - Optical Carrier Detect | - Optical Carrier Detect |

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### CONNECTORS

| | |
|---|---|
| Optical: | ST (Standard) SC or FC (Optional) |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

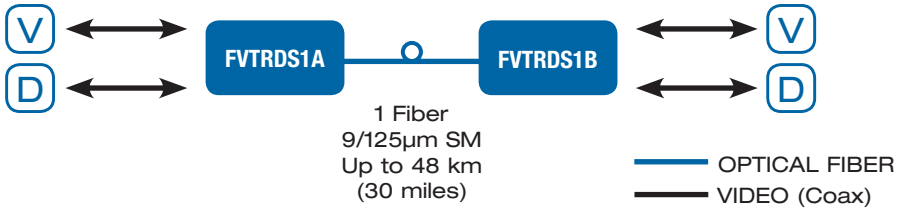
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

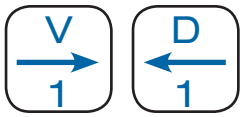
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVTRDM1A | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 1 |
| FVTRDM1B | Video Receiver/Data Transceiver | | | | | |
| FVTRDS1A | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 1 |
| FVTRDS1B | Video Receiver/Data Transceiver | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory)<br>Add '/SC' for SC Connectors<br>Add '/FC' for FC Connectors | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion. **Check with control system manufacturer for distance limits on up-the-coax systems.**
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



video with return data








## Description

The ComNet™ FVT15M2 video transmitter/data receiver and the FVR15M2 video receiver/data transmitter support the simultaneous transmission of video and return data over two multimode optical fibers. These modules are universally compatible with all major CCTV camera manufacturers and supports RS232 and RS422 data interfaces and all major data protocols. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- CCTV with one-way PTZ Camera Control
- CCTV with Remote Signalization

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT15M2<br>FVR15M2 | 2 (850 nm) | Multimode<br>62.5/125µm |

## Features

- AM Video Transmission and Reception
- NTSC, PAL, or SECAM compatible
- Full Color Compatibility
- NTCIP Compatible
- Supports RS232 or RS422 Data interfaces
- Transparent to data encoding/compatible with major CCTV camera manufacturers
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Distances up to 1.5 miles (2.5 km) without repeaters
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable fuses on all power lines
- Lifetime Warranty

video with return data



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Bandwidth: | 5 Hz - 10 MHz |
| Differential Gain: | <5% |
| Differential Phase: | <5˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | >55 dB @ 10 dB ATTN. |

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422, Manchester, bi-phase |
| Data Rate: | DC-115 Kbps (NRZ) |

### WAVELENGTH

850 nm

### NUMBER OF FIBERS

2

### LED INDICATORS*

- Video Present
- Transmit Data
- Receive Data

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 250 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | FVT: 1, FVR: 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <4 lb./1.8 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Heat Generation: | 10 BTU |
| Relative Humidity: | 0% to 95% (non-condensing)† |

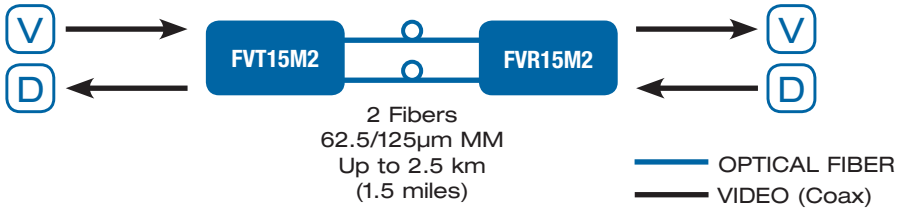
† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT15M2 | Video Transmitter/Data Receiver (850 nm) | 2 | Multimode 62.5/125µm | 10 dB | 2.5 km (1.5 miles) | 1 |
| FVR15M2 | Video Receiver/Data Transmitter (850 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 1-channel digital video + 4 bi-directional data channels 10-bit digital short-haul video

V 1 D 4



## Description

The ComNet™ FVT/FVR1014 video transmitter/data transceiver and video receiver/data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that meets the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of one independent video channel and four bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1014M1<br>FVR1014M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT1014S1<br>FVR1014S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission: transmits one real-time color video signal and 4 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485 with tri-state data interfaces
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 1-channel digital video + 4 bi-directional data channels 10-bit digital short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 1 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 4 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in $10^{-9}$ @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

* LEDS: RED = “No Activity” GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 4W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

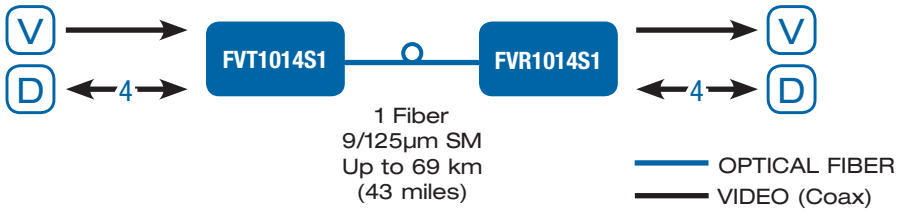
† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

FC PART 15 COMPLIANT · CE · cULus E322911 · RoHS COMPLIANT · C-Tick N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1014M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR1014M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT1014S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FVR1014S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 2-channel digital video + 4 bi-directional data channels + 10-bit digital short-haul video


V 2

D 4



## Description

The ComNet™ FVT/FVR2014 video transmitter/data transceiver and video receiver/data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that meets the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of two independent video channels and four bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT2014M1<br>FVR2014M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT2014S1<br>FVR2014S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission: transmits 2 real-time color video signals and 4 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485 with tri-state data interfaces
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 2-channel digital video + 4 bi-directional data channels + 10-bit digital short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 2 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 4 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 10-9 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Link

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Link

* LEDS: RED = “No Activity” GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 4W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

AGENCY COMPLIANCE

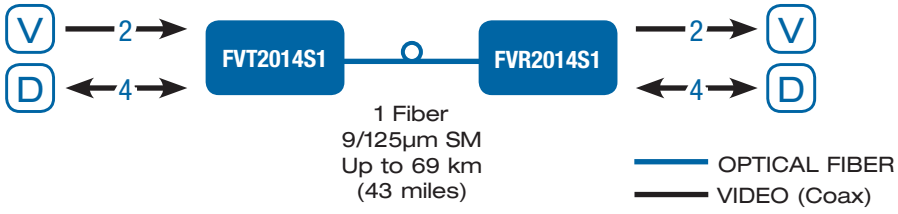
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT2014M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR2014M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT2014S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FVR2014S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 4-channel digital video + 2 bi-directional data channels


V 4

D 2



## Description

The ComNet™ FVT/FVR46 video transmitter/data transceiver and video receiver/data transceiver series utilize digital encoding and decoding for high-quality video transmission. These environmentally hardened units provide transmission of four independent video channels and two bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT46M1<br>FVR46M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT46S1<br>FVR46S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- Digital video transmission: transmits 4 real-time color video signals and 2 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485 with tri-state data interfaces
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 4-channel digital video/ 2 bi-directional data channels



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <4% |
| Differential Phase: | <0.3˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 57 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 2 |
| Data Format: | RS232, RS422, 2 or 4-wire RS485 w/ Tri-State, Manchester, bi-phase |
| Data Rate: | DC-115 Kbps (NRZ) |
| Bit Error Rate: | <1 in $10^{-9}$ @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | 1310/1550 nm, Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Optical
- Video (Sync Presence for Each Video Input Channel)
- RX1 - TX1
- RX2 -TX2

FVR Video Receiver/Data Transceiver Unit:
- Optical
- Video (Sync Presence for Each Video Output Channel)
- RX1 - TX1
- RX2 -TX2

* LEDS: RED = “No Activity” GRN = “Activity” NOTE: RED DOES NOT MEAN “Error”

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

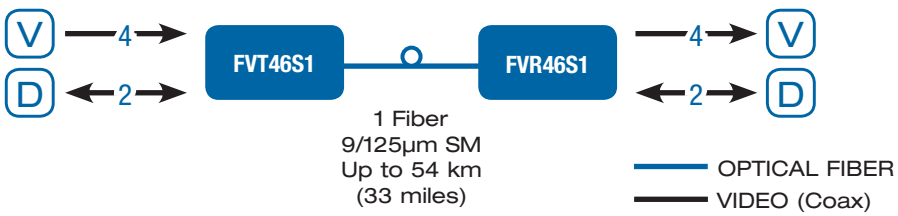
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

Note: When interfacing to a Bosch 2-wire RS485 bus (keypad), please add a ‘/Bosch’ to the model number.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT46M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 10 dB | 3 km (2 miles) | 2 |
| FVR46M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT46S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 18 dB | 54 km (33 miles) | 2 |
| FVR46S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory)<br>Add ‘/Bosch’ for use with Bosch keyboard (See above Note) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 4-channel 8-bit digital video/ 2 bi-directional data multiplexer


V 4

D 2



## Description

The ComNet™ FVT/FVR406 series video transmitter/ data transceiver and video receiver/data transceiver series utilize 8-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for medium-haul video transmission. These environmentally hardened units provide transmission of four independent video channels and two bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT406M1<br>FVR406M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT406S1<br>FVR406S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 8-bit digital video transmission: transmits 4 real-time color video signals and 2 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485 with tri-state data interfaces
- Exceeds all requirements for RS-250C medium-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 4-channel 8-bit digital video/ 2 bi-directional data multiplexer



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 63 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 2 |
| Data Format: | RS232, RS422, 2 or 4-wire RS485 w Tri-State, Manchester, bi-phase |
| Data Rate: | DC-115 Kbps (NRZ) |
| Bit Error Rate: | <1 in $10^{-9}$ @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

* LEDS: RED = "No Activity" GRN = "Activity" NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 350 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

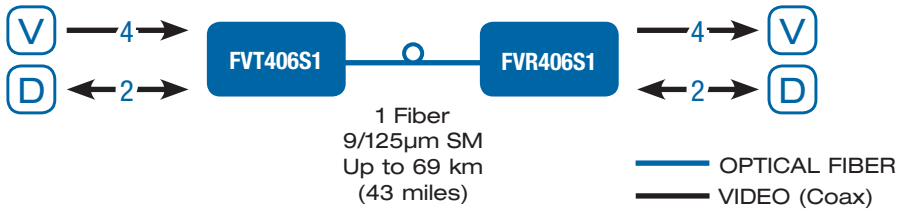
Note: When interfacing to a Bosch 2-wire RS485 bus (keypad), please add a '/Bosch' to the model number.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT406M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 10 dB | 3 km (2 miles) | 2 |
| FVR406M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT406S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 18 dB | 69 km (43 miles) | 2 |
| FVR406S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory)<br>Add '/Bosch' for use with Bosch keyboard (See above Note) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 4-channel digital video/ 4 bi-directional data channels


V 4 D 4



## Description

The ComNet™ FVT/FVR414 video transmitter/data transceiver and video receiver/data transceiver series utilize digital encoding and decoding for high-quality video transmission. These environmentally hardened units provide transmission of four independent video channels and four bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS-232, RS-422 and 2 or 4-wire RS-485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT414M1<br>FVR414M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT414S1<br>FVR414S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- Digital video transmission: transmits 4 real-time color video signals and 4 bi-directional data signals on one optical fiber
- Supports RS-232, RS-422, and 2 or 4-wire RS-485 with tri-state data interfaces
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 4-channel digital video/ 4 bi-directional data channels



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <4% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 57 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 4 |
| Data Interface: | RS-232, RS-422, and RS-485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 10-9 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pc. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 x 5.3 x 2.2 in., (15.5 x 13.5 x 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

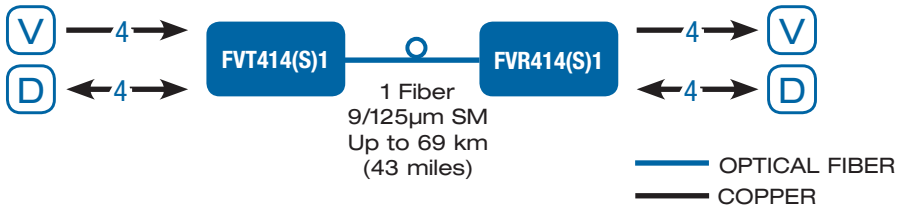
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT414M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR414M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT414S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FVR414S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| | One 5pc. RJ45 Breakout Wiring Kit (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 4-channel digital video + 4 bi-directional data channels + 10-bit digital short-haul video


V 4

D 4



## Description

The ComNet™ FVT/FVR4014 video transmitter/data transceiver and video receiver/data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that meets the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of four independent video channels and four bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485 with tri-state support. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT4014M1<br>FVR4014M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT4014S1<br>FVR4014S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission: transmits 4 real-time color video signals and 4 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485 with tri-state data interfaces
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Ideally suited to networks requiring multiple physical layers where video degradation may be a problem
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 4-channel digital video + 4 bi-directional data channels + 10-bit digital short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 4 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 10-9 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | 1310/1550 nm, Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

* LEDS: RED = “No Activity”
GRN = “Activity”
NOTE: RED DOES NOT MEAN “Error”

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 4W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

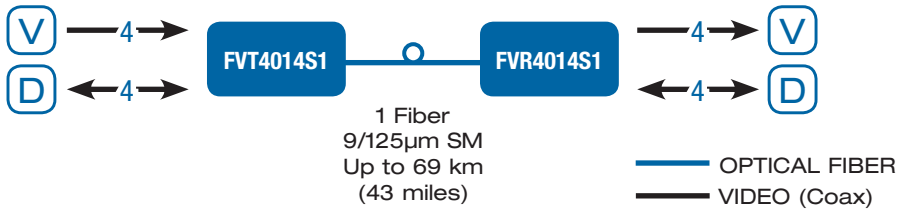
AGENCY COMPLIANCE

PART 15 COMPLIANT · E322911 · N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT4014M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 2 |
| FVR4014M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT4014S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FVR4014S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 8-channel 10-bit digital medium-haul video + 4 bi-directional data channels


V 8 D 4



## Description

The ComNet FVT/FVR8014(M)(S)1 Series transmits eight (8) channels of 10-Bit Digital Video along with four (4) channels of bi-directional data over one single mode or multimode optical fiber. The video quality exceeds RS-250C for medium-haul video transmission. This equipment is environmentally hardened and suitable for use in unconditioned roadside or out-of plant installations. The FVT/FVR8014 is compatible with NTSC, PAL and SECAM video transmission protocols and supports bi-direction RS232, 422 and RS485 (2 & 4 Wire) data. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are required. Bi-Color (RED/GREEN) LED indicators are provided to indicate the status of the system, video and data. The FVT/FVR8014 series feature ComFit design ensuring they can be directly mounted in a ComNet rack or stand-alone mounted. No additional parts or power supplies are required.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT8014M1<br>FVR8014M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT8014S1<br>FVR8014S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission: transmits 8 real-time color video signals and 4 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485
- Exceeds all requirements for EIA RS-250C medium-haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 8-channel 10-bit digital medium-haul video + 4 bi-directional data channels



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 8 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 4 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 10-9 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | 1310/1550 nm, Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 4W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 3 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 3.3 in., (15.5 × 13.5 × 8.3 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

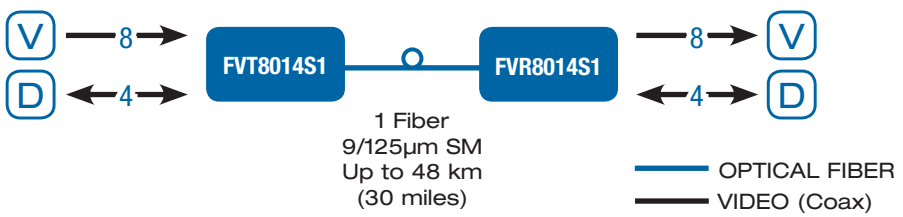
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT8014M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 3 |
| FVR8014M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT8014S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 16 dB* | 48 km (30 miles) | 3 |
| FVR8014S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion. * Add "HP" for 23dB
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 8-channel digital video + 8 bi-directional data channels + 10-bit digital short-haul video


V 8

D 8



## Description

The ComNet FVT/FVR8018(M)(S)1 Series transmits eight (8) channels of 10-Bit Digital Video along with eight (8) channels of bi-directional data over one single mode or multimode optical fiber. The video quality exceeds RS-250C for short-haul video transmission. This equipment is environmentally hardened and suitable for use in unconditioned roadside or out-of plant installations. The FVT/FVR8018 is compatible with NTSC, PAL and SECAM video transmission protocols and supports bi-direction RS232, 422 and RS485 (2 & 4 Wire) data. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are required. Bi-Color (RED/GREEN) LED indicators are provided to indicate the status of the system, video and data. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT8018M1<br>FVR8018M1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT8018S1<br>FVR8018S1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Applications

- High-Performance CCTV (Fixed Video)

## Features

- 10-bit digital video transmission: transmits 8 real-time color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485
- Exceeds all requirements for EIA RS-250C short-haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 8-channel digital video + 8 bi-directional data channels + 10-bit digital short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 8 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 10-9 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

1310/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS*

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect

* LEDS: RED = “No Activity” GRN = “Activity” NOTE: RED DOES NOT MEAN “Error”

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 4W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 3 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 3.3 in., (15.5 × 13.5 × 8.3 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix ‘/C’ to model number for conformal coating.

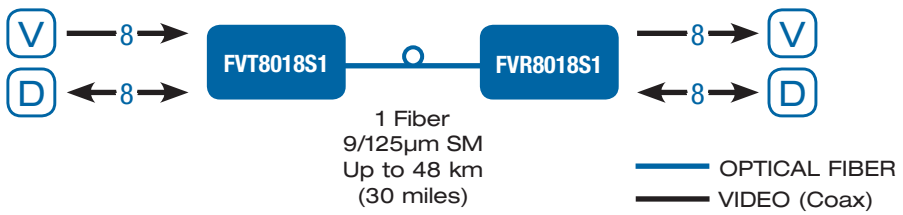
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

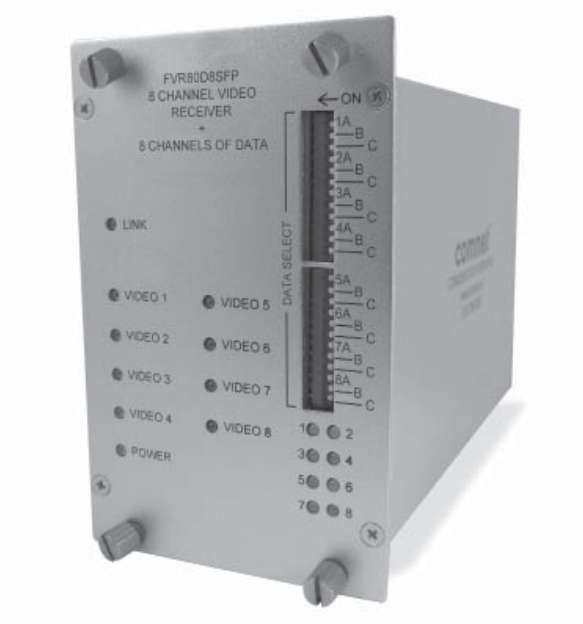
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT8018M1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2 miles) | 3 |
| FVR8018M1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |
| FVT8018S1 | Video Transmitter/Data Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 16 dB* | 48 km (30 miles) | 3 |
| FVR8018S1 | Video Receiver/Data Transceiver (1550/1310 nm) | | | | | |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| | (5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add ‘/C’ for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
**Distance may be limited by optical dispersion. * Add “HP” for 23dB
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# (8) 10-bit digital video channels with 8 bi-directional data channels with small form-factor pluggable (SFP) optical devices




V 8 D 8



## Description

The ComNet™ FVT/FVR80D8SFP series optical video link provides transmission of eight 10-bit short-haul quality digital video channels and eight bi-directional data channels through a selectable small form factor pluggable module (SFP).

The data channels support RS232, RS422 and 2 wire and 4 wire RS485. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

## Features

- Up to eight 10-bit digital video channels
- 8 Bi-directional data channels
- Uses interchangeable SFPs for fiber type, distance and connector
- Exceeds all requirements for RS-250C short-haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# (8) 10-bit digital video channels with 8 bi-directional data channels with small form-factor pluggable (SFP) optical devices



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7° |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### WAVELENGTH

SFP (Small Form-Factor Pluggable) dependent

### NUMBER OF FIBERS[1]

SFP (Small Form-Factor Pluggable) dependent

### OPTICAL EMITTER

SFP (Small Form-Factor Pluggable) dependent

### LED INDICATORS

FVT Transmitter/Data Transceiver Unit:
- Fiber Status
- Video Input Sync Presence
- Received Data
- Transmitted Data
- Power

FVR Receiver/Data Transceiver Unit:
- Fiber Status
- Video Output Sync Presence
- Received Data
- Transmitted Data
- Power

### CONNECTORS

| | |
|---|---|
| Optical: | SFP modules |
| Power: | Terminal Block |
| Video: | BNC |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 3 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 3.3 in., (15.5 × 13.5 × 8.3 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

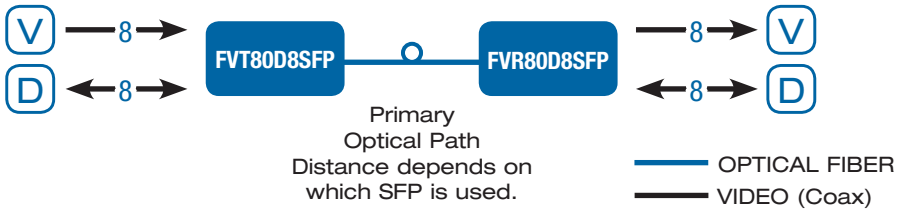
AGENCY COMPLIANCE

PART 15 COMPLIANT · E322911 · N24621

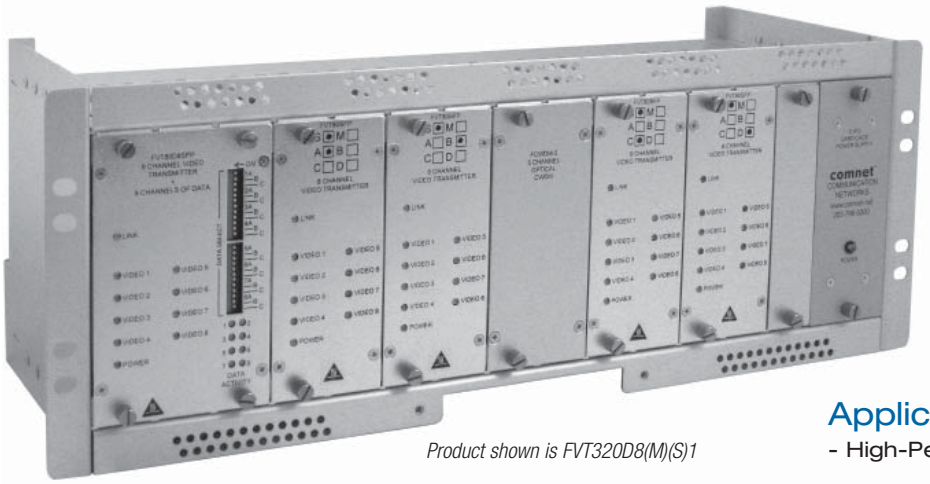
| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 12-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



*Product shown is FVT320D8(M)(S)1*

V 12 D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR120D8 series video transmitter/data transceiver and video receiver/ data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 12 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT120D8(M)1<br>FVR120D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT120D8(S)1<br>FVR120D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 12 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 12-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 12 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

LED INDICATORS

| FVT Video Transmitter/Data Transceiver Unit: | FVR Video Receiver/Data Transceiver Unit: |
|---|---|
| - Video Input Sync Presence for Each Video Channel | - Video Output Sync Presence for Each Video Channel |
| - Received Data | - Received Data |
| - Transmitted Data | - Transmitted Data |
| - Optical Carrier Detect | - Optical Carrier Detect |
| - Power | - Power |

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |
| FUSING | 1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused) |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

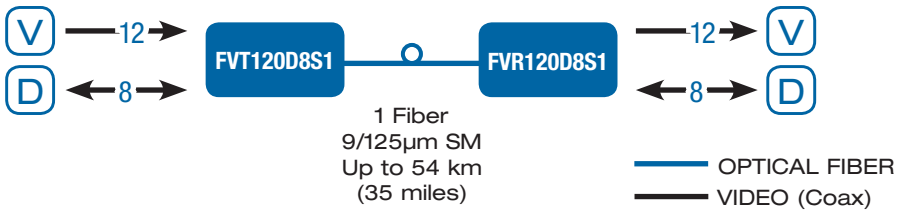
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

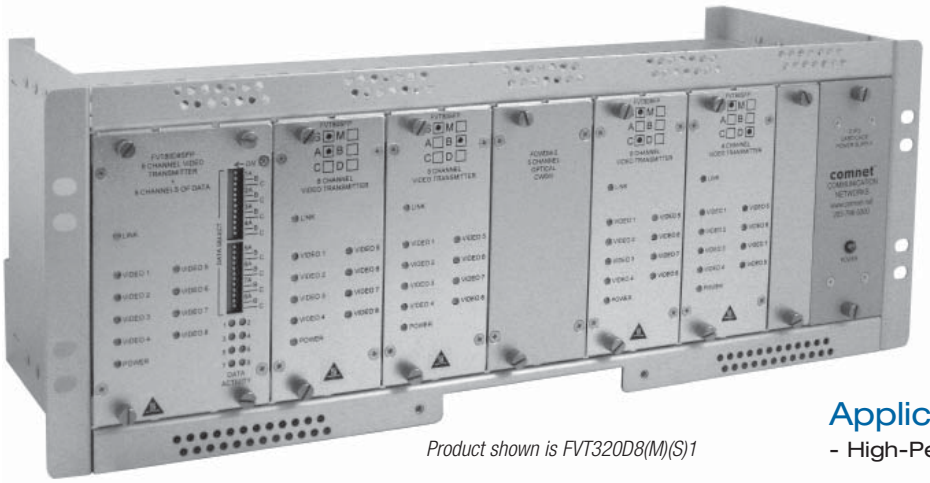
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT120D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR120D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT120D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR120D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 16-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



*Product shown is FVT320D8(M)(S)1*

V 16

D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR160D8 series video transmitter/data transceiver and video receiver/ data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 16 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT160D8(M)1<br>FVR160D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT160D8(S)1<br>FVR160D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 16 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 16-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 16 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |
| LED INDICATORS | |

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

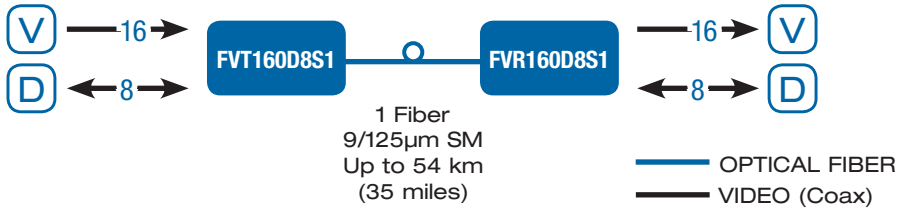
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

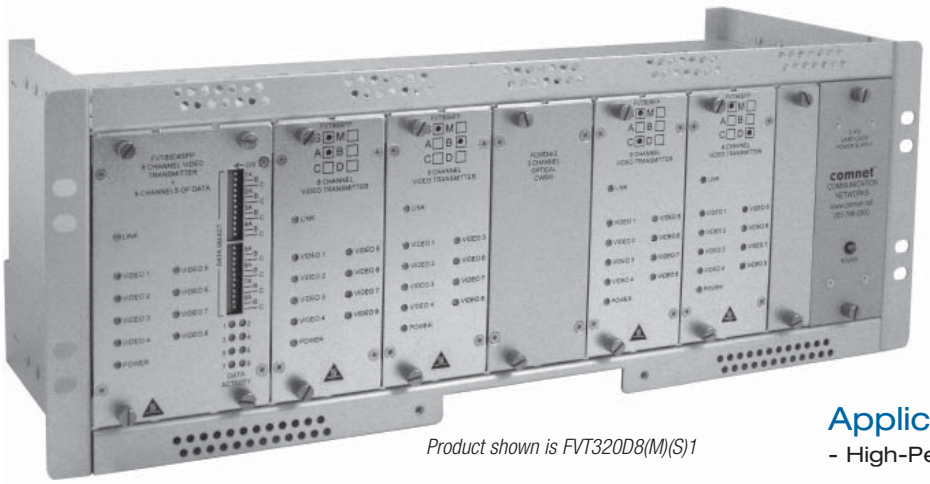
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT160D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR160D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT160D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR160D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 20-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video




*Product shown is FVT320D8(M)(S)1*

V 20

D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR200D8 series video transmitter/data transceiver and video receiver/ data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 20 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT200D8(M)1<br>FVR200D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT200D8(S)1<br>FVR200D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 20 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/ low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 20-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 20 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

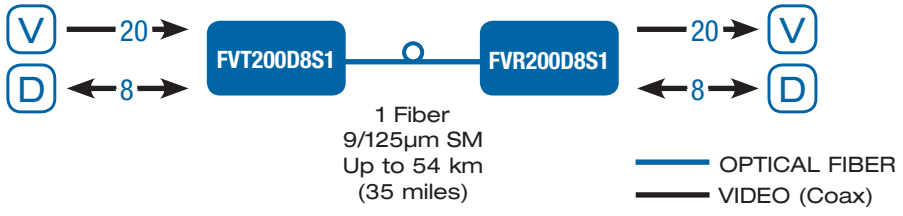
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

