

Fiber Optical E1/T1/Datacom/ Ethernet Multiplexer

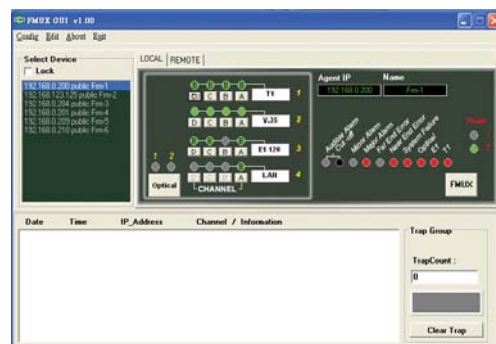
FMUX01A



The **FMUX01A** is a single unit (1U), 19" rack mountable, E1/T1, Datacom & Ethernet Bridge multiplexer that transmits up to 16 channels over a single fiber optic link. The **FMUX01A** features a modular design that provides a wide variety of customized user configurations. The optical fiber interface modules are available in single mode or multi-mode fiber connections and a number of connector types. The **FMUX01A** 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, datacom (V.35, X.21, RS-530), or Ethernet Bridge cards are supported. All line cards provide completely transparent transmission of E1, T1, datacom, or Ethernet regardless of frame mode or timeslot assignment. Optional hardware cards are also available for external clock and SNMP. The standard FMUX01A configuration may be viewed or set via the front panel LCD/menu keys, serial VT-100 terminal connection or Telnet/SNMP with SNMP option.

Features

- Channel Capacity : 4,8,12 or 16 channels
- Auto Laser Shutdown (ALS) to prevent hazardous laser radiation to personnel
- Optical modules are hot swappable even during unit operation
- Real Time Clock (RTC) run by backup battery to avoid time setting loss caused by power disruption.
- Configuration data can be stored into flash buffer to avoid any loss caused by power disruption.
- Modularized interface: G.703 E1 / T1 / Datacom (V.35/RS-449,530/X.21) / Ethernet Bridge 10/100Base-T
- End to end propagation delay is less than 2 m sec
- Alarm relay contacts provided which can offer the critical, major and minor alarms with audible and visible alarm output.
- TFTP remote software upgradable (for SNMP option)
- Local and Remote Loop-Back Functions.
- Redundant Fiber 1+1 Protection. (Optional)
- Management : Local side can be managed via Keypad, Terminal and Telnet ; Remote side can be managed inband via keypad, Terminal, Telnet & optional SNMP
- Supports BERT



GUI Optional MS-Window(R)
Based SNMP Manager



Different Modules on Rear Panel View



Fiber Optical E1/T1/Datacom/ Ethernet Multiplexer

FMUX01A

Transmission Units
E1/T1 CSU/DSUs

Transmission
Units xDSL

Fiber Media
Converters

Network Testers

Interface
Converters

Datacom
Accessories

Technical Specifications

E1 Interface Module

- **Ports** 4 ports
- **Standards** ITU-T G.703, G.704, G.706, G.732
- **Framing** Unframed, CAS, CCS
- **Data rate** 2.048 Mbps
- **Line code** HDB3/AMI
- **Receive Level** Short haul - 15dB
- **Line impedance** 75 ohms / 120 ohms
- **Connector** RJ-45 for 120 ohms
BNC for 75 ohms

Ethernet Interface Module

- **Port** 1 port
- **Compliance** IEEE 802.3/802.3u
- **Connector** Shielded RJ-45
- **Data Rate** 10/100Mbps; Half Duplex
(20/200Mbps; Full duplex)
- **Filtering and Forwarding**
WAN speed
- **Delay** 1 frame
- **WAN Protocol** HDLC



Optional Cables for Datacom Interface Module

- HD-68 to four V.35 (MB34) male/female connector
- HD-68 to four X.21 (DB15) male/female connector
- HD-68 to four RS-530 (DB25) male/female connector
- HD-68 to four RS-232 (DB25) male/female connector
- HD-68 to four RS-449 (DB37) male/female connector

T1 Interface Module

- **Ports** 4 ports
- **Standards** ITU-T G.703, G.704, AT&T TR-62411, ANSI T1.403
- **Framing** Unframed, D4, ESF
- **Data rate** 1.544 Mbps
- **Line Code** B8ZS / AMI
- **Receive Level** Short haul - 15dB
- **Line impedance** 100 ohms
- **Connector** RJ-45

