# DIVISION 28 23 23 VT/VR71230 SERIES – FIBER OPTIC

**TRANSMITTER AND RECEIVER**

**ENGINEERING SPECIFICATIONS**

**PART 1 - GENERAL**

* 1. SUMMARY

A. Fiber Optic Digital 12 Channel Video Multiplexing System

* 1. SECTION INCLUDES

1. VT/VR71220-R3 Digital 12 Channel Video Multiplexing System - Rack Mount
2. VT/VR71230-R3 Digital 12 Channel Video

Multiplexing System - Rack Mount

* 1. REFERENCES

1. Underwriters Laboratory (UL)
2. Underwriters Laboratory Canada (ULC)
3. European Union Compliance (CE)
   1. SYSTEM DESCRIPTION
4. Performance Requirements: Provide a Digital 12 Channel Video Multiplexing System.
   1. The system shall utilize 1310/1550nm optics capable of multiplexing 12 channels of

video on one Multi mode optical fiber. (VT/VR71220-R3)

* 1. The system shall utilize 1310/1550nm optics capable of multiplexing 12 channels of

video on one single mode optical fiber. (VT/VR71230-R3)

* 1. SUBMITTALS

1. Product Data: Manufacturer’s printed product data sheet for each type of Transmitter/Receiver

specified.

1. Detail Drawings: Electrical and optical connect drawings. Product mounting template.
2. Manufacturer’s Installation and Operating Manual: Printed installation and operating

information for each type of Transmitter/Receiver specified.

1. Test Reports: Manufacturer’s Printed Test Report via a Tektronics VM700A Video Test

Generator verifying product performance meets or exceeds the specified product performance

referenced in Part 2.

1. Warranty: Manufacturer’s Printed Warranty
   1. DELIVERY, STORAGE AND HANDLING
2. Deliver materials in unopened factory packaging with Manufacturer’s bar coding to the job site.
3. Inspect product upon delivery to assure that

specified products have been received.

1. Store in original packaging in a climate controlled environment. Storage Temperature

not to exceed: -40˚ C to +85˚ C

* 1. PROJECT/SITE CONDITIONS

1. Temperature Requirements: Products shall operate in an environment with an ambient temperature range of –40˚ C to +74˚ C without the assistance of fan-forced cooling.
2. Humidity Requirements: Products shall operate in an environment with relative humidity of 0%

to 95% (non-condensing). If product is installed in condensation conditions, unit shall have conformal coating applied to the printed circuit board.

* 1. WARRANTY

A. Standard International Fiber Systems Comprehensive Lifetime Warranty: IFS

warrants the product to be free of factory defects

under manufacture’s Lifetime Warranty as submitted under article 1.05 (E)

# PART 2 - PRODUCTS

* 1. MANUFACTURER

1. Acceptable Manufacturer: International Fiber Systems, Inc.; 16 Commerce Road, Newtown,

CT 06470 USA; Telephone: 203-426-1180; Fax

203-426-3326; Email: sales@ifs.com; Internet:

[www.ifs.com](http://www.ifs.com/)

1. Substitutions: Not Permitted
2. All fiber optic modules shall be supplied from a single manufacturer.
   1. MANUFACTURED UNITS
3. Model Number Descriptions: Reference Table A: Product Number Descriptions
4. Model Compatibility Chart: Reference Table B: Product Compatibility Chart
   1. GENERAL SPECIFICATIONS