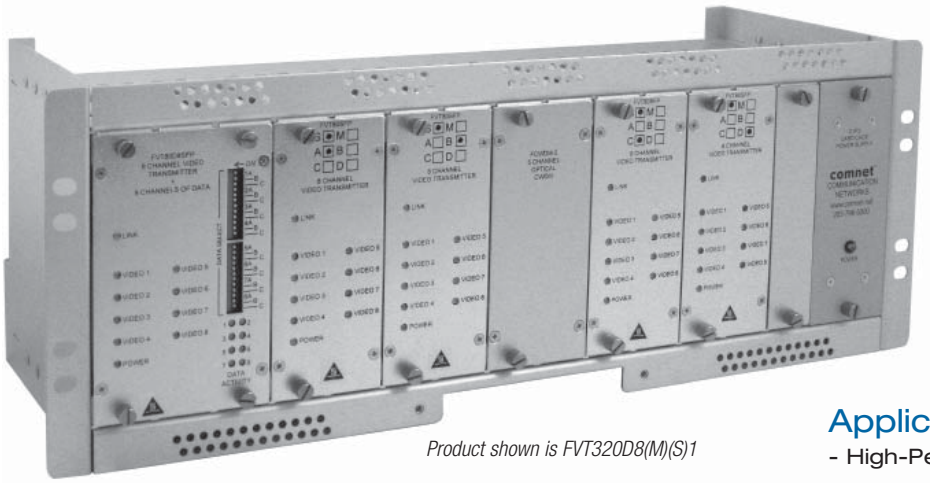
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT200D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR200D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT200D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR200D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 24-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



*Product shown is FVT320D8(M)(S)1*

V 24

D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR240D8 series video transmitter/data transceiver and video receiver/ data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 24 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT240D8(M)1<br>FVR240D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT240D8(S)1<br>FVR240D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 24 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/ low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 24-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 24 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |

### WAVELENGTH

Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

### OPTICAL EMITTER

Laser Diode

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

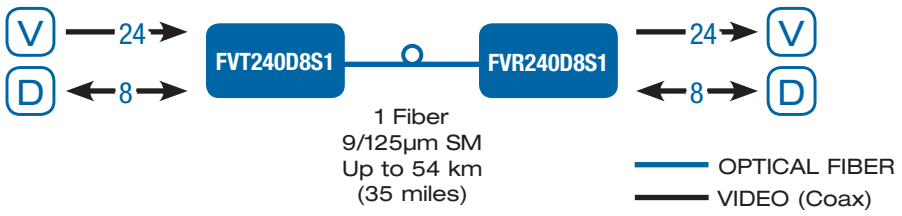
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

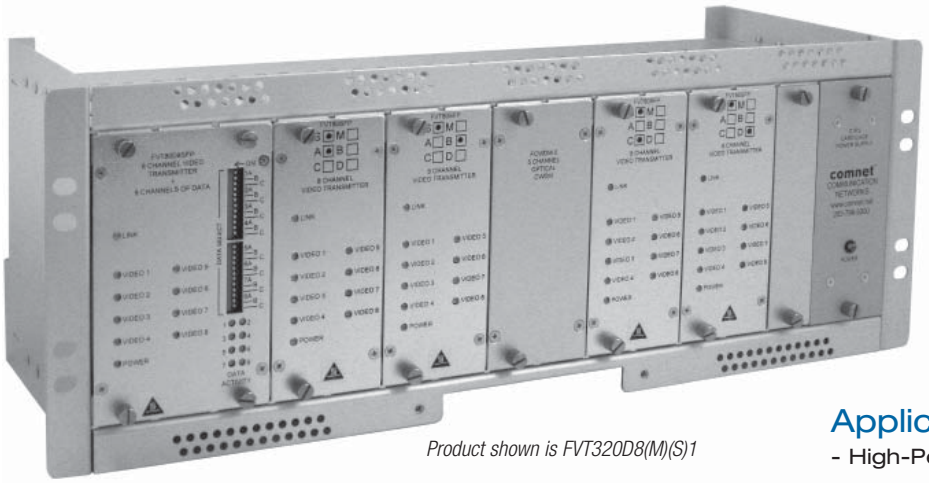
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT240D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR240D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT240D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR240D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 28-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



*Product shown is FVT320D8(M)(S)1*

V 28 D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR280D8 series video transmitter/data transceiver and video receiver/ data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 28 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT280D8(M)1<br>FVR280D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT280D8(S)1<br>FVR280D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 28 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/ low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 28-channel digital video + 8 bi-directional data channels/ 10-bit digital/short-haul video



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 28 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |
| Bit Error Rate: | <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

LED INDICATORS

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |
| FUSING | 1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused) |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

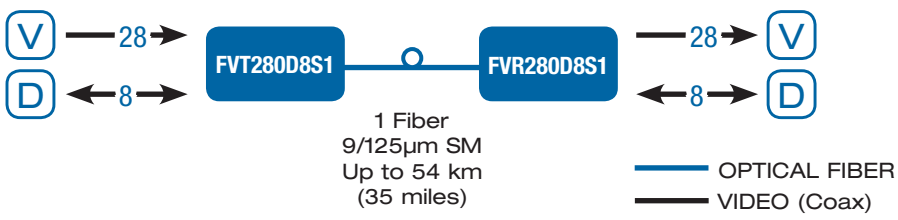
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT280D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR280D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT280D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR280D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# 32-channel 10-bit digital/short-haul video + 8 bi-directional data channels

V 32

D 8



## Applications

- High-Performance CCTV Systems

## Description

The ComNet™ FVT/FVR320D8 series video transmitter/data transceiver and video receiver/data transceiver series utilize 10-bit digital encoding and decoding for high-quality video transmission that exceeds the requirements of EIA RS-250C for short-haul video transmission. These environmentally hardened units provide transmission of 32 independent video channels and eight bi-directional data channels over one optical fiber and are ideal for use in unconditioned roadside or out-of-plant installations. These units are completely transparent to and universally compatible with any NTSC, PAL, or SECAM CCTV camera systems, data channels can be set independently for RS232, RS422 and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT320D8(M)1<br>FVR320D8(M)1 | 1 | Multimode 62.5/125µm |
| FVT320D8(S)1<br>FVR320D8(S)1 | 1 | Single Mode 9/125µm |

## Features

- 10-Bit digitally encoded video transmission, transmits 32 real-time/full frame color video signals and 8 bi-directional data signals on one optical fiber
- Supports RS232, RS422, and 2 or 4-wire RS485, Sensornet, Bi-phase and Manchester
- Exceeds all requirements for EIA RS-250C short-haul transmission: Extremely high video performance
- Exceptionally low video distortion with zero Performance Variation vs. Optical Path Loss
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Robust design ensures extremely high reliability in unconditioned out-of-plant environments
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# 32-channel 10-bit digital/short-haul video + 8 bi-directional data channels



## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 32 |
| Bandwidth (minimum): | 10 Hz - 6.5 MHz per channel |
| Differential Gain: | <2% |
| Differential Phase: | <0.7˚ |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB Typical |

### DATA

| | |
|---|---|
| Data Channels: | 8 |
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-Phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ)Bit Error Rate: <1 in 1010 @ Maximum Optical Loss Budget |
| Operating Mode: | Simplex or Full-Duplex |
| WAVELENGTH | Multimode and Single Mode |
| NUMBER OF FIBERS | 1 |

### LED INDICATORS

FVT Video Transmitter/Data Transceiver Unit:
- Video Input Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

FVR Video Receiver/Data Transceiver Unit:
- Video Output Sync Presence for Each Video Channel
- Received Data
- Transmitted Data
- Optical Carrier Detect
- Power

| | |
|---|---|
| OPTICAL EMITTER | Laser Diode |

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 (5 pcs. Included) |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

| | |
|---|---|
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 19 × 7.5 × 6 in., (48 × 19 × 15 cm) |
| Shipping Weight: | <8 lbs./3.6 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

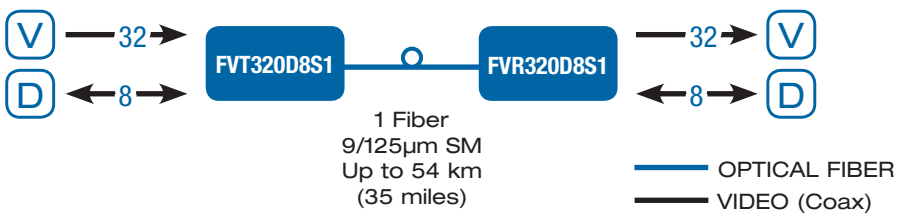
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** |
|---|---|---|---|---|---|
| FVT320D8(M)1 | Video Transmitter/Data Transceiver | 1 | Multimode 62.5/125µm | 18 dB | 1 km (.621 miles) |
| FVR320D8(M)1 | Video Receiver/Data Transceiver | | | | |
| FVT320D8(S)1 | Video Transmitter/Data Transceiver | 1 | Single Mode 9/125µm | 18 dB | 54 km (35 miles) |
| FVR320D8(S)1 | Video Receiver/Data Transceiver | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.




FVT40A4C1
S M
4 CHANNEL
VIDEO TRANSMITTER
+
4 CHANNEL
AUDIO TRANSMITTER
LINK
VIDEO 1
VIDEO 2
VIDEO 3
VIDEO 4
POWER
AUDIO IN
1
2
3
4
CNTCT
OUT
IN
FVR40A4C1
S M
4 CHANNEL
VIDEO RECEIVER
+
4 CHANNEL AUDIO
RECEIVER
LINK
VIDEO 1
VIDEO 2
VIDEO 3
VIDEO 4
POWER
AUDIO OUT
1
2
3
4
CNTCT
OUT
IN

## VIDEO, DATA & AUDIO PRODUCT NUMBERING GUIDE*


**Media and Signal Type**
F = Fiber
V = Video

**Unit**
T = Transmitter
R = Receiver

**Product Series**
May include additional letters:
D = Data
A = Audio
E = Ethernet
C = Contact Closure

**Mode**
S = Single
M = Multi

## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

# 4-channel 10-bit digital video 24-bit audio multiplexer
# 1 bi-directional contact closure


V 4 | A 4 | CC 1



## Applications

- High-Performance CCTV (Fixed Video)
- Transmission of Broadcast Audio
- Recording Studios and Post-Production Facilities
- Elimination of EMI/RFI Interference in Audio Cables
- Optical Isolation for Elimination of Ground Loop Noise

## Description

The ComNet™ FVT/FVR40A4C1 series video/audio multiplexer utilizes 10-bit encoding for short-haul video transmission and 24-bit 96kHz sample rate encoded audio for broadcast quality performance. These environmentally hardened units provide transmission of four independent video and audio channels and one bi-directional contact closure over one multimode or single mode fiber. The FVT/FVR40A4C1 series is completely transparent to and universally compatible with any NTSC, PAL or SECAM CCTV camera system. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators confirm equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT40A4C1M<br>FVR40A4C1M | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVT40A4C1S<br>FVR40A4C1S | 1 (1310/1550 nm | Single Mode 9/125µm |

## Features

- 10-bit digital video transmits 4 real-time color video signals on one optical fiber
- 4 channels of 24-bit 96kHz sample rate encoded audio that provides Broadcast Performance
- One Bi-directional Contact Closure
- 20Hz - 18kHz Audio Bandwidth
- 600 Ohms Audio Input Impedance
- Directly compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Wide Optical Dynamic Range: optical attenuators are never required
- Meets NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Bi-color (Red/Green) LED status indicators confirm equipment operating status
- Transmits Balanced Line-Level Audio up to +6dBm
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 48 km (30 miles) without repeaters
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 4-channel 10-bit digital video 24-bit audio multiplexer
# 1 bi-directional contact closure



## specifications

### VIDEO

| | |
|---|---|
| Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| # Input/Output Channels: | 4 |
| Bandwidth (minimum): | 10Hz - 6.5MHz |
| Differential Gain: | <2% |
| Differential Phase: | <0.7° |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67dB (Typical) |

### AUDIO

| | |
|---|---|
| # Input/Output Channels: | 4 (balanced) |
| Audio Input/Output Signal: | 4.4 volt pk-pk (+6dBm) |
| Bandwidth: | 20Hz - 18kHz |
| Total Harmonic Distortion: | <0.02% |
| Signal-to-Noise Ratio (SNR): | 85dB (minimum) |

### CONTACT

| | |
|---|---|
| Contact Interface: Response Time: | 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay, 0.5 A Contact Rating - normally open |

### WAVELENGTH

1310 nm/1550 nm, Multimode & Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

- Video CH 1-4 - Audio CH 1-4
- Link - Power - Contact Closure

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Audio: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 5 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C[1] |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Included Power Supply operating temperature range is 0 - +40° C.

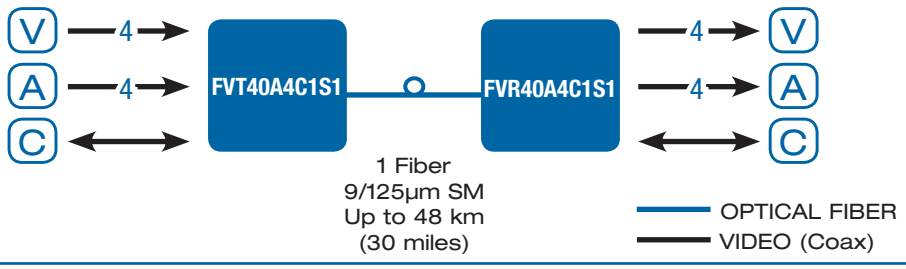
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

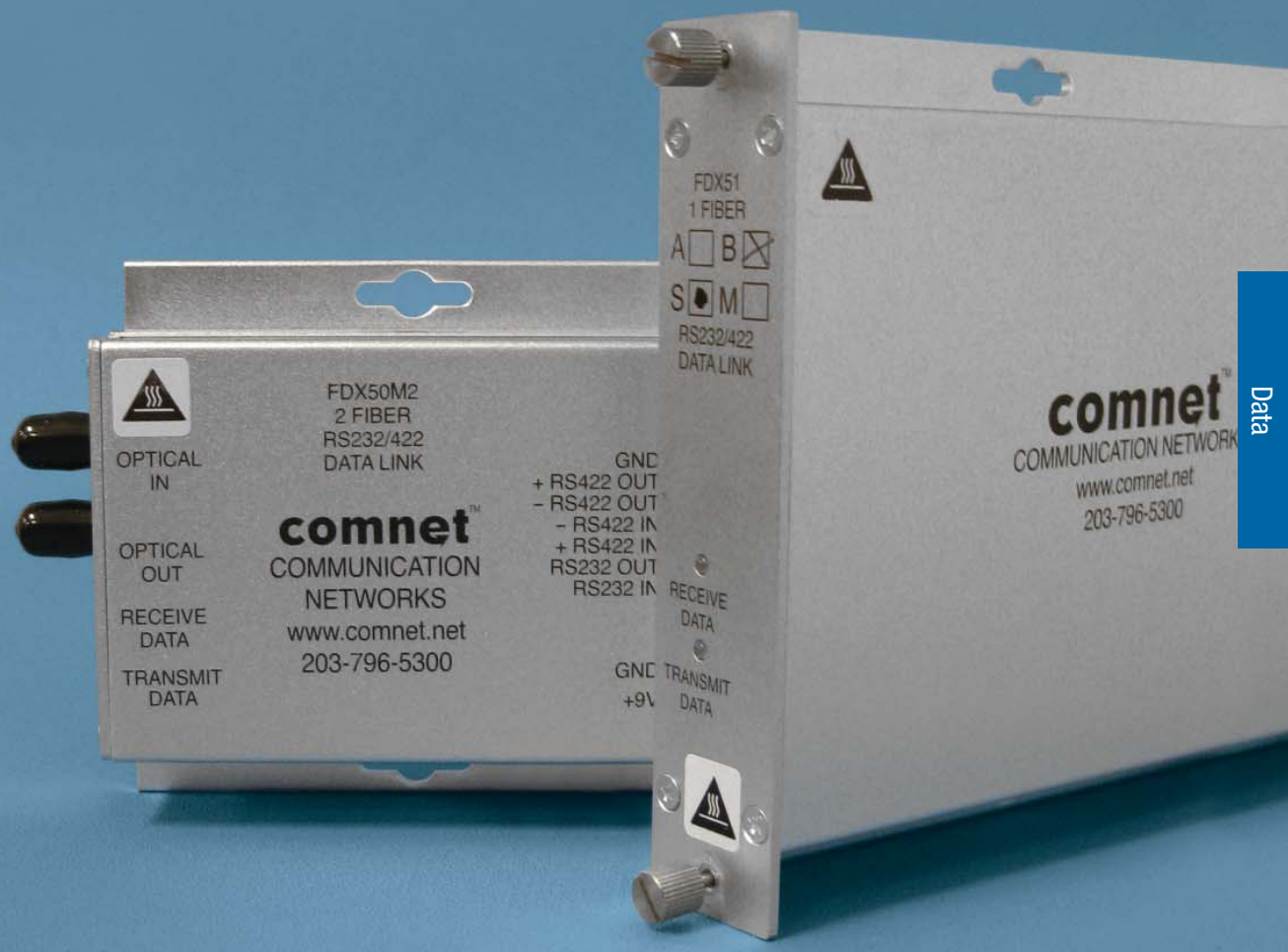
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

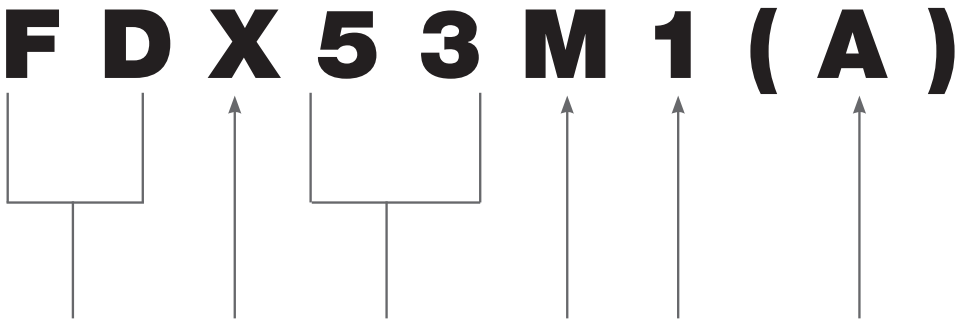
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT40A4C1M | 4 Channel Video/Audio Transmitter (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2.5 miles) | 2 |
| FVR40A4C1M | 4 Channel Video/Audio Receiver (1310/1550 nm) | | | | | |
| FVT40A4C1S | 4 Channel Video/Audio Transmitter (1310/1550 nm) | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 2 |
| FVR40A4C1S | 4 Channel Video/Audio Receiver (1310/1550 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.




FDX51
1 FIBER
A B
S M
RS232/422
DATA LINK
comnet
COMMUNICATION NETWORK
www.comnet.net
203-796-5300
FDX50M2
2 FIBER
RS232/422
DATA LINK
OPTICAL
IN
OPTICAL
OUT
RECEIVE
DATA
TRANSMIT
DATA
comnet
COMMUNICATION
NETWORKS
www.comnet.net
203-796-5300
GND
+ RS422 OUT
– RS422 OUT
– RS422 IN
+ RS422 IN
RS232 OUT
RS232 IN
GND
+9V
RECEIVE
DATA
TRANSMIT
DATA

## DATA PRODUCT NUMBERING GUIDE*




**Media and Signal Type**
F = Fiber
D = Data

**Unit**
X = Transceiver
C = Contact Closure

**Product Series**
May include additional letters:
D = Data
A = Audio
E = Ethernet
C = Contact Closure

**Mode**
S = Single
M = Multi

**Fibers Required**
1 = Single Fiber
2 = Two Fibers

**A or B**
A = Emitter
B = Detector



## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

# RS232/422 point-to-point data transceiver


D
1

## Applications

- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

## Description

The ComNet™ FDX50 and FDX51 series data transceivers are interchangeable by application and provide point-to-point transmission of simplex or duplex EIA RS232/RS422 data signals over one or two optical fibers. The transceivers are transparent to data encoding allowing for broad-range compatibility. Models within this series are available for use with multimode or single mode optical fiber. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Each transceiver incorporates a bi-color (Red/Green) indicating LED for monitoring proper system operation. The FDX50 has a small footprint and is designed for surface mounting. The FDX51 can be rack or surface mounted.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX50M2<br>FDX50M1(A)(B) | 2 (1310 nm)<br>1 (1310/1550 nm) | Multimode 62.5/125µm |
| FDX51M2<br>FDX51M1(A)(B) | 2 (1310 nm)<br>1 (1310/1550 nm) | |
| FDX50S1(A)(B) | 1 (1310/1550 nm) | Single Mode 9/125µm |
| FDX51S1(A)(B) | 1 (1310/1550 nm) | |

## Features

- Meets EIA RS232/422 specifications
- Distances up to 69 km (43 miles)
- Transparent to data encoding/compatible with major data protocols
- Point-to-Point topology
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Data rates up to 115 Kbps (NRZ)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Transmit and Receive LED's
- NTCIP compatible
- Integrated WDM for greater product reliability
- Automatic resettable solid-state current limiters
- FDX51 is a hot-swappable rack module
- FDX51 is interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# RS232/422 point-to-point data transceiver

## specifications

### DATA

| | |
|---|---|
| Data Format: | RS232 (data lines only), RS422, Manchester, bi-phase |
| Data Rate: | DC-115 kbps (NRZ) |
| Operating Mode: | Asynchronous, simplex or full duplex |
| Bit Error Rate: | <1 in 10˚ |

### WAVELENGTH / FIBERS

| | | |
|---|---|---|
| FDX50M2 | 1310 nm, Multimode | 2 |
| FDX50M1(A)(B) | 1310/1550 nm, Multimode | 1 |
| FDX50S1(A)(B) | 1310/1550 nm, Single Mode | 1 |
| FDX51M2 | 1310 nm, Multimode | 2 |
| FDX51M1(A)(B) | 1310/1550 nm, Multimode | 1 |
| FDX51S1(A)(B) | 1310/1550 nm, Single Mode | 1 |

### OPTICAL EMITTER LED INDICATORS*

Laser
- Receive Data
- Transmit Data

### CONNECTORS

Optical: ST
Data and Power: Terminal Block

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 70 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount (FDX50): | 4.1 × 3.7 × 1.1 in., (10.4 × 9.4 × 2.8 cm) |
| Rack Mount (FDX51): | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

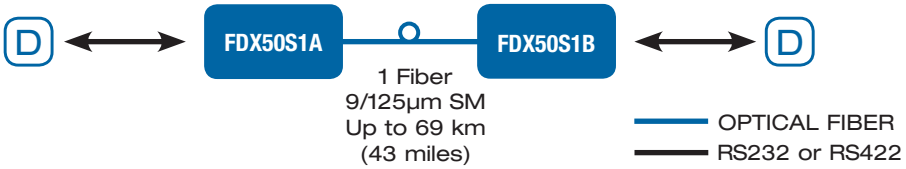
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT · E322911 · N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX50M2 | RS232/RS422 Transceiver (1310 nm) | 2 | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | NA |
| FDX50M1(A)(B) | RS232/RS422 Transceiver (1310/1550 nm) | 1 | | | | |
| FDX51M2 | RS232/RS422 Transceiver (1310 nm) | 2 | | | | 1 |
| FDX51M1(A)(B) | RS232/RS422 Transceiver (1310/1550 nm) | 1 | | | | |
| FDX50S1(A)(B) | RS232/RS422 Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | NA |
| FDX51S1(A)(B) | RS232/RS422 Transceiver | | | | | 1 |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)
NOTE: This product requires a fiber installation with a minimum 30dB connector return loss. The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.




NOTE: Unit can be used for transmission of RS232 or RS422, but not simultaneously.

# universal RS232/422/485 (2w/4w) bi-directional data transceiver

D
1

## Description

The ComNet™ FDX53 series data transceiver supports bi-directional data transmission over one multimode or single mode optical fiber. The transceiver is universally compatible with RS232, RS422, and 2-wire and 4-wire RS485 data interfaces and all major data protocols. The transceiver is also transparent to data encoding, and is compatible with the FDX54 series data transceiver. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX53M1(A)<br>FDX53M1(B) | 1 | Multimode 62.5/125µm |
| FDX53S1(A)<br>FDX53S1(B) | 1 | Single Mode 9/125µm |

## Features

- Meets EIA RS232/422 specifications (Simplex or Duplex)
- NTCIP compatible
- Distances up to 69 km (43 miles)
- Transparent to data encoding/compatible with major data protocols
- Drop and Repeat network architecture (when used with the FDX54 Series)
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- No in-field electrical or optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Integrated WDM for greater product reliability
- Bi-Color (Red/Green) Transmit and Receive LED Indicators
- Battery Backup (Optional)
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable solid-state current limiters
- Lifetime Warranty

# universal RS232/422/485 (2w/4w) bi-directional data transceiver

## specifications

### DATA

| | |
|---|---|
| Data Format*: | RS232, RS422, 2 or 4-wire RS485 w/Tri-State,Manchester, bi-phase |
| Data Rate: | DC-115 kbps |
| Operating Mode: | Asynchronous, simplex or full duplex |
| Bit Error Rate: | $10^{-9}$ |

### WAVELENGTH

| | |
|---|---|
| FDX53M1 | 1310/1550 nm, Multimode |
| FDX53S1 | 1310/1550 nm, Single Mode |

### FIBERS

1

### OPTICAL EMITTER

Laser

### LED INDICATORS*

- Receive Data
- Transmit Data

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Data and Power: | Terminal Block |

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2.5 W |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### BATTERY BACKUP OPTION

Internal, rechargeable Nickel Metal Hydride (NIMH) battery.
Operating Period: 12 hours typical

### ENVIRONMENTAL

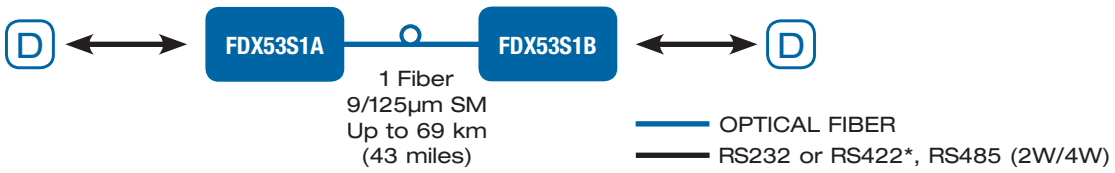
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX53M1(A)<br>FDX53M1(B) | Universal Bi-Directional Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | 1 |
| FDX53S1(A)<br>FDX53S1(B) | Universal Bi-Directional Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| Accessories<br>Options | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>Add '-B' for NIMH battery backup<br>Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.




* Unit can be used for transmission of RS232 or RS422, but not simultaneously.

