# Division 27 50 00 AT/AR71600 SERIES – FIBER OPTIC

**TRANSMITTER AND RECEIVER**

**ENGINEERING SPECIFICATIONS**

**PART 1 - GENERAL**

* 1. SUMMARY
1. Fiber Optic Digital 16 Channel Audio Multiplexing System
	1. SECTION INCLUDES
2. AT/AR71600-R3 Series 16 Channel Audio Multiplexing System - Rack Mount
	1. REFERENCES
3. Underwriters Laboratory (UL)
4. Underwriters Laboratory Canada (ULC)
5. European Union Compliance (CE)
	1. SYSTEM DESCRIPTION
6. Performance Requirements: Provide a digital 16 Channel Audio Multiplexing System.
	1. The system shall utilize 1550nm optics capable of multiplexing 16 channels of

audio on one single-mode or multi-mode optical fiber. (AT/AR71630, AT/AR71620)

* 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 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.

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.

1. 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 digital16-channel audio multiplexing system shall be an IFS AT/AR71600 series. The module shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation. The module shall transmit the audio and using twenty bit digital encoding for superior transmission of balanced line level audio. The module shall provide power, optical lock and audio level (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 IPC 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. AUDIO SPECIFICATIONS
1. Input/Output: 4.4 volts peak- to – peak (+6dBm)
2. # input/output channels: 16 (balanced)
3. Bandwidth: 20 Hz – 18 KHz
4. Total Harmonic Distortion: 0.05%
5. Signal/Noise Ratio: 80 dB (min)
	1. OPTICAL SPECIFICATIONS
6. IFS Model Numbers AT/AR71630, AT/AR71620
	1. Optical Fiber: 9/125 micron single-mode
	2. Number of Fibers Required: 1
	3. Optical Wavelength: 1510/1530/1550/1570nm
	4. Optical Power Budget: 10 dB
	5. Optical Attenuation: No manual adjustments required
	6. STATUS INDICATORS
7. Power: On/Green – Off/Off
8. Optical Carrier received: Optical lock/Green – No Lock/Red
9. Electrical Audio Strength: Audio Green/No Red
	1. CONNECTORS
10. Optical: ST, Optional SC,FC
11. Power: Terminal Block with Screw Clamps
12. Audio: BNC(Gold plated center pin)
	1. ELECTRICAL SPECIFICATIONS
13. Power: From rack,
14. Current Protection: Automatic re-settable solid- state current limiters
15. Voltage Regulation: Solid-state, Independent on

each board

1. Circuit Board: UL 94 flame rated and meets all IPC standards.
2. Rack mount Card: Shall be hot-swappable with

IFS Model Number R3 (EIA 19” card cage)

* 1. MECHANICAL SPECIFICATIONS
1. Rack Mount Dimensions: 7.7” x 5.0” x 2.0”

(19.56 cm x 12.70 cm x 5.08 cm)

1. Number of Rack Slots: 5
2. Finish: Rack mount units shall be constructed of anodized aluminum.
3. Weight: <25 lbs./12kg
	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
8. 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.

* 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 Audio Link.
	1. Verify that the coax and optic fibers are properly connected.
	2. 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.
	2. 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

# AT71600 SERIES DESCRIPTION

AT71620-R3 MM Audio – 1510/1530/1550/1570 >, 1 Fiber

AT71630-R3 SM Audio – 1510/1530/1550/1570 >, 1 Fiber

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

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| **AR71600 SERIES** | **DESCRIPTION** |
| AR71620-R3 AR71630-R3 | MM Audio – 1510/1530/1550/1570 >, 1 Fiber, Rack Mount SM Audio – 1510/1530/1550/1570 >, 1 Fiber, Rack Mount |

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

panels.

Table B: Product Compatibility Chart

AT71620-R3 AT71630-R3

# TRANSMITTER COMPATIBLE RECEIVER

AR71620-R3 AR71630-R3

# END OF SECTION