A. The digital 12-channel video multiplexing system shall be an IFS VT/VR71230-R3. The rack

mount unit shall be capable of multiplexing 12

channels of full color video in real time in NTSC, PAL or SECAM formats on one single mode fiber optic cable or one multimode fiber optic cable (VT/VR71220). The rack mount unit shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation. The modules shall utilize state – of – the – art 8 – bit digital encoding and decoding for high quality video transmission that exceeds the requirements of EIA RS-250C for medium-haul video transmission. The modules shall provide power, optical carrier detect / link – lock, video input sync presence (for each channel), video output sync presence (for each channel) status indicating LED’s for monitoring proper system operation. The modules shall provide automatic re- settable solid-state current limiters and independent voltage regulators on each module to reduce the chance of a single point failure of the system. The module shall be hot swappable in a rack mount system to reduce complete system shut down during maintenance or repair. The module shall have an MTBF of >100,000 hours and operate in an environment of –40˚ C to +74˚ C and relative humidity between 0% to 95% (non-condensing). The module shall be UL and ULC listed and CE marked. The circuit board shall be UL 94 flame rated and meet all PCI standards. All PC boards shall be designated with part number, PC board number and show appropriate revision number. Housing shall be of all metal construction. All LED indicators and both electrical and mechanical connections shall be

identified with silk-screened labels. The module shall have a lifetime warranty to reduce system life cycle cost in an event of a module failure.

* 1. VIDEO SPECIFICATIONS

1. Input Video: 1 volt pk-pk (75 ohms)
2. # of input/output channels: 12
3. Bandwidth: 10 Hz – 6.5 MHz (10 MHz video bandwidth per channel optionally available)
4. Differential Gain: < 2 %
5. Differential Phase: < 0.7 °
6. Tilt: <1%
7. Signal/Noise Ratio: 60 dB @ maximum optical loss budget
   1. OPTICAL SPECIFICATIONS
8. IFS Model Number VT/VR71230-R3
   1. Optical Fiber: 9/125 micron single mode
   2. Number of Fibers Required: 1
   3. Optical Wavelength: 1310/1550nm
   4. Optical Power Budget: 10 dB
   5. Optical Attenuation: No manual adjustments required
9. IFS Model Number VT/VR71220-R3
10. Optical Fiber: 62.5/125 micron single mode
11. Number of Fibers Required: 1
12. Optical Wavelength: 1310/1550nm
13. Optical Power Budget: 6 dB
14. Optical Attenuation: No manual adjustments required
    1. STATUS INDICATORS
15. Power: On/Green – Off/Off
16. Video Input Sync Presence: Input Sync Present/Green – No Input Sync Present/Off
17. Video Output Sync Presence: Output Sync Present/Green – No Output Sync Present/Off
18. Optical Carrier Detect: Carrier Active/Yellow – No Carrier/Off
    1. CONNECTORS
19. Optical: ST (SC or FC optional)
20. Power: Terminal Block with Screw Clamps
21. Video: BNC (Gold Plated Center PIN)
    1. ELECTRICAL SPECIFICATIONS
22. Power: 115/230VAC
23. Current Protection: Automatic re-settable solid- state current limiters
24. Voltage Regulation: Solid-state, Independent on each board
25. Circuit Board: UL 94 flame rated and meets all PCI standards.
26. Rack mount Card: Shall be hot-swappable with IFS Model Number R3 (EIA 19” card cage)
    1. MECHANICAL SPECIFICATIONS
27. Rack Mount Dimensions: 19” x 7.0” x 5.3” (48.3 cm x 17.8 cm x 13.3 cm)
28. Number of Rack Slots: 6
29. Finish. Rack mount units shall be constructed of anodized aluminum.
30. Weight: <12.0 lbs./5.4kg
    1. ENVIRONMENTAL SPECIFICATIONS
31. MTBF: >100,000 Hours
32. Operating Temp: –40˚ C to +74˚ C
33. Storage Temp: -40˚ C to +85˚ C
34. Relative Humidity: 0% to 95% (non- condensing). If product is installed under condensation conditions, unit shall have conformal coating applied to the printed circuit board. (Add –C to model number for conformal coated printed circuit board)
    1. REGULATORY AGENCIES/APPROVALS AND LISTINGS
35. Underwriters Laboratory (UL) Listing Number:

I.T.E. 6D16

1. Underwriters Laboratory Canada (ULC) Listing Number: I.T.E. 6D16
2. UL 94-flame rated PCB board: 94VO

D.