# RS485 (2w/4w) drop and repeat data transceiver

D
1

## Applications

- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

## Description

The ComNet™ FDX54 series data transceiver provides drop and repeat transmission of 2-wire and 4-wire RS485 (half duplex) data signals over one optical fiber. The transceiver features optical "drop and repeat" capability that allows the user to easily configure the network operation. The transceiver is transparent to data encoding allowing for broad-range compatibility. The FDX53 series transceivers can be used as line-terminating devices with these modules. Models within this series are available for use with multimode or single mode fiber. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Features

- Meets EIA RS485 (2-wire or 4-wire) specifications
- Distances up to 69 km (43 miles)
- Transparent to data encoding/compatible with major data protocols
- Drop and Repeat network architecture
- Tested and certified by an independent laboratory for full compliance with the environmental requirements ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Data rates up to 115 kbps NRZ
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Bi-Color (Red/Green) Transmit and Receive LED Indicators
- Battery Backup (Optional)
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Automatic resettable solid-state current limiters
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX54M1<br>FDX54M1 | 1 In/1 Out | Multimode<br>62.5/125µm |
| FDX54S1<br>FDX54S1 | 1 In/1 Out | Single Mode<br>9/125µm |

# RS485 (2w/4w) drop and repeat data transceiver

## specifications

### DATA

| | |
|---|---|
| Data Format: | RS485 (2w/4w) |
| Data Rate: | DC-115 kbps (NRZ) |

### WAVELENGTH

| | |
|---|---|
| FDX54M1 | 1310/1550 nm, Multimode |
| FDX54S1 | 1310/1550 nm, Single Mode |

### FIBERS

1 In/1 Out

### OPTICAL EMITTER

Laser

### LED INDICATORS*

- Receive Data
- Transmit Data

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Data and Power: | Terminal Block |

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2.5 W |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### BATTERY BACKUP OPTION

Internal, rechargeable Nickel Metal Hydride (NIMH) battery.
Operating Period: 12 hours typical

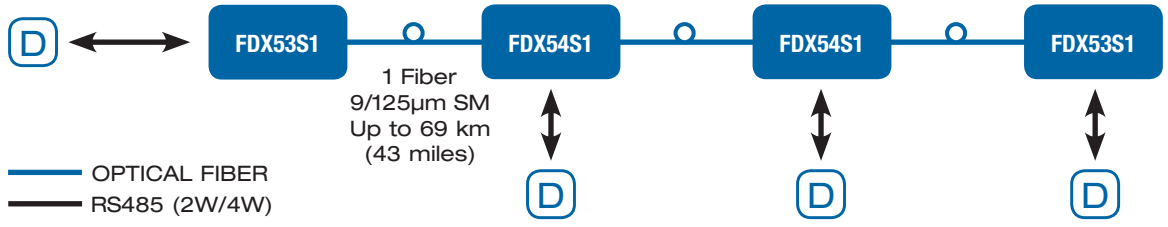
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

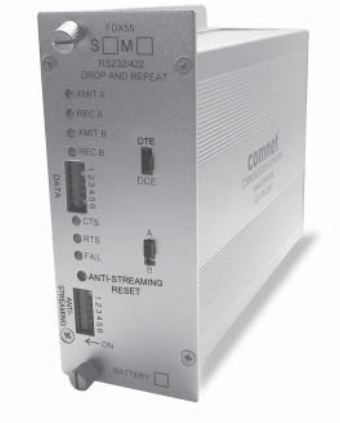
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX54M1<br>FDX54M1 | RS485 (2w/4w) Drop and Repeat Transceiver (1310/1550 nm) | 1 In/1 Out | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | 1 |
| FDX54S1<br>FDX54S1 | RS485 (2w/4w) Drop and Repeat Transceiver (1310/1550 nm) | 1 In/1 Out) | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '-B' for NIMH battery backup<br>Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# anti-streaming RS232/422 drop and repeat data transceiver




D
1

## Description

The ComNet™ FDX55 series consists of fully-digital transceiver units designed for implementing simplex or full-duplex RS232 Drop-and-Repeat poll-and-respond traffic signalization/communications data networks utilizing one or two optical fibers. These environmentally-hardened units are ideal for use in unconditioned out-of-plant or roadside installations and the master-configured transceiver unit may be located anywhere within the network, making this equipment ideal for applications involving on-street master controllers with upstream and downstream communication requirements. These units are compatible with FDX50, FDX51 and FDX52 Series of optical modems. Manually resettable anti-streaming is included for unparalleled network protection. Optional battery backup capability provides the highest level of network reliability in the event of a loss of local prime operating power, and maintains continuous communications channel operation. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Access Control Systems
- Building Automation & Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

## Features

- Meets EIA RS232C/D specifications (Simplex or Duplex)
- NTCIP compatible
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Robust design assures extremely high reliability in unconditioned roadside environments
- User-selectable DTE or DCE interface ensures ease of installation and maximum versatility
- Supports Request to Send (RTS) and Clear to Send (CTS) signals
- RJ-11 expansion port provides network branching capability by electrically linking co-located transceiver units
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Optional internal battery backup provides 12 hours operating time in the event of loss of 115 VAC prime operating power, and maintains continuous channel communications.
- Wide optical dynamic range: optical attenuators are never required
- User-configurable optical and electrical Anti-Streaming provides network protection against faulty streaming controller operation
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# anti-streaming RS232/422 drop and repeat data transceiver



## specifications

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422 |
| Data Rate: | DC-115 kbps |
| Operating Mode: | Asynchronous, simplex or full duplex |
| Bit Error Rate: | <1 in $10^{9}$ @ Max. Optical Loss Budget |
| Anti-Streaming Time-out: | 4, 8, 16, 64 Seconds or Infinity (disabled) |

### WAVELENGTH

| | |
|---|---|
| FDX55M2, FDX55M2E: | 1310 nm, Multimode |
| FDX55M28: | 850 nm, Multimode |
| FDX55S1, FDX55S1(A)(B)E: | 1310/1550 nm, Single Mode |
| FDX55S2, FDX55S2E: | 1310/1550 nm, Single Mode |

### FIBERS

| | |
|---|---|
| FDX55M28, FDX55M2, FDX55S2: | 2 In/2 Out |
| FDX55M2E: | 2 |
| FDX55S1: | 1 In/1 Out |
| FDX55S1(A)(B)E: | 1 |

### OPTICAL EMITTER

Laser

### LED INDICATORS*

1. Transmit Data, Opt. Chan. A
2. Receive Data, Opt. Chan. A
3. Transmit Data, Opt. Chan. B
4. Receive Data, Opt. Chan. B
5. Clear to Send (CTS)
6. Request to Send (RTS)
7. Fault/Anti-Streaming Activated

* LEDS: RED = "No Activity" GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### CONNECTORS

| | |
|---|---|
| Optical: | ST standard (SC, FC as options only) |
| Power: | Terminal Block |
| Data: | Type DB-25S |
| Expansion Port: | RJ-11 |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 9-30 VDC @ 2.5 W |
| Rack: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in. (15.5 × 13.2 × 5.6 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### BATTERY BACKUP OPTION

Internal, rechargeable Nickel Metal Hydride (NIMH) battery.
Operating Period: 12 hours typical

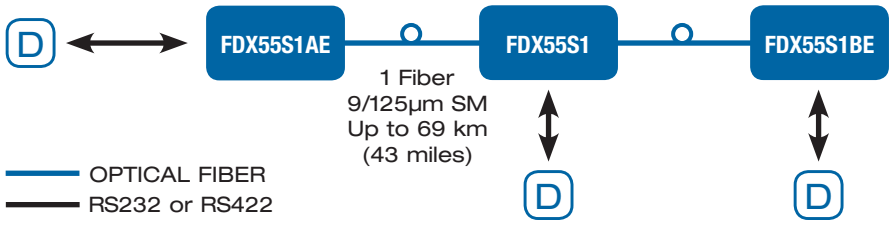
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX55S1 | 1 In/1 Out | Single Mode 9/125µm |
| FDX55M2 | 2 In/2 Out | Multimode 62.5/125µm |
| FDX55M28 | 2 In/2 Out | Multimode 62.5/125µm |
| FDX55S2 | 2 In/2 Out | Single Mode 9/125µm |

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX55S1(A)(B)E | 1 | Single Mode 9/125µm |
| FDX55M2E | 2 | Multimode 62.5/125µm |
| FDX55S2E | 2 | Single Mode 9/125µm |




NOTE: Unit can be used for transmission of RS232 or RS422, but not simultaneously.

# anti-streaming RS232/422 drop and repeat data transceiver

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX55S1 | 232/422 Drop and Repeat Transceiver (1310/1550 nm) | 1 In/1 Out | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FDX55M2 | 232/422 Drop and Repeat Transceiver (1310 nm) | 2 In/2 Out | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) | 2 |
| FDX55M28 | 232/422 Drop and Repeat Transceiver (850 nm) | 2 In/2 Out | Multimode 62.5/125µm | 14 dB | 3 km (1.8 miles) | 2 |
| FDX55S2 | 232/422 Drop and Repeat Transceiver (1310/1550 nm) | 2 In/2 Out | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX55S1AE | 232/422 Drop and Repeat Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FDX55S1BE | 232/422 Drop and Repeat Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| FDX55M2E | 232/422 Drop and Repeat Transceiver (850 nm) | 2 | Multimode 62.5/125µm | 14 dB | 4 km (2.5 miles) | 2 |
| FDX55S2E | 232/422 Drop and Repeat Transceiver (1310/1550 nm) | 2 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add '-B' for NIMH battery backup<br>Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory)<br>Add '/SC' for SC connectors<br>Add '/FC' for FC connectors } (1 meter adapter cables supplied at no cost) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

AGENCY COMPLIANCE
PART 15 COMPLIANT
E322911
N24621

Data

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# self-healing ring/full duplex RS232/RS422/RS485 data transceiver


D
1

## Description

The ComNet™ FDX57 series Self-Healing Ring Transceiver unit is a fully-digital transceiver designed for implementing full duplex RS232/422 or RS485 2 or 4-wire traffic signalization/communications data networks of the highest possible reliability. Full data re-clocking and regeneration permit an almost unlimited number of transceiver/controller units to be used within the network. These environmentally hardened transceivers are ideal for use in unconditioned out-of-plant or roadside installations. Utilizing wave division multiplexing technology (WDM), only one optical fiber is required to implement a fully self-healing ring. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status both locally and at the head-end/central location. These units are interchangeable between stand-alone or card-cage mount configurations.

## Applications

- High Reliability Traffic Signalization Networks

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDX57M1 | 1 In/1 Out | Multimode 62.5/125µm |
| FDX57S1 | 1 In/1 Out | Single Mode 9/125µm |

## Features

- Meets EIA RS232C/D and RS422/RS485 (2 or 4-wire) specifications (Simplex or Duplex Operation)
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Only one optical fiber required for Fault Tolerant/Self-Healing Ring Operation
- Remote Summary Fault Indication allows the user at the Head-End to determine when a transceiver in the field has failed
- Robust design assures extremely high reliability in unconditioned out-of-plant/roadside environments
- LED status indicators provide rapid indication of all critical operating parameters
- Full data re-clocking and regeneration: no limit as to the number of transceiver units used within the network
- User-configurable optical & electrical anti-streaming provides network protection against faulty streaming controller operation
- NTCIP compatible
- User-selectable local or master operation and DTE or DCE interface ensures ease of installation and maximum versatility
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Wide optical dynamic range: optical attenuators are never required
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# self-healing ring/full duplex RS232/RS422/RS485 data transceiver

## specifications

### DATA

| | |
|---|---|
| Data Format: | RS232, RS422, 2 or 4-wire RS485 w/Tri-State, Manchester, bi-phase |
| Data Rate: | DC-115 kbps |
| Operating Mode: | Asynchronous, simplex or full-duplex |
| Bit Error Rate: | $<10^{-12}$ @ Maximum Optical Loss Budget |
| Anti-Streaming Time-Out: | Selectable to 4, 8, 16, 32, 64 Seconds, or Infinity (Disabled) |

### WAVELENGTH

| | |
|---|---|
| FDX57M1 and FDX57S1 | 1310/1550 nm |

### FIBERS

1 In/1 Out

### OPTICAL EMITTER

Laser

### LED STATUS INDICATORS

1. Power On
2. Local/Master Status
3. Anti-Streaming Timeout Status
4. Receive Data
5. Transmit Data
6. RTS On/Off
7. Port A Fiber Link Status
8. Port B Fiber Link

Each of the two Fiber Link status indicating LEDs convey the status of the link to the next unit around the ring, as well as the operational health of the ring as a whole. There are three basic Link LED states: solid green, solid red, or green/red blink.

- Solid Green: A good optical link exists between this optical port and the next unit.
- Solid Red: The link has failed between this port and the next unit.
- Green/Red Blink: This particular link is good, but a fiber break has been detected somewhere in the ring. The LED will blink with a particular pattern to communicate the location of the failure. The number of red blinks in a sequence indicates how many units back around the optical ring where the break has occurred. For example, two red blinks indicate that a break was detected two nodes back around the ring.

Based upon these indicators, the user can be anywhere in the field or at the head-end and determine:

- That a failure has occurred.
- Where the failure has occurred.
- Determine whether the failure is a fiber break, or that an individual repeater unit has failed.

AGENCY COMPLIANCE

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### RELAYS

1. Anti-Streaming Timeout Relay: Normally open contacts. Contacts close when the unit has triggered an anti-streaming timeout. Solid-State relay contacts rated at 250 VAC/VDC @ 170 mA, resistive load.
2. Ring Failure Relay: Normally open contacts: Contacts close when a fiber break has occurred somewhere within the ring. Solid-State relay contacts rated at 250 VAC/VDC @ 170 mA, resistive load.

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Plug |
| Optical: | ST |
| Data: | Type DB-25S |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 5 W |
| Rack: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

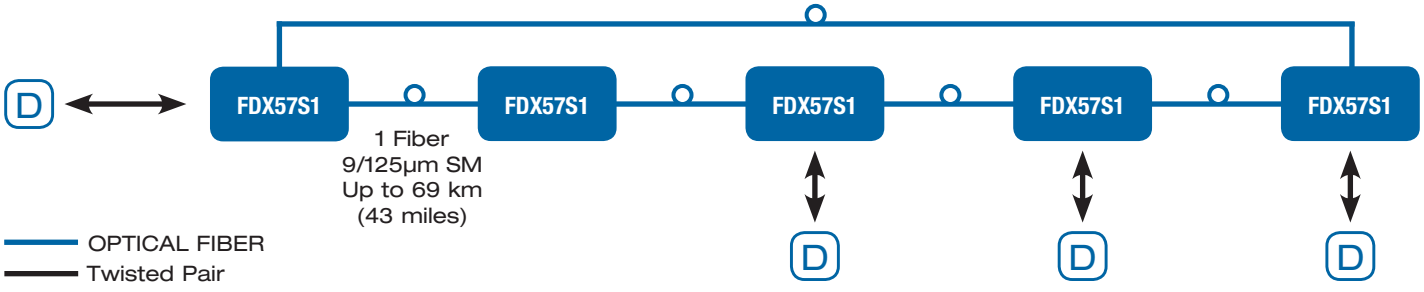
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDX57M1 | Repeater (1310/1550 nm) | 1 In/1 Out | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | 2 |
| FDX57S1 | Repeater (1310/1550 nm) | 1 In/1 Out | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 2 |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

In the event of a cable break, all nodes on the network maintain communication with the Master Controller/Computer.



# bi-directional contact closure transceiver


C
1

## Applications

- Alarm Event Triggering
- Building Automation and Environmental Control Systems
- Fire and Alarm Systems
- Gate Control
- PIR Signal Transmission
- Traffic Signal Control Equipment

## Description

The ComNet™ FDC10 Series bi-directional contact closure transceiver provides bi-directional transmission of contact closure over one multimode or single mode
optical fiber. The transceiver has a contact input and a 0.5 amp contact output. Plug-and-play design ensures ease of installation requiring no electrical or optical adjustments. The bi-directional contact closure module has two relay outputs and one relay input. One relay output follows the “relay input” at the remote end. When the remote “relay input” is shorted, the local relay output is closed and vice-versa. The second relay output is closed when “carrier” is detected from the remote end, this indicates that the optical fiber is connected and that the remote end has power and is operating. The relay position (open for RED and closed for GREEN) is indicated by separate bi-color indicators for each relay.

## Features

- Transmits a single contact closure in one or two directions
- Distances up to 69 km (43 miles)
- 24 VDC, 0.5 amp relay output, normally open
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Point-to-Point transmission architecture
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- No in-field electrical or optical adjustments required
- Bi-Color (Red/Green) Carrier Detect and Relay closed indicators
- Relay contact for Carrier Detect (normally closed with carrier present)
- Automatic resettable solid-state current limiters
- Lifetime Warranty

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDC10M1 (A)<br>FDC10M1 (B) | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FDC10S1 (A)<br>FDC10S1 (B) | 1 (1310/1550 nm) | Single Mode 9/125µm |

# bi-directional contact closure transceiver

## specifications

### CONTACTS

| | |
|---|---|
| Contact Interface: | Response Time: 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay, 0.5 A Contact Rating - normally open |

### WAVELENGTH

1310/1550 nm, Multimode
1310/1550 nm, Single Mode

### NUMBER OF FIBERS

1

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Contact and Power: | Terminal Block |

### LED INDICATORS*

- Contact Relay
- Carrier Detect

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 80 mA |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 4.0 × 3.7 × 1.0 in., (10.4 × 9.5 × 2.7 cm) |
| Shipping Weight: | <1 lb./0.5 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
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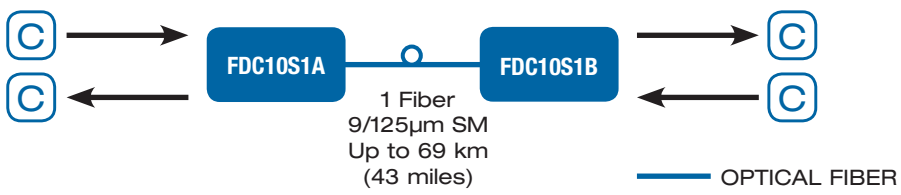
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE* | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDC10M1(A)<br>FDC10M1(B) | Bi-Directional Contact Closure Transceiver (1310/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | NA |
| FDC10S1(A)<br>FDC10S1(B) | Bi-Directional Contact Closure Transceiver (1310/1550 nm) | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | NA |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

* Optical transmission distance is limited to optical loss of the fiber and any additional loss introduced by connectors, splices and patch panels. Distance can also be limited by fiber bandwidth.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 8-channel contact closure transmitter and receiver

C8

## Applications

- Alarm Event Triggering
- Building Automation and Environmental Control Systems
- Fire and Alarm Systems
- Lane/Gate Control
- PIR Signal Transmission

## Description

The ComNet™ FDC8 Series contact closure transmitter and receiver provides transmission of up to eight independent contact closures over one RS232 link or optical fiber. Microprocessor-based logic sends the contact information in packets that are ordered and encoded, ensuring extremely robust transmission. Packets that are garbled, packets out of sequence, and transmission bit errors will not cause random changes of state on the contact relays. Also, the mechanical latching relays maintain their state even when the unit loses power. Each module incorporates power and individual status indicating LED's for monitoring confirmation of contact closure of each of the eight channels. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FDC8T(M)1<br>FDC8R(M)1 | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FDC8T(S)1<br>FDC8R(S)1 | 1 (1310/1550 nm) | Single Mode 9/125µm |

| PART NUMBER | MEDIA |
|---|---|
| FDC8T232<br>FDC8R232 | RS232 Link |

## Features

- Transmits up to eight contact closures over one RS232 link, or one optical fiber
- Eight channel Point-to-Point transmission architecture
- Power and eight individual channel status LED indicators
- Eight SPST latching relays (with individual indicators)
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Microprocessor-based logic and latching relays in receiver unit eliminate random contact closure status in the event of loss of link or loss of prime operating power.
- Relay contact rating: 30 VDC, 1 Amp, normally open
- Automatic resettable solid-state current limiters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 8-channel contact closure transmitters and receivers

## specifications

### CONTACTS

| | |
|---|---|
| Input/Output Channels: | 8 |
| Input Contacts: | 5 VDC, 0.5 mA, normally open |
| Output Contacts: | 30 VDC, 1 Amp, normally open |
| Response Time: | 25 msec maximum |

### CONNECTORS

| | |
|---|---|
| FDC8T/R232, Contacts: | Terminal Block |
| FDC8T/R(M)(S)1: | ST Optical Connectors |

### LED INDICATORS*

- Power
- Channel Status
- Link (receiver only)

* LEDS: RED = "No Activity" GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 150 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Surface Mount: | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

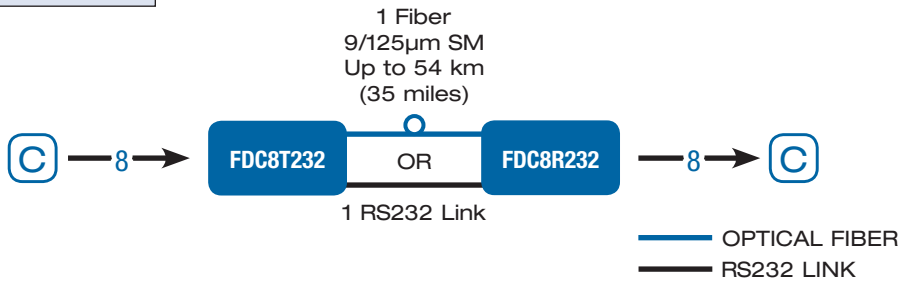
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE* | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FDC8T(M)1<br>FDC8R(M)1 | 8-Channel Contact Closure Transmitter<br>8-Channel Contact Closure Receiver | 1 | Multimode 62.5/125µm | 16 dB | 16 km (10 miles) | 1 |
| FDC8T(S)1<br>FDC8R(S)1 | 8-Channel Contact Closure Transmitter<br>8-Channel Contact Closure Receiver | 1 | Single Mode 9/125µm | 23 dB | 69 km (43 miles) | 1 |
| Accessories<br>Options | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

* Optical transmission distance is limited to optical loss of the fiber and any additional loss introduced by connectors, splices and patch panels. Distance can also be limited by fiber bandwidth.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

| PART NUMBER | MEDIA REQUIRED |
|---|---|
| FDC8T232 | RS232 LINK |
| FDC8R232 | RS232 LINK |




FVTXA4C1
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QUAD AUDIO
TRANSMITTER
LINK
AUDIO IN
1
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POWER
FVTXA2C1
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POWER
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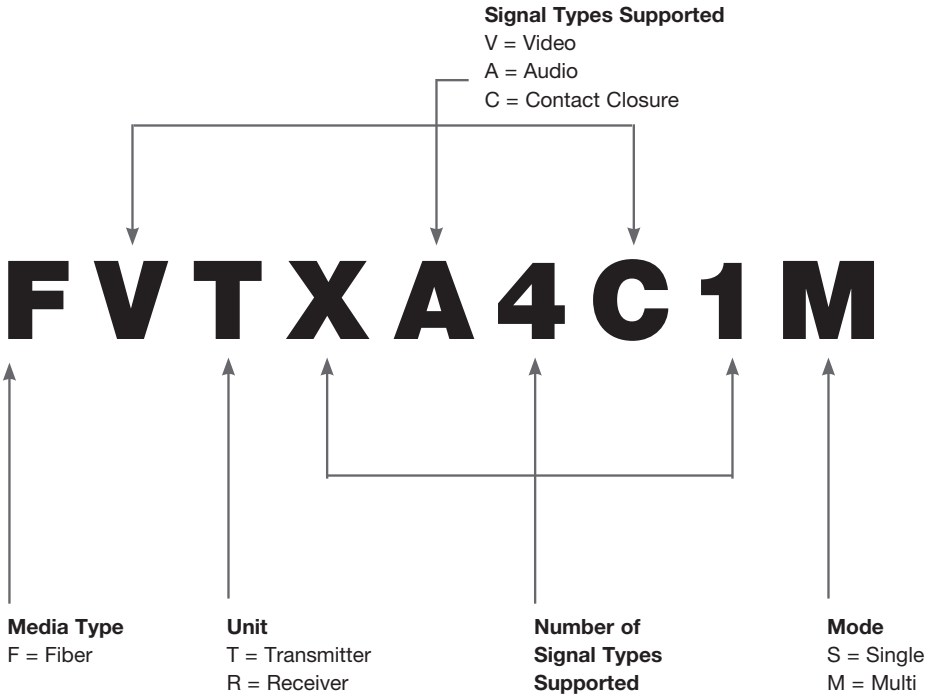
## AUDIO PRODUCT NUMBERING GUIDE*



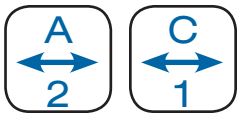



## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

# 2 bi-directional audio channels + one bi-directional contact closure


## Description

The ComNet™ FVT/FVRXA2C1 series audio multiplexer provides the transmission of two bi-directional audio signals and one bi-directional contact closure over one multimode or single mode optical fiber. The modules use 24-bit 96kHz sample rate digital encoding for superior transmission of balanced line-level audio. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators confirm equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Intercoms
- Point-to-Point Audio Communication
- Push-to-Talk Applications

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVTXA2C1M<br>FVRXA2C1M | 1 (1310/1550 nm) | Multimode<br>62.5/125µm |
| FVTXA2C1S<br>FVRXA2C1S | 1 (1310/1550 nm) | Single Mode<br>9/125µm |

## Features

- Two bi-directional Audio Channels
- One bi-directional Contact Closure
- 24-Bit 96kHz Digitally Encoded Transmission
- 20Hz - 18kHz Audio Bandwidth
- 600 Ohms Audio Input Impedance
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators confirm equipment operating status
- Transmits Balanced Line-Level Audio up to +6dBm
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 48 km (30 miles) without repeaters
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 2 bi-directional audio channels + one bi-directional contact closure

## specifications

### AUDIO

| | |
|---|---|
| # Input/Output Channels: | 2 (balanced) |
| Audio Input/Output Signal: | 4.4 volt pk-pk (+6dBm) |
| Bandwidth: | 20Hz - 18kHz |
| Total Harmonic Distortion: | 0.02% |
| Signal-to-Noise Ratio (SNR): | 85dB (Typical) |

### CONTACT

| | |
|---|---|
| Contact Interface: Response Time: | 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay, 0.5 A Contact Rating - normally open |

### WAVELENGTH

1310 nm/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

- Audio Input Channels 1-2
- Audio Output Channels 1-2
- Link - Power - Contact Closure

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Audio: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C[1] |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVTXA2C1M | 2-Ch. Bi-Directional Audio Transmitter (1310 nm/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2.5 miles) | 1 |
| FVRXA2C1M | 2-Ch. Bi-Directional Audio Receiver (1310 nm/1550 nm) | | | | | |
| FVTXA2C1S | 2-Ch. Bi-Directional Audio Transmitter (1310 nm/1550 nm) | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 1 |
| FVRXA2C1S | 2-Ch. Bi-Directional Audio Receiver (1310 nm/1550 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

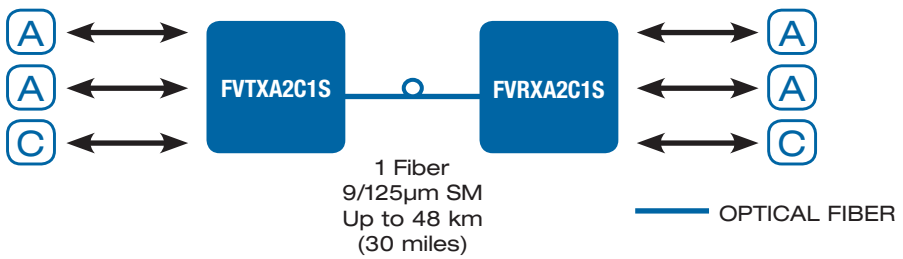
NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.

**Distance may be limited by optical dispersion.

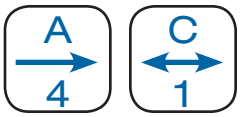
[1] Included Power Supply operating temperature range is 0 - +40° C.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 4-channel 24-bit audio multiplexer + one bi-directional contact closure


## Description

The ComNet™ FVT/FVRXA4C1 series audio multiplexer provides the transmission of four audio signals and one bi-directional contact closure over one multimode or single mode optical fiber. The modules use 24-bit 96kHz sample rate digital encoding for superior transmission of balanced line-level audio. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators confirm equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Transmission of Broadcast Audio
- Recording Studios and Post-Production Facilities
- Elimination of EMI/RFI Interference in Audio Cables
- Optical Isolation for Elimination of Ground Loop Noise

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVTXA4C1M<br>FVRXA4C1M | 1 (1310/1550 nm) | Multimode 62.5/125µm |
| FVTXA4C1S<br>FVRXA4C1S | 1 (1310/1550 nm) | Single Mode 9/125µm |

## Features

- 24-bit 96kHz Digital Transmission
- One Bi-directional Contact Closure
- 20Hz - 18kHz Audio Bandwidth
- 600 Ohms Audio Input Impedance
- No In-field electrical or optical adjustments
- Bi-color (Red/Green) LED status indicators confirm equipment operating status
- Transmits Balanced Line-Level Audio up to +6dBm
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km) without repeaters
- Automatic resettable fuses on all power lines
- Lifetime Warranty

# 4-channel 24-bit audio multiplexer + one bi-directional contact closure

## specifications

### AUDIO

| | |
|---|---|
| # Input/Output Channels: | 4 (balanced) |
| Audio Input/Output Signal: | 4.4 volt pk-pk (+6dBm) |
| Bandwidth: | 20Hz - 18kHz |
| Total Harmonic Distortion: | 0.02% |
| Signal-to-Noise Ratio (SNR): | 85dB (Typical) |

### CONTACT

| | |
|---|---|
| Contact Interface: Response Time: | 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay, 0.5 A Contact Rating - normally open |

### WAVELENGTH

1310 nm/1550 nm, Multimode and Single Mode

### NUMBER OF FIBERS

1

### LED INDICATORS

- Link - Audio Channels 1-4
- Contact Closure - Power

### CONNECTORS

| | |
|---|---|
| Optical: | ST |
| Power: | Terminal Block |
| Audio: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 2 W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C [1] |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVTXA4C1M | 4 Channel Audio Transmitter (1310 nm/1550 nm) | 1 | Multimode 62.5/125µm | 16 dB | 3 km (2.5 miles) | 1 |
| FVRXA4C1M | 4 Channel Audio Receiver (1310 nm/1550 nm) | | | | | |
| FVTXA4C1S | 4 Channel Audio Transmitter (1310 nm/1550 nm) | 1 | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 1 |
| FVRXA4C1S | 4 Channel Audio Receiver (1310 nm/1550 nm) | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

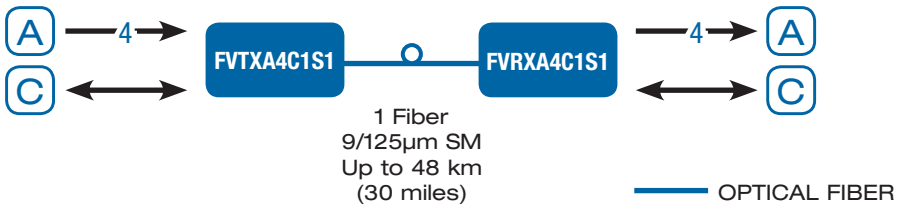
NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended.

**Distance may be limited by optical dispersion.

[1] Included Power Supply operating temperature range is 0 - +40° C.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

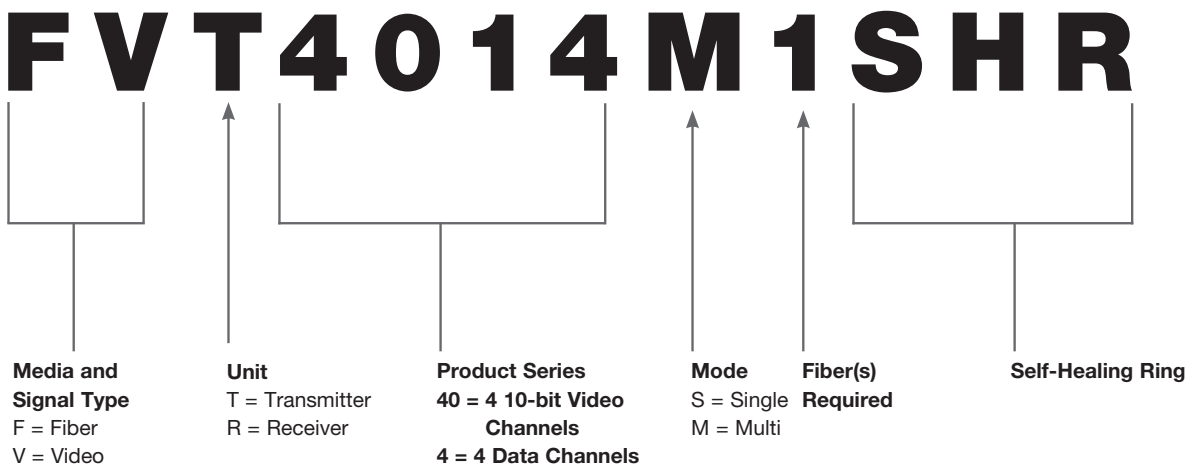
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



## Low-Cost, Easy-to-Implement, True Broadcast-Quality Video Insert and Repeat Networking System

- Self-Healing Ring
- Linear Drop-and-Insert
- Redundant

## SELF-HEALING RING PRODUCT NUMBERING GUIDE*




## SECTION INDEX





* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

## THE COMNET FVT/FVR SELF-HEALING RING (SHR) PRODUCT LINE

The ComNet FVT/FVR-SHR product line allows the user to insert up to eight independent video and eight independent data channels on one optical fiber in either a self-healing ring or linear drop-and-repeat topology.

