

A & E Specifications of Fiber-optic Single-Channel Digital

Bi-directional Data Transceiver

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DIVISION 01

GENERAL REQUIREMENTS

01 00 00

GENERAL REQUIREMENTS

01 10 00

SUMMARY

01 11 00 Summary of Work

01 11 13 Work Covered by Contract Documents:

This document covers the general design, construction, manufacture, and the general requirements for the supply and installation of the Fiber-optic Transmission Equipment catering for bi-directional data transmission purposes.

01 30 00

ADMINISTRATIVE REQUIREMENTS

01 32 00 Construction Progress Documentation

01 32 19 Submittals Schedule:

(i) Product data sheet(s) produced by manufacturer for all types of Transmitters, Receivers, and Transceivers specified.

(ii) Product design drawings and connection diagrams:

- a) Physical and mechanical drawings with all dimensions and mounting details included.
- b) System connection diagrams include electrical and optical connections.
- c) Manufacturer's installation and operational manuals for each type of Transmitters, Receivers, and Transceivers specified.
- d) Manufacturer's warranty statement applicable to the types of products and accessories as specified.

01 40 00

QUALITY REQUIREMENTS

01 42 00 References

01 42 19 Reference Standards:

Relevant industrial standards and regulations have to be complied

with, such as the BS, UL, FCC, CE, IP, etc., as applicable.

01 60 00

PRODUCT REQUIREMENTS

01 61 00 Common Product Requirements

Functions & Components:

(i) The products shall be capable of serving the transmission of One-Channel Bi-directional Data signal and shall be able to operate independently or as components of a Fiber-optic Transmission system:

- a) protocol transparency transmit and receive One-Channel Bi-directional Data and support both full-duplex (4-wire) and half-duplex (2-wire) transmission, and truly reflect the data line status (Tri-state exhibition) with the implementation of the Carrier Detection scheme;
- b) external access user selectable data formats;
- c) capable of integrating with different types of optical modules for short, medium and long transmission coverage;
- d) incorporated with protective devices for surge and transient suppression; and
- e) compatibility and adaptability must be ensured aiming at system optimization and expansion in collaboration with the family products made by the same manufacturer.

(ii) The products and accessories deployed will be suitable for working in the environment under the most adverse weather conditions as stipulated.

(iii) All electronic components used must be of RoHS compliant.

01 62 00 Product Options

FT010DB series Fiber-optic Single-Channel Bi-Directional Data Transceiver

01 65 00 Product Delivery Requirements

(i) Deliver all products and materials in original factory packaging with bar coded information attached for destinations verifications.

(ii) Inspect products upon delivery to assure that specified products are received at site and in original packaging.

01 66 00 Product Storage and Handling Requirements

(i) Storage the products in original packaging in a climate controlled environment subject to conditions as specified by the manufacturer.

(ii) Handling with reasonable care and in a manner to avoid any damage caused during transportation, un-packaging and installation process.

01 80 00

PERFORMANCE REQUIREMENTS

01 86 00 Facility Services Performance Requirements

01 86 26 Electrical Performance Requirements:

The products shall be supplied with external power adaptors for powering the standalone units and they shall be with the characteristics as specified in the product specifications; and the card modules housed inside the rack-mount chassis are powered by the internal supply unit within the chassis. The power adaptor and the rack-mount chassis derive energy from domestic supply outlets.

01 87 00 Equipment and Furnishings Performance Requirements

01 87 13 Equipment Performance Requirements:

(i) The Fiber-optic One-Channel Digital Bi-directional Data Transceiver is designed and integrated with either multi-mode or single-mode fiber-optic module to facilitating the signal transmission for the required coverage within the designed optical budget.

(ii) The products support RS232, RS422, and RS485 (both 2-wire and 4-wire) Tri-state bi-directional protocol transparency transmission.

(iii) The products shall be capable of working in single-mode at

wavelength 1310nm /1550nm.

(v) The products shall also be capable of working in multi-mode at wavelength 1310nm /1550nm.

(vi) The latest technologies are employed in the design of the signal processing within the products to improve the performance with enhanced reliability and stability.

