
DIVISION 27 21 29
**DE7100 SERIES – FIBER OPTIC ETHERNET 3-
PORT SWITCH TRANSCEIVER**
ENGINEERING SPECIFICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Fiber Optic Ethernet Transceiver

1.02 SECTION INCLUDES

- A. DE7100 Series Ethernet Transceiver – Standalone

1.03 REFERENCES

- A. Underwriters Laboratory (UL)
B. Underwriters Laboratory Canada (ULC)
C. European Union Compliance (CE)

1.04 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide an Ethernet 3-port switch transceiver system that transmits bi-directional 10 or 100Mbps data over multimode, single mode fiber, or all electrical connections.
1. The system shall utilize 1310nm optics capable of bi-directional data transmission of 10 or 100Mbps on two multimode optical fibers. (DE7100-MM, DE7100-EM)
 2. The system shall utilize 1310nm optics capable of bi-directional data transmission of 10 or 100Mbps on two single mode optical fibers. (DE7100-SS, DE7100-ES)
 3. The system shall utilize 1310nm optics capable of bi-directional data transmission of 10 or 100Mbps on a multimode and single mode optical fibers. (DE7100-MS)

1.05 SUBMITTALS

- A. Product Data: Manufacturer's printed product data sheet for each type of Transmitter/Receiver specified.
- B. Detail Drawings: Electrical and optical connect drawings. Product mounting template.
- C. Manufacturer's Installation and Operating Manual: Printed installation and operating information for each type of Transmitter/Receiver specified.
- D. Warranty: Manufacturer's Printed Warranty

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging with Manufacturer's bar coding to the job site.
- B. Inspect product upon delivery to assure that specified products have been received.
- C. Store in original packaging in a climate controlled environment. Storage Temperature not to exceed: -40° C to +85° C

1.07 PROJECT/SITE CONDITIONS

- A. 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.
- B. 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.

1.08 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

2.01 MANUFACTURER

- A. 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
- B. Substitutions: Not Permitted
- C. All fiber optic modules shall be supplied from a single manufacturer.

2.02 MANUFACTURED UNITS

- A. Model Number Descriptions: Reference Table A: Product Number Descriptions
- B. Model Compatibility Chart: Reference Table B: Product Compatibility Chart

2.03 GENERAL SPECIFICATIONS

- A. The Ethernet data transceiver system shall be an IFS DE7100 series module. The module shall support the transmission of 10 or 100 Mbps over a single-mode or multimode fiber. The module shall support the Ethernet data interface and be IEEE 802.3 compliant. The unit provides Network Detection for MDI/MDI-X cabling by a user selected dip switch, making plug and play easy. The unit is set to auto-negotiate data rates and can be used for half duplex or full duplex transmission. The module shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation. The unit also provides a continuously active contact closure relay to activate an external alarm. The module shall provide power and fiber link 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 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 DATA SPECIFICATIONS

- A. Data Interface: Ethernet IEEE802.3
- B. Data Rate: 10/100 Mbps
- C. Operation Mode: Full or Half Duplex

2.05 OPTICAL SPECIFICATIONS

- A. IFS Model Number DE7100-MM
 - 1. Optical Fiber: 62.5/125 micron multimode
 - 2. Number of Fibers Required: 4
 - 3. Optical Wavelength: 1310nm
 - 4. Optical Power Budget: 10 dB
 - 5. Optical Attenuation: No manual adjustments required
- B. IFS Model Number DE7100-SS
 - 1. Optical Fiber: 9/125 micron single mode
 - 2. Number of Fibers Required: 4
 - 3. Optical Wavelength: 1310nm
 - 4. Optical Power Budget: 15 dB
 - 5. Optical Attenuation: No manual adjustments required
- C. IFS Model Number DE7100-MS
 - 1. Optical Fiber: 9/125 micron single-mode 62.5/125 micron multimode
 - 2. Number of Fibers Required: 4
 - 3. Optical Wavelength: 1310nm
 - 4. Optical Power Budget: 10 dB MM 15 dB SM
 - 5. Optical Attenuation: No manual adjustments required
- D. IFS Model Number DE7100-EM
 - 1. Optical Fiber: 62.5/125 micron multimode
 - 2. Number of Fibers Required: 2
 - 3. Optical Wavelength: 1310nm
 - 4. Optical Power Budget: 10 dB
 - 5. Optical Attenuation: No manual adjustments required
- E. IFS Model Number DE7100-ES
 - 1. Optical Fiber: 9/125 micron single-mode
 - 2. Number of Fibers Required: 2
 - 3. Optical Wavelength: 1310nm
 - 4. Optical Power Budget: 15 dB
 - 5. Optical Attenuation: No manual adjustments required