The ComNet FVT/FVR-SHR allows a maximum of eight video channels and eight serial data channels to be transported back to the control center.

Video and camera control function can be accessed from anywhere along the transmission path. There is no limit as to the number of monitoring locations that may be inserted anywhere within the network.

At the video monitoring locations, up to eight simultaneous video outputs and up to eight full-duplex serial data channels are available. The serial data channels may be used for CCTV pan-tilt-zoom (PTZ) control, or any other terminal or communications device or application utilizing RS232/RS422, or 2 or 4-wire RS485 data.

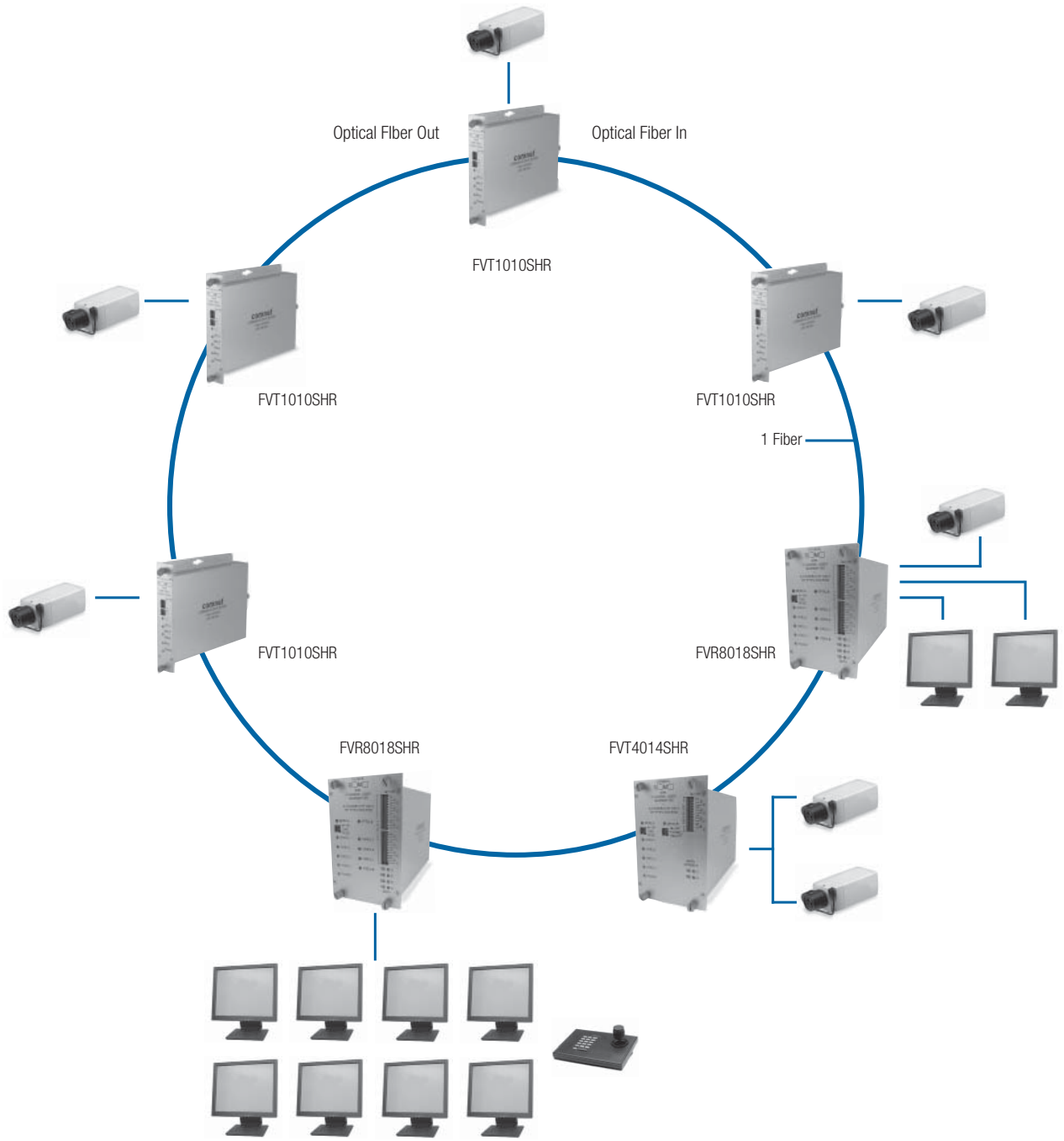
The system may also be utilized as an optically redundant point-to-point up to eight-channel video and up to eight-channel serial data multiplexer/de-multiplexer system. This is ideal for those applications requiring a very high level of communications reliability.

The ComNet SHR line can be configured in a linear insert-and-repeat/daisy-chain. This allows any of the eight video and data channels to be added or extracted anywhere along the transmission path.

In a self-healing ring topology either multimode or single mode fiber may be used to provide a redundant optical path for an extremely high level of network dependability. Transmission distances of up to 48 km are supported with single mode optical fiber, making the system ideal for monitoring applications where considerable distances may exist between locations.

Video performance exceeds the requirements of EIA/TIA Standard RS-250C for Medium-Haul Transmission performance. The system is capable of providing performance that is essentially equivalent to true broadcast quality video.

## SELF-HEALING RING (SHR) CONFIGURATION



(1) 10-bit digital video channel with 1 bi-directional data channel / daisy chain 8 video channels on one single mode fiber / dual optical port self-healing ring configuration / single fiber operation


V 1 D 1

## Description

The ComNet™ FVT/FVR1010SHR series of optical video links provides 10-bit digital video, 6.5 Mhz bandwidth, medium haul video quality, one bi-directional data channel and a “Dual Optical Port” (DOP) Self-Healing Ring (SHR) topology. Up to (8) video transmitters and multiple video receivers can be “Daisy Chained” on one optical fiber.

The Self-Healing Ring (SHR) topology using the Dual Optical Ports (DOP) provide fail safe operation in the event of loss of one fiber or one optical module. Each optical port uses wavelength division multiplexing (WDM) to both transmit and receive on one optical fiber. The data channel supports RS232, RS422 and 2 wire and 4 wire RS485. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT1010M1SHR<br>FVR1010M1SHR | 1 in/1 out<br>(1310/1550 nm) | Multimode<br>62.5/125µm |
| FVT1010S1SHR<br>FVR1010S1SHR | 1 in/1 out<br>(1310/1550 nm) | Single Mode<br>9/125µm |

## Features

- One 10-bit digital video channel
- One bi-directional data channel; or 8 contact closures
- Daisy chain 8 video links on one single mode or multimode fiber
- Dual optical port Self-Healing Ring (SHR) configuration
- Exceeds all requirements for RS-250C medium haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# (1) 10-bit digital video channel with 1 bi-directional data channel / daisy chain 8 video channels on one single mode fiber / dual optical port self-healing ring configuration / single fiber operation

## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | < 0.7º |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### CONTACT (Replaces 1 Data Channel)

| | |
|---|---|
| Contact Interface: | Response time 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay 0.5A Contact Rating – normally open |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

1 in/1 out

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

| FVT Transmitter/Data Transceiver Unit: | FVR Receiver/Data Transceiver Unit: |
|---|---|
| - Fiber Status | - Fiber Status |
| - Video Input Sync Presence | - Video Output Sync Presence |
| - Received Data | - Received Data |
| - Transmitted Data | - Transmitted Data |
| - Power | - Power |

### CONNECTORS

| | |
|---|---|
| Optical: | 2 ST connectors for the Dual Port configuration (Required for Daisy Chain Self-Healing Ring operation) |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | Terminal Block |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

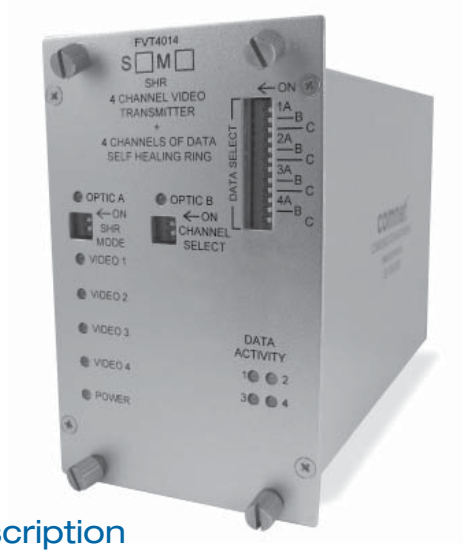
† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT1010M1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Multimode 62.5/125µm | 16 dB | 2 km (1.2 miles) | 1 |
| FVR1010M1SHR | Video Receiver/Data Transceiver | | | | | |
| FVT1010S1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 1 |
| FVR1010S1SHR | Video Receiver/Data Transceiver | | | | | |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | | | | | |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | | | | | |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.
**Distance may be limited by optical dispersion.

# (4) 10-bit digital video channels + 4 bi-directional data channels/daisy chain 8 video channels on one optical fiber/dual optical port self-healing ring configuration/single fiber operation




V 4 D 4

## Description

The ComNet™ FVT/FVR4014SHR series of optical video links provides four 10-bit digital video channels, medium haul video quality, and four bi-directional data channels and a "Dual Optical Port" (DOP) Self-Healing Ring (SHR) topology. Up to (8) video channels and multiple video receivers can be "Daisy Chained" on one optical fiber. The Self-Healing Ring (SHR) topology using the Dual Optical Ports (DOP) provide fail safe operation in the event of loss of one fiber or one optical module. Each optical port uses wavelength division multiplexing (WDM) to both transmit and receive on one optical fiber.
The data channels support RS232, RS422 and 2 wire and 4 wire RS485. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT4014M1SHR<br>FVR4014M1SHR | 1 in/1 out<br>(1310/1550 nm) | Multimode<br>62.5/125µm |
| FVT4014S1SHR<br>FVR4014S1SHR | 1 in/1 out<br>(1310/1550 nm) | Single Mode<br>9/125µm |

## Features

- Up to four 10-bit digitally encoded video channels
- Four bi-directional data channels; or 8 – 32 contact closures
- Daisy chain 8 video links on one single mode fiber
- Dual optical port Self-Healing Ring (SHR) configuration
- Exceeds all requirements for RS-250C medium haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# (4) 10-bit digital video channels + 4 bi-directional data channels/ daisy chain 8 video channels on one optical fiber/dual optical port self-healing ring configuration/single fiber operation

## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload: | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | < 0.7º |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### CONTACT (Replaces 1 Data Channel)

| | |
|---|---|
| Contact Interface: | Response time 0.5 msec |
| Input: | Dry Contact Closure |
| Output: | SPST Relay 0.5A Contact Rating – normally open |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

1 In/1 Out

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

| FVT Transmitter/Data Transceiver Unit: | FVR Receiver/Data Transceiver Unit: |
|---|---|
| - Fiber Status | - Fiber Status |
| - Video Input Sync Presence | - Video Output Sync Presence |
| - Received Data | - Received Data |
| - Transmitted Data | - Transmitted Data |
| - Power | - Power |

### CONNECTORS

| | |
|---|---|
| Optical: | 2 ST connectors for the Dual Port configuration (Required for Daisy Chain Self-Healing Ring operation) |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 3 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 3.3 in., (15.5 × 13.5 × 8.3 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT4014M1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Multimode 62.5/125µm | 16 dB | 2 km (1.2 miles) | 3 |
| FVR4014M1SHR | Video Receiver/Data Transceiver | | | | | |
| FVT4014S1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 3 |
| FVR4014S1SHR | Video Receiver/Data Transceiver | | | | | |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# (8) 10-bit digital video channels with 8 bi-directional data channels/ daisy chain 8 video channels on one optical fiber/dual optical port self-healing ring configuration/single fiber operation


V 8

D 8

## Description

The ComNet™ FVT/FVR8018SHR series of optical video links provides eight 10-bit digital video channels, medium haul video quality, and 8 bi-directional data channels and a "Dual Optical Port" (DOP) Self-Healing Ring (SHR) topology. Up to eight video channels and multiple video receivers can be "Daisy Chained" on one optical fiber. The Self-Healing Ring (SHR) topology using the Dual Optical Ports (DOP) provide fail safe operation in the event of loss of one fiber or one optical module. Each optical port uses wavelength division multiplexing (WDM) to both transmit and receive on one optical fiber. The data channels support RS232, RS422 and 2 wire and 4 wire RS485. Plug-and-play design ensures ease of installation and no electrical or optical adjustments are ever required. Bi-color (Red/Green) LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

| PART NUMBER | FIBERS REQUIRED | FIBER |
|---|---|---|
| FVT8018M1SHR<br>FVR8018M1SHR | 1 in/1 out<br>(1310/1550 nm) | Multimode<br>62.5/125µm |
| FVT8018S1SHR<br>FVR8018S1SHR | 1 in/1 out<br>(1310/1550 nm) | Single Mode<br>9/125µm |

## Features

- Up to eight 10-bit digital video channels
- Eight bi-directional data channels
- Daisy chain eight video links on one single mode fiber
- Dual optical port Self-Healing Ring (SHR) configuration
- Exceeds all requirements for RS-250C medium haul transmission
- Compatible with all NTSC, PAL, or SECAM CCTV camera systems
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/ low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Automatic resettable fuses on all power lines
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Distances up to 30 miles (48 km)
- Bi-color (Red/Green) LED status indicators provide rapid indication of critical operating parameters
- Lifetime Warranty

# (8) 10-bit digital video channels with 8 bi-directional data channels/ daisy chain 8 video channels on one optical fiber/dual optical port self-healing ring configuration/single fiber operation

## specifications

### VIDEO

| | |
|---|---|
| Video Input: | 1 volt pk-pk (75 ohms) |
| Overload | >1.5V pk-pk |
| Bandwidth: | 5 Hz - 6.5 MHz |
| Differential Gain: | <2% |
| Differential Phase: | < 0.7º |
| Tilt: | <1% |
| Signal-to-Noise Ratio (SNR): | 67 dB @ Maximum Optical Loss Budget |

### DATA

| | |
|---|---|
| Data Interface: | RS232, RS422 and RS485 (2W/4W) |
| Data Format: | NRZ, NRZI, Manchester, Bi-phase and Sensornet |
| Data Rate: | DC-250 Kbps (NRZ) |

### WAVELENGTH

1310/1550 nm, MM and SM

### NUMBER OF FIBERS

1 In/1 Out

### OPTICAL EMITTER

Laser Diode

### LED INDICATORS

| FVT Transmitter/Data Transceiver Unit: | FVR Receiver/Data Transceiver Unit: |
|---|---|
| - Fiber Status | - Fiber Status |
| - Video Input Sync Presence | - Video Output Sync Presence |
| - Received Data | - Received Data |
| - Transmitted Data | - Transmitted Data |
| - Power | - Power |

### CONNECTORS

| | |
|---|---|
| Optical: | 2 ST connectors for the Dual Port configuration (Required for Daisy Chain Self-Healing Ring operation) |
| Power: | Terminal Block |
| Video: | BNC (Gold Plated Center-Pin) |
| Data: | RJ45 |

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 3W |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 3 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 3.3 in., (15.5 × 13.5 × 8.3 cm) |
| Shipping Weight: | <2 lb./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions by adding suffix '/C' to model number for conformal coating.

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

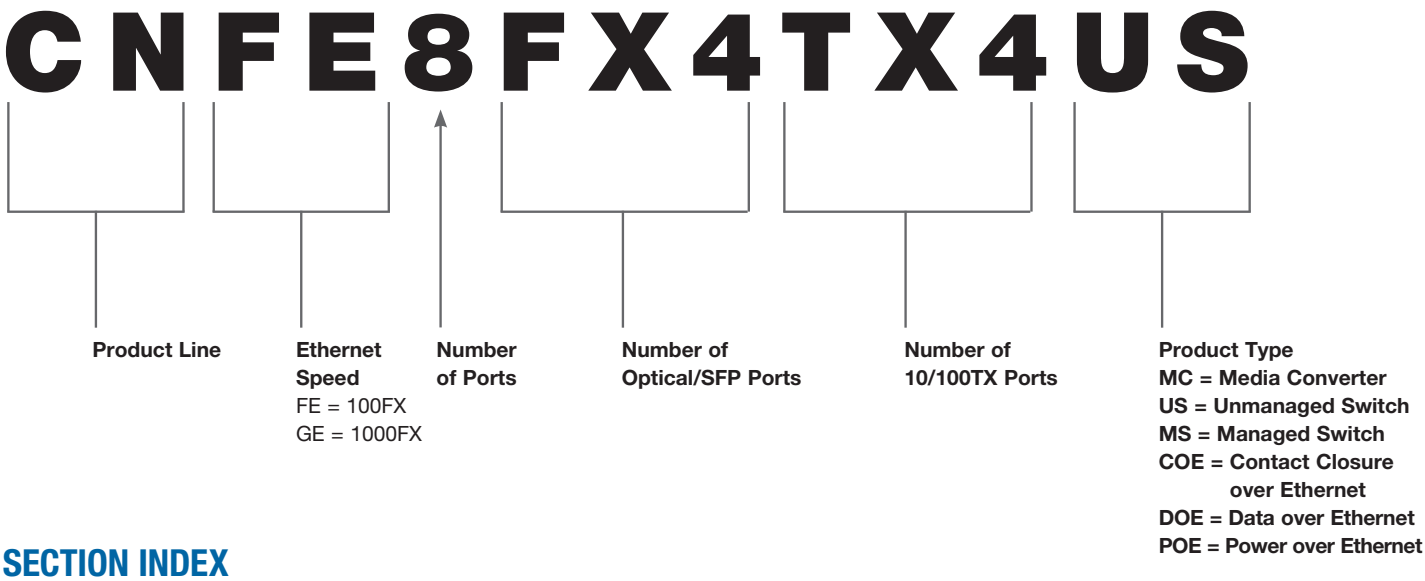
| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|---|
| FVT8018M1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Multimode 62.5/125µm | 16 dB | 2 km (1.2 miles) | 3 |
| FVR8018M1SHR | Video Receiver/Data Transceiver | | | | | |
| FVT8018S1SHR | Video Transmitter/Data Transceiver | 1 In/1 Out | Single Mode 9/125µm | 16 dB | 48 km (30 miles) | 3 |
| FVR8018S1SHR | Video Receiver/Data Transceiver | | | | | |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included)<br>(5) RJ45 - RJ45 Breakout Wiring Kit (Includes cable and terminal block) |
| Options | Add '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 35 dB connector return loss. The use of Super Polish Connectors is recommended. **Distance may be limited by optical dispersion.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.


ComWorx™
Ethernet Products from ComNet

## ETHERNET PRODUCT NUMBERING GUIDE*




## SECTION INDEX



* Not every combination is a valid part number. Refer to available model number in catalog. Consult factory for questions and information.

# 10/100 Mbps Ethernet 2 port media converter
# 1 Channel: Electrical ↔ Optical



## Description

The ComNet™ Ethernet 2 port media converters are designed to transmit and receive 10/100 Mbps data over multimode or single mode optical fiber. The electrical interface will Auto-Negotiate to a 10 Mbps, or 100 Mbps Ethernet rate without any adjustments. The optical interface operates at a 100 Mbps Ethernet rate. These media converters are environmentally hardened to operate in extreme temperatures. LED indicators are provided for rapidly ascertaining equipment operating status. The ComNet™ rack mount units are interchangeable between stand-alone or card mount configurations.

## Applications

- 10/100 Mbps Ethernet Media Converter
- High Speed Computer Links

## Features

- 10/100 Mbps Ethernet
  - 10/100 BASE-T/TX electrical port
  - 100 BASE-FX optical port
- Electrical port supports Auto-Negotiation for 10 Mbps or 100 Mbps, full duplex or half duplex data.
- Optical port supports 100 Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Distances up to: 3 km (2 miles) Multimode
  45 km (28 miles) Single Mode
- Transparent to data encoding/compatible with major data protocols
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- ST or SC optical connectors
- 1 or 2 fiber design
- AC or DC powered models
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- No in-field optical adjustments required
- LED Indicators
- Standard size is hot-swappable rack module
- Standard size is interchangeable between stand-alone or rack mount use – ComFit
- IEEE 802.3 compliant
- Lifetime Warranty

# 10/100 Mbps Ethernet 2 port media converter
# 1 Channel: Electrical ↔ Optical

## specifications

### DATA

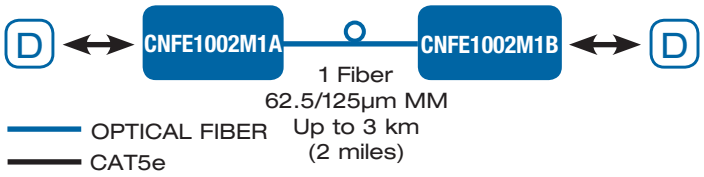
| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 10/100 Mbps<br>IEEE 802.3 Compliant<br>Full Duplex or Half Duplex Electrical Port/<br>Full Duplex Optical Port |

### CONNECTORS

| | |
|---|---|
| Optical: | ST or SC, 1 or 2 Fibers |
| Power: | Terminal Block |
| Electrical: | RJ45 |

### LED INDICATORS

- Optical Link/Data Activity
- Electrical Link/Data Activity
- Power




NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss. The use of Super Polish Connectors is recommended. Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J. In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Standard Size: | 8-24 VDC @ 220 mA<br>From Rack |
| Mini: | 8-15 VDC @ 220 mA |
| Mini AC/DC: | 22-27 VAC @ 100mA or<br>8-24 VDC @ 220 mA |
| Number of Rack Slots (Standard Size): | 1 |
| Current Protection: | Automatic Resettable<br>Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) : | |
| CNFE100(*X*)MC: | 6.1 × 5.3 × 1.1 in.,<br>(15.5 × 13.5 × 2.8 cm) |
| CNFE100(*X*)MC-M: | 3.3 × 2.5 × 1.1 in.,<br>(8.4 × 6.4 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

† May be extended to condensation conditions

AGENCY COMPLIANCE
PART 15 COMPLIANT
E322911
N24621

## ordering information

### Standard Mount DC-only Media Converter

| PART NUMBER | WAVELENGTH | CONNECTOR | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|---|
| CNFE1002M1A | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1002M1B | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1002S1A | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | 1 |
| CNFE1002S1B | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | 1 |
| CNFE1003M2 | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1003MS2 | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Singlemode | 15 dB | 45 km (28 miles) | 1 |
| CNFE1004M1A | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1004M1B | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1004S1A | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | 1 |
| CNFE1004S1B | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | 1 |
| CNFE1005M2 | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Multimode | 10 dB | 3 km (2 miles) | 1 |
| CNFE1005S2 | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Singlemode | 15 dB | 45 km (28 miles) | 1 |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

10/100 Mbps Ethernet 2 port media converter
1 Channel: Electrical ↔ Optical

## ordering information, cont'd

### Mini DC-only Power Media Converter

| PART NUMBER | WAVELENGTH | CONNECTOR | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|---|
| CNFE1002M1A-M | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1002M1B-M | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1002S1A-M | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1002S1B-M | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1003M2-M | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1003S2-M | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1004M1A-M | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1004M1B-M | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1004S1A-M | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1004S1B-M | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1005M2-M | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1005S2-M | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Singlemode | 15 dB | 45 km (28 miles) | N/A |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

### Mini AC/DC Power Media Converter

| PART NUMBER | WAVELENGTH | CONNECTOR | FIBERS REQUIRED | FIBER | OPTICAL PWR BUDGET | MAX. DISTANCE | # RACK SLOTS |
|---|---|---|---|---|---|---|---|
| CNFE1002MAC1A-M | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1002MAC1B-M | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1002SAC1A-M | 10/100 Mbps Ethernet (1310 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1002SAC1B-M | 10/100 Mbps Ethernet (1550 nm) | ST | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1003MAC2-M | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1003SAC2-M | 10/100 Mbps Ethernet (1310 nm) | SC | 2 | Singlemode | 15 dB | 45 km (2 miles) | N/A |
| CNFE1004MAC1A-M | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1004MAC1B-M | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1004SAC1A-M | 10/100 Mbps Ethernet (1310 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1004SAC1B-M | 10/100 Mbps Ethernet (1550 nm) | SC | 1 | Singlemode | 15 dB | 45 km (28 miles) | N/A |
| CNFE1005MAC2-M | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Multimode | 10 dB | 3 km (2 miles) | N/A |
| CNFE1005SAC2-M | 10/100 Mbps Ethernet (1310 nm) | ST | 2 | Singlemode | 15 dB | 45 km (28 miles) | N/A |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

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# 10/100 Mbps Ethernet 2 port media converter
## 1 Channel: Electrical ↔ SFP Optical
## 2 Channels: Electrical ↔ SFP Optical

D 1 D 2


(SFP) = Small Form-Factor Pluggable Module

## Description

The ComNet™ CNFE2MC Ethernet 2 port media converter and CNFE22MC dual 2 port are designed to transmit and receive 10/100 Mbps data over optical fiber through user selectable SFP options. These models require the ordering of sold-separately interchangeable SFP modules for fiber type, distance and connectors. The CNFE2MC transmits and receives a single channel of Ethernet data and the CNFE22MC transmits and receives two independent channels in one unit. The electrical interface will Auto-Negotiate to a 10 Mbps, or 100 Mbps Ethernet rate without any adjustments. The optical interface operates at a 100 Mbps Ethernet rate. Both are environmentally hardened to operate in extreme temperatures. LED indicators are provided for confirming equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- 10/100 Mbps Ethernet Media Converter
- High Speed Computer Links

| PART NUMBER | DESCRIPTION |
|---|---|
| CNFE2MC | 10/100 Mbps Ethernet 2 port media converter |
| CNFE2MC-M | 10/100 Mbps Ethernet 2 port media converter |
| CNFE22MC | Dual 10/100 Mbps Ethernet 2 port media converter |

## Features

- 10/100 Mbps Ethernet
  - 10/100 BASE-T/TX electrical port
  - 100 BASE-FX optical port
- Electrical port supports Auto-Negotiation for 10 Mbps or 100 Mbps, full duplex or half duplex data.
- Optical port supports 100 Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Distances up to 80 km with optional SFPs
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Uses interchangeable SFP for fiber type, distance and connector (Ordered separately)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- No in-field optical adjustments required
- CNFE2MC and CNFE22MC are hot-swappable rack modules
- CNFE2MC and CNFE22MC are interchangeable between stand-alone or rack mount use – ComFit
- LED Indicators
- IEEE 802.3 compliant
- Lifetime Warranty

# 10/100 Mbps Ethernet 2 port media converter
# 1 Channel: Electrical ↔ SFP Optical
# 2 Channels: Electrical ↔ SFP Optical

## specifications

### DATA

| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 10/100 Mbps<br>IEEE 802.3 Compliant<br>Full Duplex or Half Duplex Electrical Port/Full Duplex Optical Port |
| FIBERS[1] | SFP Dependent |
| FIBER CONNECTORS | Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules |

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Electrical: | RJ-45 |
| LED INDICATORS* | - Optical Link/Data Activity<br>- Power |

* LEDS: RED = "No Activity"
GRN = "Activity"
NOTE: RED DOES NOT MEAN "Error"

AGENCY COMPLIANCE

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 220 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Standard Size | 6.1 x 5.3 x 1.1 in., (15.5 x 13.5 x 2.8 cm) |
| Small Size | 3.3 x 2.5 x 1.1 in., (8.4 x 6.4 x 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

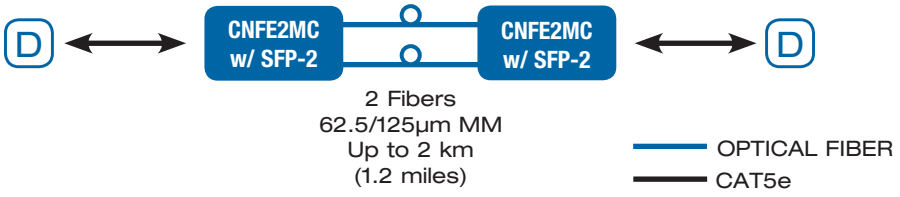
| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

† May be extended to condensation conditions

| PART NUMBER | DESCRIPTION |
|---|---|
| CNFE2MC | 2 Port 10/100 Mbps Ethernet Media Converter |
| CNFE2MC-M | 2 Port 10/100 Mbps Ethernet Media Converter |
| CNFE22MC | Dual 2 Port 10/100 Mbps Ethernet Media Converter |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10/100/1000 Mbps Ethernet 2 port media converters
# 2 Channels: Electrical ↔ SFP Optical


D 1 D 2

(SFP) = Small Form-Factor Pluggable Module

## Description

The ComNet™ CNGE2MC and CNGE22MC Ethernet 2 port media converter are designed to transmit and receive 10/100/1000 Mbps data over optical fiber through user selectable SFP options. The CNGE2MC transmits and receives a single channel of Ethernet data and the CNGE22MC transmits and receives two independent channels in one unit. These models require the ordering of sold-separately interchangeable SFP modules for fiber type, distance and connectors. Both models' electrical interface swill Auto-Negotiate to a 10 Mbps, 100 Mbps or 1000 Mbps Ethernet rate without any adjustments. The optical interface operates at a 1000 Mbps Ethernet rate. Both the CNGE2MC and CNGE22MC are environmentally hardened to operate in extreme temperatures. LED indicators are provided for confirming equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- 10/100/1000 Mbps Ethernet Media Converter
- High Speed Computer Links

