# Division 27 50 00

**A2100 SERIES – FIBER OPTIC TRANSCEIVER ENGINEERING SPECIFICATIONS**

**PART 1 - GENERAL**

* 1. SUMMARY

A. Fiber Optic Audio Repeater

* 1. SECTION INCLUDES

A. A2100 Series Audio Repeater – Standalone

* 1. REFERENCES
1. Underwriters Laboratory (UL)
2. Underwriters Laboratory Canada (ULC)
3. European Union Compliance (CE)
	1. SYSTEM DESCRIPTION
4. Performance Requirements: Provide an Audio Repeater.
	1. The system shall utilize 850nm optics

capable of audio transmission on four multimode optical fibers. (A2100)

* 1. The system shall utilize 1300nm optics capable of audio transmission on four

multimode optical fibers. (A2120)

* 1. The system shall utilize 1300nm optics capable of audio transmission on four

single-mode optical fibers. (A2125)

* 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. 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. 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 Audio repeater system shall be an IFS A2100 series module. The module shall require

no in-field electrical or optical adjustments or in-

line attenuators to ease installation. The module shall provide power and carrier 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 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. Bandwidth: 20Hz – 20 KHZ
2. Input/Output: 2.2 volts peak – to - peak
3. Impedance: 600 ohms
	1. OPTICAL SPECIFICATIONS
4. IFS Model Number A2100
	1. Optical Fiber: 62.5/125 micron multimode
	2. Number of Fibers Required: 4
	3. Optical Wavelength: 850nm
	4. Optical Emitter Type: 850nm LED
	5. Transmitter Output Power: 20µw (-17 dB)
	6. Optical Detector Type: 850nm PIN DIODE
	7. Receiver Sensitivity: 0.5µw (-33 dB)
	8. Optical Power Budget: 16 dB
	9. Optical Attenuation: No manual adjustments required
5. IFS Model Number A2120
	1. Optical Fiber: 62.5/125 micron multimode
	2. Number of Fibers Required: 4
	3. Optical Wavelength: 1300nm
	4. Optical Emitter Type: 1300nm LED
	5. Transmitter Output Power: 20µw (-17 dB)
	6. Optical Detector Type: 1300nm PIN DIODE
	7. Receiver Sensitivity: 0.5µw (-33 dB)
	8. Optical Power Budget: 16 dB
	9. Optical Attenuation: No manual adjustments required
6. IFS Model Number A2125
	1. Optical Fiber: 9/125 micron single-mode
	2. Number of Fibers Required: 4
	3. Optical Wavelength: 1300nm
	4. Optical Emitter Type: 1300nm LED
	5. Transmitter Output Power: 25µw (-16 dB)
	6. Optical Detector Type: 1300nm PIN DIODE
	7. Receiver Sensitivity: 0.5µw (-33 dB)
	8. Optical Power Budget: 17 dB
	9. Optical Attenuation: No manual adjustments required
	10. STATUS INDICATORS
7. Power: On/Red – Off/Off
8. Carrier Detect: Carrier Detected/Yellow – No Carrier Detected/Off
	1. CONNECTORS
9. Optical: ST
10. Power and Audio: Terminal Block with Screw Clamps
	1. ELECTRICAL SPECIFICATIONS
11. Power: 12VDC
12. Current Protection: Automatic re-settable solid- state current limiters
13. Voltage Regulation: Solid-state, Independent on

each board

1. Circuit Board: UL 94 flame rated and meets all IPC standards.
	1. MECHANICAL SPECIFICATIONS
2. Surface Mount Dimensions: 7.1” x 4.9” x 2.0”

(18.0 cm x 12.45 cm x 5.08 cm)

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

# 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. 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 Audio Link.
	1. Verify that the Audio leads and optical 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.
	3. Successful Audio link operation should be confirmed at this point.
	4. 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

# MAX. DISTANCE\*

|  |  |
| --- | --- |
| **A2100 SERIES** | **DESCRIPTION** |
| A2100 | MM Audio – 850 <> Audio – 850, 4 Fibers |
| A2120 | MM Audio – 1300 <> Audio – 1300, 4 Fibers |
| A2125 | SM Audio – 1300 <> Audio – 1300, 4 Fibers |

2.8 Miles (4.5KM)

10 Miles (16KM)

30 Miles (49KM)

\* 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

# TRANSCEIVER COMPATIBLE TRANSCIVER

A2100 A2100

A2120 A2120

A2125 A2125

# END OF SECTION