

## TECHNICAL DATA

### E1 Tributaries

2048 kbit/s according to ITU-T G.703, G.704 and G.706

### 2w/4w analog voice interface with E/M signaling

Impedance	600 $\Omega$
Relative levels	
2w/4w input and output levels in steps	-16 up to +4 dBr 0.5 dB
E/M signaling	
output (E)	$\leq 50$ mA/75 V
input (M)	$\leq 500$ $\Omega$ (2 mA)

### 2 wire analog voice interface ATC

Impedance	600 $\Omega$
Relative levels	
output	-4 dBr $\pm$ 3 dB (in 0.5 dB steps)
input	-3 dBr $\pm$ 3 dB (in 0.5 dB steps)
Loop current	$\leq 60$ mA
Loop resistance	$\leq 350$ $\Omega$
Ring load impedance	$> 1$ k $\Omega$ + 0.47 $\mu$ F
Ring detection level	15 up to 35 V <sub>eff</sub> /25 Hz
Maximum ringing voltage	90 V <sub>eff</sub>
Ring frequency	16 up to 50 Hz
Metering	
frequency(standard/option)	16/12 kHz $\pm$ 1%
sensitivity level	85 mV

### 2 wire analog voice interface ATA

Impedance	600 $\Omega$
Relative levels	
output	-7 dBr $\pm$ 3 dB (in 0.5 dB steps)
input	0 dBr $\pm$ 3 dB (in 0.5 dB steps)
Loop feeding	48 V/2x400 $\Omega$ , loop resistance up to 1200 $\Omega$ ,
Ring signal from ring generator (GZV15)	50 do 75 V <sub>eff</sub> /25 Hz
Metering	
frequency (standard/option)	16/12 kHz $\pm$ 1%

### 2 wire analog voice interface LB

Impedance	600 $\Omega$
Relative levels	
output	-4 dBr $\pm$ 3 dB (in 0.5 dB steps)
input	-3 dBr $\pm$ 3 dB (in 0.5 dB steps)
Ring load impedance	$> 1$ k $\Omega$ + 0.47 $\mu$ F
Ring detection level	15 up to 35 V <sub>eff</sub> /25 Hz
Maximum ringing voltage	90 V <sub>eff</sub>
Ring frequency	16 do 50 Hz
Ring signal from ring generator (GZV15)	50 do 75 V <sub>eff</sub> /25 Hz

### 64 kbit/s digital interface

according to ITU-T G.703, codirectional

### n x 64 kbit/s digital interface

according to ITU-T V.11/X.21 or V.35

### Fractional 2048 kbit/s, n x 64 kbit/s interface

according to ITU-T G.703 and G.704

### ISDN interface

U interface	channel structure: 2B+D line code: 2B1Q according to ETSI ETR 080
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### SHDSL interface