* 1. ACCESSORIES

1. Card Cage: IFS Model Number R3 (EIA 19” card cage) shall be available to house and power rack mount modules.
2. Blank Panels: IFS Model Number R3-BP shall be available to cover unused rack slots.

# PART 3 - EXECUTION

* 1. EXAMINATION

1. Inspect modules before installation.
2. Modules shall be free of any cosmetic defects or damage.
3. All optical connectors shall be covered with dust caps and remain on the module until installing

cable connectors to module.

1. Shipping box shall include the module, power supply and operations manual.
   1. PREPARATION
2. Rack Mount Module (19” Rack)
   1. Shall be installed in the IFS Model Number R3 card cage. Ensure the card cage is

installed in a standard EIA 19” (482.6 mm)

rack or wall standoff bracket adequate for the size and weight of the card cage. The placement of the unit shall allow provision for cable installation and maintenance as indicated on the approved detail drawings and in compliance with the IFS installation manual.

1. Optical Fibers
   1. Caution: NEVER look into the end of an active optical fiber when using laser light output. Eye damage can occur. Wear eye protection when cleaving, terminating, and splicing fiber.
   2. The number and type (multimode or single- mode) of optical fiber shall meet the

requirements of the IFS model number in

article 2.05 used in the installation.

* 1. All optical fiber cables shall be properly installed and terminated with the mating

optical connectors as submitted in article

2.07 (A).

* 1. The optical link shall be tested with either a power meter, at a minimum, or OTDR to

ensure the link budget (overall path loss) plus an added 3dB of optical safety margin does not exceed the optical power budget as submitted in article 2.05.

* 1. All optical connectors on cable shall be cleaned in compliance to optical connector manufactures specifications and covered with dust caps until connection to the fiber optic module.
  2. INSTALLATION

A. General: Locate fiber optic modules as indicated on the approved detail drawings and install module in compliance with the IFS installation and operations manual.

* 1. TESTING

1. Testing the Fiber Optic Video Link.
   1. Verify that the coax and optic fibers are properly connected.
   2. Make sure that power is applied to all fiber optic modules, camera, and video monitor or

other equipment used in the system.

* 1. The carrier detect indicator LED should be lit confirming a presence of a video signal.
  2. Successful video link operation should be visible at this point as witnessed by a good

quality video picture on the monitor.

1. Testing the Fiber Optic Data Link.
   1. Verify that the data leads and optical fibers are properly connected.
   2. Make sure that power is applied to all fiber optic modules, controllers, and receiver

drivers or other equipment used in the system.

* 1. Successful data link operation should be confirmed at this point by using the

controller to pan, tilt, and zoom the camera or communicate with other equipment.

* 1. CLEANING

1. Follow all instructions for proper use of solvents and adhesives used for termination and splicing.
2. At completion of the installation, dispose of all

fiber scraps properly.

# MANUFACTURED UNITS REFERENCE TABLES

Table A: Product Number Descriptions

# VT71230 SERIES DESCRIPTION MAX\* DISTANCE

VT71230-R3 SM Video – 1310/1550 1 Fiber, Rack Mount

VT71220-R3 MM Video – 1310/1550 1 Fiber, Rack Mount

25 Miles (40 km)

1.2 Miles (2 km)

\* Maximum distance is limited to optical loss of the fiber and any additional loss by connectors, splices and patch panels.

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| **VR71230 SERIES** | **DESCRIPTION** |
| VR71230-R3 | SM Video/Data – 1310/1550, 1 Fiber, Rack Mount |
| VR71220-R3 | MM Video/Data – 1310/1550, 1 Fiber, Rack Mount |

Table B: Product Compatibility Chart

# TRANSCEIVER COMPATIBLE TRANSCEIVER

VT71230-R3 VR71230-R3

VT71220-R3 VR71220-R3

# END OF SECTION