# DIVISION 28 23 23 VT/VR7400SERIES – FIBER OPTIC TRANSMITTER AND RECEIVER ENGINEERING SPECIFICATIONS

**PART 1 - GENERAL**

* 1. SUMMARY

A. Fiber Optic Digital 4 Channel Video Multiplexing System

* 1. SECTION INCLUDES

1. VT/VR7400 Digital 4 Channel Video Multiplexing System – Standalone
2. VT/VR7400-R3 Digital 4 Channel Video

Multiplexing System - Rack Mount

* 1. REFERENCES

1. Underwriters Laboratory (UL)
2. Underwriters Laboratory Canada (ULC) C.
   1. SYSTEM DESCRIPTION
3. Performance Requirements: Provide a Digital 4 Channel Video Multiplexing System.
   1. The system shall utilize 1300nm optics capable of multiplexing 4 channels of video on one multimode optical fiber. (VT/VR7420)
   2. The system shall utilize 1300nm optics

capable of multiplexing 4 channels of video on one single mode optical fiber. (VT/VR7430)

* 1. The system shall utilize 1300nm optics capable of multiplexing 4 channels of video on one single mode optical fiber. (VT7430- HP/VR7430)
  2. The system shall utilize 1550nm optics capable of multiplexing 4 channels of video on one single mode optical fiber. (VT/VR7450, VT7450-HP/VR7450)
  3. SUBMITTALS

1. Product Data: Manufacturer’s printed product data sheet for each type of Transmitter/Receiver specified.
2. Detail Drawings: Electrical and optical connect

drawings. Product mounting template.

1. Manufacturer’s Installation and Operating Manual: Printed installation and operating information for each type of Transmitter/Receiver specified.
2. 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.
3. Warranty: Manufacturer’s Printed Warranty
   1. DELIVERY, STORAGE AND HANDLING
4. Deliver materials in unopened factory packaging with Manufacturer’s bar coding to the job site.
5. 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
2. 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.
3. Humidity Requirements: Products shall operate in an environment with relative humidity of 0% to 95% (non-condensing). If product is installed in condensation conditions, Add –C to the part number 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 4-channel video multiplexing system shall be an IFS VT/VR7400 series module. The module shall be capable of multiplexing 4 channels of full color video in real time in NTSC, PAL or SECAM formats. The module 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 overload (for each channel), video input sync presence (for each channel), video output overload (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

|  |
| --- |
| **Deleted:** – |
| **Deleted:** – |
| **Deleted:** – |
| **Deleted:** and |
| **Deleted:** |
| **Deleted:** 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. |

Project name/project number/date 00000 - 1 Section Title (Optional information, e.g., owner, A/E)

a lifetime warranty to reduce system life cycle cost in an event of a module failure.

* 1. VIDEO SPECIFICATIONS

1. # of Input/Output channels: 4
2. Input Video: 1 volt pk-pk (75 ohms)
3. Bandwidth: 10 Hz – 6.5
4. Differential Gain: < 2 % E. Differential Phase: < 0.7 ° F. Tilt: <1%