01 87 16 Furnishings Performance Requirements:

(i) The products can be supplied either as standalone units or card modules housing in a 19” standard rack-mount chassis.

(ii) Products shall be designed and manufactured to facilitate inspection, cleaning, removal, repair and future maintenance.

(iii) Only materials which do not support combustion and do not emit corrosive, noxious or toxic fumes when heated shall be used. Where it is not possible to meet these requirements, materials shall be selected which provide the minimum practicable hazard. Care shall be taken in the design and selection of materials to minimize the spread of fire in the event of its occurrence.

(iv) Each transmitter/receiver shall be a Type-tested Assembly (TTA). The TTA shall be a construction of self supporting enclosure with top, bottom and side panels of so formed as to give a rigid welded construction without cross-struts, and to have clear accessibility to all internal components within the TTA. Metal work shall be treated to prevent corrosion before being painted. The panels and metal sheets shall not deform as a result of grit blasting. Treated metal work shall be suitably cleaned and degreased.

(v) In general, the TTA shall be constructed to conform to the appropriate IP standard as required, particularly for those standalone units installed outdoors. The equipment shall be suitable for continuous operation in such IP-compliant cabinet construction.

(vi) Detachable units/panels of the TTA shall each be provided with a pair of handles or alike for easy fixing/removal of such items. This may not be applicable to Microtypes, Minitypes and standalone units.

(vii) The TTA shall be uniform in height and uniform in depth front-to-back throughout its length and shall present a neat and tidy appearance.

(viii) The TTA shall comply with the temperature rise test requirement as stipulated in the product specification.

(ix) The exterior of each TTA shall be finished to the specified colour with the end plates, blank panels and heads of any external fixing bolts or set screws finished to match.

(x) Unless otherwise specified, each TTA supplied shall be suitable for operation throughout the whole warranty period as stipulated in the product specification under the specified environmental conditions.

01 89 00 Site Construction Performance Requirements

01 89 13 Site Preparation Performance Requirements:

Products shall be able to operate and function properly in an environment under a condition as specified by the manufacturer: For those products to be working under extreme conditions exceeding the specified environmental limits, extra weather-proof & environmental conditions control (e.g. temperature, humidity, waterproof, etc.) facilities shall be provided on site in accordance with the manufacturer's recommendation and the PCBs shall be furnished with a conformal coating as appropriate.

01 89 26 Site Electrical Utilities Performance Requirements:

Domestic supply outlets have to be provided in accordance with the local supply ordinance and Code of Practice for powering the equipment and accessories on site as required.

DIVISION 27

COMMUNICATIONS

27 00 00

COMMUNICATIONS

27 06 00 Schedules for Communications

27 06 20 Schedules for Data Communications:

This document covers the general design, construction, manufacture, and the general requirements for the supply and installation of the Fiber-optic Transmission Equipment catering for bi-directional data transmission purposes.

1. Products and Components

FT-Series Fiber-optic Single-Channel Digital Bi-directional Data Transceiver

1.1 Manufacturer

OT Systems Limited

Rm. 1023, Landmark North, 39, Lung Shum Ave., Sheung Shui, New Territories, Hong Kong.

Telephone: 852-2672 5153

Fax: 852-2679 0756

Email: sales@ot-systems.com Web-site: www.ot-systems.com

1.2 Model Types

- | | |
|--|-------------------------------------|
| (i) Single-mode: | a) FT010DB-SSTR 1 Data Transceiver |
| | b) FT010DB-SSRT 1 Data Transceiver |
| (ii) Single-mode (For Long Distance Transmission): | a) FT010DB-SSTRL 1 Data Transceiver |
| | b) FT010DB-SSRTL 1 Data Transceiver |
| (iii) Multi-mode: | a) FT010DB-SMTR 1 Data Transceiver |
| | b) FT010DB-SMRT 1 Data Transceiver |

1.3 Optical Modules

All fiber-optic modules shall be supplied by one vendor for quality and compatibility assurance.