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE2MC | 10/100/1000 Mbps Ethernet 2 port media converter |
| CNGE2MC-M | 10/100/1000 Mbps Ethernet 2 port media converter |
| CNGE22MC | 10/100/1000 Mbps Ethernet dual 2 port media converter |

## Features

- 10/100/1000 Mbps Ethernet
  - 10/100 BASE-T/TX electrical port
  - 100 BASE-FX optical port
  - 1000 BASE-FX optical port
- Electrical port supports Auto-Negotiation for 10 Mbps, Mbps or 1000 Mbps, full duplex or half duplex data.
- Optical port supports 1000 Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Distances up to 120 km with optional SFPs
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Uses interchangeable SFP for fiber type, distance and connector (Ordered separately)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- No in-field optical adjustments required
- CNGE2MC and CNGE22MC are hot-swappable rack modules
- CNGE2MC and CNGE22MC are interchangeable between stand-alone or rack mount use – ComFit
- LED Indicators
- IEEE 802.3 compliant
- Lifetime Warranty

# 10/100/1000 Mbps Ethernet 2 port media converters
# 2 Channels: Electrical ↔ SFP Optical

## specifications

### DATA

| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 10/100/1000 Mbps<br>IEEE 802.3 Compliant<br>Full Duplex or Half Duplex Electrical Port/Full Duplex Optical Port |

### FIBERS

SFP Dependent

### FIBER CONNECTORS[1]

Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Electrical: | RJ45 |

### LED INDICATORS

- Optical Link/Data Activity
- Power

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-15 VDC @ 220 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| Standard Size: | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Small Size: | 3.3 x 2.5 x 1.1 in., (8.4 x 6.4 x 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)[†] |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

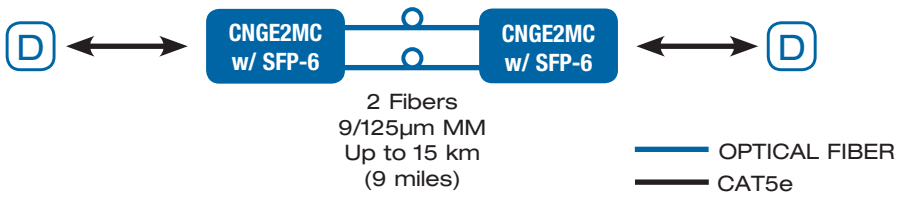
[†] May be extended to condensation conditions

AGENCY COMPLIANCE

PART 15 COMPLIANT · E322911 · N24621

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE2MC | 2 Port 10/100/1000 Mbps Ethernet Media Converter |
| CNGE2MC-M | 2 Port 10/100/1000 Mbps Ethernet Media Converter |
| CNGE22MC | Dual 2 Port 10/100/1000 Mbps Ethernet Media Converter |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# 10/100 Mbps Ethernet 4 port unmanaged switch
## 2 Channels: Electrical ↔ 2 Channels: SFP Optical
## 4 Channels: Electrical
## 4 Channels: SFP Optical


## Applications
- 10/100 Mbps Ethernet
- High Speed Computer Links

(SFP) = Small Form-Factor Pluggable Module

## Description
The ComNet™ CNFE4US Ethernet 4 port unmanaged switch Series is designed to transmit and receive 10/100 Mbps data over optical fiber through user selectable SFP options or 10/100 Mbps data over CAT5E/6 electrical cable. This unit integrates 4 independent 10/100 Mbps channels in a single package. The CNFE4FX2TX2US and CNFE4FX4US require the ordering of sold-separately interchangeable SFP modules for fiber type, distance and connectors. The CNFE4FX2TX2US and CNFE4TX4US electrical interfaces will Auto-Negotiate to 10 Mbps, or 100 Mbps Ethernet rate without any adjustments. The optical interfaces operate at a 100 Mbps Ethernet rate. All models are environmentally hardened to operate in demanding environments. LED indicators are provided for confirming equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Features
- 10/100 Mbps Ethernet
  - 10/100 BASE-T/TX electrical port
  - 100 BASE-FX optical port
- Electrical ports support Auto-Negotiation for 10 Mbps or 100 Mbps, full duplex or half duplex data.
- Optical port supports 100 Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Uses interchangeable SFP for fiber type, distance and connector (Ordered separately)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- No in-field optical adjustments required
- LED Indicators for Power and Activity
- IEEE 802.3 compliant
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

| PART NUMBER | DESCRIPTION |
|---|---|
| CNFE4FX2TX2US | 10/100 Mbps Ethernet 4 port unmanaged switch; 2 TX, 2 FX |
| CNFE4FX4US | 100 Mbps Ethernet 4 port unmanaged switch; 4 FX |
| CNFE4TX4US | 10/100 Mbps Ethernet 4 port unmanaged switch; 4 TX |

# 10/100 Mbps Ethernet 4 port unmanaged switch
# 2 Channels: Electrical ↔ 2 Channels: SFP Optical
# 4 Channels: Electrical
# 4 Channels: SFP Optical

## specifications

### DATA

| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 10/100 Mbps<br>IEEE 802.3 Compliant<br>Full Duplex or Half Duplex Electrical Ports/Full Duplex Optical Port |

### FIBERS[1]

SFP Dependent

### CABLE

CAT5E/6

### FIBER CONNECTORS

Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Data: | RJ45 |

### LED INDICATORS

- Optical Link/Data Activity
- Electrical Link/Data Activity
- Power

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 8-24 VDC @ 500 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

† May be extended to condensation conditions

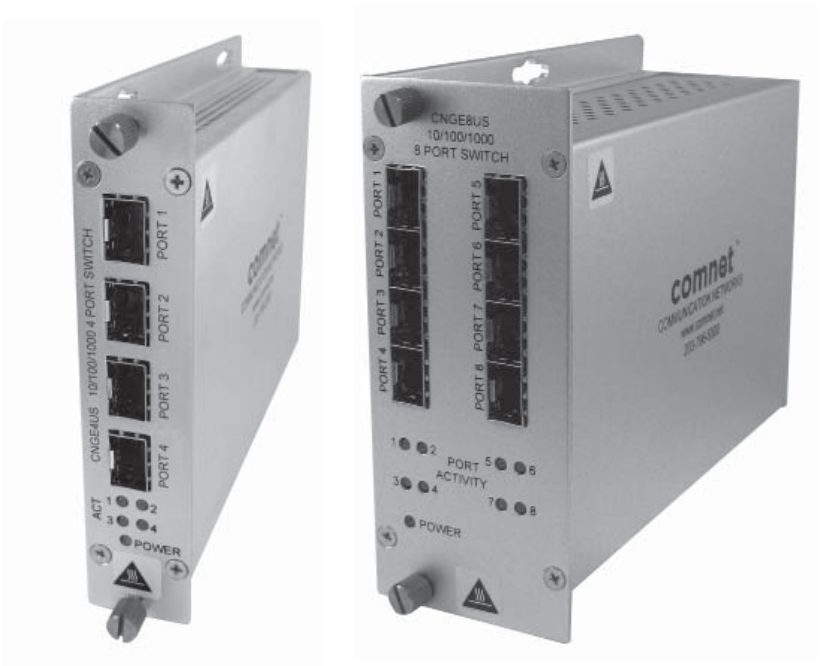
AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | DISTANCE |
|---|---|---|
| CNFE4FX2TX2US | 4 Port 10/100 Mbps Ethernet Unmanaged Switch; 2 FX, 2 TX | See SFP Modules data sheet for optional distances, fiber type and connector type. |
| CNFE4FX4US | 4 Port 100 Mbps Ethernet Unmanaged Switch; 4 FX | |
| CNFE4TX4US | 4 Port 10/100 Mbps Ethernet Unmanaged Switch; 4 TX | 100 m (330 feet) |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | |
| | Small Form-Factor Pluggable Modules (See SFP Data sheet) | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# 1000 Mbps 4 port Ethernet unmanaged switch
# 1000 Mbps 8 port Ethernet unmanaged switch
# Electrical ↔ SFP Optical




(SFP) = Small Form-Factor Pluggable Module

## Description

The ComNet™ CNGE4US Ethernet 4 port unmanaged switch and CNGE8US Ethernet 8 port unmanaged switch are designed to transmit and receive 1000 Mbps data using small form factor pluggable modules. Both are environmentally hardened to operate in demanding environments. LED indicators are provided for confirming equipment operating status. Plug-and-play design ensures ease of installation requiring no optical adjustments. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- 1000 Mbps Gigabit Ethernet
- High Speed Computer Links

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE4US | 1000 Mbps Ethernet 4 port unmanaged switch |
| CNGE8US | 1000 Mbps Ethernet 8 port unmanaged switch |

## Features

- CNGE4US: 4 Small Form Factor (SFP) ports
  CNGE8US: 8 Small Form Factor (SFP) ports
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- No In-field optical adjustments required
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Power and Port status LED indicators
- IEEE 802.3 compliant
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# 1000 Mbps 4 port Ethernet unmanaged switch
# 1000 Mbps 8 port Ethernet unmanaged switch
# Electrical ↔ SFP Optical

## specifications

### DATA

| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 1000 Mbps, IEEE 802.3 Compliant |
| Operating Mode: | SFP Selectable |

### FIBER CONNECTORS[1]

Requires selection of sold-separately SFP modules. See ComNet data sheet "SFP Small Form-Factor Pluggable Modules" for number and description of SFP modules.

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Optical: | LC or SC (depending on SFP module used) |
| Data: | RJ45 |

### LED INDICATORS

- Data Activity
- Power

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 12-24 VDC @ 700 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | |
| CNGE4US | 1 |
| CNGE8US | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | |
| CNGE4US | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| CNGE8US | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

† May be extended to condensation conditions

| PART NUMBER | DESCRIPTION | DISTANCE |
|---|---|---|
| CNGE4US | 4 Port 1000 Mbps Ethernet Unmanaged Switch | See SFP Modules data sheet for optional distances, fiber type and connector type. |
| CNGE8US | 8 Port 1000 Mbps Ethernet Unmanaged Switch | |
| Accessories | 12 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | |
| | Small Form-Factor Pluggable Modules (See SFP data sheet) | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# 10/100 Mbps Ethernet 8 port unmanaged switch
## 4 Ports: Electrical ↔ 4 Ports: SFP Optical
## 8 Ports: Electrical
## 8 Ports: SFP Optical


(SFP) = Small Form-Factor Pluggable Module

## Description

The ComNet™ CNFE8US Series Ethernet 8 port unmanaged switch is designed to transmit and receive 10/100 Mbps data over optical fiber through user selectable SFP options or 10/100 Mbps data over CAT5E/6 electrical cable. This unit integrates eight independent 10/100 Mbps channels in a single package. The CNFE8FX4TX4US and CNFE8FX8US require the ordering of sold-separately interchangeable SFP modules for fiber type, distance and connectors. All electrical interfaces will Auto-Negotiate to 10 Mbps, or 100 Mbps Ethernet rate without any adjustments. The optical interfaces operate at a 100 Mbps Ethernet rate. The CNFE8US Series models are environmentally hardened to operate in demanding environments. LED indicators are provided for confirming equipment operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- 10/100 Mbps Ethernet
- High Speed Computer Links

| PART NUMBER | DESCRIPTION |
|---|---|
| CNFE8FX4TX4US | 10/100 Mbps Ethernet 8 port unmanaged switch; 4 TX, 4 FX |
| CNFE8FX8US | 100 Mbps Ethernet 8 port transceiver; 8 FX |
| CNFE8TX8US | 10/100 Mbps Ethernet 8 port transceiver; 8 TX |

## Features

- 10/100 Mbps Ethernet
  - 10/100 BASE-T/TX electrical port
  - 100 BASE-FX optical port
- Electrical ports support Auto-Negotiation for 10 Mbps or 100 Mbps, full duplex or half duplex data.
- Optical port supports 100 Mbps full duplex data
- Automatic MDI/MDI-X crossover
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Uses interchangeable SFP for fiber type, distance and connector (Ordered separately)
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- No in-field optical adjustments required
- Power, Activity and Port status LED indicators
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- IEEE 802.3 compliant
- Lifetime Warranty

# 10/100 Mbps Ethernet 8 port unmanaged switch
# 4 Ports: Electrical ↔ 4 Ports: SFP Optical
# 8 Ports: Electrical
# 8 Ports: SFP Optical

## specifications

### DATA

| | |
|---|---|
| Data Interface: | Ethernet |
| Data Rate: | 10/100 Mbps<br>IEEE 802.3 Compliant<br>Full Duplex or Half Duplex Electrical Ports/Full Duplex Optical Port |

### FIBERS[1]

SFP Dependent

### CABLE

CAT5E/6

### FIBER CONNECTORS

Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Data: | RJ45 |

### LED INDICATORS

- Optical Link/Data Activity
- Electrical Link/Data Activity
- Power

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 12-24 VDC @ 700 mA |
| Rack Mount: | From Rack |
| Number of Rack Slots: | 2 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 2.2 in., (15.5 × 13.5 × 5.6 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651.
Single mode fiber needs to meet or exceed fiber standard ITU-T G.652.
† May be extended to condensation conditions

AGENCY COMPLIANCE
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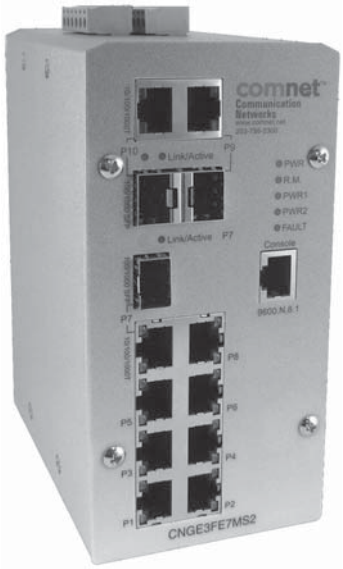
| PART NUMBER | DESCRIPTION | DISTANCE |
|---|---|---|
| CNFE8FX4TX4US | 8 Port 10/100 Mbps Ethernet Unmanaged Switch; 4 TX, 4 FX | See SFP Modules data sheet for optional distances, fiber type and connector type. |
| CNFE8FX8US | 8 Port 100 Mbps Ethernet Unmanaged Switch; 8 FX | |
| CNFE8TX8US | 8 Port 10/100 Mbps Ethernet Unmanaged Switch; 8 TX | 100 m (33 feet) |
| Accessories | 12 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | |
| | Small Form-Factor Pluggable Modules (See SFP Data sheet) | |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# environmentally hardened managed Ethernet switch with (7) 10/100TX + (3) configurable 10/100/1000TX / 1000FX ports




D
7+3

## Applications

- ITS Traffic Signalization & Surveillance/ Incident Detection Networks
- Industrial and Factory Automation
- Integrated IP-Video and Data Transmission Networks
- Industrial Security Access Control Systems

## Description

The ComNet™ CNGE3FE7MS2 Managed Ethernet Switch provides robust transmission of (7) 10/100 BASE-TX and (3) 10/100/1000TX or 1000FX combo ports, of gigabit Ethernet data. Unlike most Ethernet switches, these environmentally hardened units are designed for direct deployment in difficult out-of-plant or roadside operating environments, and are available for use with either conventional CAT-5e copper or optical transmission media. Diverse media selection allows for easy implementation of point-to-point, linear add-drop, drop-and-repeat, star, or true self-healing ring and mesh network system architectures. The 7 electrical ports support the 10/100 Mbps Ethernet IEEE 802.3 protocol, and auto-negotiating and auto-MDI/ MDIX features are provided for simplicity and ease of installation. 3 ports are 10/100/1000 configurable for copper or fiber media for use with multimode or single mode optical fiber, selected by optional SFP modules. These network managed layer 2 switches are optically (1000 BASE-FX) and electrically compatible with any IEEE 802.3 compliant Ethernet devices. Plug-and-play design ensures ease of installation, and no electrical or optical adjustments are ever required. The CNGE3FE7MS2 incorporates LED indicators for monitoring the operating status of the managed switch and network. These units are DIN-rail or wall mountable.

## Features

- Environmentally hardened for direct deployment in difficult unconditioned out-of-plant and roadside installations
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and CALTRANS Traffic Signal Control Equipment Specifications
- Extended ambient operating temperature range: -40° C to +75° C
- 10/100 BASE-TX and 10/100/1000 BASE-FX compatible
- Flexible optics configuration via SFP plug-in modules
- DIN rail or wall mountable mounted
- Redundant power supply compatibility reduces possibility of single-point-of-failure for highest possible reliability
- Fully configurable through web-based or SNMP network management
- IGMP Snooping V1/V2 for multicast filtering and IGMP Query V1/V2
- Port based VLAN (IEEE 802.1Q)
- Rapid Spanning Tree protocol (IEEE 802.1W)
- Lifetime Warranty

# environmentally hardened managed Ethernet switch with (7) 10/100TX + (3) configurable 10/100/1000TX / 1000FX ports

## benefits

**System Interface/Performance:**
- RJ45 port support Auto MDI/MDI-X function
- SFP supports 100/1000 Dual Mode
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 7.4Gbps
- 1Mbits Packet Buffer
- 8K MAC Address Table
- Wide operating temperature (-40˚C - 75˚C)

**Power Supply**
- Wide-range Redundant Power Design
- Power Polarity Reverse Protect
- Overload Current Protection

**VLAN**
- Port Based VLAN
- Support 802.1 Q Tag VLAN
- GVRP

**Port Trunk with LACP**

**QoS (Quality of Service)**
- Support IEEE 802.1p Class of Service
- Per port provides 4 priority queues
- Port Base, Tag Base and Type of Service Priority

**Port Mirror: Monitor traffic in switched networks**
- TX packet only
- RX packet only
- Both TX and RX packet

**Security**
- Port Security: MAC address entries/filter
- IP Security: IP address security management to prevent unauthorized intruder
- Login Security: IEEE802.1X/RADIUS

**IGMP**
- Query mode for Multi Media Application
- Support multicast filter

**Case/Installation**
- IP-30 Protection
- DIN Rail and Wall Mount Design

**Spanning Tree**
- Support IEEE802.1d Spanning Tree
- Support IEEE802.1w Rapid Spanning Tree

**X-Ring**
- X-Ring, Dual Homing, Couple Ring and Dual Ring Topology
- Provide redundant backup feature and the recovery time below 20ms

**Support IEEE802.1ab LLDP**

**Bandwidth Control**
- Support Rate-based and Priority-based rate limiting
- Broadcast/Multicast Packet Filter Control

**System Event Log**
- System Log Server/Client
- SMTP e-mail Alert
- Relay Alarm Output System Events

**SNMP Trap**
- Device cold start
- Power status
- Authentication failure
- X-Ring topology changed
- Port Link Up/ Link Down

**TFTP Firmware Update and System Configure Restore and Backup**

**Supports 6000 VDC Ethernet ESD protection**

**Supports DIDO function**

**Provides EFT protection 3000 VDC for power line**

**Standard Compliance**
- IEEE802.3 10Base-T Ethernet
- IEEE802.3u 100Base-TX/100
- IEEE802.3ab 1000Base-T
- IEEE802.3z Gigabit fiber
- IEEE802.3x Flow Control and Back Pressure
- IEEE802.3ad Port trunk with LACP
- IEEE802.1d Spanning Tree/ IEEE802.1w Rapid Spanning Tree
- IEEE802.1p Class of Service
- IEEE802.1q VLAN Tag
- IEEE802.1x User Authentication (Radius)
- IEEE802.1ab LLDP

# environmentally hardened managed Ethernet switch with (7) 10/100TX + (3) configurable 10/100/1000TX / 1000FX ports

## hardware specifications

| | |
|---|---|
| **Switch Architecture** | Back-plane (Switching Fabric): 7.4Gbps<br>Packet throughput ability (Full Duplex):<br>11 Mpps @64bytes |
| **Transfer Rate** | 14,880pps for Ethernet port<br>148,800pps for Fast Ethernet port<br>1,488,000pps for Gigabit Fiber Ethernet port |
| **Packet Buffer** | 1Mbits |
| **Mac Address** | 8K MAC address table |
| **Flash ROM** | 4Mbytes |
| **DRAM** | 32Mbytes |
| **Connector**[1] | 10/100TX: 7 × RJ45<br>10/100/1000T/Mini-GBIC Combo:<br>3 × RJ45 + 3 × 100/1000 SFP sockets<br>RS232 connector: RJ45 type |
| **DI/DO** | 2 Digital Input (DI): Level 0 : -30–2V<br>Level 1 : 10–30V<br>Max. input current 8mA<br>2 Digital Output (DO): Open collector to 40 VDC, 200mA |
| **Network Cable** | 10Base-T: 2-pair UTP/STP Cat. 3, 4, 5 cable. EIA/TIA-568 100-ohm (100m)<br>100Base-TX: 2-pair UTP/STP Cat. 5/5E cable. EIA/TIA-568 100-ohm (100m)<br>1000Base-TX: 2-pair UTP/STP Cat. 5e or 6 cable. EIA/TIA-568 100-ohm (100m) |
| **Optical Fiber**[1] | Multimode: 50/125µm - 62.5/125µm<br>Single Mode: 9/125µm<br>Requires selection of sold-separately SFP Modules. See ComNet data sheet "SFP Small Form-Factor Pluggable Modules" for number and description of SFP modules. |

[1]Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

| | |
|---|---|
| **Protocol** | CSMA/CD |
| **LED** | 10/100TX: Link/Activity (Green)<br>Full Duplex/Collision (Yellow)<br>Giga Copper: Link/Activity (Green)<br>Speed: 1000Mbps (Green)<br>SFP: Link/Activity (Green)<br>Power (Green), Power 1 (Green), Power 2 (Green), Fault (Red), Master (Green) |
| **Reserve Polarity Protection** | Present |
| **Overload Current Protection** | Present |
| **Power Supply** | 12 - 48VDC, Redundant power with polarity reverse protect function and removable terminal block |
| **Power Consumption** | 10 Watts (Max.) |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Operating Temperature** | -40˚C to 75˚C |
| **Storage Temperature** | -40˚C – 85˚C |
| **Case Dimensions** | Metal case. IP-30,<br>72mm (W) × 105mm (D) × 152mm (H)<br>2.84" (W) × 4.13" (D) × 5.98" (H) |
| **Installation** | DIN Rail and Wall Mount Design |
| **EMI** | FCC Class A, CE EN61000-4-2 (ESD), CE EN61000-4-3 (RS), CE EN61000-4-4 (EFT), CE EN61000-4-5 (Surge), CE EN55022, CE EN61000-4-6 (CS), CE EN61000-4-8, CE EN61000-6-2, CE EN61000-6-4 |
| **Safety** | UL, cUL, CE/EN60950-1 |
| **Stability Testing** | IEC60068-2-32 (Free fall),<br>IEC60068-2-27 (Shock),<br>IEC60068-2-6 (Vibration) |

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE3FE7MS2 | Environmentally Hardened Managed Ethernet Switch with (7) 10/100TX + (3) 10/100/1000TX / 1000FX Ports |
| Accessories | 24VDC Plug in Power Supply, 90-264VAC, 50/60Hz (Included) |

# environmentally hardened managed Ethernet switch with (7) 10/100TX + (3) configurable 10/100/1000TX / 1000FX ports

## software features

**Management**
SNMP v1, v2c, v3/ Web/Telnet/CLI/NS-View Management

**SNMP MIB**
RFC 1215 Trap, RFC 1213 MIBII, RFC 1157 SNMP MIB, RFC 1493 Bridge MIB, RFC 2674 VLAN MIB, RFC 1643, RFC 1757, RSTP MIB, Private MIB

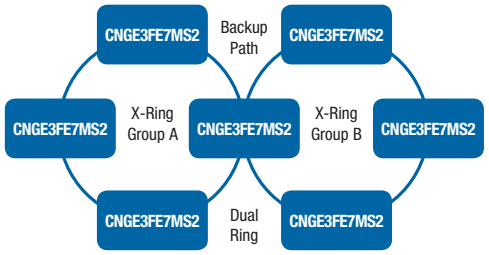
**VLAN**
Port Based VLAN
IEEE802.1Q Tag VLAN (256 entries)/
VLAN ID (UP to 4K, can be assigned from 1 to 4096)
GVRP (256 Groups)

**Port Trunk with LACP**
LACP Port Trunk: 4 Trunk groups/ Maximum 4 Trunk members

**LLDP**
Support LLDP to allow switch to advise its identification and capability on the LAN

**Spanning Tree**
Support IEEE802.1w Rapid Spanning Tree

**X-Ring**
Support X-Ring, Dual Homing, Couple Ring and Central Ring Topology.
Provide redundant backup feature and the recovery time below 20ms.
Dual Ring can connect two rings without couple ring and supports the following topology:




**Quality of Service**
The quality of service determined by port, Tag and IPv4 Type of Service, IPv4 Different Service

**Class of Service**
Support IEEE802.1p class of service, per port provides 4 priority queues

**Port Security**
Support 1000 entries of MAC address for static MAC and another 100 for MAC filter

**Port Mirror**
Support 3 mirroring types: RX, TX and Both packet

**IGMP**
Support IGMP snooping v1, v2; 256 multicast groups and IGMP query

**IP Security**
Supports 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder.

**Login Security**
Support IEEE802.1X Authentication/RADIUS

**Bandwidth Control**
Support ingress packet filter and egress packet limit. The egress rate control all of the packet types and the limit rates are 100K-250Mbps. Ingress filter packet type combination rules are Broadcast/Multicast/Unknown Unicast packet, Broadcast/ Multicast packet, Broadcast packet only and all of packet. The packet filter rate can be set from 100K-250Mbps.

**Flow Control**
Support Flow Control for Full-duplex and Back Pressure from Half-duplex

**System Log**
Support System log record and remote system log server

**SMTP**
Support SMTP Server and 6 e-mail accounts for receiving event alert

**Relay Alarm**
Provides one relay output for port breakdown, power fail.
Alarm Relay current carry ability: 1A @ DC24V

**DIDO**
DO: When disconnection of the specific port was detected, DO will activate the signal LED to alarm.
DI: Integrate critical sensors: 2 groups of digital inputs. DI can integrate the sensors into the auto alarm system and transfer the alarm information to IP network with email and SNMP.

**SNMP Trap**
Up to 3 Trap stations. Cold start, Port link up, Port link down, Authentication Failure, Private Trap for power status, Port Alarm configuration, Fault alarm, X-Ring topology change.

**DHCP**
Provide DHCP Client/ DHCP Server and IP Relay

**DNS**
Provide DNS client feature and support Primary and Secondary DNS server

**SNTP**
Support SNTP to synchronize system clock in Internet

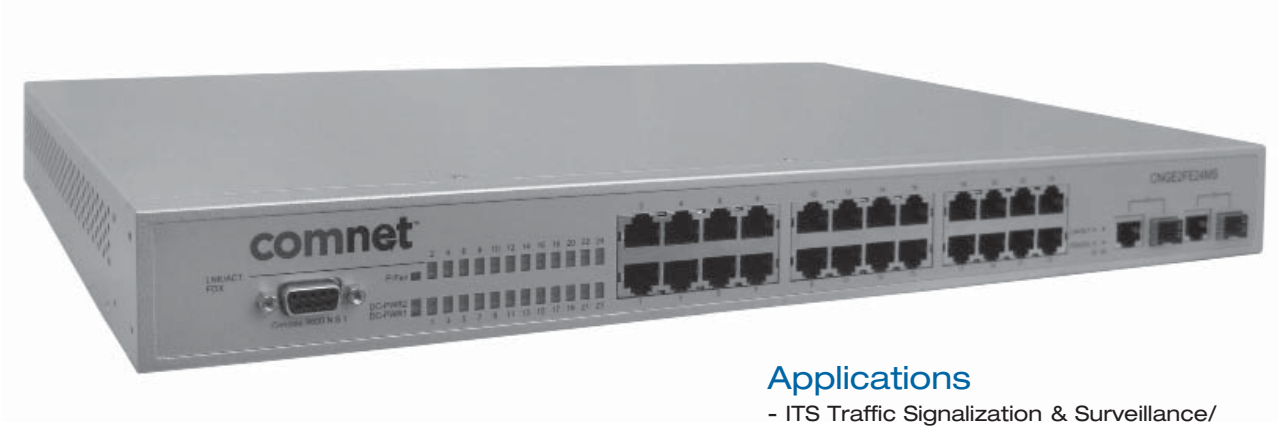
**Firmware Update, configuration backup and restore**
Support TFTP firmware update, system configure backup and restore

**If Alias**
Each port allows importing 128 bit of alphabetic string of words on SNMP and CLI interface.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J. In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

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24+2

## Applications

- ITS Traffic Signalization & Surveillance/ Incident Detection Networks
- Industrial and Factory Automation
- Integrated IP-Video and Data Transmission Networks
- Industrial Security Access Control Systems

## Description

The ComNet™ CNGE2FE24MS Managed Ethernet Switch provides transmission of (24) 10/100 BASE-TX and (2) 10/100/1000TX or 1000FX combo ports. Unlike most Ethernet switches, these environmentally hardened units are designed for deployment in difficult operating environments, and are available for use with either conventional CAT-5e copper or optical transmission media. The 24 electrical ports support the 10/100 Mbps Ethernet IEEE 802.3 protocol, and auto-negotiating and auto-MDI/MDIX features are provided for simplicity and ease of installation. 2 ports are 10/100/1000 configurable for copper or fiber media for use with multimode or single mode optical fiber, selected by optional SFP modules. These network managed layer 2 switches are optically (1000 BASE-FX) and electrically compatible with any IEEE 802.3 compliant Ethernet devices. Plug-and-play design ensures ease of installation, and no electrical or optical adjustments are ever required. The CNGE2FE24MS incorporates LED indicators for monitoring the operating status of the managed switch and network. These units are rack mountable.

