

## Fibre Optical Multiplexer

### PX-F02-FMUX-03



F. 1

#### Introduction

PX-F02-FMUX-03 is a fibre optical multiplexer that integrates 4/8/16 channels of E1 signal into a single optical data stream. It extends the transmission distance up to 80 kilometre. With the optional secondary optical link PX-F02-FMUX-03 provides 1+1 optical line protection. In addition, FMUX03 also provides the standard SNMP interface for Network Management, using Ethernet and PPP ports to connect to central office. User can monitor the PX-F02-FMUX-03 through built-in In-band operation channel to reach a remote terminal. Moreover, PX-F02-FMUX-03 simplifies testing and maintenance with order wire, allowing communication between local and remote maintenance crews. The PX-F02-FMUX-03 provides the telecommunication company a multipurpose and easy to use high quality fibre optics multiplexer.

#### System Application

PX-F02-FMUX-03 is designed for providing reliable and robust digital signal transmission in short, medium and long distance applications. It is a simple and economical fibre equipment for inter-office networks and access networks.

Applications are as follows:

- connections between mobile switch centers (MSC) and base stations in cellular phone networks.
- connections between the Central Office Terminal (COT) and Remote Terminal (RT) of Digital Loop Carrier (DLC) systems
- trunk connections between digital switches
- optical transmission for LAN/WAN applications
- transmission media for B-ISDN or ATM networks.

#### Interface Options & Specifications

##### E1/T1 Interface

Channel capacity 4/8/16 E1 or T1

Bit rate (E1) 2.048Mbps  $\pm$ 50ppm  
(T1) 1.544Mbps  $\pm$ 50ppm

Line Code (E1) HDB3/AMI  
(T1) B8ZS/AMI

Line Impedance (E1) 120 $\Omega$  balanced,  
75 $\Omega$  unbalanced  
(T1) 100  $\Omega$

##### Optical Interface

Connector Types FC/PC, SC or ST

Wave Lengths 850, 1310 &  
1550nm

Output power -12dBm all  
wavelengths

Receive Sensitivity 0dBm (850nm)  
-32dBm  
(1310/1550nm)

System Gain 12-14dB (850nm)  
20-30dB  
(1310/1550nm)

##### Interface

###### Front

Manual system configuration, via LCD Fibre via FC, SC of ST connectors  
Order wire, Mic and Ear sockets

###### Back

Terminal configuration, via Craft Port E1 connections, via DB25 connector  
Alarm (relay and buzzer) via DB9 Remote terminal via LAN –RJ45 socket AC  
power input via IEC socket DC power input via terminal block

##### Power

AC: 90V ~ 288V(47Hz ~ 63Hz)  
DC: -36V ~ -72V

##### Environment

Operating Temperature: 0 ~ 40°C  
Storage -25 ~ 70°C  
Humidity: 5 ~ 95%

EMI: Comply with CISPR 22 standards A(EN55022) and FCC Part 15 rules.  
EMS: Comply with EN55082-2 standards  
Safety: Complies with EN60950 standards

### PX-F02-FMUX-01

#### E1/ T1 DSU/ CSU

#### E1/ T1 Multiplexer



F. 2

The **PX-F02-FMUX-01** is a single unit (1U), 19" rack mountable, E1/T1 multiplexer that transmits over a single fiber optic link. The **PX-F02-FMUX-01** features a modular design that provides a wide variety of customized user configurations. The optical fiber interface module is available in a number of standard fiber connections and with standard or optional redundant optical connections. The **PX-F02-FMUX-01** chassis is available in five different power configurations : single AC, single DC, dual AC, dual DC or AC+DC. The AC supplies operate from 90~260VAC while DC supplies operate from 20~60VDC. From the rear of the chassis, one to four quad E1 or T1 line cards are supported. Depending upon the configuration, the QUAD line cards are RJ-45 (E1/T1 balanced) or BNC (E1 unbalanced), for a total of 4, 8, 12, or 16 E1 or T1 links. All line cards provide completely transparent transmission of E1 or T1 regardless of frame mode or timeslot assignment. Optional hardware cards are also available for external clock and SNMP. The standard **PX-F02-FMUX-01** configuration may be viewed or set via the front panel LCD/menu keys, serial terminal connection or Telnet/SNMP with SNMP option.

