# DIVISION 27 21 16

**DED2500 – FIBER OPTIC TRANSMITTER AND RECEIVER**

**ENGINEERING SPECIFICATIONS**

**PART 1 - GENERAL**

**1.01** SUMMARY

1. Fiber Optic Ethernet Data Transceiver
2. **1.02** SECTION INCLUDES

A. DED2500 Fiber Optic Ethernet Data Transceiver

– Standalone

* 1. REFERENCES

1. Underwriters Laboratory (UL)
2. Underwriters Laboratory Canada (ULC)
3. European Union Compliance (CE)
   1. SYSTEM DESCRIPTION
4. Performance Requirements: Provides 10/100 Ethernet Data Transceiver
5. The system shall utilize 1310nm optics capable

of data transmission on two multi mode or single mode optical fibers. (DED2500-M, DED2500-S)

* 1. SUBMITTALS

1. Product Data: Manufacturer’s printed product data sheet for each type of Transceiver 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 Transceiver

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.

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

1. Standard International Fiber Systems Comprehensive Lifetime Warranty: IFS

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 10/100 Ethernet Data Transceiver system shall be an IFS DED2500 module. The module shall use 10/100 Ethernet encoding and decoding. The module shall be compatible RS- 232, RS-422 and 2 and 4-wire RS-485. The module shall be transparent to data protocols used by various manufacturers, providing for universal compatibility should future system expansion or changes be required. The module shall utilize a GBIC integrated optic to increased stability and reliability of system performance. The module shall require no in-field electrical or optical adjustments or in-line attenuators to ease installation. The module shall provide power, Link – lock, data transmit, and data receive 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.

* 1. DATA SPECIFICATIONS

1. Data Interface: RS-232, RS-422, 2 and 4-wire RS-485 with tri-state
2. Data Format: NRZ, NRZI, Manchester, Bi- phase
3. Data Rate: DC – 512 kbaud

warrants the product to be free of factory defects under manufacture’s Lifetime Warranty as

1. Bit Error Rate (BER): < 1 in 10-9

optical loss budget

@ maximum

submitted under article 1.05 (E)

# PART 2 - PRODUCTS

**2.01** MANUFACTURER

A. Acceptable Manufacturer: International Fiber Systems, Inc.; 16 Commerce Road, Newtown,

E. Operating Mode: Simplex or Full Duplex

* 1. OPTICAL SPECIFICATIONS

1. IFS Model Number DED2500-M
   1. Optical Fiber: 62.5/125 micron multi-mode
   2. Number of Fibers Required: 2
   3. Optical Wavelength: 1310nm

Optical Emitter Type: 1310nm Laser

* 1. Optical Detector Type: 1310nm Pin Diode Optical Power Budget: 13 dB
  2. Optical Attenuation: No manual adjustments required

1. IFS Model Number DED2500-S
2. Optical Fiber: 9/125 micron singlemode
3. Number of Fibers Required: 2
4. Optical Wavelength: 1310nm

Optical Emitter Type: 1310nm Laser

1. Optical Detector Type: 1310nm Pin Diode Optical Power Budget: 15 dB
2. Optical Attenuation: No manual adjustments

required

* 1. STATUS INDICATORS

1. Power: On/Red – Off/Off
2. Data Transmit: Transmit Data/Green – No Data Transmit/Off
3. Data Receive: Receive Data/Yellow – No Data Received/Off
   1. CONNECTORS
4. Optical: SC
5. Power and Data: Terminal Block with Screw Clamps, Optional Type DB-25 Connector
   1. ELECTRICAL SPECIFICATIONS
6. Power: 24VAC or 12VDC
7. Current Protection: Automatic re-settable solid- state current limiters
8. Voltage Regulation: Solid-state, Independent on each board
9. Circuit Board: UL 94 flame rated and meets all PCI standards.
   1. MECHANICAL SPECIFICATIONS
10. Surface Mount Dimensions: 7.1” x 4.9” x 1.0”

(18.00 cm x 12.45 cm x 2.54 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.

1. Weight: <2.0 lbs./0.9kg
   1. ENVIRONMENTAL SPECIFICATIONS
2. MTBF: >100,000 Hours
3. Operating Temp: –40˚ C to +74˚ C
4. Storage Temp: -40˚ C to +85˚ C
5. 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
6. 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
   1. ACCESSORIES

# 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.

* 1. 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.
  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 Data 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.

* 1. Successful data link operation should be confirmed at this point by using the controller to pan, tilt, and zoom the camera or communicate with other equipment.
  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

# MAX. DISTANCE\*

|  |  |
| --- | --- |
| **DED2500 SERIES** | **DESCRIPTION** |
| DED2500-M | MM Data – 1310 <> Data – 1310, 2 Fiber |
| DED2500-S | SM Data – 1310 <> Data – 1310, 2 Fiber |

1.2 Miles (2KM)

23 Miles (37KM)

\* 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 TRANSCEIVER** |
| DED2500-M  DED2500-S |  | DED2500-M, DED2500-EM  DED2500-S, DED2500-ES |

# END OF SECTION