## Features

- Environmentally hardened for direct deployment in difficult unconditioned out-of-plant and roadside installations
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and CALTRANS Traffic Signal Control Equipment Specifications
- Extended ambient operating temperature range: -40˚ C to +75˚ C
- 10/100 BASE-TX and 1000 BASE-FX compatible
- Flexible optics configuration via SFP plug-in modules
- Redundant power supply compatibility reduces possibility of single-point-of-failure for highest possible reliability - Fully configurable through web-based or SNMP network management
- IGMP Snooping V1/V2 for multicast filtering and IGMP Query V1/V2
- Port based VLAN (IEEE 802.1Q)
- Rapid Spanning Tree protocol (IEEE 802.1W)
- Port Based Security
- Lifetime Warranty

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## benefits

**System Interface/Performance:**
- RJ45 port support Auto MDI/MDI-X function
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 8.8Gbps
- 4Mbits Packet Buffer
- 8K MAC Address Table
- Redundant Power Supply Design

**VLAN**
**- Port Based VLAN**
**- Support 802.1 Q Tag VLAN**
**- GVRP**

**Port Trunk with LACP**

**QoS (Quality of Service)**
- Support IEEE 802.1p Class of Service
- Per port provides 4 priority queues
- Port Base, Tag Base and Type of Service Priority

**Port Mirror: Monitor traffic in switched networks**
- TX packet only
- RX packet only
- Both TX and RX packet

**Security**
- Port Security: MAC address entries/filter
- IP Security: IP address security management to prevent unauthorized intruder
- Login Security: IEEE802.1X/RADIUS

**IGMP with Query mode for Multi Media Application**

**X-Ring**
- X-Ring, Dual Homing, Couple Ring and Central Ring Topology
- Provide redundant backup feature and the recovery time below 20ms

**Provides EFT protection 4KV for power line**

**Spanning Tree**
- Support IEEE802.1d Spanning Tree
- Support IEEE802.1w Rapid Spanning Tree

**Support up to 256 Policy ACL (Access Control List)**

**Support IEEE802.1ab LLDP**

**Bandwidth Control**
- Ingress Packet Filter and Egress Rate Limit
- Broadcast/Multicast Packet Filter Control

**System Event Log**
- System Log Server/Client
- SMTP e-mail Alert
- Relay Alarm Output System Events

**SNMP Trap**
- Device cold start
- Power failure
- Authentication failure
- Port Link Up/ Link Down
- Private trap

**TFTP Firmware Update and System Configure Restore and Backup**

**Case/Installation**
- IP-30 Protection

**Supports 6KV Ethernet ESD protection**

## STANDARD COMPLIANCE
- IEEE802.3 10Base-T Ethernet
- IEEE802.3u 100Base-TX/100Base-FX
- IEEE802.3z Gigabit fiber
- IEEE802.3ab 1000Base-T
- IEEE802.3x Flow Control and Back Pressure
- IEEE802.3ad Port trunk with LACP
- IEEE802.1d Spanning Tree/ IEEE802.1w Rapid Spanning Tree
- IEEE802.1p Class of Service
- IEEE802.1q VLAN Tag
- IEEE802.1x User Authentication (Radius)
- IEEE802.1ab LLDP

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## hardware specifications

| | |
|---|---|
| **Switch Architecture** | Back-plane (Switching Fabric): 8.8Gbps Packet throughput ability (Full Duplex): 13.1 Mpps @64bytes |
| **Transfer Rate** | 14,880pps for Ethernet port<br>148,800pps for Fast Ethernet port<br>1,488,000pps for Gigabit Fiber Ethernet port |
| **Packet Buffer** | 4Mbits |
| **Mac Address** | 8K MAC address table |
| **Flash ROM** | 4Mbytes |
| **DRAM** | 32Mbytes |
| **Jumbo Frame** | 9022bytes (for Gigabit ports) |
| **Connector**[1] | (Front) RS232: Female DB-9 (for Console)<br>(Rear) RS232: Male DB-9 (for UPWM)<br>10/100TX: 24 × RJ45<br>10/100/1000T and 1000FX Combo:<br>2 × RJ45 + 2 × SFP sockets |
| **LED** | Gigabit Fiber: Link/Activity (Green)<br>Gigabit Copper: Link/Activity (Green)<br>Full Duplex/Collision (Amber)<br>Mini GBIC Link/Activity (Green) |

| | |
|---|---|
| **Power Supply** | 12V- 48V |
| **Redundant Power Supply** | 12V- 48V |
| **Power Consumption** | 16.2 Watts |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Operating Temperature** | -40˚C to 75˚C |
| **Storage Temperature** | -40˚C to 85˚C |
| **Fan** | Fanless |
| **Case Dimensions** | 440mm (W) × 280mm (D) × 44mm (H)<br>17.32" (W) × 11.0" (D) × 1.73" (H) |
| **Installation** | 19" Rack Mount |
| **EMI** | FCC Class A, CE EN61000-4-2 (ESD), CE EN61000-4-3 (RS), CE EN61000-4-4 (EFT), CE EN61000-4-6 (CS), CE EN61000-4-8, CE EN61000-6-2, CE EN61000-6-4, UL, cUL, CE/EN60950-1 |
| **Stability Testing** | IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration) |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE2FE24MS | Environmentally Hardened Managed Ethernet Switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP Ports[1] |
| Accessories | 24VDC Plug in Power Supply, 90-264VAC, 50/60Hz (Included) |

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## software features

**Management**
SNMP v1, v2c, v3/ Web/Telnet/CLI Management

**SNMP MIB**
RFC 2418 SNMP MIB, RFC 1213 MIBII, RFC 2011 SNMP V2 MIB, RFC 1493 Bridge MIB, RFC 2674 VLAN MIB, RFC 1215 Trap MIB, RFC 1643 Ethernet Like, RFC 1757 RMON1, RSTP MIB, UPS MIB, LLDP MIB, Private MIB

**VLAN**
Port based VLAN, up to 24 groups
IEEE802.1Q Tag VLAN
Static VLAN groups up to 256, Dynamic VLAN group up to 2048, VLAN ID from 1 to 4094. GVRP up to 256 groups.

**Port Trunk with LACP**
LACP Port Trunk: 13 Trunk groups/ Maximum 4 Trunk members

**LLDP**
Support LLDP to allow switch to advise its identification and capability on the LAN

**X-Ring**
Support X-Ring, Dual Homing, Couple Ring and Central Ring Topology.
Provide redundant backup feature and the recovery time below 20ms.

**Spanning Tree**
Support IEEE802.1d Spanning Tree and IEEE802.1w Rapid Spanning Tree

**Quality of Service**
The quality of service determined by port, Tag and IPv4 Type of Service, IPv4 Different Service

**Class of Service**
Support IEEE802.1p class of service, per port provides 4 priority queues

**Port Security**
Support 50 entries of MAC address for static MAC and another 50 for MAC filter

**Port Mirror**
Support 3 mirroring types: RX, TX and Both packet

**IGMP**
Support IGMP snooping v1, v2; 256 multicast groups and IGMP query

**IP Security**
Supports 10 IP addresses that have permission to access the switch management and to prevent unauthorized intruder.

**Login Security**
Support IEEE802.1X Authentication/RADIUS

**Access Control List (ACL)**
Support up to 255 Policy

**Bandwidth Control**
Support ingress packet filter and egress packet limit. The egress rate control all of the packet types and the limit rates are 0-100Mbps. Ingress filter packet type combination rules are Broadcast/Multicast packet, Broadcast packet only and all of packet. The packet filter rate can be set from 0 to 100Mbps.

**Flow Control**
Support Flow Control for Full-duplex and Back Pressure from Half-duplex

**System Log**
Support System log record and remote system log server

**SMTP**
Support 1 SMTP Server and 6 e-mail accounts for receiving event alert

**SNMP Trap**
1. Device cold start 2. Authorization failure
3. X-Ring topology changed 4. Port link up/ link down
Trap station up to 3

**Relay Alarm**
Provides one relay output for port breakdown, power fail.
Alarm Relay current carry ability: 1A @ DC24V

**DHCP**
Provide DHCP Client/ DHCP Server/ IP Relay functions

**DNS**
Provide DNS client feature and support primary and Secondary DNS server

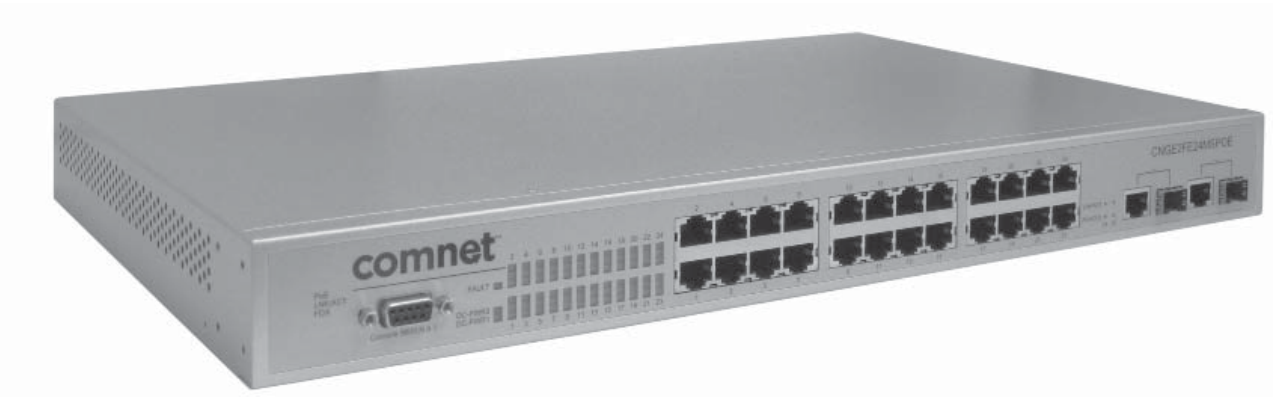
**SNTP**
Support SNTP to synchronize system clock in Internet

**Firmware Update**
Support TFTP & Console firmware update, TFTP & Console backup and restore

**Configuration upload and download**
Support binary format configuration file for system quick installation

**If Alias**
Each port allows importing 128 bit of alphabetic string of words on SNMP and CLI interface

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports




D
24+2

## Description

The ComNet™ CNGE2FE24MSPoE Managed Ethernet Switch provides transmission of (24) 10/100 BASE-TX and (2) 10/100/1000TX or 1000FX combo ports. Unlike most Ethernet switches, these environmentally hardened units are designed for deployment in difficult operating environments, and are available for use with either conventional CAT-5e copper or optical transmission media. The 24 electrical ports support the 10/100 Mbps Ethernet IEEE 802.3 protocol, and auto-negotiating and auto-MDI/MDIX features are provided for simplicity and ease of installation. All 24 ports support IEEE.802.3af based POE. 2 ports are 10/100/1000 configurable for copper or fiber media for use with multimode or single mode optical fiber, selected by optional SFP modules. These network managed layer 2 switches are optically (1000 BASE-FX) and electrically compatible with any IEEE 802.3 compliant Ethernet devices. Plug-and-play design ensures ease of installation, and no electrical or optical adjustments are ever required. The CNGE2FE24MSPoE incorporates LED indicators for monitoring the operating status of the managed switch and network. These units are rack mountable.

## Applications

- ITS Traffic Signalization & Surveillance/Incident Detection Networks
- Industrial and Factory Automation
- Integrated IP-Video and Data Transmission Networks
- Industrial Security Access Control Systems

## Features

- Environmentally hardened for direct deployment in difficult unconditioned out-of-plant and roadside installations
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and CALTRANS Traffic Signal Control Equipment Specifications
- Extended ambient operating temperature range: -40˚ C to +75˚ C
- 10/100 BASE-TX and 1000 BASE-FX compatible
- Flexible optics configuration via SFP plug-in modules
- Redundant power supply compatibility reduces possibility of single-point-of-failure for highest possible reliability
- Fully configurable through web-based or SNMP network management
- IGMP Snooping V1/V2 for multicast filtering and IGMP Query V1/V2
- Port based VLAN (IEEE 802.1Q)
- Rapid Spanning Tree protocol (IEEE 802.1W)
- Port Based Security
- Lifetime Warranty

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## benefits

**System Interface/Performance:**
- RJ45 port support Auto MDI/MDI-X function
- Embedded 24-port PoE inject function
- Store-and-Forward Switching Architecture
- Back-plane (Switching Fabric): 8.8Gbps
- 4Mbits Packet Buffer
- 8K MAC Address Table
- Redundant Power Supply Design

**VLAN**
- **Port Based VLAN**
- **Support 802.1 Q Tag VLAN**
- **GVRP**

**Port Trunk with LACP**

**QoS (Quality of Service)**
- Support IEEE 802.1p Class of Service
- Per port provides 4 priority queues
- Port Base, Tag Base and Type of Service Priority

**Port Mirror: Monitor traffic in switched networks**
- TX packet only
- RX packet only
- Both TX and RX packet

**Security**
- Port Security: MAC address entries/filter
- IP Security: IP address security management to prevent unauthorized intruder
- Login Security: IEEE802.1X/RADIUS

**IGMP with Query mode for Multi Media Application**

**X-Ring**
- X-Ring, Dual Homing, Couple Ring and Central Ring Topology
- Provide redundant backup feature and the recovery time below 20ms

**Provides EFT protection 4KV for power line**

**Spanning Tree**
- Support IEEE802.1d Spanning Tree
- Support IEEE802.1w Rapid Spanning Tree

**Support up to 256 Policy ACL (Access Control List)**

**Support IEEE802.1ab LLDP**

**Bandwidth Control**
- Ingress Packet Filter and Egress Rate Limit
- Broadcast/Multicast Packet Filter Control

**System Event Log**
- System Log Server/Client
- SMTP e-mail Alert
- Relay Alarm Output System Events

**SNMP Trap**
- Device cold start
- Power failure
- Authentication failure
- Port Link Up/ Link Down
- PoE events
- Private trap

**TFTP Firmware Update and System Configure Restore and Backup**

**Case/Installation**
- IP-30 Protection

**Supports 6KV Ethernet ESD protection**

## STANDARD COMPLIANCE
- IEEE802.3 10Base-T Ethernet
- IEEE802.3u 100Base-TX/100Base-FX
- IEEE802.3z Gigabit fiber
- IEEE802.3ab 1000Base-T
- IEEE802.3x Flow Control and Back Pressure
- IEEE802.3ad Port trunk with LACP
- IEEE802.1d Spanning Tree/ IEEE802.1w Rapid Spanning Tree
- IEEE802.1p Class of Service
- IEEE802.1q VLAN Tag
- IEEE802.1x User Authentication (Radius)
- IEEE802.3af Power over Ethernet
- IEEE802.1ab LLDP

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## hardware specifications

| | |
|---|---|
| **Switch Architecture** | Back-plane (Switching Fabric): 8.8Gbps<br>Packet throughput ability<br>(Full Duplex): 13.1 Mpps @64bytes |
| **Transfer Rate** | 14,880pps for Ethernet port<br>148,800pps for Fast Ethernet port<br>1,488,000pps for Gigabit Fiber Ethernet port |
| **Packet Buffer** | 4Mbits |
| **Mac Address** | 8K MAC address table |
| **Flash ROM** | 4Mbytes |
| **DRAM** | 32Mbytes |
| **Jumbo Frame** | 9022bytes (for Gigabit ports) |
| **Connector** | (Front) RS232: Female DB-9 (for Console)<br>(Rear) RS232: Male DB-9 (for UPWM)<br>10/100TX: 24 × RJ45<br>10/100/1000T and 1000FX Combo:<br>2 × RJ45 + 2 × SFP sockets |
| **PoE pin assignment** | RJ45 port #1 - #24 support IEEE802.3af<br>End-point Positive (VCC+): RJ45 pin 1, 2<br>Negative (VCC-): RJ45 pin 3, 6<br>Data (1, 2, 3, 6)<br>System Power (Green) |
| **Max. PoE current per port** | 350mA continuous |

| | |
|---|---|
| **LED** | Gigabit Fiber: Link/Activity (Green)<br>Gigabit Copper: Link/Activity (Green)<br>Full Duplex/Collision (Amber)<br>Mini GBIC Link/Activity (Green) |
| **Power Supply*** | 45V- 52V |
| **Redundant Power Supply** | 45V- 52V |
| **Power Consumption** | 400 Watts |
| **Operating Humidity** | 5% to 95% (Non-condensing) |
| **Operating Temperature** | -40˚C to 75˚C |
| **Storage Temperature** | -40˚C to 85˚C |
| **Fan** | Fanless |
| **Case Dimensions** | 440mm (W) × 280mm (D) × 44mm (H)<br>17.32” (W) × 11.0” (D) × 1.73” (H) |
| **Installation** | 19” Rack Mount |
| **EMI** | FCC Class A, CE EN61000-4-2 (ESD), CE EN61000-4-3 (RS), CE EN61000-4-4 (EFT), CE EN61000-4-6 (CS), CE EN61000-4-8, CE EN61000-6-2, CE EN61000-6-4, UL, cUL, CE/EN60950-1 |
| **Stability Testing** | IEC60068-2-32 (Free fall), IEC60068-2-27 (Shock), IEC60068-2-6 (Vibration) |

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

* Power supply not included. Optional power supply available. Consult ComNet for available power supplies.

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

| PART NUMBER | DESCRIPTION |
|---|---|
| CNGE2FE24MSPoE | Environmentally Hardened Managed Ethernet Switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP Ports[1] |

# environmentally hardened managed Ethernet switch with (24) 10/100TX + (2) 10/100/1000TX RJ45 or 1000 FX SFP ports

## software features

**Management**
SNMP v1, v2c, v3/ Web/Telnet/CLI Management

**SNMP MIB**
RFC 2418 SNMP MIB, RFC 1213 MIBII, RFC 2011 SNMP V2 MIB, RFC 1493 Bridge MIB, RFC 2674 VLAN MIB, RFC 1215 Trap MIB, RFC 1643 Ethernet Like, RFC 1757 RMON1, RSTP MIB, PoE MIB, UPS MIB, LLDP MIB, Private MIB

**VLAN**
Port based VLAN, up to 24 groups
IEEE802.1Q Tag VLAN
Static VLAN groups up to 256, Dynamic VLAN group up to 2048,
VLAN ID from 1 to 4094. GVRP up to 256 groups.

**Port Trunk with LACP**
LACP Port Trunk: 13 Trunk groups/ Maximum 4 Trunk members

**LLDP**
Support LLDP to allow switch to advise its identification and capability on the LAN

**X-Ring**
Support X-Ring, Dual Homing, Couple Ring and Central Ring Topology.
Provide redundant backup feature and the recovery time below 20ms.

**Spanning Tree**
Support IEEE802.1d Spanning Tree and IEEE802.1w Rapid Spanning Tree

**Quality of Service**
The quality of service determined by port, Tag and IPv4 Type of Service, IPv4 Different Service

**Class of Service**
Support IEEE802.1p class of service, per port provides 4 priority queues

**Port Security**
Support 50 entries of MAC address for static MAC and another 50 for MAC filter

**Port Mirror**
Support 3 mirroring types: RX, TX and Both packet

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Support IGMP snooping v1, v2; 256 multicast groups and IGMP query

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**Bandwidth Control**
Support ingress packet filter and egress packet limit. The egress rate control all of the packet types and the limit rates are 0-100Mbps. Ingress filter packet type combination rules are Broadcast/Multicast packet, Broadcast packet only and all of packet. The packet filter rate can be set from 0 to 100Mbps.

**Flow Control**
Support Flow Control for Full-duplex and Back Pressure from Half-duplex

**System Log**
Support System log record and remote system log server

**SMTP**
Support 1 SMTP Server and 6 e-mail accounts for receiving event alert

**SNMP Trap**
1. Device cold start 2. Authorization failure 3. X-Ring topology changed 4. Port link up/ link down 5. DC disconnect trap-PoE port Event Trap station up to 3

**Relay Alarm**
Provides one relay output for port breakdown, power fail.
Alarm Relay current carry ability: 1A @ DC24V

**DHCP**
Provide DHCP Client/ DHCP Server/ IP Relay functions

**DNS**
Provide DNS client feature and support primary and Secondary DNS server

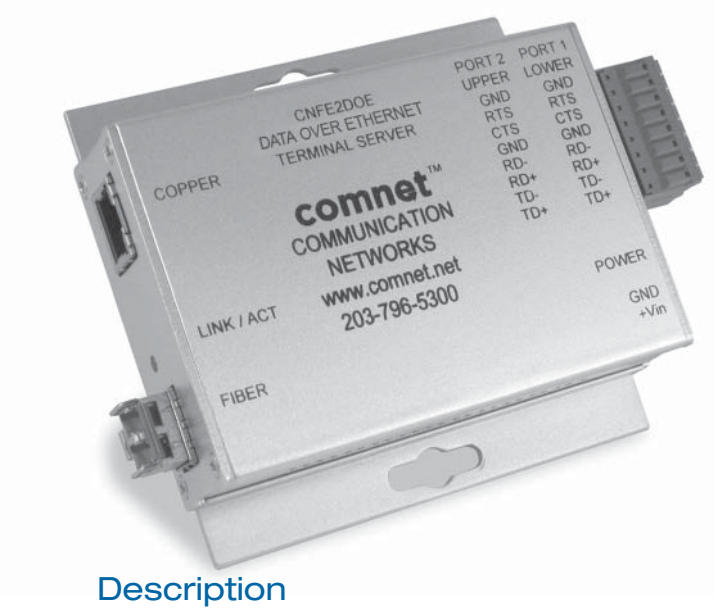
**SNTP**
Support SNTP to synchronize system clock in Internet

**Firmware Update**
Support TFTP & Console firmware update, TFTP & Console backup and restore

**Configuration upload and download**
Support binary format configuration file for system quick installation

**If Alias**
Each port allows importing 128 bit of alphabetic string of words on SNMP and CLI interface

# RS232/422/485 (2w/4w) Data over Ethernet (terminal server)




D
2

## Applications

- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

## Description

The ComNet™ CNFE2DOE terminal server supports 2-channel bi-directional data transmission over 1 or 2 optical fibers. The server is universally compatible with RS232, RS422, and 2-wire and 4-wire RS485 and serial data protocols. All configurations are done through its web server. The CNFE2DOE has two serial ports which can be configured by communicating from one port to another through the network. Distances depend on which SFP (Small Form Pluggable) module is used. The RJ45 Ethernet connector is included and is automatically disabled if the optical interface is used.

Open source com0com TCP/IP protocol is supported for any customer PC applications to communicate with terminal servers over the Ethernet. The software utility allows customers to search for the terminal servers installed on the same subnet, and create virtual com ports for each serial port on these servers. Individual serial ports running in client mode can be connected to a different serial port on a different terminal server running in server mode.

| PART NUMBER | DESCRIPTION |
|---|---|
| CNFE2DOE | Serial Data Terminal Server |

## Features

- Environmentally Hardened -40° to +75°C
- One or two RS232/422/485 selectable serial ports
- NTCIP compatible
- Easy configuration through web interface (HTTP)
- Saved to a web server based configuration
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Port control and management supported by open source com0com and com2TCP
- Power and Port status LED indicators
- Automatic resettable solid-state current limiters
- Lifetime Warranty

# RS232/422/485 (2w/4w) Data over Ethernet (terminal server)

## specifications

### DATA

| | |
|---|---|
| Data Interface: | UART, RS232/RS422/RS485 (2W/4W), RS232 Hardware Handshaking |
| Data Rate: | 2400, 9600, 19200, 57600, 115200 Kbps |

### ETHERNET

10/100TX, 100FX

### MANAGEMENT

HTTP, Auto-Discovery Tool

### NETWORK PROTOCOLS SUPPORTED

TCP/IP, UDP, HTTP, DHCP, ARP, UPNP, Telnet RFC2217

### OPERATING SYSTEMS SUPPORTED

Windows® XP®, Windows® Server® 2003, Windows® Server® 2008, Windows® Vista®

### CABLE

CAT5(e)/6

### FIBER CONNECTORS[1]

Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules

### CONNECTORS

| | |
|---|---|
| Optical: | SFP Dependent |
| Copper: | RJ45 |
| Data: | Terminal Block |

### LED INDICATORS

- Power - Link/Act

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 9-12 VDC @ 350 mA |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 4.08 × 3.74 × 1.1 in., (10.36 × 9.5 × 2.8 cm) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1] Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

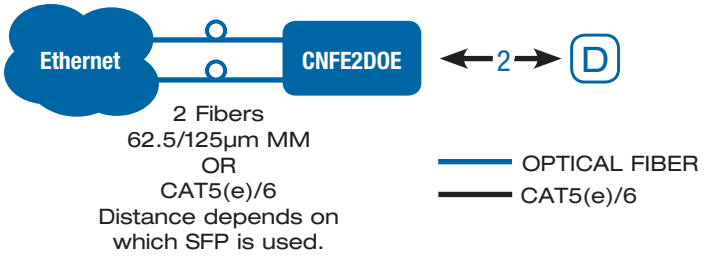
† May be extended to condensation conditions

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | DISTANCE** |
|---|---|---|
| CNFE2DOE | 2 Port 10/100 Mbps Terminal Server | See SFP Modules data sheet for optional distances, fiber type and connector type. |
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) | |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) | |

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.



# Eight Channel Contact Closures over 10/100 Ethernet


## Description

The contact-mapping ComNet™ CNFE8TCOE/ CNFE8RCOE series transmits up to eight contact closures over an Ethernet network. It is available with a 10/100TX RJ45 Ethernet connector and an SFP enabled fiber optic interface. These units can be one-to-one mapped over Ethernet or controlled via a PC. Included is a driver that allows the COE to read or write contact information from a PC based application. A software utility allows customers to search for this device that is installed on the network. The CNFE8TCOE/ CNFE8RCOE supports Windows® Discovery. Distances depend on which SFP (Small Form Pluggable) module is used. The CNFE8TCOE/ CNFE8RCOE is environmentally hardened to operate in extreme temperatures. LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Access Control Systems
- Building Automation and Environmental Control Systems
- Computer/Data Equipment
- Fire and Alarm Systems
- Traffic Signal Control Equipment

## Features

- NTCIP compatible
- Remote network configuration
- Saved to a web server based configuration, requires no electrical or optical adjustments
- Tested and certified by an independent laboratory for full compliance with the environmental requirements (ambient operating temperature, mechanical shock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Power and Port status LED indicators
- Automatic resettable solid-state current limiters
- Hot-swappable rack modules
- Interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# Eight Channel Contact Closures over 10/100 Ethernet

## specifications

### CONTACT

| | |
|---|---|
| Response Time: | 25 msec typical, network dependent |
| Input/Output Channels: | 8 |
| Inputs: | Dry Contact Input |
| Outputs: | 0 – 250V, 190mA (AC or DC) |

### ETHERNET
10/100TX, 100FX

### NUMBER OF FIBERS
1 or 2, SFP dependent

### FIBER CONNECTORS[1]
Requires selection of sold-separately SFP modules. See ComNet data sheet for number and description of SFP modules

### CONNECTORS

| | |
|---|---|
| Power: | Terminal Block |
| Optical: | LC or SC (SFP dependent) |
| Data: | RJ45 |
| Contact Closure: | Terminal Block |

### LED INDICATORS
- Power
- Link
- Com
- Contact Closure

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Surface Mount: | 9–12 VDC @ 350 mA |
| Rack: | From Rack |
| Number of Rack Slots: | 1 |
| Current Protection: | Automatic Resettable Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |
| Size (in./cm) (L×W×H) | 6.1 × 5.3 × 1.1 in., (15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <1 lb./0.45 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

[1]Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652

† May be extended to condensation conditions

AGENCY COMPLIANCE

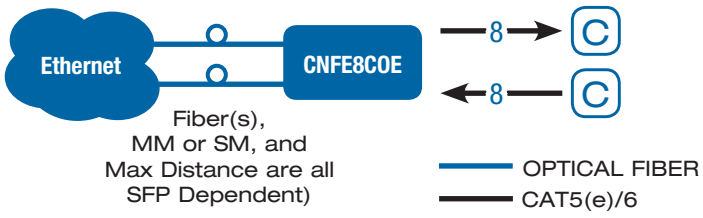
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | FIBERS REQUIRED | OPTICAL PWR BUDGET | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|---|
| CNFE8TCOE<br>CNFE8RCOE | Contact to Ethernet Transmitter<br>Contact to Ethernet Receiver | SFP dependent | SFP dependent | SFP dependent | 1 |

| | |
|---|---|
| Accessories | 9 Volt DC Plug-in Power Supply, 90-264 VAC, 50/60 Hz (Included) |
| Options | Add suffix '/C' for Conformally Coated Circuit Boards (Extra charge, consult factory) |

NOTE: This product requires a fiber installation with a minimum 30 dB connector return loss.
The use of Super Polish Connectors is recommended.

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice. **Distance may be limited by optical dispersion.



# Fast Ethernet over Twisted Pair or Coaxial Cable


## Description

The ComNet CNFE1CL1MC(-M) transmits Ethernet data over twisted pair copper or coaxial CCTV (75Ω) cable. The CNFE1CL1MC(-M) is designed to use existing CCTV cabling as effective Ethernet transmission media. The CNFE1CL1MC(-M) uses a standard RJ45 port for Ethernet data and gives the user a choice of a terminal block port for twisted pair or BNC for coaxial cable use. The CNFE1CL1MC(-M) is environmentally hardened to operate in extreme temperatures. LED indicators are provided for confirming operating status. These units are interchangeable between stand-alone or card mount configurations.