according to ETSI TS 101 524 and ITU-T G.991.2

### Ethernet bridge interface

10/100 BaseT and 100 BaseFX according to IEEE 802.3

### External clock reference

2048 kHz according to ITU-T G.703/10

### Control and monitoring interface

F interface for local control V.24/V.28  
Q2 interface for central control

### Operating temperature range

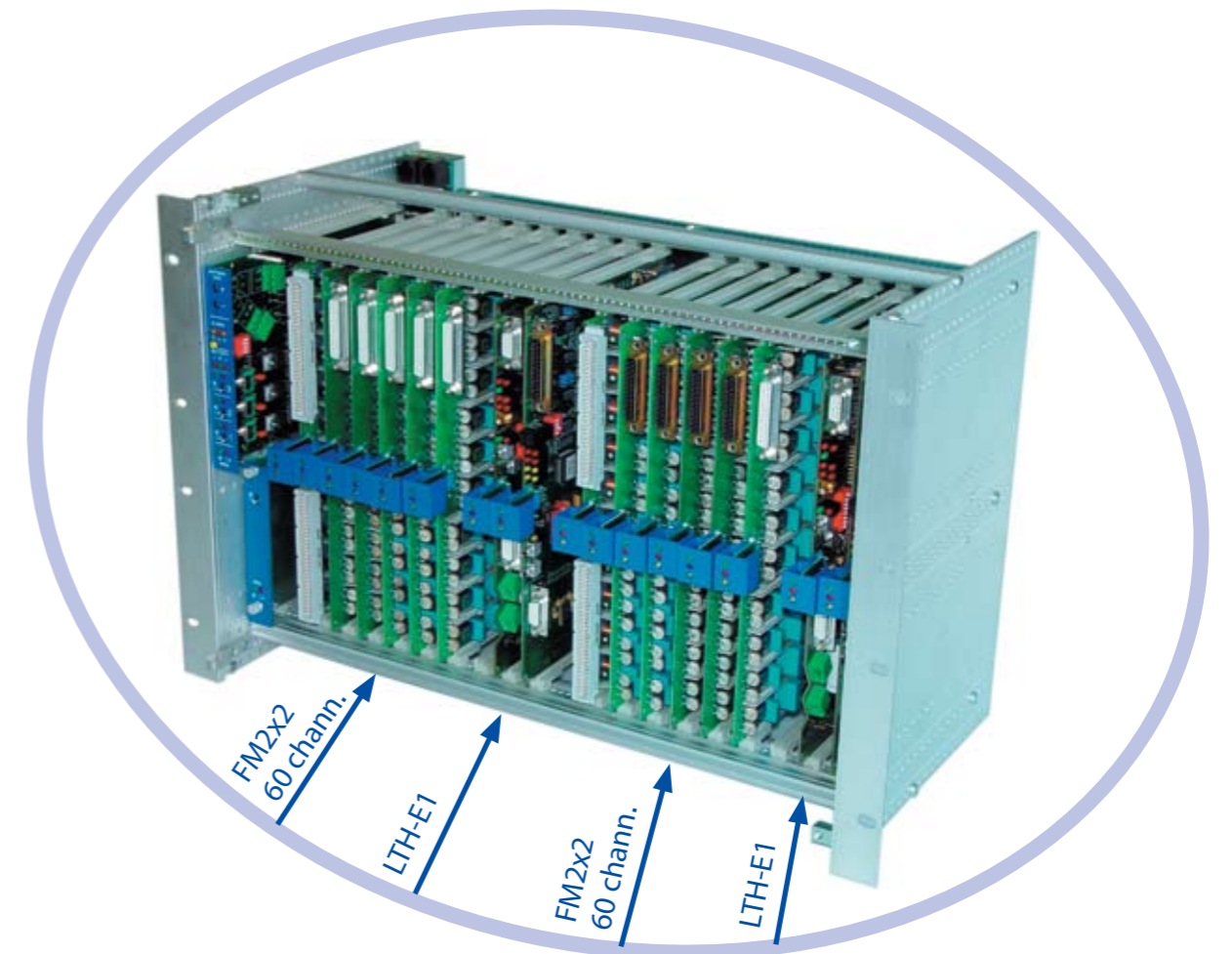
+5 $^{\circ}$ C up to +45 $^{\circ}$ C

# FM2x2

## FLEXIBLE MULTIPLEXER

### 2x2 Mbit/s

- Two 2 Mbit/s E1 tributaries (2x30 channels)
- User interface capacity 2x32 channels
- Digital channel cross-connect (non blocking)



## Applications

FM2x2 Flexible multiplexer is designed to allow transmission of voice and data in access telecommunication networks. It can be configured as primary multiplexer, double primary multiplexer, drop/insert, cross-connect and fractional multiplexer.

## Basic functions

- Digital 64 kbit/s multiplexing/demultiplexing
- Digital channel cross-connect including corresponding signaling bits (non blocking)
- analog and digital user interfaces