A. Signal/Noise Ratio: 60 dB @ maximum optical loss budget

* 1. OPTICAL SPECIFICATIONS

1. IFS Model Number VT/VR7420
   1. Optical Fiber: 62.5/125 micron multimode
   2. Number of Fibers Required: 1
   3. Optical Wavelength: 1300nm
   4. Optical Emitter Type: 1300nm Laser
   5. Optical Detector Type: 1300nm PIN DIODE
   6. Optical Power Budget: 12 dB
   7. Optical Attenuation: No manual adjustments required
2. IFS Model Number VT/VR7430
3. Optical Fiber: 9/125 micron single mode
4. Number of Fibers Required: 1
5. Optical Wavelength: 1300nm
6. Optical Emitter Type: 1300nm Laser
7. Optical Detector Type: 1300nm PIN DIODE
8. Optical Power Budget: 20 dB
9. Optical Attenuation: No manual adjustments required
10. IFS Model Number VT7430/VR7430-HP
11. Optical Fiber: 9/125 micron single mode
12. Number of Fibers Required: 1
13. Optical Wavelength: 1300nm
14. Optical Emitter Type: 1300nm Laser
15. Optical Detector Type: 1300nm PIN DIODE
16. Optical Power Budget: 26 dB
17. Optical Attenuation: No manual adjustments required
18. IFS Model Number VT/VR7450
19. Optical Fiber: 9/125 micron single mode
20. Number of Fibers Required: 1
21. Optical Wavelength: 1550nm
22. Optical Emitter Type: 1550nm Laser
23. Optical Detector Type: 1300nm PIN DIODE
24. Optical Power Budget: 20 dB
25. Optical Attenuation: No manual adjustments required
26. IFS Model Number VT7450-HP/VR7450
27. Optical Fiber: 9/125 micron single mode 30. Number of Fibers Required: 1
28. Optical Wavelength: 1550nm
29. Optical Emitter Type: 1550nm Laser
30. Optical Detector Type: 1300nm PIN DIODE 34. Optical Power Budget: 27 dB

35. Optical Attenuation: No manual adjustments required

* 1. STATUS INDICATORS

1. Power: On/Green – Off/Off
2. Video Input Sync Presence: Input Sync Present/Green – No Input Sync Present/Off
3. Video Input Overload: Video Input Overload/Green – No Video Input Overload/Off
4. Video Output Sync Presence: Output Sync Present/Green – No Output Sync Present/Off
5. Video Output Overload: Video Output Overload/Green – No Video Output Overload/Off
6. Optical Carrier Detect: Carrier Active/Yellow – No Carrier/Off
7. Audio level: Green when present?????????????
   1. CONNECTORS
8. Optical: ST (SC or FC optional)
9. Power: Terminal Block with Screw Clamps
10. Video: BNC (Gold Plated Center PIN)
11. Audio: Terminal Block with Screw Clamps
    1. ELECTRICAL SPECIFICATIONS

A. Power Surface Mount: 12VDC @ 500 mA B. Power ,Rack: From rack

1. Current Protection: Automatic re-settable solid- state current limiters
2. Voltage Regulation: Solid-state, Independent on each board
3. Circuit Board: UL 94 flame rated and meets all PCI standards.
4. Rack mount Card: Shall be hot-swappable with IFS Model Number R3 (EIA 19” card cage)
   1. MECHANICAL SPECIFICATIONS
5. Surface Mount Dimensions:

VT: 7.0” x 4.9” x 3.0” (17.80 cm x 12.5 cm x

7.5 cm)

1. Rack Mount Dimensions: 7.7” x 5.0” x 3.0” (19.6cm x 12.70 cm x 7.5 cm)
2. Number of Rack Slots: 3
3. Finish: Module shall be constructed of a metal enclosure with a powder coat finish model Number F63B12 with all connections and indicators silk-screened directly on unit. Rack mount units shall be constructed of anodized aluminum.
4. Weight: <2.0 lbs./0.9kg
   1. ENVIRONMENTAL SPECIFICATIONS
5. MTBF: >100,000 Hours
6. Operating Temp: –40˚ C to +74˚ C
7. Storage Temp: -40˚ C to +85˚ C
8. 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