2.06 STATUS INDICATORS

- A. Power: On/Green – Off/Off
- B. Fiber Link: Fiber connection/Green – No Fiber Connection/Off

2.07 CONNECTORS

- A. Optical: SC
- B. Power: Terminal Block with Screw Clamps.
- C. Contact closure: Terminal Block with Screw Clamps.
- D. Data: RJ-45

2.08 ELECTRICAL SPECIFICATIONS

- A. Power: Surface Mount: 12VDC @ 200 mA
- B. Current Protection: Automatic re-settable solid-state current limiters
- C. Voltage Regulation: Solid-state, Independent on each board

- D. Circuit Board: UL 94 flame rated and meets all IPC standards.

2.09 MECHANICAL SPECIFICATIONS

- A. Surface Mount Dimensions: 4.0" x 3.0" x 1.0" (10.2 cm x 7.6 cm x 2.5 cm)
- B. 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.
- C. Weight: <2.0 lbs./0.9kg

2.10 ENVIRONMENTAL SPECIFICATIONS

- A. MTBF: >100,000 Hours
- B. Operating Temp: -40° C to +74° C
- C. Storage Temp: -40° C to +85° C
- D. 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)

2.11 REGULATORY AGENCIES/APPROVALS AND LISTINGS

- A. Underwriters Laboratory (UL) Listing Number: I.T.E. 6D16
- B. Underwriters Laboratory Canada (ULC) Listing Number: I.T.E. 6D16
- C. UL 94-flame rated PCB board: 94VO
- D. European Listed (CE)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspect modules before installation.
- B. Modules shall be free of any cosmetic defects or damage.
- C. All optical connectors shall be covered with dust caps and remain on the module until installing cable connectors to module.
- D. Shipping box shall include the module, power supply and operations manual.

3.02 PREPARATION

- A. 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.
- B. 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).

4. 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.
5. 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.

3.03 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.

3.04 TESTING

- A. Testing the Fiber Optic Ethernet 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.
3. Successful data link operation should be confirmed at this point by communicating with other equipment.

3.05 CLEANING

- A. Follow all instructions for proper use of solvents and adhesives used for termination and splicing.
- B. At completion of the installation, dispose of all fiber scraps properly.

MANUFACTURED UNITS REFERENCE TABLES

Table A: Product Number Descriptions

DE7100 SERIES	DESCRIPTION	MAX. DISTANCE*
DE7100-MM	MM 10/100 Mbps Ethernet (1310 nm), 4 Fibers	1.2 Miles (2KM)
DE7100-SS	SM 10/100 Mbps Ethernet (1310 nm), 4 Fibers	28 Miles (45KM)
DE7100-MS	MM, SM 10/100 Mbps Ethernet (1310nm), 4 Fibers	1.2 Miles (2KM), 28 Miles (45KM)
DE7100-EM	MM 10/100 Mbps Ethernet (1310 nm), 2 Fiber	1.2 Miles (2KM)
DE7100-ES	MM 10/100 Mbps Ethernet (1310nm), 2 Fiber	28 Miles (45KM)

* 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 REPEATER / TRANSCEIVER
DE7100-MM	DE7100-MM, DE7100-MS, DE7100-EM, DE7200-EM, DE7200-MM, DE7200-MS
DE7100-SS	DE7100-SS, DE7100-MS, DE7100-ES, DE7200-ES, DE7200-SS, DE7200-MS
DE7100-MS	DE7100-MM, DE7100-SS, DE7100-MS, DE7100-EM, DE7100-ES, DE7200-EM, DE7200-MM, DE7200-MS, DE7200-ES, DE7200-SS
DE7100-EM	DE7100-MM, DE7100-EM, DE7200-EM, DE7200-MM, DE7200-MS
DE7100-ES	DE7100-SS, DE7100-ES, DE7200-ES, DE7200-SS, DE7200-MS

END OF SECTION