## Configurations

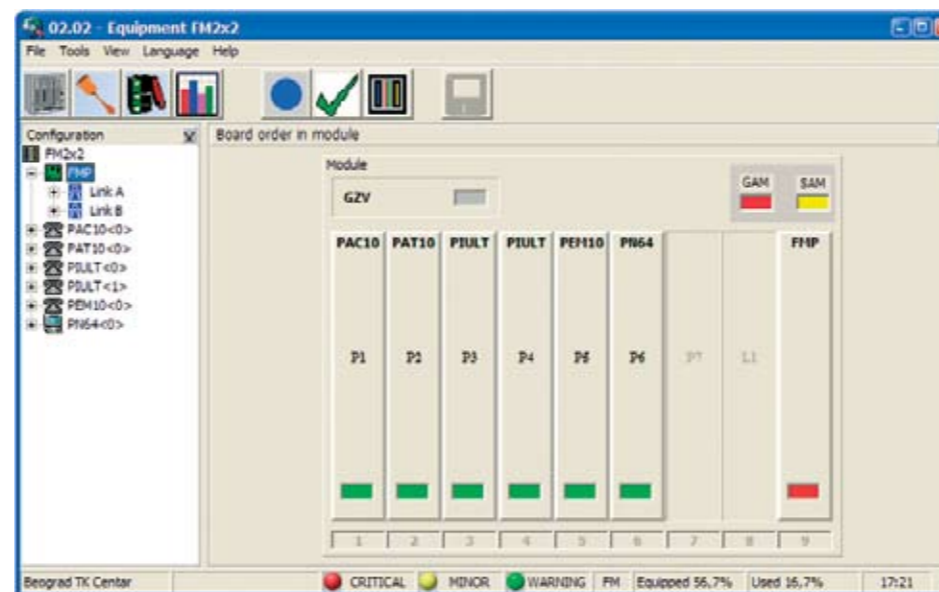
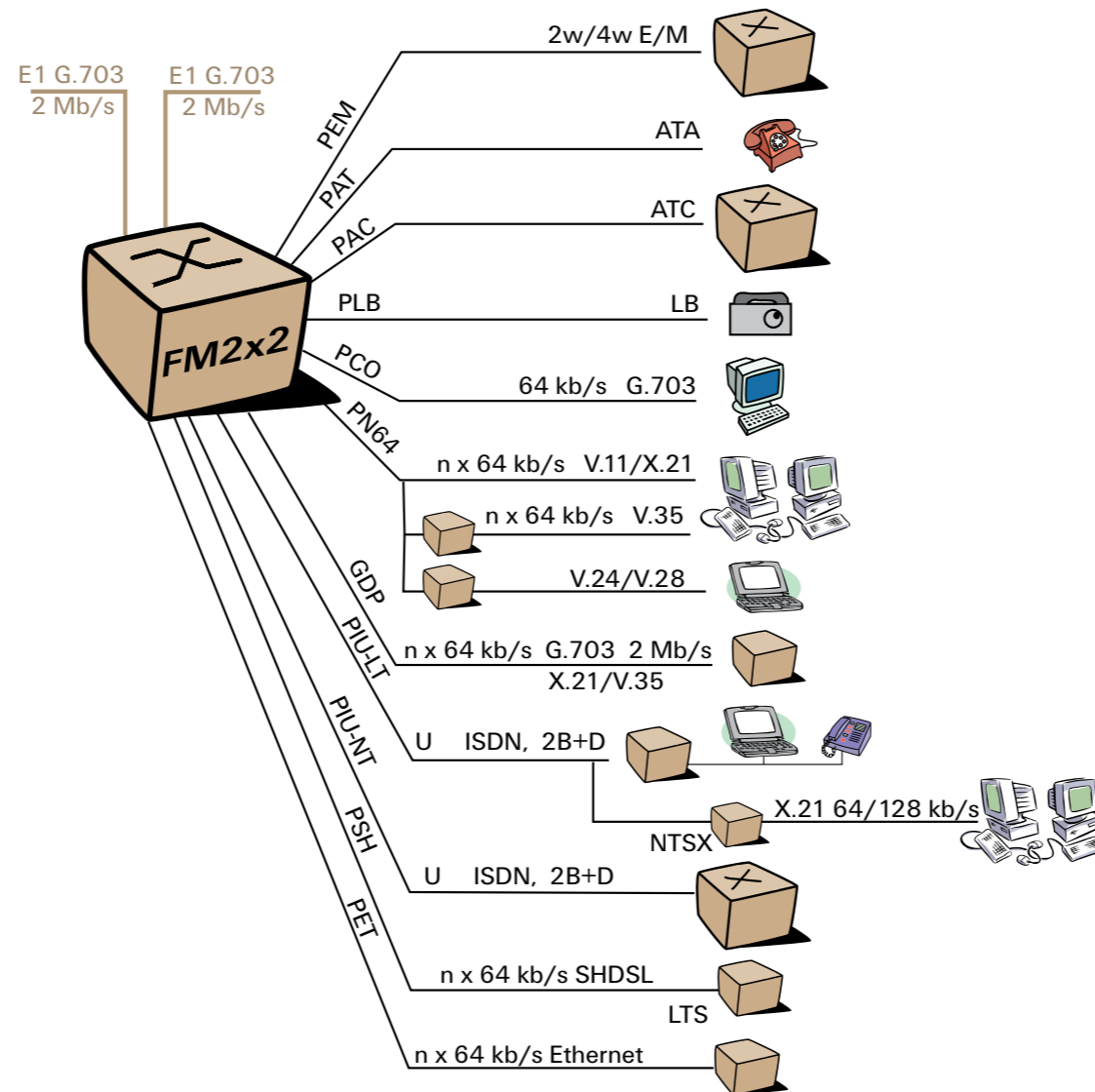
- FMP – multiplex, cross-connect, control and power supply unit
- Various types of channel units with up to 10 user interfaces

