

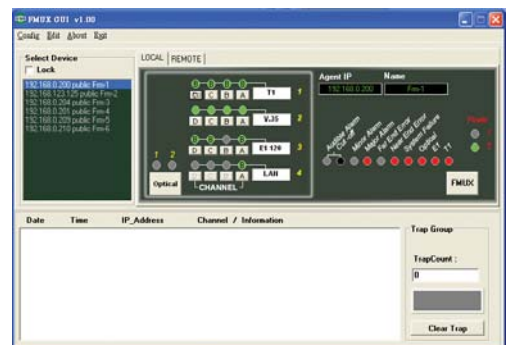


## Point to Point Solution F. O. M. SERIES Fiber Optical E1/T1/Datacom /Ethernet Multiplexer

### Features

- Channel Capacity : 4,8,12 or 16 channels
- Auto Laser Shutdown (ALS) to prevent hazardous laser radiation to personnel
- **Wire-Wrap designed for E1/T1 commoned module, can be set by internal jumpers.**
- 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 and will be restored automatically by system.
- Modularized interface: G.703 E1 / T1 / Datacom (V.35/RS-449,530/X.21) / Ethernet Bridge 10/100Base-T
- 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)
- Supports E1/T1 Local and Remote Loop-Back.
- Redundant Fiber 1+1 Protection, the switching time between is less than 50 m sec .
- Management : Local side can be managed via Keypad, Terminal and Telnet ; Remote side can be managed inband via keypad, Terminal, Telnet & optional SNMP
- **Supports hot-swapping of optical modules ; will not affect or interrupt the operation and communication.**
- **Supports BERT**

The **FOM02-MUX** 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 **FOM02-MUX** 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 **FOM02-MUX** 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.



GUI Optional MS-Window(R)  
Based SNMP Manager

### 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
- End to end propagation delay is less than 2 m sec
- **System Performance(BER)**
  - $\leq 10^{-11}$
- **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 ~ 60 VDC
- **AC** 90 ~ 260 VAC@47-63Hz
- **Consumption** 40VA
- **MTBF Figure** 57,350 hours

#### Craft interface

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

#### LED Indications

- **Power 1 & 2, Optical 1 & 2 (for optical signal and link status),**
- **Minor & Major Alarms, Far End & Near End Error**
- **System Failure, E1 & T1 (for signal status)**



# Point to Point Solution

## F. O. M. SERIES

### Fiber Optical E1/T1/Datacom /Ethernet Multiplexer

#### Technical Specifications

##### E1 Interface Module

- Ports 4 ports
- Standards ITU-T G.703, G.704, G.706, G.732
- Framing Unframed ( clear channel )
- Data rate 2.048 Mbps  $\pm$ 50 ppm
- Line code HDB3/AMI
- Receive Level Short haul - 15dB
- Line impedance 75 ohms  $\pm$ 5% / 120 ohms  $\pm$ 5%
- Connector RJ-45 for 120 ohms  
BNC for 75 ohms  
Wirewrap for 120 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
- The switching time between is less than 50 m sec .

##### T1 Interface Module

- Ports 4 ports
- Standards ITU-T G.703, G.704, AT&T TR-62411, ANSI T1.403
- Framing Unframed ( clear channel)
- Data rate 1.544 Mbps  $\pm$ 50 ppm
- Line Code B8ZS / AMI
- Receive Level Short haul - 15dB
- Line impedance 100 ohms  $\pm$ 5%
- Connector RJ-45  
Wirewrap

##### 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



**NEW**

The **High-Speed Datacom Interface Module** is a new module that provides a single data port with speed up to 8Mbps on V,35/X,21/RS530 and RS-449.

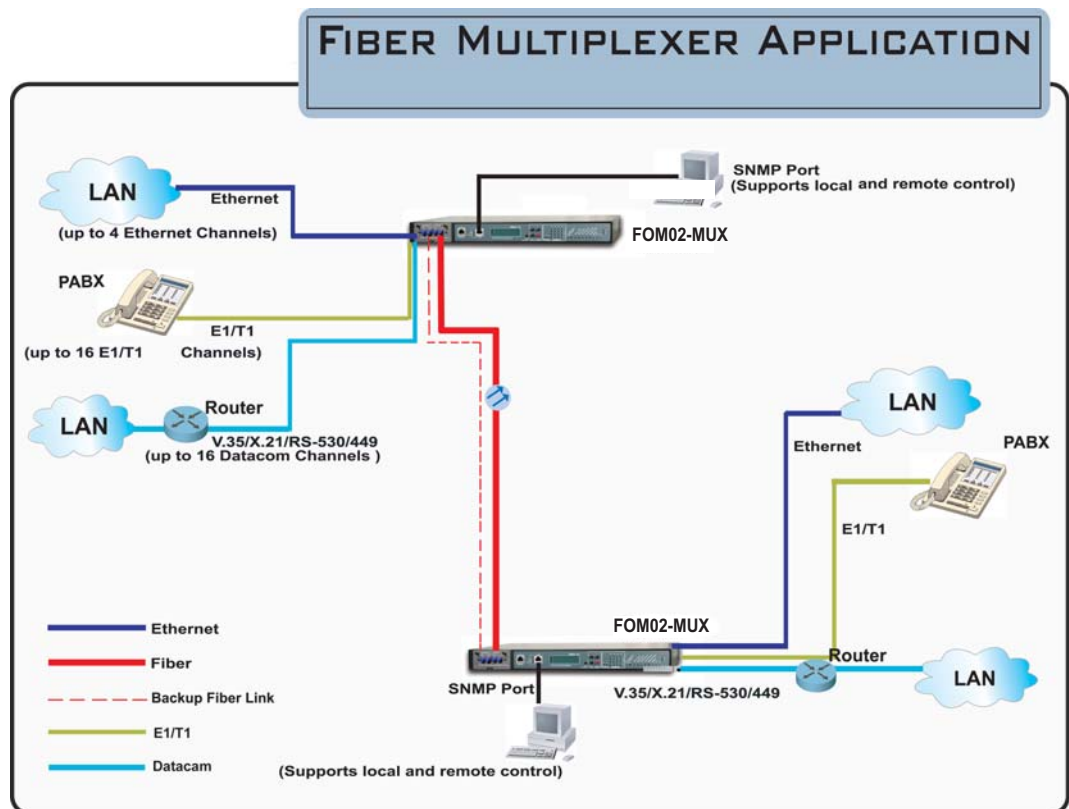
Baud Rate for options: n\*64K or n\*256K, n = 1 to 32  
No support for RS-232.