## Applications

- Ethernet transmission using existing media

| PART NUMBER | MEDIA REQUIRED |
|---|---|
| CNFE1CL1MC | Unshielded Twisted Pair (UTP) copper media or Coaxial Cable (75Ω) |
| CNFE1CL1MC-M | |

## Features

- 10/100 BASE-T/TX electrical port
- Terminal Block with screw terminals or BNC
- Automatic MDI/MDI-X crossover
- Distances up to 10,000 ft (3048 km) over Twisted Pair.
- Distances up to 1500 ft (457 m) over Coaxial Cable.
- Designed to meet full compliance with the environmental requirements (ambient operating temperature, mechanical hock, vibration, humidity with condensation, high-line/low-line voltage conditions and transient voltage protection) of NEMA TS-1/TS-2 and the Caltrans Specification for Traffic Signal Control Equipment.
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- LED Indicators
- IEEE 802.3 compliant
- CNFE1CL1MC is a hot-swappable rack modules
- CNFE1CL1MC is interchangeable between stand-alone or rack mount use – ComFit
- Lifetime Warranty

# Fast Ethernet over Twisted Pair or Coaxial Cable

## specifications

### INTERFACE

Ethernet Port:

| | | | |
|---|---|---|---|
| Ethernet connector: | RJ45 | | |
| Cable: | Cat 5, Cat 5E, Cat 6 | | |
| Speed: | 10/100Mbps | | |
| Distance: | 100m | | |
| Line Side Port 1: | | | |
| UTP connector: | Terminal Block | | |
| Cable: | Telephone wire 26 WG (one twisted pair) | | |
| Throughput: | (Down Stream | / | Up Stream) |
| 1000 ft (305 m) | 70 Mbps | / | 65 Mbps |
| 2500 ft (762 m) | 26 Mbps | / | 17 Mbps |
| 5000 ft (1524 m) | 16 Mbps | / | 1 Mbps |
| 7500 ft (2286 m) | 5 Mbps | / | 0.5 Mbps |
| 10,000 ft (3048 m) | 1 Mbps | / | 0.25 Mbps |
| Line Side Port 2: | | | |
| Coax connector: | BNC | | |
| Impedance: | 75 ohm coax | | |
| Throughput: | (Down Stream | / | Up Stream) |
| 250 ft (76 m) | 91 Mbps | / | 84 Mbps |
| 500 ft (152 m) | 86 Mbps | / | 82 Mbps |
| 1000 ft (305 m) | 65 Mbps | / | 69 Mbps |
| 1500 ft (457 m) | 40 Mbps | / | 52 Mbps |

### CONFIGURATION (DIP Switches):

DIP1: Master. Slave switch-ON: Master / OFF: Slave
DIP2: Impulse noise Protection-ON: Fast mode / OFF: Interleave mode
DIP3: Rate Limit control -ON: Limit line-rate Disable / OFF: Limit line-rate Enable
DIP4: General Protection-ON: SNR 6dB / OFF: SNR 9dB

### ELECTRICAL & MECHANICAL

Power:

| | |
|---|---|
| Surface Mount: | 22–27 VAC @ 100 mA or<br>8-15 VDC @ 70 mA |
| Rack (CNFE1CL1MC): | From Rack |
| Number of Rack Slots: | 1 (CNFE1CL1MC) |
| Current Protection: | Automatic Resettable<br>Solid-State Current Limiters |
| Circuit Board: | Meets IPC Standard |

### SIZE (L×W×H)

| | |
|---|---|
| Small (CNFE1CL1MC-M): | 4.1 × 3.7 × 1.1 in.,<br>(10.4 × 9.4 × 2.8 cm) |
| Standard Size (CNFE1CL1MC): | 6.1 × 5.3 × 1.1 in.,<br>(15.5 × 13.5 × 2.8 cm) |
| Shipping Weight: | <2 lbs./0.9 kg |

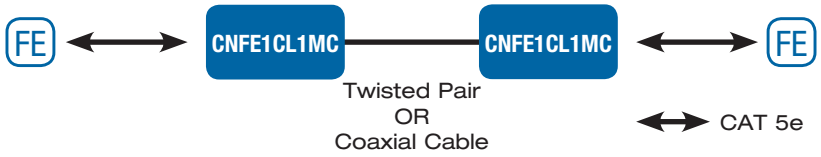
### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40° C to +75° C |
| Storage Temp: | -40° C to +85° C |
| Relative Humidity: | 0% to 95% (non-condensing)† |

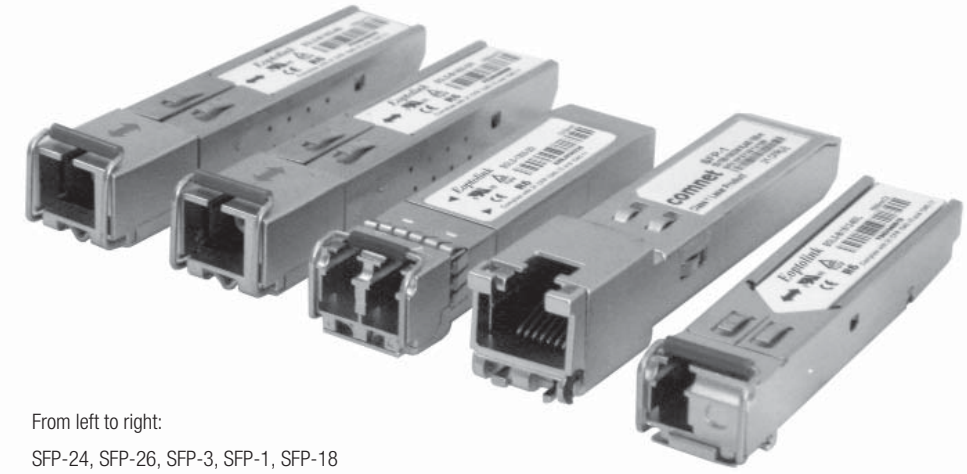
† May be extended to condensation conditions by adding suffix '/C'

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

| PART NUMBER | DESCRIPTION | MEDIA REQUIRED | MAX. DISTANCE** | # RACK SLOTS |
|---|---|---|---|---|
| CNFE1CL1MC-M | Ethernet over Twisted Pair or Coax | See "Interface" Above | See "Interface" Above | N/A |
| CNFE1CL1MC | Ethernet over Twisted Pair or Coax | See "Interface" Above | See "Interface" Above | 1 |



# Copper and Optical Fiber Ethernet Connectors



From left to right:
SFP-24, SFP-26, SFP-3, SFP-1, SFP-18

## Description

The ComNet selection of Small Form-Factor Pluggable modules allow for an optical or copper interface when using a ComNet managed switch, unmanaged switch or media converter. These interchangeable SFP modules are available for use with copper media, or multimode and single mode optical fiber. The optical fiber SFP modules are available in fast Ethernet one and two fiber versions and Gigabit one and two fiber versions. They also are available with LC or SC optical connectors. The ComNet SFP modules have different wavelengths and optical power to offer distances from 300 meters to 120 kilometers. These SFP modules are industrially rated to perform in the most difficult operating environments. The ComNet SFP interface is required for use with all ComNet SFP configurable products to qualify for the ComNet Lifetime Warranty.

## Features

- Transparent to data encoding/compatible with major data protocols
- Interchangeable SFP for fiber type, distance and connector
- No in-field optical adjustments required
- Conforms to (SFP) Small Form-Factor Pluggable Multi-Source Agreement
- IEEE 802.3 compliant
- Operating temperature: -40˚ C to +75˚ C
- Lifetime Warranty

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

# Copper and Optical Fiber Ethernet Connectors

## specifications

| Item Number | Mbps | Transmission Medium* | Transmit Wavelength | Receive Wavelength | Maximum Path Length | TX Power (dBm) | RX Sensitivity (dBm) | Opt. Loss Budget (dBm) | Number of Fibers | Receptacle Type |
|---|---|---|---|---|---|---|---|---|---|---|
| SFP-1 | 10/100/1000 | Copper | N/A | N/A | IEEE 802.3 | N/A | N/A | N/A | N/A | RJ45 |
| SFP-2 | 100 | Multimode | 1310 nm | 1310 nm | 2 km | -19 | ≤-30 | 11 | 2 | LC |
| SFP-3 | 100 | Single Mode | 1310 nm | 1310 nm | 20 km | -15 | ≤-31 | 16 | 2 | LC |
| SFP-4 | 100 | Single Mode | 1310 nm | 1310 nm | 40 km | -14 | ≤-34 | 20 | 2 | LC |
| SFP-5 | 100 | Single Mode | 1550 nm | 1550 nm | 80 km | -5 | ≤-31 | 26 | 2 | LC |
| SFP-6 | 1000 | Single Mode | 1310 nm | 1310 nm | 15 km | -8 | ≤-24 | 16 | 2 | LC |
| SFP-7 | 1000 | Single Mode | 1310 nm | 1310 nm | 40 km | -5 | ≤-24 | 19 | 2 | LC |
| SFP-8 | 1000 | Single Mode | 1550 nm | 1550 nm | 70 km | 0 | ≤-24 | 24 | 2 | LC |
| SFP-9 | 1000 | Single Mode | 1550 nm | 1550 nm | 120 km | 0 | ≤-32 | 32 | 2 | LC |
| SFP-10 | 100 | Single Mode | 1310 nm | 1550 nm | 20 km | -14 | ≤-33 | 19 | 1 | LC |
| SFP-11 | 100 | Single Mode | 1550 nm | 1310 nm | 20 km | -14 | ≤-33 | 19 | 1 | LC |
| SFP-12 | 1000 | Single Mode | 1310 nm | 1550 nm | 20 km | -8 | ≤-22 | 14 | 1 | LC |
| SFP-13 | 1000 | Single Mode | 1550 nm | 1310 nm | 20 km | -8 | ≤-22 | 14 | 1 | LC |
| SFP-14 | 1000 | Single Mode | 1310 nm | 1550 nm | 20 km | -8 | ≤-22 | 14 | 1 | SC |
| SFP-15 | 1000 | Single Mode | 1550 nm | 1310 nm | 20 km | -8 | ≤-22 | 14 | 1 | SC |
| SFP-16 | 1000 | Multimode | 850 nm | 850 nm | 550 m† | -9.5 | ≤-17 | 7.5 | 2 | LC |
| SFP-17 | 1000 | Single Mode | 1310 nm | 1550 nm | 60 km | -1 | ≤-26 | 25 | 1 | LC |
| SFP-18 | 1000 | Single Mode | 1550 nm | 1310 nm | 60 km | -3 | ≤-26 | 23 | 1 | LC |
| SFP-19 | 100 | Single Mode | 1310 nm | 1550 nm | 60 km | -5 | ≤-34 | 29 | 1 | LC |
| SFP-20 | 100 | Single Mode | 1550 nm | 1310 nm | 60 km | -6 | ≤-34 | 28 | 1 | LC |
| SFP-21 | 1000 | Single Mode | 1310 nm | 1550 nm | 60 km | -1 | ≤-26 | 25 | 1 | SC |
| SFP-22 | 1000 | Single Mode | 1550 nm | 1310 nm | 60 km | -3 | ≤-26 | 23 | 1 | SC |
| SFP-23 | 100 | Single Mode | 1310 nm | 1550 nm | 60 km | -5 | ≤-34 | 29 | 1 | SC |
| SFP-24 | 100 | Single Mode | 1550 nm | 1310 nm | 60 km | -6 | ≤-34 | 28 | 1 | SC |
| SFP-25 | 100 | Multimode | 1310 nm | 1550 nm | 2 km | -15 | ≤-30 | 15 | 1 | SC |
| SFP-26 | 100 | Multimode | 1550 nm | 1310 nm | 2 km | -15 | ≤-30 | 15 | 1 | SC |
| SFP-27 | 1000 | Single Mode | 1310 nm | 1310 nm | 40 km | 0 | ≤-24 | 24 | 2 | LC |
| SFP-28 | 1000 | Single Mode | 1510 nm | 1510 nm | 40 km | -5 | ≤-24 | 19 | 2 | LC |
| SFP-29 | 1000 | Single Mode | 1530 nm | 1530 nm | 40 km | -5 | ≤-24 | 19 | 2 | LC |
| SFP-30 | 1000 | Single Mode | 1550 nm | 1550 nm | 40 km | -5 | ≤-24 | 19 | 2 | LC |
| SFP-31 | 1000 | Single Mode | 1570 nm | 1570 nm | 40 km | -5 | ≤-24 | 19 | 2 | LC |
| SFP-36 | 100 | Single Mode | 1310 nm | 1310 nm | 20 km | -15 | ≤-34 | 19 | 1 | SC |
| SFP-37 | 100 | Single Mode | 1550 nm | 1550 nm | 20 km | -15 | ≤-34 | 19 | 1 | SC |

* Multimode fiber needs to meet or exceed fiber standard ITU-T G.651. Single mode fiber needs to meet or exceed fiber standard ITU-T G.652. † 550m using 50/125µm fiber; 300m using 62.5/125µm fiber.
Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.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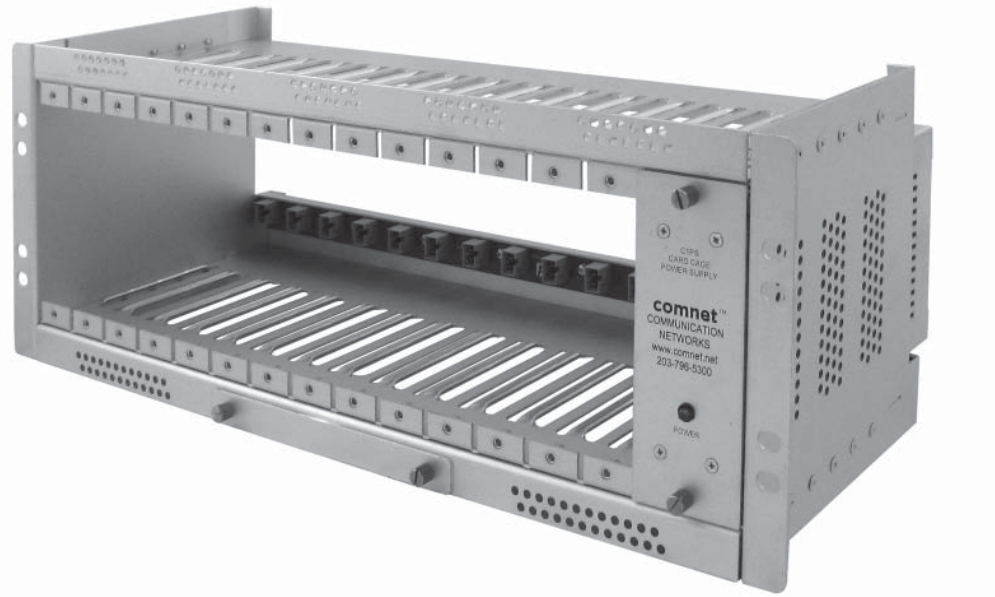
POWER

## SECTION INDEX

# rack mount card cage




## Description

The design approach employed by ComNet for equipment mounted within the model C1 chassis rack unit with modular C1PS power supply, provides for the elimination of a single-point failure in the event of a major fault within any module located within the chassis rack. This is accomplished through the use of automatic electronic current limiting within each rack-mountable module, rather than providing the current limiting within the power supply unit which supports the power requirements for equipment located within the rack. In nearly all competing designs,a major fault within a module, located within the chassis rack, results in the power supply unit going into a current limiting condition, and as a result, all of the modules within the rack shut down. The C1 rack design employed by ComNet eliminates this possibility, as only the faulty module shuts down, and the operation of the other modules within the rack continue unimpaired. This automatic current limiting feature is also self-resetting, should the fault or overload be of a temporary or intermittent condition. Furthermore, all modules located within the chassis rack are hot-swappable, so that it is not necessary to power-down the rack when removing or replacing modules.

## Features

- Automatic electronic current limiting feature
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- (14) Fourteen 1-inch rack slots available
- All modules located within the chassis rack are hot-swappable
- Lifetime Warranty

# rack mount card cage

## specifications

### ELECTRICAL

| | |
|---|---|
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |

### FUSING

1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused)

### POWER INDICATOR

Red LED

### AC LINE CORD

Detachable, IEC-connected. Allows easy field replacement or exchange for various worldwide AC power plug configurations.

### MECHANICAL

| | |
|---|---|
| Size (in./cm.) (L×W×H) | |
| Rack Mount: | 19.0 × 7.5 × 6.9 in., (48.2 × 19 × 17.5 cm) |
| Rack Slots: | (14) 1-inch slots available |
| Shipping Weight: | <5 lbs./2.15 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C |
| Storage Temp: | -40˚ C to +85˚ C |
| Heat Generation: | 240 BTU |

AGENCY COMPLIANCE*

*Power Supply Only

### ORDERING INFORMATION

| PART NUMBER | DESCRIPTION |
|---|---|
| C1-US (US AC Power Cord) | 19" Rack, 90-264 VAC Input (includes US power supply and power cord) |
| C1-EU (EU & UK Power Cord) | 19" Rack, 90-264 VAC Input (includes EU and UK power supply and power cord) |
| C1-IN (US, EU, UK & AU Power Cord) | 19" Rack, 90-264 VAC Input (includes US, EU, UK and AU power supply and power cord) |
| C1-CH | 19" Rack, (no power supply) |

| | | |
|---|---|---|
| **OPTIONS** | C1-BP | Blank Panel (1") |
| | C1-SA | South African Power Cord |
| | C1-AU | Australian Power Cord |

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J
In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# card cage power supply


## Description

The design approach employed by ComNet for equipment mounted for the C1PS integral 115/230 VAC power supply, provides for the elimination of a single-point failure in the event of a major fault within any module located within the chassis rack. This is accomplished through the use of automatic electronic current limiting within each rack-mountable module, rather than providing the current limiting within the power supply unit which supports the power requirements for equipment located within the rack. In nearly all competing designs, a major fault within a module, located within the chassis rack, results in the power supply unit going into a current limiting condition, and as a result, all of the modules within the rack shut down. The C1PS design employed by ComNet eliminates this possibility, as only the faulty module shuts down, and the operation of the other modules within the rack continue unimpaired. This automatic current limiting feature is also self-resetting, should the fault or overload be of a temporary or intermittent condition.

## Features

- Automatic electronic current limiting feature
- Voltage transient protection on all power and signal input/output lines provides unconditional protection from power surges and other voltage transient events.
- Lifetime Warranty

# card cage power supply

## specifications

### ELECTRICAL

| | |
|---|---|
| Input Voltage: | 90-264 VAC @ 70 W Maximum |
| Output Voltage: | 9 VDC +/- 5% @ 6.5 Amps @ 75˚C |
| FUSING | 1.25 A slow blow (rack power supply) (plug-in modules individually electronically fused) |
| POWER INDICATOR* | Red LED |
| AC LINE CORD | Detachable, IEC-connected. Allows easy field replacement or exchange for various worldwide AC power plug configurations. |

* LED: RED = Power On

### MECHANICAL

| | |
|---|---|
| Size (in./cm.) (L×W×H) | |
| Rack Mount: | 5.25 x 1.95 x 7.75 in., (13.34 x 4.95 x 7.75 cm) |
| Shipping Weight: | <3 lbs./1.4 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -40˚ C to +75˚ C, ambient |
| Storage Temp: | -40˚ C to +85˚ C, ambient |
| Heat Generation: | 240 BTU |

### ORDERING INFORMATION

| PART NUMBER | DESCRIPTION |
|---|---|
| C1PS | 90-264 VAC Input Power Supply* |

* Power cords appropriate to the country where the unit is being used will be included with the order.

AGENCY COMPLIANCE

PART 15 COMPLIANT

N24621

Complies with FDA Performance Standard for Laser Products, Title 21, Code of Federal Regulations, Subchapter J

In a continuing effort to improve and advance technology, product specifications are subject to change without notice.

# 12VDC high temperature power supply for stand-alone units


## Description

The ComNet™ PS12DC-HT power transformer supplies 12V DC power to ComNet™ stand-alone units. The PS12DC-HT operates on 100-240 VAC. The PS12DC-HT is provided for installations with high ambient temperatures.

## Features

- Universal power input, 100-240 VAC
- High temperature operating range
- Lifetime Warranty

## specifications

### ELECTRICAL & MECHANICAL

| | |
|---|---|
| Power: | |
| Input: | 100-240 VAC, 50-60 Hz @ 0.6 A Max. |
| Output: | 12 VDC @ 1.5 A Max. |
| Size (in./cm) (L×W×H) | |
| (excluding line cord) | 4.53 × 1.77 × 1.22 in., (11.5 × 4.5 × 3.1 cm) |
| Shipping Weight: | <0.5 lb./0.25 kg |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | 0˚ C to +75˚ C |
| Relative Humidity: | 20% to 90% (non-condensing) |

| PART NUMBER | DESCRIPTION |
|---|---|
| PS12DC-HT-EU<br>PS12DC-HT-UK | 12VDC High Temperature PSU |

AGENCY COMPLIANCE
PART 15 COMPLIANT
E322911
N24621

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# AC to DC Power Converter


## Description

The ComNet™ PS24AC12DC power converter supplies 12V DC regulated power to a select group of ComNet™ stand-alone units. The PS24AC12DC has a 300mA output current.

| PART NUMBER | DESCRIPTION |
|---|---|
| PS24AC12DC | AC to DC Power Converter |

AGENCY COMPLIANCE
PART 15 COMPLIANT E322911 N24621

## specifications

### ELECTRICAL

| | |
|---|---|
| Power: | |
| Input: | AC20 - 28V; DC16 - 30V |
| Output: | DC 12V Regulated |
| Output Current: | 300mA |
| Cable Input Side: | 11.8 inch, (29.97 cm) 22AWG, 2 Pin Terminal Block |
| Cable Output Side: | 11.8 inch, (29.97 cm), 22AWG, DC Plug |
| Size (in./cm) (L×W×H) | 1.77 × 1.0 × 0.75 in., (4.50 × 2.54 × 1.90 cm) |

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din rail power supply


## Description

The ComNet™ PS24-1A-DIN Rail Power Supply is the low profile solution for building automation. The PS24-1A-DIN is an environmentally hardened unit which is double insulated and ideal for most installations. Bi-color (Red/Green) LED indicators are provided for rapidly ascertaining equipment operating status.

Output voltage: 24V
Output power max: 30w
Output current: 1.3a
Number of outputs: 1

## Features

- Low 2.2 inch profile for building automation
- Wide range AC input
- 24V Output
- Class II double insulation
- -25 to +71˚ operating temperature
- DIN Rail Mount
- Global use with no input selector switches
- Convection cooled
- No derating needed
- 2 Year Warranty

# din rail power supply

## specifications

### ELECTRICAL

| | |
|---|---|
| Voltage Output: | 24V |
| AC Voltage Input Range: | 100 - 240VAC, Class II double insulated (No ground connection required) |
| Input Frequency: | 47 - 63Hz |
| Rated Input Current (max) | 800mA |
| Efficiency (typ): | >83% |
| Power (Watts): | 30W |
| Current: | 1.3A |
| Output Voltage Accuracy: | ±1% of Nominal |
| Ripple and Noise (20 MHz BW): | 50mV |
| Overvoltage Protection: | 120 - 145% |
| Power Supply Type: | Switching (Closed Frame) |

### MOUNTING TYPE

DIN Rail

### SAFETY AGENCY APPROVALS

UL1310 Class 2, UL508 Listed, UL60950-1, EN60950-1, CE

### POWER INDICATOR*

Red/Green LEDs

### RoHS STATUS

RoHS Compliant

### MECHANICAL

| | |
|---|---|
| Size (in./cm.) (L×W×H) | |
| Rack Mount: | 3.6 × 3.5 × 2.24 in., (9.0 × 8.9 × 5.7 cm) |
| Shipping Weight: | 11.29 ounces/320 g |

### ENVIRONMENTAL

| | |
|---|---|
| MTBF: | >100,000 hours |
| Operating Temp: | -25° C to +71° C, ambient (Derate linearly 2.5% / °C from 61-71°C) |
| Storage Temp: | -25° C to +85° C, ambient |
| Operating Humidity: | 20 - 95% RH (non-condensing) |
| Conducted and Radiated EMI: | PS24: EN55022 Class A |

* LED: GREEN = Power On
RED = Output Low

| PART NUMBER | DESCRIPTION |
|---|---|
| PS24-1A-DIN | Switch Mode Power Supply |

AGENCY COMPLIANCE

PART 15 COMPLIANT E322911 N24621

# Switching Mode Power Supply 480 watt DIN-rail mounting for Power Over Ethernet (POE) Applications


## Description

ComNet™ model PS48VDC-10A is a high-quality, low-noise switching mode power supply ideally suited to those applications requiring POE (Power Over Ethernet). This rugged unit may be either DIN-rail or shelf-mounted, providing an identical mounting configuration to the mating POE switch. Up to 24 POE field devices may be powered from a single supply, and the high output current capacity provides an adequate safety margin. A maximum of three of these units may be paralleled together to triple the number of POE devices supported. The wide ambient operating temperature range permits installation in most out-of-plant and unconditioned environments, such as those found in intelligent transportation systems or factory automation/industrial control applications. Unconditional line and load protection is provided.

## Features

- Universal AC input: 90 to 264 VAC, 47-63Hz
- Mounts on standard 7.5 or 15 mm DIN-rail
- Automatic power factor correction (PFC)
- High operating efficiency; up to 90%
- Small package for limited space installations
- Natural convection cooling; no troublesome fans

| PART NUMBER | OUTPUT CURRENT (A) | VOLTAGE TRIM RANGE* MIN. VDC | VOLTAGE TRIM RANGE* MAX. VDC | DC OK @ START UP (VDC) MIN. | DC OK @ START UP (VDC) MAX. | DC LOW AFTER START UP (VDC) MIN. | DC LOW AFTER START UP (VDC) MAX. | TYPICAL EFFICIENCY |
|---|---|---|---|---|---|---|---|---|
| PS48VDC-10A | 10 | 47.0 | 56.0 | 37.0 | 40.0 | 37.0 | 40.0 | 90% |

* When S/P switch is set to parallel, it is not possible to trim output voltage.

# Switching Mode Power Supply 480 watt DIN-rail mounting for Power Over Ethernet (POE) Applications

## specifications

### OUTPUT DATA

| | |
|---|---|
| Line regulation | ± 0.5% |
| Load regulation, Non parallel mode | ± 0.5% |
| Parallel mode | ± 5% |
| Ouput Voltage accuracy | +1% (factory adjusted) |
| Ripple and Noise | 100mV |
| Hold up time Vi = 230Vac | 30ms |
| Minimum load | 0% |
| Parallel Operation | 3 units max. (only with S/P switch on “P” position) |

### INPUT DATA

| | |
|---|---|
| Rated input voltage range | |
| AC | 90 - 264 Vac |
| DC | 120 - 370 Vdc |
| Rated input current (115/230) | 7 / 3.5A |
| Frequency range | 47- 63 Hz |
| Inrush current | |
| Vi= 115Vac | 25A |
| Vi= 230Vac | 50A |

### OPTIONAL FEATURES

| CODE | DESCRIPTION |
|---|---|
| B | Plug-in connectors |

### CONTROLS AND PROTECTIONS

| | |
|---|---|
| Input Fuse | T10A/250Vac internal* |
| Output Overvoltage Protection | 57 – 63VDC |
| Output Short Circuit Protection | Current limit |
| Rated Overload Protection | 120-140% |

### GENERAL DATA (@ NOMINAL LINE, FULL LOAD, 25°C)

| | |
|---|---|
| Ambient operating temperature | -25°C to 71°C |
| Derating (>56°C to +71°C) | 2.5%/°C |
| Ambient humidity | 20 - 95%RH, non-condensing |
| Storage | -25°C to +85°C |
| Dimensions L x W x D | 125 x 175 x 123 (screw terminal connector)<br>142 x 175 x 123 (plug connector version) |
| Cooling | Free air convection |
| Case material | Aluminium, Powder Coat Finish |
| Weight | 1920g |
| Protection | IP20 |

### APPROVALS AND EMC COMPLIANCE†

| | |
|---|---|
| Insulation voltage I/O | 3.000Vac |
| Insulation resistance I/O @ 500VDC | 100Mohm |
| UL / cUL | UL508 listed, UL60950-1, Recognised |
| TUV | EN60950-1 |
| CE | EN61000-6-3<br>EN55022 class B<br>EN61000-3-2<br>EN61000-3-3<br>EN61000-6-2<br>EN55024 |


* When S/P switch is set to parallel, it is not possible to trim output voltage.

† For complete compliance information contact ComNet for manufacturer’s data sheet.

# Switching Mode Power Supply 480 watt DIN-rail mounting for Power Over Ethernet (POE) Applications

## PIN ASSIGNMENT AND FRONT CONTROLS

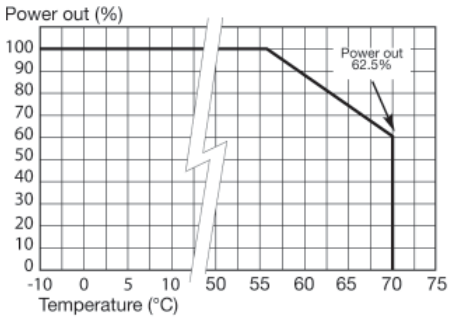
| PIN # | DESIGNATION | DESCRIPTION |
|---|---|---|
| 1 | + | Positive output terminal |
| 2 | + | Positive output terminal |
| 3 | - | Negative output terminal |
| 4 | - | Negative output terminal |
| 5 | GND | Ground terminal to minimise High frequency emissions |
| 6 | L | Phase input ( no polarity with DC input ) |
| 7 | N | Neutral input ( no polarity with DC input ) |
| | DC ON | DC output ready LED |
| | DC LO | DC low indicator LED |
| | Vout ADJ. | Trimmer for fine output voltage adjustment |
| | S/P | Single parallel selection switch |

## INSTALLATION

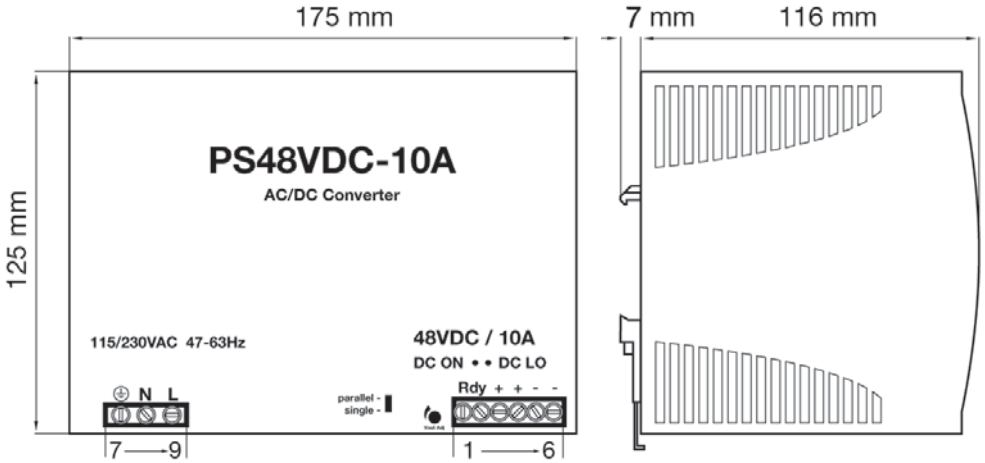
| | |
|---|---|
| COOLING | Natural air convection<br>Allow 25mm of free space along all sides to ensure adequate cooling |
| SCREW CONNECTIONS | 10-24AWG Flexible or solid cable |
| PLUG IN CONNECTORS | 10-24AWG Flexible or solid cable |

NOTE: Specify desired connector style at time of your order.