## Subscriber interfaces

- 2w/4w analog voice interface with E/M signaling
- 2w analog voice interface ATA – for direct connection to a phone
- 2w analog voice interface ATC – for direct connection to a exchange
- 2w analog voice interface LB – for direct connection to a phone with local battery supply
- 64 kbit/s digital interface, codirectional G.703
- n x 64 kbit/s digital interface with X.21 interface and with adapters for interfaces: V.35, RS232S, RS232 asynchronous up to 115 kbit/s
- Fractional 2 Mbit/s, nx64 kbit/s interface
- ISDN basic rate access U interface
- SHDSL, nx64 kbit/s interface
- Ethernet 10/100 BaseT and 100 BaseFX interface

## Subscriber units

- PEM10 – 10 channels 2w/4w with E/M signaling
- PAT10 – 10 channels, ATA interface
- PAC10 – 10 channels, ATC interface
- PLB10 – 10 channels, LB interface



Control and monitoring software FM2x2 Explorer

- PCO – 10 channels, 64 kbit/s digital interface, codirectional G.703
- PCO/128 – 10 channels, 64 or 128 kbit/s digital interface, codirectional G.703
- PN64 – 4 channels, n x 64 kbit/s, V.11/X.21 interface
- GDP – 1 fractional G.703 2 Mbit/s, nx64 kbit/s interface and 1 nx64 kbit/s X.21 or V.35 digital interface
- PIU-LT – 4 channels, ISDN U interface, 2B1Q for direct connection to a ISDN phone
- PIU-NT – 4 channels, ISDN U interface, 2B1Q for direct connection to a ISDN exchange
- PSH – 2 channels, SHDSL nx64 kbit/s interface
- PET – 3 channels, nx64 kbit/s Ethernet bridge with 10/100 BaseT or/and 100 Base FX interface

## Control and monitoring

All control and monitoring functions are contained on the central CPU unit (FMP). Control and monitoring can be either local or integrated in the network:

- Control and monitoring by local terminal (PC) with F interface and application software with graphical user interface FM2x2 Explorer (Element Manager)
- Integrated control and monitoring in IRITEL's transmission network (ODS155, OTSM, LTH-E1), with Q2 interface, and application software with graphical user interface for PC, SUNCE-M (Network Manager)

## Synhronization

- From internal built-in oscillator
- From external 2 MHz clock
- From received clock on the link A or B
- From received clock on a chosen digital channel interface

## Mechanical design

- Unit (233x160x20 mm)
- M1 module (257.5x115x210 mm) for 5 units
- 2M1 module (257.5x235x210 mm) for 11 units
- 19"/ETSI cabinet's rack (310x483/533x230 mm) for 2 FM2x2 with line units
- Wall mount cabinet for 6 units (525x150x235 mm)
- Wall mount cabinet for 11 units (525x300x235 mm)
- 4 or 8 M1 module rack (2600x252x120 mm)
- 19"/ETSI cabinet for 4 racks (2200x600x300 mm)
- ETSI cabinet for 2 racks (1000x600x400 mm)