##### Fiber Optical Module

- Port 1 + 1 ports (redundant)
- Connector FC/PC
- Fiber Cable 9/125 um for single mode ;  
50/125 or 62.5/125 for multi-mode
- Wavelength Range 1280 ~ 1550 nm
- System Power Gain > 25dB@1\*10<sup>-10</sup>

## Point to Point Solution F. O. M. SERIES Fiber Optical E1/T1/Datacom /Ethernet Multiplexer

Optical Specifications (Redundant fiber has identical specifications primary)											
		Standard Type						WDM Type			
Type		M-M	S-M	S-M	S-M	S-M	S-M	S-M	S-M	S-M	S-M
Distance (Km)		2	15	30	50	80	120	20(A)	20(B)	40(A)	40(B)
Wavelength (nm)		1310	1310	1310	1310	1550	1550	TX:1310	TX:1550	TX:1310	TX:1550
								RX:1550	RX:1310	RX:1550	RX:1310
BER		<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>	<10 <sup>-10</sup>
Sensitivity		-31dB	-32dB	-35dB	-36dB	-34dB	-35dB	-32dB	-32dB	-32dB	-32dB
Output Power		-20dB	-20dB	-10dB	-8dB	-5dB	0dB	-18dB	-15dB	-10dB	-7dB
Power Margin		11dB	12dB	25dB	28dB	29dB	35dB	14dB	17dB	22dB	25dB
Return Loss		-12dB	-12dB	-12dB	-12dB	-12dB	-12dB	-14dB	-14dB	-14dB	-14dB
Connector Type	ST	ü	ü	ü	ü	ü	ü				
	SC	ü	ü	ü	ü	ü	ü	ü	ü	ü	ü
	LC	ü	ü	ü	ü	ü	ü				
	FC	ü	ü	ü	ü	ü	ü				





# Point to Point Solution

## F. O. M. SERIES

### Fiber Optical E1/T1/Datacom /Ethernet Multiplexer



#### Ordering Information

**FOM02-MUX-XXX / XXXX / X XX XXX**

Power Module Type

AC	one AC module
DC	one DC module
AC2	two AC modules
DC2	two DC modules
AD	one AC & one DC module

Line Card I/F Type

0	Empty slot
A	Quad E1 BNC I/F
B	Quad E1 RJ-45 I/F
C	Quad T1 RJ-45 I/F
D	Quad V.35 I/F
E	Quad RS-232 I/F
F	Quad RS-530 I/F
G	Single Port Fast Ethernet 10/100 I/F
H	Quad X.21 I/F
I	Quad RS-449 I/F
J	Wire-Wrap I/F for Quad E1/T1 (set by jumpers)

Distance Connectivity

002:	2Km [multi-mode only]
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

Fiber Redundant Type

S:	Standard
R:	Redundant

#### Options

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

#### Examples

- FOM02-MUX-AC2/AABB/SSC120  
FOM02-MUX 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
- FOM02-MUX-AD/ADG0/RSC2  
FOM02-MUX 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 Purchase of Extra Modules

##### E1/T1 Interface Card

- FOM02-MUX-E1/BNC I/F 4 Channel 75 ohm E1 Port Card
- FOM02-MUX-E1/RJ45 I/F 4 Channel 120 ohm E1 Port Card
- FOM02-MUX-E1/BNC I/F 4 Channel 100 ohm T1 Port Card

##### Ethernet Interface Card

- FOM02-MUX-Ethernet I/F Single Channel Fast Ethernet Bridge Card

##### External Clock

FOM-EXT/CLK I/F Optional external clock I/F

##### SNMP Management

FOM-SNMP I/F SNMP management

##### GUI Management S/W

FOM-GUI S/W Optional MS-Window(r) Based GUI (Graphic User Interface management software)

#### Optical Transceiver Interface

**FOM02-MUX-X / XX XXX**

Fiber Redundant Type

S:	Standard
R:	Redundant

Connector Type

SC	SC Type
ST	ST Type
FC	FC Type
LC	LC Type
MT	MT-RJ Type

Distance Connectivity

002:	2Km [multi-mode only]
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	

#### Example:

- FOM02-MUX-S/SC002  
Optical I/F SC type, Multi-Mode 2Km
- FOM02-MUX-R/ST050  
Optical I/F ST type, Single mode, 50Km, Redundant