# DIVISION 28 23 23 VAT/VAR1200SERIES – FIBER OPTIC TRANSMITTER AND RECEIVER ENGINEERING SPECIFICATIONS

**PART 1 - GENERAL**

* 1. SUMMARY

A. Fiber Optic AM Video and Audio Transmitter and Receiver System

* 1. SECTION INCLUDES

1. VAT/VAR1200 AM Video and Audio Transmitter and Receiver System – Standalone
2. VAT/VAR1200-R3 AM Video and Audio

Transmitter and Receiver 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 an AM Video and Audio Transmitter and Receiver System.
   1. The system shall utilize 850nm optics capable of transmitting and receiving a

video and audio signal on one multimode

optical fiber. (VAT/VAR1210)

* 1. 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.
3. 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 Audio 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.
4. 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. Provide fiber optic modules shall be supplied from a single manufacture.
   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 AM video and audio transmitter and receiver system shall be an IFS VAT/VAR1200

series module. The module shall require no in-field

electrical or optical adjustments or in-line attenuators to ease installation. The module shall transmit the video and audio and using amplitude modulation of the optical signal. The module shall provide power or power and carrier detect 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.

**2.04(A)** VIDEO SPECIFICATIONS

1. Input: 1 volt peak- to - peak
2. Bandwidth: 5 Hz – 10 MHz
3. Differential Gain: <5%
4. Differential Phase: <5
5. Tilt: <1%

**2.04(B)** AUDIO SPECIFICATIONS

1. Input/Output: 2.2 volts peak- to - peak
2. Bandwidth: 300 Hz – 5 KHz
3. Total Harmonic Distortion: <1%
4. Signal/Noise Ratio: 60dB
   1. OPTICAL SPECIFICATIONS
5. IFS Model Number VAT/VAR1200
   1. Optical Fiber: 62.5/125 micron multimode
   2. Number of Fibers Required: 1
   3. Optical Wavelength: 850nm
   4. Optical Emitter Type: 850nm LED
   5. Optical Detector Type: 850nm PIN DIODE
   6. Optical Power Budget: 14 dB
   7. Optical Attenuation: No manual adjustments required
   8. STATUS INDICATORS
6. Power: On/Red – Off/Off
7. Carrier Detect: Video Active/Yellow – No Video/Off
   1. CONNECTORS
8. Optical: ST
9. Power and Audio: Terminal Block with Screw Clamps
10. Video: BNC (Gold Plated Center-PIN)
    1. ELECTRICAL SPECIFICATIONS
11. Power: 24 VAC CT
12. Current Protection: Automatic re-settable solid- state current limiters
13. Voltage Regulation: Solid-state, Independent on each board
14. Circuit Board: UL 94 flame rated and meets all PCI standards.
15. Rack mount Card: Shall be hot-swappable with IFS Model Number R3 (EIA 19” card cage)
    1. MECHANICAL SPECIFICATIONS
16. Surface Mount Dimensions: 7.1” x 4.9” x 1.0”

(18.00 cm x 12.45 cm x 2.54 cm)

1. Rack Mount Dimensions: 7.7” x 5.0” x 1.0”

(19.56 cm x 12.70 cm x 2.54 cm)

1. Number of Rack Slots: 1
2. 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.
3. Weight: <2.0 lbs./1.0kg
   1. ENVIRONMENTAL SPECIFICATIONS
4. MTBF: >100,000 Hours
5. Operating Temp: –40˚ C to +74˚ C
6. Storage Temp: -40˚ C to +85˚ C
7. 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

1. 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
3. Card Cage: IFS Model Number R3 (EIA 19” card cage) shall be available to house and power

rack mount modules.

1. 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. 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.
3. 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.

* 1. 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 and video equipment used in the system.
   3. The carrier detect indicator LED should be lit confirming a presence of a video signal.
2. Testing the Fiber Optic Audio Link.
3. Verify that the coax and optic fibers are properly connected.
4. Make sure that power is applied to all fiber optic modules, pre-amplifiers amplifiers or

other equipment used in the system.

1. The carrier detect indicator LED should be lit confirming a presence of an audio signal.
   1. CLEANING
2. Follow all instructions for proper use of solvents and adhesives used for termination and splicing.
3. At completion of the installation, dispose of all fiber scraps properly.

# MANUFACTURED UNITS REFERENCE TABLES

Table A: Product Number Descriptions

|  |  |  |
| --- | --- | --- |
| **VAT1200 SERIES** | **DESCRIPTION** | **MAX. DISTANCE\*** |
| VAT1200 | MM Video/Audio – 850 > 1 Fiber | 2.5 Miles (4 km) |
| VAT1200-R3 | MM Video/Audio – 850 > 1 Fiber, Rack Mount | 2.5 Miles (4 km) |

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

panels.

# VAR1200 SERIES DESCRIPTION

VAR1200 MM Video/Audio – 850 > 1 Fiber

VAR1200-R3 MM Video/Audio – 850 > 1 Fiber, Rack Mount

Table B: Product Compatibility Chart

|  |  |  |
| --- | --- | --- |
|  | **TRANSMITTER** | **COMPATIBLE RECEIVER** |
| VAT1200 VAT1200-R3 |  | VAR1210, VAR1200-R3 VAR1210, VAR1200-R3 |

# END OF SECTION