#### FEATURES

- E1/T1 G.703, Modular 4/8/12/16 Channel Interface.
- 3 Interface options: BNC Pairs/75 ohms(E1)  
RJ-45/120 ohms(E1)  
RJ-45/100 ohms(T1)
- Completely transparent transmission.
- Provides alarm indicators for major / minor alarms.
- System performance : Less than 1 error in 10<sup>-10</sup> bits
- Link distance up to 120 Km. (75 miles)
- Alarm relay contacts provided which can offer major and minor alarms with audible and visible alarm output.
- Software configuration.
- Redundant Fiber 1+1 (Optional) Protection.
- Local and Remote Loop-Back Functions.
- Management via local LCD/keypad, ASCII terminal or Telnet/SNMP (optional). Visual alarm indicators includes : Power, Optical Signal Loss & E1/T1 Signal Loss

#### SPECIFICATIONS

##### E1/T1 Interface

Channel Capacity: 4,8,12, or 16 channels

Bit rate: (E1) 2.048Mbps  $\pm$ 50ppm  
(T1) 1.544Mbps  $\pm$ 50ppm

Line Code: (E1) HDB3/AMI  
(T1) B8ZS/AMI

Line Impedance: (E1) 120 $\Omega$ / 75 $\Omega$   $\pm$ 5%  
(T1) 100 $\Omega$   $\pm$ 5%

Jitter Performance: (E1) complies with G.823  
(T1) complies with G.824

Pulse Mask: Complies with ITU-T G.703

Connector: Uses 25 pin D type Female

##### Optical interface

Connector: FC/PC, SC or ST type  
Wave Length: 1310nm  $\pm$ 50nm (single mode)  
850nm  $\pm$ 50nm (multi-mode)

Line Coding: Scrambled NRZ  
Nominal Gain: 25dB@1X10<sup>-10</sup> BER  
Nominal Power: -8dBm

Input Range: -8dBm to -40dBm (BER<10<sup>-10</sup>)  
Data Rate: 51.84Mbps

Fiber Cable Type: 9/125 $\mu$ m, single mode  
62.5/125 $\mu$ m, multi-mode

##### Craft interface

Interface: RS-232C Asynchronous  
Bit rate: 9600,8,N,1

#### POWER

(Can be single/dual DC or single/dual AC in one set or one AC plus one DC in one set)

DC: 20 ~ 60VDC  
AC: 90 ~ 260VAC @ 47-63Hz  
Consumption: < 15 watts  
MTBF Figure: 50,000 hours

#### SYSTEM

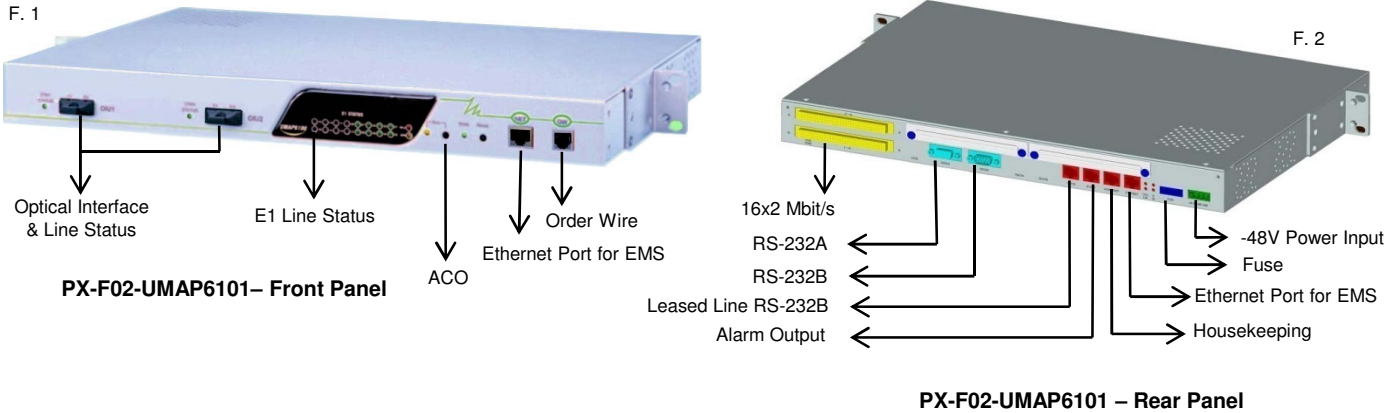
EMI: FCC, Part 15, Sub B (class A)