Datacom Interface Module

- **Card Type** V.35 / RS-530 (Include X.21 and RS-449)
/ RS-232 I/F
- **Bit rate** n x 64K, n = 1 to 32
V.35 & RS-530 up to 2Mbps
RS-232 up to 128Kbps (SYNC)
- **Line Code** NRZ
- **Clock Mode** Transparent, Recovery,
External (From data port)
Internal (From oscillator)
- **Control Signal** 1.CTS always On or follows RTS
2.DSR constantly ON, except during test loops
(RS-530 DSR always connect to DTR)
3. DCD constantly ON,
except during fiber signal loss
- **Test Loops** Local loop back, Remote loop back, V.54
- **Connector Type** Uses HD-68 pin D type Female with adapter cables

General Specifications

SYSTEM

- **EMI** FCC, Part 15, Sub B (Class A)
European standard EN55022:
1994/A1 : 1995/A2 : 1997 Class A,
EN61000-3-2:1995, EN61000-3-3:1995 and
EN50082-1:1997
- **Alarm** 4 relay contacts
- **Temperature** 0~55°C, 32~131°F (operating)
- **Humidity** Up to 95% (non-condensing)
- **Dimensions** 43 x 438 x 250 mm (HxWxD)
- **Weight** 3.58Kg
(empty chassis without any I/F & optical module)
4.5Kg (with 4 I/F & 2 optical modules)

Power

- (May 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** 40VA
 - **MTBF Figure** 57,350 hours

Craft interface

- **Interface** RS-232D(RJ-45) Asynchronous
- **Bit rate** 19200,8,N,1

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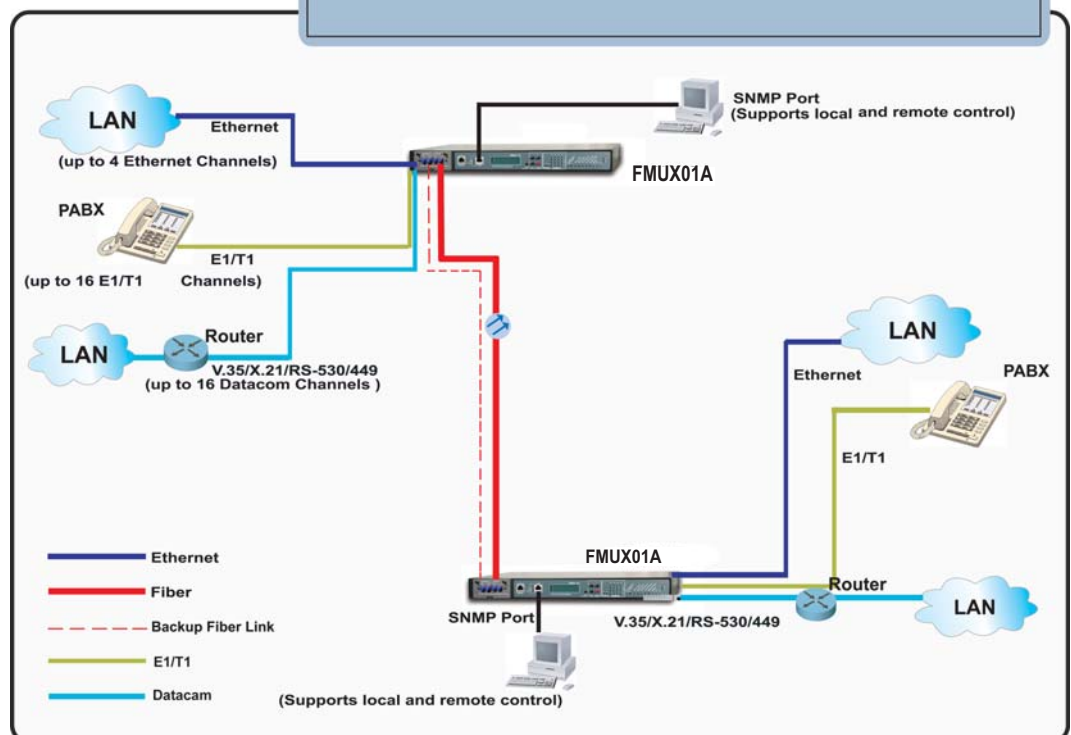
Optical Specifications (redundant fiber has identical specifications as primary)