## DERATING DIAGRAM




## OUTLINE DRAWING




Specifications are subject to change without notice.

## COMPATIBILITY REFERENCE – VIDEO/CCTV

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| Ademco Video | Up-the-Coax Control | FVT/FVR1031, FVT/FVR109 |
| Ademco Video | RS485 Data Bus | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Ademco Video | RapidGold™ | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014,FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Bosch | Bi-Phase Data<br>PTZ Signals | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Bosch | RS485 (2-wire)<br>LTC8500 Matrix Keyboard Signals<br>LTC2600 Multiplexer Keyboard Signals | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| CBC | RS485 Camera & Keyboard Links | FVT/FVR1031, FVT/FVR109, FVT/FVR4014, FVT/FVR8014 |
| Cohu | MPC System | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Cohu | 3920 i-Dome™ | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Conway | TX1, TX2, TX3, TX4, TX5, TX23 telemetry control keyboards, RF matrix (keyboard data only)<br>RS485 Matrix 3 camera switching matrix, AIF8 Remote Alarm Interface | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Dedicated Micros | SD Series RS485 | FVT/FVR109, FVT/FVR4014, FVT/FVR8014 |
| Diamond | Fast Scan/Smart Scan | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| GE Security (Kalatel) | Digiplex RS422 (2-wire)<br>PTZ Signals & Matrix Keyboard Signals | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| GE Security (Kalatel) | RS485 (2-wire)<br>Calibur Multiplexer Keyboard Signals | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Lectrolarm | Spector Series | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Mercer | RS485 Camera & Keyboard Links | FVT/FVR109, FVT/FVR4014, FVT/FVR8014 |
| Meyertech | ZSC Series RS485 | FVT/FVR1031, FVT/FVR109, FVT/FVR4014, FVT/FVR8014 |
| Molynx | TX616-V, Molynx 600 Series Controllers, CR2000 Camera Controllers, TRX228, TRX250 and TRX260 | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |

## COMPATIBILITY REFERENCE – VIDEO/CCTV, CONT'D

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| Panasonic | Up-the-Coax<br>PTZ Signals | FVT/FVR1031, FVT/FVR109 |
| Panasonic | RS485<br>PTZ Signals & Keyboard Signals | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Pelco | Coaxitron (Up-the-Coax)<br>Both Extended & Standard Formats<br>PTZ Signals | FVT/FVR1031, FVT/FVR109 |
| Pelco | Type"P" and "D" protocol RS422 (4 wire)<br>PTZ Signals | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Pelco | Spectra III™/IV™ | FVT104(M)(S)1P, FVR104P |
| Pelco | RS485 (4 wire)<br>CBD200/CBD300 Matrix Keyboard Signals<br>Genex Multiplexer Keyboard Signals | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Pelco | RS422 (4 wire)<br>CM-9500KBD Matrix Keyboard Signals | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Sensormatic AD | Manchester Code (2 wire)<br>PTZ Signals | FVT/FVR109 |
| Sensormatic AD | RS485 Sensornet<br>PTZ Signals | FVT/FVR109 |
| Sensormatic AD | RS422 (4 wire)<br>PTZ Signals | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Sensormatic AD | RS232<br>AD2050/AD2150/AD2160<br>AD1676B/BE, AD1677E, AD1678BM/CM/CME<br>Matrix Keyboard Signals | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Silent Witness | V27 Plus Camera | FVT/FVR11 |
| Synectics | RS422 & RS485 Camera & Keyboard Links | FVT/FVR109, FVT/FVR4014, FVT/FVR8014 |
| Ultrak | Ultra Dome (RS485 2 wire),<br>KD-6 | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Vicon | VPS1200/1300 | FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Vicon | Modupulse Protocol | FVT/FVR15,FVT/FVR1021, FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Vicon | Surveyor™ | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR46, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |

## COMPATIBILITY REFERENCE – VIDEO/CCTV, CONT'D

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| Vicon | Vicoax Systems | FVT/FVR1031, FVT/FVR109 |
| Vicon | Quantum | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Videolarm | Coalynx | FVT/FVR1031, FVT/FVR109 |
| Videolarm | Modupulse Systems | FVT/FVR15, FVT/FVR1021, FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |

## COMPATIBILITY REFERENCE – FIRE ALARM

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| Notifier | RS485 Annunciator | FDX53, FDX54, FDX57 |

## COMPATIBILITY REFERENCE – DATA

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| Advantor | 3000 Series Advantages Access | NA |
| Amano Cincinnati | TF Series | FDX50, FDX51, FDX52 |
| AMDI | AAP, MPX, AAS | FDX50, FDX51, FDX52 |
| Andover Controls | RS485 Infinite | FDX53, FDX57 |
| Automating Peripherals | RS485 Comm Board to Badge Reader | FDX50, FDX51, FDX52 |
| Automating Peripherals | Deduction Readers | FDX53, FDX57 |
| Axxess Identification | Axxess RC-2, NC100, Axiom III | FDX53, FDX57 |
| Cerberus Pyrotronics (Fire) | MXL/CXL | NA |
| Checkpoint Systems | AC300/AC500/AC600 RS485 | FDX53, FDX57 |
| Cincinnati Time | CINTAC, TACTICS II | FDX53, FDX57 |
| Control Systems International | G7/CNET-E1 | FDX53, FDX57 |
| CSI (Control Systems International) | Lan/Sub Lan | FDX53, FDX57 |

## COMPATIBILITY REFERENCE – DATA, CONT'D

| MANUFACTURER | MODELS | COMNET PRODUCTS |
|---|---|---|
| DSX | 7790, 7798, 7728, 7756, 7718, N-1000, PW2000. N-485PCI | FDX53, FDX57 |
| Eagle Signal | RS485 (4-wire), WinDSX Sftwr.,1020,1030 Pnls. | FDX55 |
| Eagle Signal | CP2035 Remote I/O Driver, XL 516 Remote | FDX55 |
| Econolite | ASC/2 (RS232) | FDX50, FDX51, FDX52 |
| Europlex | All Europlex Alarm Panels | FDX53, FDX57 |
| Federal APD | Port Controller Communications | FDX50, FDX51, FDX52 |
| Galaxy Control Systems | Models 260/270 Gemini | FDX53, FDX57 |
| Grinnell | DLC, FSK | FDX53, FDX57 |
| Hirsch | RS485 (4 wire) | FDX50, FDX51, FDX52 |
| Honeywell | R9.5 | FDX53, FDX57 |
| Mosler | Comsec System RTU's | FDX50, FDX 51, FDX52 |
| Mosler | Pro Pass (Host-APC-APC) | FDX50, FDX 51, FDX52 |
| Mosler | APC to Card Reader | FDX53, FDX54, FDX57 |
| Northern Computers | RS485 (2-wire), Pro-Watch 5000 | FDX53, FDX54, FDX57 |
| Pelco Camera Control | Remote Keyboard CM9500 | FVT/FVR1031, FVT/FVR4014, FVT/FVR8014, FVT/FVR406, FVT/FVR8018 |
| Software House | I STAR, DPC, APC to Host | FDX50, FDX51, FDX52 |
| Software House | I STAR, DPC, APC to Reader | FDX53, FDX54, FDX57 |
| TDSI | Syst. 1X access control unit (part no. 5002-1306)<br>Syst. 2 access control unit (part no. 5002-1368)<br>Syst. 4 analogue access control unit (part no. 5002-1369)<br>Syst. 4 digital access control unit (part no. 5002-1384) | FDX53, FDX54, FDX57 |
| Traffic Control Technologies | LM System | FDX55 |
| Trane | Tracer Building Automation System | FDX53, FDX54, FDX57 |
| Westinghouse | Impacc Communications | FDX53, FDX54, FDX57 |
| Westinghouse | 808S | FDX50, FDX51, FDX52 |

## QUICK PRODUCT CROSS REFERENCE

| | COMNET | AMERICAN FIBERTEK | COMMUNICATIONS SPECIALTIES (CSI) | GE/FIBER OPTIONS | GE/IFS | INFINOVA |
|---|---|---|---|---|---|---|
| 1-CHANNEL VIDEO | FV10, FV20, FV1001 | 10, 20, MT-1, M100C, M1C, M30C, M300, M3C, M33C, VK-M100, VKM1, 210 | Beamer V3105 | S700V, S701V, S702V, S705V, S706V, S7705V, S7706V | VT1101M, VT1001, VR1000, VR1001, VR1100, VR2100, FP1101, V4000, V14100, FP1101 | N3510, N3511, N3610, N3810 |
| 1-CHANNEL VIDEO WITH DATA | FV15M2, FV104, FV1021, FV109, FV1031, FV1014 | 1200B, 3200B, M3200, 1300, 3300, 1400, M1400, 3400, M3400, M1410, M1420, 1485, M1485, 3485, M3485, 911, M61, 1600, 3600, M3600, M1605, M1615, M1690, 913, 915 | 3810, 3820 | S730DV, S731DV, S732DV, S733DV, S739DV, S7730DV, S7731DV, S7732DV, S7733DV, S7739DV | V1500, V1505, VD1505, V1900, V4500, V4700, V4900, V9900, VD14100, VD14330. FP1500WDM, FP1505WDM, FP1910WDM | N3729, N3530, N3730, N3531, N3731, N3631, N3831, N3635 |
| MULTI-CHANNEL VIDEO | FV2001, FV41, FV401, FV801, FV120, FV160, FV200, FV240, FV280, FV320 | 220, 440, 404C, 904, 940, 860, 880, 980, 91600, 92400, 93200, 94000, 94800, 95600, 96400 | 7030, 7040 | S703V, S704V, S707V, S708V, 709V12,VS709V16, S7703V, S7704V, S7707V, S7708V, 9902 – 9910V | V5000, V6010, V8000, V11000, V7400, V7800, V71200, V71600, V72000, V72400, V72800, V73200, FP6010 | N3542, N3742, M3544, N3744, N3546, N3746, N3548, N3748, N3642, N3644 |
| MULTI-CHANNEL VIDEO WITH DATA | FV2014, FV414, FV4014, FV8014, FV8018, FV160D8, FV240D8, FV320D8 | 925SL, 8410C, 8423C, 8485C, 945, 8610C, 8623C, 8685C, 8810C, 8823C, 8885C, 90885C, 981, 985, 91685, 92485, 93285, 94085, 94885 | 7300, 7400 | S734DV, S735DV, S736DV, S737DV, S7734DV, 9902 - 9940VMPD | V5000-DRDT, V7400-2DRDT, V7800-2DRDT, V71200-2DRDT, V71600-2DRDT, V72000-2DRDT, V72400-2DRDT, V72800-2DRDT, V73200-2DRDT | N3551, N3751, N3553, N3753, N3554, N3754, N3556, N3756, N3557, N3757, N3559, N3759, N3651, N3655 |
| SERIAL DATA | FDX53, FDX54, FDX55 | 02C, 03, 483T, 04, 0485, 481, 485, 480 | 5002, 5012, 5018, XRD8050 | S710D, S711D, S712D, S7711D, S7712D | D1000, D1100, D1300, D1315, D2100, D2300, D2315, D9100, D9100E, D9100WDM, D9100WDME | N3571, N3771, N3674 |
| CONTACT CLOSURE | FDC10, FDC8 | 80, 81, 82 | XC/XR-1000A | S250D, S251D, S2250D, S2251D | D1810, D1800, D3000 | N3579, N3779 |

| KBC | MERIDIAN | OPTELECOM | OSD | OT SYSTEMS | PELCO |
|---|---|---|---|---|---|
| FDVA | 100µ, 100µB, 100, 140, 145, ST/SR-1W, ST/SR-1U-x, MT/MR-1U-x , DT/DR-1W | Pico, Up-the-Fiber 4000, VBS2000, 9111D | OSD351, OSD353, OSD361, OSD365A, OSD381, OSD383, OSD461, OSD463, OSD8810, OSD8815 | FTD100µ, FTD100M, FTD100, FT100 | F8301 |
| FCVA1, FDVA1-DC1, FDVA1-DB1 | ST/SR-1W / 1F, ST/SR-1W / 1G, BT/SR-1W1F/1F-P, ST/SR-1W1F/1F-P, ST/SR-1W1G / 1G, ST/SR-1W2G / 2G, ST/SR-1U1G / 1G, DT/DR-1V1D/1D, DT/DR-1W1D/1D, DT/DR-1W1D1F/1D1F, DT/DR-1W2D1F/2D1F, DT/DR-1W1MPS, DT/DR-1W1G/1G, DT/DR-2V1D/1D | Up-the-Fiber 4200, VDX2200, 9221D, 9281D, 9241D | OSD416, OSD418, OSD816, OSD8816, OSD8817, OSD818 | FTD110DBµ, FTD110DBM, FTD110DB, FT110DF, FT120DF, FT110DR, FT120DR, FT110DB, FT120DB | F85011 |
| FDVA4 | ST/SR-2V & 2W, ST/SR-2W, ST/SR-4V, ST/SR-3U-x, DT/DR-4V, DT/DR-8V, DT/DR-12V, DT/DR-16V, DT/DR-6W, DT/DR-8W, DT/DR-xV, DT/DR-xW | TETRA4000, TETRA5000, OCTA4000, OCTA5010, OCTA6050 | OSD690 | FT200, FT400, FT800, FT1600, FT2400, FT3200 | F8302, F8304, F8308, F8316 |
| FDVA4-DB1 | DT/DR-2V2D/2D, DT/DR-2V(W) 1K/1K, DT/DR-2V2F/2F, DT/DR-2W1G/1G, DT/DR-2W2G/2G, DT/DR-2W3G/3G, DX-2V2F, DT/DR-4V/1F, DT/DR-4V(W)/4F, DT/DR-4V/4M, DT/DR-4V1D/1D, DT/DR-4V1F/1F, DT/DR-4V1G/1G, DT/DR-4V1K/1K, DT/DR-4V2K/2K, DT/DR-4W/1F, DT/DR-4W1F1K/1F1K, DT/DR-4W1G/1G, DT/DR-4W2F2J/2F2J, DT/DR-6V/1F, DT/DR-6V1J/1J, DT/DR-6V4J/4J, DT/DR-6V1K/1K, DT/DR-8V/1F, DX-1V1D | 9191D, 9341D, TETRA4200, TETRA5200, 9131D, 9231D, 9442D, 9152D, 9252D | — | FT210DF, FT220DF, FT210DR, FT220DR, FT210DB, FT220DB, FT410DF, FT420DF, FT410DR, FT420DR, FT410DB, FT420DB, FT810DF, FT820DF, FT810DR, FT820DR, FT810DB, FT820DB | F85041, F85081 |
| FDDB1, FTDB | 1300, 1300i, 1400, 1400i, 1800, 1800i, SXT-1G, SXR-1G, SXT-1J, SXR-1J, SXT-1K, SXR-1K | 4132B, 4185A, 9591 | OSD135, OSD138, OSD139 | FT010DB | F8101 |
| — | — | CCM1010 | OSD158 | FT010CB, FT080CF | — |

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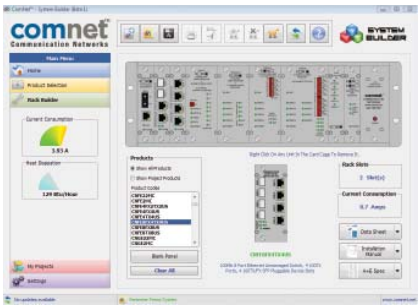
## COMNET SYSTEM BUILDER



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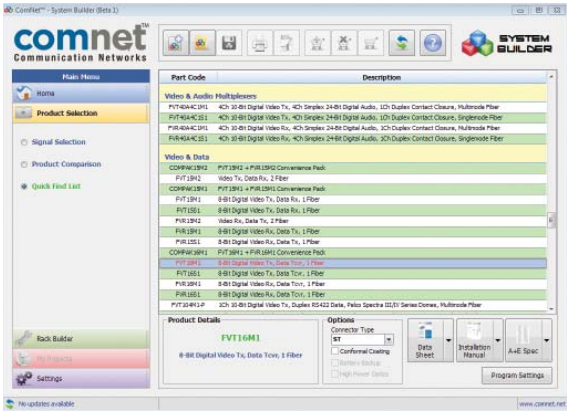
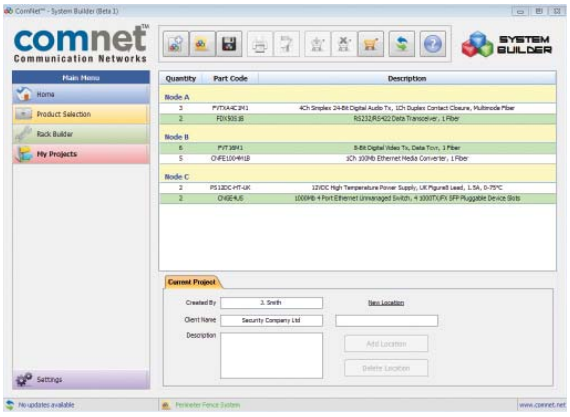
This easy – to-use program allows the user many different ways to choose the right ComNet product for their application.

Choose by application…

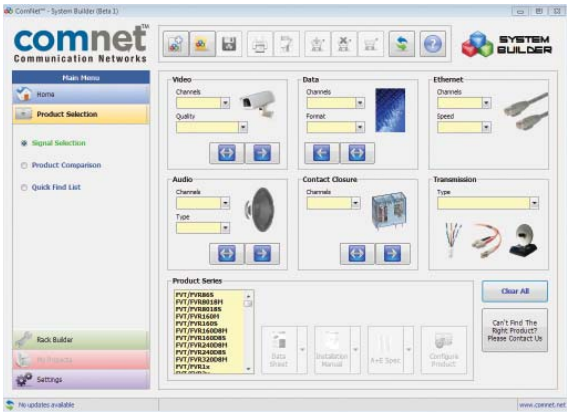


Choose by competitive part number equivalent…

Create a product list by location…



Or choose by the type of signal you need to transmit.



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## COMMUNICATION NETWORKS LLC, (D.B.A. COMNET) TERMS AND CONDITIONS OF SALE

**1.) Acceptance.** Any purchase order received by ComNet shall be construed as a written acceptance of ComNet's offer to sell goods. The contract created by such acceptance is expressly limited to the terms and conditions contained herein. Notwithstanding any subsequent performance by ComNet, no additional terms or conditions contained in a purchase order or other document delivered by Buyer, except as assented to in writing by ComNet shall be deemed to be part of said contract.

**2.) Delivery.** Delivery shall occur, and risk of loss shall pass to buyer upon delivery of the goods to a carrier at the point of shipment, which, unless otherwise specified, shall be ComNet factory in Danbury, Connecticut. Transportation shall be at Buyer's sole risk and expense, and any claim for loss or damage in transit shall be against the carrier only. Date of delivery is determined from the date of ComNet's receipt of Buyer's purchase order and is an estimate of the approximate date of delivery, but not a guarantee of a particular date of delivery. ComNet shall be excused from any prohibition, failure, interruption or delay in manufacture or delivery which may be occasioned by sabotage, fire, flood, explosion, labor dispute, strike, work stoppage, riot, insurrection, war, act of, or priorities granted by request of or for the benefit directly or indirectly, of any government body, authority or agency, shortage of raw materials or supplies, act of God, or of any other cause beyond ComNet's control. In the event of any such prohibition, failure, interruption, or delay, ComNet may cancel the order in whole or in part. IN NO EVENT SHALL COMNET BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES OR CLAIMS RESULTING FROM FAILURE OR DELAYING DELIVERY.

**3.) Payment.** The terms of payment for each order shall be net cash within 30 days from the date of invoice. Payments shall be made in United States dollars. The unpaid portion of any amounts due to ComNet shall bear interest at the rate of 1.5% per month simple interest.

**4.) Limited Lifetime Warranty.** (a) Seller warrants to the original End User that products and any services furnished hereunder will be free from defects in material and workmanship as of the date of delivery, and will conform to Seller's published technical specifications. The foregoing shall apply only to failures to meet said warranties which appear within that period of time during which the Products are installed in their original installation for the original End User and operator of such Products; provided, however, that in the event of product discontinuance, warranty support is limited to five (5) years from the announcement of discontinuance. Notwithstanding the preceding sentence, the duration of the warranty period for products not manufactured by Seller (e.g., fiber optic cabling, test equipment, power supplies or batteries) shall be the warranty period offered by the original manufacturer, if any. (b) The conditions of any tests shall be mutually agreed upon and Seller shall be notified of, and may be represented at, all tests that may be made. The warranties and remedies set forth herein are conditioned upon (a) proper storage, installation, use and maintenance, and conformance with any applicable recommendations of Seller and (b) Buyer promptly notifying Seller of any defects and, if required, promptly making the product available for correction. (c) If any product or service fails to meet the foregoing warranties, Seller shall thereupon correct any such failure either at its option, (i) by repairing any defective or damaged product or parts of the products, or (ii) by making available any necessary repaired or replacement products or parts thereof. Any repaired or replacement part or product shall be warranted for the remaining period of the original Warranty Period. Seller shall pay, or credit Buyer for, the cost of freight for all return shipments of products or parts to Buyer. Where a failure cannot be corrected by Seller's reasonable efforts, the parties will negotiate an equitable adjustment in price. (d) The preceding paragraph sets forth the exclusive remedies for claims based on defect in or failure of products or services, whether the claim is in contract, indemnity, warranty, tort (including Seller's negligence), strict liability or otherwise and however instituted. Upon the expiration of the warranty period, all such liability shall terminate and BUYER shall have a reasonable time, within thirty days after the warranty period, to give written notice of any defects which appeared during the warranty period. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. NO IMPLIED OR STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY. Seller does not warrant any products or services of others, which BUYER has designated. To obtain warranty service, you must first call ComNet and speak to a qualified service representative. If a return of product is deemed necessary, a Return Merchandise Authorization number (RMA#) will be issued. Upon receiving a RMA#, the product must be shipped back in either its original packaging or packaging affording an equal degree of protection back to ComNet. This warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, or modification of, or to any part of the Product. This warranty does not cover damage due to improper operation or maintenance, connection to improper voltage supply, or attempted repair by anyone other

than a facility authorized by ComNet to service the product. Repair or replacement as provided under this warranty is the exclusive remedy of the consumer. ComNet shall not be liable for any incidental or consequential damages for breach of any express or implied warranty on this product. Except to the extent prohibited by applicable law, any implied warranty of merchantability or fitness for a particular purpose on this product is limited in duration to the duration of this warranty. This warranty only covers the first user of the equipment.

5.) **Changes and Cancellations.** ComNet reserves the right to make changes in design or additions to or improvements in its products without liability or obligation to make equivalent changes in products previously manufactured. All prices, extras, and applicable freight or transportation rates are subject to change, without notice, to reflect ComNet's prices, extras and applicable freight or transportation rates, in effect as of the date of shipment. Buyer may, in writing, request changes in methods of shipping and packaging, schedule and place of delivery, subject to appropriate adjustments in price and time of delivery. An order cannot otherwise be modified or cancelled by the Buyer without the written consent of ComNet, and, in no event, shall any order be modified or cancelled by Buyer without the written consent of ComNet, and in no event, shall any order be modified or cancelled for any portion thereof already manufactured, or in process of manufacture at the time when request for modification or cancellation is received by ComNet, except upon terms satisfactory to ComNet, which shall protect and indemnify ComNet against all loss incurred as a result of such modification or cancellation.

6.) **Taxes.** Any excise, levy or tax which ComNet is required to pay or collect, under any existing or future law or regulation (domestic or foreign), upon or with respect to the sale, purchase, delivery, storage, processing, use, consumption, or transportation of any of the goods covered hereby, shall be for account of Buyer, who agrees to pay the amount thereof to ComNet upon request.

7.) **Legal Requirements.** ComNet intends to comply with all Federal, State, and local laws or regulations applicable to the performance by ComNet hereunder, provided, however, that any failure of ComNet to so comply shall not be a defense to, or excuse Buyer from, performance by Buyer hereunder.

8.) **Further Assurances.** ComNet may, at any time, suspend performance of any order or require payment in cash security or other adequate assurance satisfactory to ComNet when, in ComNet's opinion, the financial condition of Buyer, or other grounds for insecurity, warrants such action. The failure or refusal of Buyer to provide such assurance within ten (10) days after request by ComNet will constitute a sufficient basis for cancellation of the order by ComNet.

9.) **Patent Indemnification.** ComNet will defend, protect, and save Buyer harmless from and against any loss or expense (including reasonable attorney's fees) Incident to any claimed infringement against any patent or trademark due to the characteristics of any goods or parts thereof designed and manufactured by ComNet, provided the Buyer shall give ComNet prompt notice of any claim of infringement and complete authority to defend, settle, or compromise said claim. Buyer will defend, protect, and save ComNet harmless from and against any loss or expense incident to any claimed infringement of any patent or trademark arising out of (A) the manufacture, use, or sale of any goods or parts thereof which are manufactured by ComNet in accordance with design criteria furnished by the buyer, (B) the use of goods in combination with goods not reasonably contemplated by ComNet, and (C) the use of goods, or any part thereof, and a manner not reasonably contemplated by ComNet. ComNet's liability for damages hereunder is limited to the value of goods sold to the Buyer hereunder with respect to which such infringement is alleged, and, in no event, shall ComNet be liable for any consequential or incidental damages. The above is in lieu of any other indemnity or warranty, express or implied, with respect to patents, trademarks, or copyrights.

10.) **Assignment.** Neither the rights nor the obligations of either party hereunder are assignable in whole or in part without the prior written consent of the other party.

11.) **Governing Law.** This agreement shall be governed in accordance with the laws of the State of Connecticut.

12.) **Restocking Fee.** -25% will be charged for all returned items.

## RETURN POLICY

0 – 30 Days: Unopened, unused and in original cartons, no restocking fee.
30 – 60 Days: 25% restocking fee.
60 Days and Over: Non-Returnable

PLEASE NOTE: Special Orders and Single Mode Units are Non-Returnable.

RETURN REQUIREMENTS: All merchandise must be in the original packaging including all manuals, accessories, etc. with the return authorization number (RMA#) clearly printed on the outside of the package, or it will be returned. Return requests must be made within 30 days of our invoice date.

**Return for Credit Procedure**

1. All returns for credit require an RMA# and original purchase order number. RMA numbers are valid for 30 days, and product must be received at ComNet factory within this 30 day period. After 30 days the RMA# becomes void, and any equipment received after that original 30 days will be returned to the customer at their expense.

2. Product returns without an authorized RMA# listed on the outside of the carton will not be accepted, and returned to the customer at their expense.

3. Once the RMA 30 day return period expires, customer must request a new RMA#, and will incur a 25% restocking fee.

4. All returns will be credited to customer's account minus any applicable shipping charges and restocking fee.

**Return for Service Procedure**

1. All requests for the return of product for repair are directed to the ComNet Tech Support Department for authorization.

2. Requests for advance replacements must be authorized by a ComNet Tech Support application engineer, after he determines that there is a problem with the product.

3. All product returns require a RMA number, which must appear on the outside of the carton, or shipment will not be accepted and returned to the customer at their expense.

4. All returns require a packing list noting the following information:
   - Product model number
   - Details of defect or malfunction
   - Ship-to address
   - Contact person and phone number

5. All product returns must ship freight prepaid to ComNet. Collect shipments will not be accepted unless authorized in advance.

6. Products found to have no defects or non-related to factory defects are subject to service charge.

7. Return of shipment will be freight prepaid by ComNet direct to the sender by the same method as the product was received.

8. If advance replacement was authorized, upon receipt of replaced product, the customer shall return the defective unit within one week under the same RMA number to close out the RMA.

9. All RMA numbers remain valid up to 30 days from date of issue.

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## INDEX, CONT'D

# Introducing ComFit Technology


**The First Interchangeable Fiber Optic Product Line**
Inserted in a rack or stand-alone mounted, one product, one model – no differences.

**The ComFit Advantage**

- Reduces Inventory Required
- Eliminates On-Site Model Confusion
- Eases Ordering Process

At ComNet, Communications Networks, we offer a complete line of fiber optic video, audio, data, and hardened Ethernet communications equipment. Applications include CCTV Surveillance, Access Control, Intrusion, Alarm and Ethernet networking.

## TECHNICAL ENGINEERING SUPPORT

ComNet offers free system design and engineering applications support. Our Technical Support department is staffed by some of the most highly experienced, regarded and recognized experts in the industry. ComNet Technical Support is there 24/7. Call us today at 1-888-678-9427 and see where the ComNet difference lies.

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3 CORPORATE DRIVE | DANBURY, CT 06810 | USA
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8 TURNBERRY PARK ROAD | GILDERSOME | MORLEY | LEEDS, UK LS27 7LE
T: +44 (0)113 307 6400 | F: +44 (0)113 253 7462 | INFO-EUROPE@COMNET.NET


1-1 0110