Alarm: 4 relay contacts  
Temperature: 0~60°C,  
32~140°F(operating)

Humidity: up to 95% (non-condensing)

Dimension: 45x436x257mm  
(HxWxD)  
1.75 x 17 x 10.125"  
(HxWxD)

## Compact SDH – PX-F02UMAP 6101



### Product Features:-

PX-F02-UMAP6101 : compact SDH Solution

- Can be used as Terminal Mux, Add-Drop Mux or Repeater
- Up to 8 E1 / 16 E1/ 63E1 interfaces
- 1+1 protection for Optical Interface (Upgradeable)
- 5 x RS232 for transport of 3<sup>rd</sup> party network equipment communications
- POTS quality Order Wire, provides DTMF, ring and phone number setting
- Auto protection switching time < 50 ms, switching criterion is based on SD (Signal Degradation) and SF (Signal Fail)
- 1 Data Communication Channel for NMS remote control
- 1 Ethernet port for IP Based EMS
- Remote management via the SDH ECC
- Single fiber ring supported
- Multiple Sub-network management
- Database Backup & Restoration Monthly or Weekly on PC
- EMS provide pre-provisioning
- Remote Login
- Reliable Software Upgrade – Flash memory redundant
- Configuration Upload from NE or Download to NE
- Quick cross-connect table assignment – drag and drop
- Complete Alarm Filtering & Report comply to ITU G.826
- Alarm Level Setting
- On-line help Manual
- 1U Height

### System Specifications:-

- System Parameters
  - Multiplexing Scheme: ITU G.707
  - Add-Drop Capacity: 63 x E1
  - TSI level: TU-12
- Optical Interface
  - Wavelength : 1310 ± 30 nm
  - Bit Rate : 155,520Kbps ± 30ppm
  - Code : Scrambled NRZ
  - Tx O/P power : -15/-5 dBm
  - Rx sensitivity : -28/-34 dBm\* @BER=10E-10
  - Connector : FC/PC or SC/PC
  - System Gain : 12/28 dB
- Tributary Interface
  - 2M Tributaries (ITU complied)
  - Bit Rate : 2,048Kbps ± 50 ppm (G.703)
  - Code : HDB3 (G.703)
  - Impedance : 120/75 Ohm
  - Amplitude : ± 3V nominal (120 Ω), ± 2.37V nominal (75 Ω)
  - Jitter generation <0.4 UI (HP1+LP filter), <0.075 UI (HP2+LP filter)
  - Jitter tolerance : G.823
  - Jitter transfer : G.742/G.736
- Management Physical Interfaces
  - LAN Interface : Electrical 10BaseT
  - Craft person interface : Electrical 2xRS-232, Leased Line RS-232
  - Rate : 1.2/2.4/4.8/9.6/19.2 Kbps
- Management User Interface
  - PC/Window Based
  - Remote Control via SDH ECC
  - IP Based EMS
- Dimension (H/W/D)
  - 44.45 x 431.8 x 300.0 mm
- Power Input
  - Input Voltage : -42 to -56 Vdc
  - Power Consumption < 20 Watt
- Operation Environment
  - Humidity : 5% to 95% (non-condensing)
  - Temperature : -5°C ~ 65°C (63E1 : 0°C ~ 45°C)

### SNMP Architecture