		Standard Types					WDM Types*			
Type		M-M	S-M	S-M	S-M	S-M	S-M	S-M	S-M	
Distance (Km)		2	15	30	50	120	20(A)*	20(B)*	40(A)*	40(B)*
Wavelength (nm)		1310	1310	1310	1310	1550	Tx:1310	Tx:1550	Tx:1310	Tx:1550
							Rx:1550	Rx:1310	Rx:1550	Rx:1310
BER		<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰	<10 ⁻¹⁰
Sensitivity		-31dBm	-32dBm	-35dBm	-36dBm	-35dBm	-32dBm	-32dBm	-32dBm	-32dBm
Output Power		-20dBm	-20dBm	-15dBm	-8dBm	0dBm	-18dBm	-15dBm	-10dBm	-7dBm
Power Margin		11dB	12dB	20dB	28dB	35dB	14dB	17dB	22dB	25dB
Return Loss		-12dBm	-12dBm	-12dBm	-12dBm	-12dBm	-14dBm	-14dBm	-14dBm	-14dBm
Conn. Types	ST	v	v	v	v	v				
	SC	v	v	v	v	v	v	v	v	v
	LC	v	v	v	v	v				
	MT-RJ	v	v	v	v	v				
	FC	v	v	v	v	v				

M-M: multi-mode S-M: single-mode

* WDM types must match (A) with (B) in pairs

FIBER MULTIPLEXER APPLICATION





Fiber Optical E1/T1/Datacom/ Ethernet Multiplexer FMUX01A

Transmission Units
E1/T1 CSU/DSUs

Transmission
Units xDSL

Fiber Media
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Network Testers

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Ordering Information

FMUX01A-XXX / XXXX / X XX XXX

Power Module Type		Distance Connectivity	
AC	one AC module	002:	2Km [multi-mode only]
DC	one DC module	030:	30Km
AC2	two AC modules	050:	50Km
DC2	two DC modules	080:	80Km
AD	one AC & one DC module	120:	120Km
		*20A:	20Km [WDM only]
		*20B:	20Km [WDM only]
		*40A:	40Km [WDM only]
		*40B:	40Km [WDM only]
		*020A must be coupled with 020B	
		*040A must be coupled with 040B	
Line Card I/F Type		Connector Type	
0	Empty slot	SC	SC Type
A	Quad E1 BNC I/F	ST	ST Type
B	Quad E1 RJ-45 I/F	FC	FC Type
C	Quad T1 RJ-45 I/F	LC	LC Type
D	Quad V.35 I/F	MT	MT-RJ Type
E	Quad RS-232 I/F		
F	Quad RS-530 I/F		
	(also support X.21 & RS-449 I/F)		
G	Single Port Fast Ethernet 10/100 I/F		
		Fiber Redundant Type	
		S:	Standard
		R:	Redundant

Options

- External Clock Option
FMUX-EXT/CLK I/F Fiber MUX optional external clock I/F
- SNMP Management Option
FMUX-SNMP Fiber MUX SNMP management option

Examples

- FMUX01A-AC2/AABB/SSC120
FMUX01A unit with dual AC power, 8-port E1 BNC & 8-port E1 RJ-45 connectors, one single mode 120 Km, SC type connector optical interface
- FMUX01A-AD/ADG0/RSC2
FMUX01A unit with AC & DC power modules, 4-port E1 BNC connectors, 4-port V.35 DTE module & single port Ethernet bridge, dual multi-mode 2 Km, SC type connector optical interface for redundant use

For Individual Purchasing for the Extra Module

- E1/T1 Interface Card
- FMUX01A-E1/BNC I/F 4 Channel 75 ohm E1 Port Card
- FMUX01A-E1/RJ45 I/F 4 Channel 120 ohm E1 Port Card
- FMUX01A-E1/BNC I/F 4 Channel 100 ohm T1 Port Card
- Ethernet Interface Card
- FMUX01A-Ethernet I/F Single Channel Fast Ethernet Bridge Card
- External Clock
FMUX-EXT/CLK I/F Optional external clock I/F
- SNMP Management
FMUX-SNMP I/F SNMP management
- GUI Management S/W
FMUX-GUI S/W Optional MS-Window(r) Based GUI
(Graphic User Interface management software)

Optical Transceiver Interface

FMUX01A-X / XX XXX

Fiber Redundant Type		Distance Connectivity	
S:	Standard	002:	2Km [multi-mode only]
R:	Redundant	030:	30Km
		050:	50Km
		080:	80Km
		120:	120Km
		*20A:	20Km [WDM only]
		*20B:	20Km [WDM only]
		*40A:	40Km [WDM only]
		*40B:	40Km [WDM only]
		*020A must be coupled with 020B	
		*040A must be coupled with 040B	
Connector Type			
SC	SC Type		
ST	ST Type		
FC	FC Type		
LC	LC Type		
MT	MT-RJ Type		

Example:
FMUX01A-S/SC002
Optical I/F SC type, Multi-Mode 2Km
FMUX01A-R/ST050
Optical I/F ST type, Single mode, 50Km, Redundant