

## Modularized 16E1/T1 Managed Multiplexer

### FMUX1001

Modularized 16E1/T1 + 4× GbE Managed Fiber Multiplexer

### FMUX101

Modularized 16E1/T1 + 4× FE Managed Fiber Multiplexer



The FMUX1001/FMUX101 is a 1U, 19" rack mountable, PDH fiber optic multiplexer that transmits up to 16 channels plus a 10/100/1000Base-T (FMUX1001) / 10/100Base-TX (FMUX101) Ethernet channel over a single fiber optic link. The FMUX1001/FMUX101 chassis supports redundant power and hot swappable design. The AC supplies operate from 100~240VAC while DC supplies operate from 18~60VDC. From the rear of the chassis, one to four hot swappable quad E1 or T1 line cards, serial data communications (V.35, X.21, RS-530) or FXO/FXS voice cards are supported. The standard FMUX1001 configuration may be viewed or set via the front panel LCD/menu keys, serial VT-100 terminal connection, Telnet, web HTTP or SNMP.

## Features

- 1U, 19" 4-slot chassis
- 16 E1 (2.048Mb/s) Multiplexer with 100/1000Mbps Ethernet and RS-232 data (async) Interface (FMUX1001)
- 16 E1 (2.048Mb/s) Multiplexer with 10/100Mbps Ethernet and RS-232 data (async) Interface (FMUX101)
- RS-232 port for system console
- One alarm output port, one Order Wire port
- 4× 10/100/1000Base-T Ethernet ports (FMUX1001)
- 4× 10/100Base-T Ethernet ports (FMUX101)
- SNMP management
- LCD plus menu keys for local configuration
- Port based VLAN, tag based VLAN & bandwidth control
- Telnet and web based remote configuration
- 2 plug-in SFP slot for optical SFP module
- Forward 1024K byte packets on Ethernet port