# Underwriters Laboratory (UL) Listing Number: I.T.E. 6D16

1. **Underwriters Laboratory Canada (ULC)**

**Listing Number: I.T.E. 6D16**

C. UL 94-flame rated PCB board: 94VO

# D.

**Formatted:** Bullets and Numbering

**Deleted:** MHz (10 MHz video bandwidth per channel optionally available)

**Formatted:** Bullets and Numbering

**Formatted:** Bullets and Numbering

**Deleted: 05**

**Formatted:** Bullets and Numbering

**Formatted:** Bullets and Numbering

|  |
| --- |
| **Deleted:** 1 |
| **Deleted:** 1 |
| **Deleted:** 18.00 |
| **Deleted:** 45 |
| **Deleted:** 2.54 |
| **Deleted:** VR: 7.1” x 4.9” x 2.0” (18.00 cm  x 12.45 cm x 5.08 cm) |
| **Deleted:** 2 |
| **Deleted:** 56 |
| **Deleted:** 5.08 |
| **Deleted:** 2 |
| **Deleted:** 1. |
| **Deleted:** 0 |

**Formatted:** Bullets and Numbering

Section Title 00000 - 2 Project name/project number/date (Optional information, e.g., owner, A/E)

* 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.
4. Shipping box shall include the module, power

supply and operations manual.

* 1. PREPARATION

1. Standalone Module (Surface Mount)
   1. Shall be mounted on a properly prepared surface adequate for the size and weight of module. 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 mounting template and installation manual.
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.
3. 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.
   3. 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.
  2. 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.
  3. 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.
   3. The carrier detect indicator LED should be lit confirming a presence of a video signal.
   4. Successful video link operation should be

visible at this point as witnessed by a good quality video picture on the monitor.

* 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.

Project name/project number/date 00000 - 3 Section Title (Optional information, e.g., owner, A/E)

# MANUFACTURED UNITS REFERENCE TABLES

Table A: Product Number Descriptions

|  |  |  |
| --- | --- | --- |
| **VT7400 SERIES** | **DESCRIPTION** | **MAX\* DISTANCE** |
| VT7420 VT7420-R3 VT7430 | MM Video – 1300 > 1 Fiber  MM Video – 1300 > 1 Fiber, Rack Mount SM Video – 1300 > 1 Fiber | 0.63 Miles (1 km)  0.63 Miles (1 km)  38 Miles (60 km) |
| VT7430-R3 VT7430-HP | SM Video – 1300 > 1 Fiber, Rack Mount SM Video – 1300 > 1 Fiber | 38 Miles (60 km)  48 Miles (78 km) |
| VT7430-HP-R3 VT7450 VT7450-R3 VT7450 -HP | SM Video – 1300 > 1 Fiber, Rack Mount SM Video – 1550 > 1 Fiber  SM Video – 1550 > 1 Fiber, Rack Mount  SM Video – 1550 > 1 Fiber | 48 Miles (78 km)  50 Miles (80 km)  50 Miles (80 km)  67 Miles (108 km) |
| VT7450-HP-R3 | SM Video – 1550 > 1 Fiber, Rack Mount | 67 Miles (108 km) |

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

panels.

# VR7400 SERIES DESCRIPTION

VR7420 MM Video – 1300 > 1 Fiber

VR7420-R3 MM Video – 1300 > 1 Fiber, Rack Mount

VR7430 SM Video – 1300 > 1 Fiber

VR7430-R3 SM Video – 1300 > 1 Fiber, Rack Mount

VR7450 SM Video – 1550 > 1 Fiber

VR7450-R3 SM Video – 1550 > 1 Fiber, Rack Mount

Table B: Product Compatibility Chart

# TRANSMITTER COMPATIBLE RECEIVER

VT7420 VR7420, VR7420-R3

VT7420-R3 VR7420, VR7420-R3

VT7430 VR7430, VR7430-R3

VT7430-R3 VR7430, VR7430-R3

VT7430-HP VR7430, VR7430-R3

VT7430-HP-R3 VR7430, VR7430-R3

VT7450 VR7450, VR7450-R3

VT7450-R3 VR7450, VR7450-R3

VT7450-HP VR7450, VR7450-R3

VT7450-HP-R3 VR7450, VR7450-R3

# END OF SECTION

Section Title 00000 - 4 Project name/project number/date (Optional information, e.g., owner, A/E)