1.4 Product Specifications:

(A) Optical:

- i) Fiber Size & Mode:* a) 9/125 micron, single-mode
b) 62.5/125 micron, multi-mode
- ii) No. of Fibers required:* ONE
- iii) Optical devices:* a) FP Laser (single-mode & multi-mode)
b) DFB Laser (single-mode for 60Km transmission)
- iv) Wavelengths:* a) Forward: 1310nm/Reverse: 1550nm,
(single-mode & multi-mode)
b) Forward: 1550nm/Reverse: 1310nm,
(single-mode for 60Km transmission)
- v) Number of Optical Ports:* a) Input (Rx): ONE, ST or FC Type
b) Output (Tx): ONE, ST or FC Type
- vi) Optical Power Budget:* a) 17dB (single-mode)
b) 24dB (single-mode for 60Km (max.)
Transmission)
c) 23dB (multi-mode)
- vii) Maximum Transmission Range:* a) 40Km (single-mode)
b) 60Km (single-mode Long-Distance
Type)
c) 4Km (multi-mode)

(B) Data:

(i) Input/Output Channels

- a) Tx* ONE/ONE Bi-directional
b) Rx ONE/ONE Bi-directional

(ii) Input/Output Ports: 7-pin Screw Terminals

(iii) Transmission direction: Bi-directional; Full-duplex (4-wire) and half-duplex (2-wire)

(iv) Data formats: Multi-protocol,
Selective via Dip Switches:
a) RS232,
b) RS422,

	c) RS485 (2-wire & 4-wire) & Tri-state (2-wire Carrier Detection).
(v) <i>Data Rate:</i>	0 – 256Kbps
(vi) <i>Surge and Transient Protection:</i>	Two stages of protection: Line-Line and Line to Ground Surge/Transient Suppression at signal input and output ports to protect the products.
(D) <i>Status indications:</i>	a) Power Normal/Fail b) Data Transmit/Receive c) Optical Carrier Detection
(E) <i>Physical:</i>	Standalone Unit or Card Module
<i>i) Dimensions:</i>	a) Standalone Unit: 30 x 156 x 212(mm) b) Card module: 154 x 20.4 x 212(mm)
<i>ii) Weight:</i>	a) Standalone unit: 0.6Kg b) Card module: 0.16Kg
(F) <i>Power Supply Unit:</i>	a) Standalone unit: Universal power adapter: Input: 100-240VAC, 50 / 60 Hz; Output: 12VDC, 3.6W b) Card module: powered by internal supply unit within the chassis
(G) <i>System Network compatibility:</i>	Compatible with all FT-series Single-Channel Digital Bi-directional Data transmission products facilitating system optimization and/or expansion, as stipulated in Section 01 61 00 (i) (e) above.
(H) <i>Environmental:</i>	
<i>i) Operating Temperature:</i>	-40°C ~ + 75°C
<i>ii) Storage Temperature:</i>	-40°C ~ + 85°C
<i>iii) Relative Humidity:</i>	0 ~ 95% non-condensing

(I) MTBF: >100,000 Hours

(J) International Standards CE, FCC
Compliance:

2. Installation Requirements

2.1 General – Materials and Workmanship

a) Materials

i) All materials incorporated in the Works shall be suitable for the duty concerned and shall be new and of first class industrial quality, free from imperfections, and selected for long life and minimum maintenance under the specific site conditions.

ii) As far as practicable, the use of electrically dissimilar metals in contact shall be avoided. If this is not possible, the contact surfaces of the metals shall be electroplated or the metals shall be insulated from each other by an approved method.

iii) All equipment supplied shall be of current industrial quality, and of well-proven design.

iv) The above requirements may be relaxed by the Engineer in respect of certain components.

b) Workmanship

i) Workmanship – General

a) All parts which are subject to wear or damage by dust shall be totally enclosed in dust-proof housings, especially at outdoors.

b) The equipment shall operate without excessive vibration and with minimum noise, and shall also operate without excessive temperature rise at the rated load conditions.

c) The style and finish of the workmanship shall be consistent throughout the Works.

(ii) All items of the equipment shall be hardened to suit the conditions prevailing at site in general and all electrical components shall be housed in suitable enclosures which provide the required degree of protection.

Specifications and designs are subject to change without prior notice.

* *End of Document* *