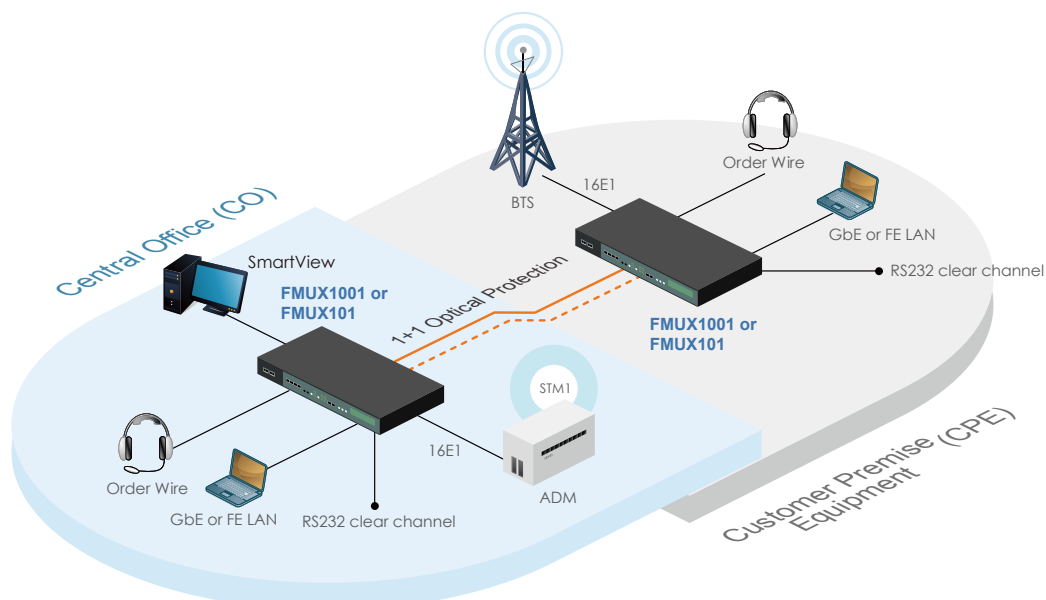
## Specifications

|                             |                |                                                   |
|-----------------------------|----------------|---------------------------------------------------|
| <b>Optical Interface</b>    | Connector      | SFP - LC                                          |
|                             | Data rate      | 1.25G (FMUX1001), 155M (FMUX101)                  |
|                             | Bit Error Rate | Less than $10^{-11}$                              |
|                             | Fiber          | MM 62.2/125μm, 50/125μm<br>SM 9/125μm             |
|                             | Distance       | MM 2km. SM 15/30/50/80/120km<br>WDM 20/40/60/80km |
|                             | Wavelength     | 1310, 1550nm                                      |
| <b>Electrical Interface</b> | Console, SNMP  | RJ45                                              |
|                             | Ethernet       | 4× RJ45                                           |
|                             | Alarm          | RJ45                                              |

|                          |                                                                                   |
|--------------------------|-----------------------------------------------------------------------------------|
| <b>Standards</b>         | E1:ITU-T, T1:ITU-T, AT&T, ANSI, Ethernet: IEEE 802.3x                             |
| <b>Indications</b>       | PWR, Alarm, Phone, ACO, Port, Channels                                            |
| <b>Power Input</b>       | AC module IN: AC 90 ~ 264V, Out: DC 12V<br>DC module IN: DC 18 ~ 72V, Out: DC 12V |
| <b>Power Consumption</b> | < 25W                                                                             |
| <b>Dimensions</b>        | 438 × 250 × 43mm (WxDxH)                                                          |
| <b>Weight</b>            | 3.58 kg                                                                           |
| <b>Temperature</b>       | 0 ~ 50°C (Operating), 0 ~ 70°C (Storage)                                          |
| <b>Humidity</b>          | 10 ~ 90% non-condensing                                                           |
| <b>Certification</b>     | CE, FCC                                                                           |
| <b>MTBF</b>              | 50,000 hrs                                                                        |

## Application

### Remote 3G BTS Connection Application



# FMUX1001 & FMUX101 Interface Module Interface Module



**4x E1/T1 RJ45 I/F**

|                      |                                                                                                                      |
|----------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Standards</b>     | ITU-T G.703, G.704, AT&T TR-62411, ANSI T1.403                                                                       |
| <b>Ports</b>         | 4 ports                                                                                                              |
| <b>Framing</b>       | Unframed (clear channel)                                                                                             |
| <b>E1</b>            | Data rate: 2.048 Mbps $\pm 50$ ppm<br>Line code: HDB3 / AMI<br>Line impedance: 120 ohms $\pm 5\%$ , 75ohms $\pm 5\%$ |
| <b>T1</b>            | Data rate: 1.544 Mbps $\pm 50$ ppm<br>Line code: B8ZS / AMI<br>Line impedance: 100 ohms $\pm 5\%$                    |
| <b>Receive Level</b> | Short haul - 15dB                                                                                                    |
| <b>Connector</b>     | RJ-45                                                                                                                |



**4x E1 BNC I/F**

|                       |                                  |
|-----------------------|----------------------------------|
| <b>Standards</b>      | ITU-T G.703, G.704, G.706, G.732 |
| <b>Ports</b>          | 4 ports                          |
| <b>Framing</b>        | Unframed (clear channel)         |
| <b>Data rate</b>      | E1 2.048 Mbps $\pm 50$ ppm       |
| <b>Line code</b>      | E1 HDB3/AMI                      |
| <b>Receive Level</b>  | Short haul - 15dB                |
| <b>Line impedance</b> | E1 75 ohms $\pm 5\%$             |
| <b>Connector</b>      | BNC 75 ohms                      |

## Related Cables (Please see order information for more details)



V35

RS530

RS449

X21

RS232



## 4x Data Com I/F

|                   |                                                                                     |
|-------------------|-------------------------------------------------------------------------------------|
| <b>Standards</b>  | ITU-T, E1A                                                                          |
| <b>Card Type</b>  | V.35/ RS-530 (Include X.21 and RS-449)/ RS-232 I/F                                  |
| <b>Bit rate</b>   | n x 64K, n = 1 to 32<br>V.35 & RS-530 up to 2Mbps<br>RS-232 up to 115.2Kbps (ASYNC) |
| <b>Line code</b>  | NRZ                                                                                 |
| <b>Clock Mode</b> | Transparent, Recovery, External (From data port ETC)<br>Internal (From oscillator)  |

|                       |                                                                                                                                                                         |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control Signal</b> | CTS always On or follows RTS<br>DSR constantly ON, except during test<br>loops (RS-530 DSR always connect to DTR)<br>DCD constantly ON, except during fiber signal loss |
| <b>Test Loops</b>     | Local loop back, Remote loop back, V.54                                                                                                                                 |
| <b>Connector</b>      | Type Uses HD-68 pin D type Female with adapter cables                                                                                                                   |



**4x FXO I/F**

|                  |                                        |
|------------------|----------------------------------------|
| <b>Standards</b> | G.711 A-law (separate modules for FXO) |
| <b>Distance</b>  | 2km                                    |
| <b>Bandwidth</b> | 64K voice channel                      |
| <b>Connector</b> | RJ45 x 4 (4 voice channel /per unit)   |



**4x FXS I/F**

|                  |                                        |
|------------------|----------------------------------------|
| <b>Standards</b> | G.711 A-law (separate modules for FXS) |
| <b>Distance</b>  | 2km                                    |
| <b>Bandwidth</b> | 64K voice channel                      |
| <b>Connector</b> | RJ45 x 4 (4 voice channel /per unit)   |

## Ordering Information

| Model Name       | Description                                             |
|------------------|---------------------------------------------------------|
| FMUX1001-CH      | 1U 19" 4-Slot Rack Mount Chassis                        |
| FMUX101-CH       | 1U 19" 4-Slot Rack Mount Chassis                        |
| FMUX-AC          | Chassis Power Module 90~264VAC                          |
| FMUX-DC          | Chassis Power Module 18~72VDC                           |
| FMUX-4E1/T1-RJ45 | 4ch E1/T1 RJ45 interface card                           |
| FMUX-4E1/T1-Wire | 4ch E1/T1 Wire Wrap interface card                      |
| FMUX-4E1/BNC     | 4ch G.703 E1 BNC interface card                         |
| FMUX-V35         | V35 interface card with HD68M to 4 x MB34F cable (30cm) |

|                |                                                                |
|----------------|----------------------------------------------------------------|
| FMUX-530       | RS-530 interface card with HD68M to 4 x DB25F cable (30cm)     |
| FMUX-449       | RS-449 interface card with one HD68M to 4 x DB37F cable (30cm) |
| FMUX-X21       | X.21 interface card with one HD68M to 4 x DB15F cable (30cm)   |
| FMUX-232/Sync  | RS-232 Sync card with one HD68M to 4 x DB9F cable (30cm)       |
| FMUX-232/Async | RS-232 Async card with one HD68M to 4 x DB9F cable (30cm)      |
| FMUX-4FXO      | 4 x FXO interface card                                         |
| FMUX-4FXS      | 4 x FXS interface card                                         |
| FMUX-Phone-2W  | 2 Wires order Wire (connect to analogue Telephone set)         |
| FMUX-Phone-4W  | 4 Wires order Wire (connect to Ear-Mic set)                    |
| FMUX-EXT/CLK   | External clock interface card                                  |

### Example:

#### Chassis/Power/Line card Only

FMUX **1 0 0 1** - CH

- 1001 : GbE Fiber Multiplexer
- 101 : FE Fiber Multiplexer

FMUX **A C**

- Power Module

FMUX **V 3 5**

- I/F Line Card

#### Whole Set

FMUX **1 0 0 1** - **A C** - **2 W** - **A B C D**

- 1001 : GbE
- 101 : FE

#### Power Type

- AC
- DC
- AA : AC + AC
- DD : DC + DC
- AD : AC + DC

#### Order Wire

- 2W : 2 Wire Phone
- 4W : 4 Wire Phone

#### Card Type

- A : 4x E1 BNC
- B : 4x E1/T1 RJ45
- C : 4x E1/T1 Wire
- D : 4x V.35
- E : 4x RS-232/Async
- F : 4x RS-530
- G : 4x X.21
- H : 4x RS-449
- I : 4x FXO
- J : 4x FXS
- L : EXT/CLK
- M : 4x RS232/Sync