



### Features Fiber Optical Delay Unit IEEE C37.94

- Two independent IEEE C37.94 fiberoptical connections over a single E1
- Standards compliant for power substation installation
- 19" mounting with only 200mm depth
- Single supply range from 48VDC to 230VAC

#### IEEE C37.94

Fiber optic interface according to standard "IEEE C37.94-2002, IEEE Standard for N times 64 Kilobit per Second Optical Fiber Interfaces between Teleprotection and Multiplexer Equipment" describes a fiber optic intrasubstation communication links between teleprotection equipment and multiplexers.

#### G.703/704 E1 Unbalanced

The ITU-standard G.703 describes the physical and electrical characteristics of hierarchical digital interfaces at rates up to 140Mbps. G.704 describes frame structures on G.703 interfaces up to 45Mbps. E1 describes a galvanic G.703 interface with G.704 frames at 2048kbps commonly used in telecommunication.

#### Function

The 21-224 is an electro optical multiplexer between one G.703/704 E1 and two IEEE C37.94 optical ports. The two IEEE ports are fully mapped into the G.704 standard frame structure of the E1 port, allowing for further SDH/PDH multiplexing and de-multiplexing. 21-224 derives its synchronization from the network port (E1) or from an internal 2048Kbps PDH compliant clock enabling it to be used in leased line applications using electrical E1 modems such as SHDSL and alike.

#### Usage

The 21-224 Fiber optic IEEE C37.94 – G.703 multiplexer from Fibersystem is intended for interfacing substation teleprotection equipment with IEEE C37.94 interfaces to telecom multiplexers using G.703 E1 interfaces.

The two independent IEEE C37.94 ports can be used for redundancy in the network or as a cross redundancy in dual installations. The 21-224 Fiber optic IEEE C37.94 – G.703 multiplexer can also be used in combination with the 21-216 Fiber optic IEEE C37.94 – G.703 64Kbps Codirectional Converter, for instance when the Teleprotection equipment lack IEEE C37.94 ports or when the intermediate SDH/PDH network offers a mixture of E1 G.703/704 ports and 64Kbps G.703 ports on different sites.

*The 21-224 product is part of a wide **product family** of interface, speed and protocol converters.*

*Fibersystem also offer **many related products** like Relay Trip Links, Asynchronous Modems, 19" Rack Based Interface Conversion and Operator Station KVM extensions.*

*The 21-224 product has been **tested and approved** to be used with the REL and RED product lines from ABB Power Technologies.*

***Fibersystem AB** is an inventive Swedish company who since 1982 has been working with the application of fibreoptic technology in the delivery of solutions fulfilling the Customers' multitude of needs.*

## Fiber optic link

Data speed	2048kbps.
Protocol	IEEE C37.94.
Fiber	Multi mode 50/125um or 62.5/125um, ST-connector.
Optical system budget	13dB in 62.5/um. 9dB in 50/125um fiber.
Typical distance	0 - 2km (3dB system margin for 50/125um and 6dB for 62.5/125um)

## Galvanic

Data speed	2048kbps
Protocol	G.703, E1
Connector	2 x BNC , Coaxial cable

## Power Supply

DC	48V DC to 250V DC, ±20%
AC	230VAC ±20%, 50–60 Hz
AC-connector	IEC 320, 3 pin

## Environmental

Operating temperature range	-25 to +55 oC
Storage teperature range	-40 to +85 oC
Relative humidity operating	5 to 95 %
Relative humidity storage	5 to 95 % non condensing

## CE compliance

Immunity	EN 61000-6-2
Emission	EN 61000-6-4
LVD	EN 50178; RIV = 250 V OVC = III

## Mechanical

Vibration	IEC 60255-21-1 Klass 2
Shock	IEC 60255-21-2 Klass 2
Seismic	IEC 60255-21-3 Klass 2

## EMC compliance

ESD	IEC 60255-22-2 Class 3, contact 6kV, air 8kV
Radiated	IEC 60255-22-3 / IEEE/ANSI C37.90.2; 35V/m
Burst Power	IEC 60255-22-1 Class III
Burst Communication	IEC 60255-22-1 Class II; 0,5 kV diff; 1 kV common mode
Fast transient Power	IEC 60255-22-4 Class IV
Fast transient Communication	IEC 60255-22-4 Class II; 1kV

## Insulation

Dielectric test	IEC 60255-5, 2,0kV 1min
Impuls voltage test	IEC 60255 / EN 50178 5kV / 6kV
Insulation resistance	IEC 60255-5; > 100 Mohm at 500 VDC

## Dimensions and Weight

Physical size	The unit is intendend to be mounted in a 19" rack. By adjusting the mount brackets the unit can also be mounted on a wall or similar Heigth 45 mm, Width 483 mm (Witkout brackets 380mm), Depth 173 mm
Weight	3 kg

## Ordering information

Product number	Model	Description
60-00-6763	21-224	Fiber Optical Delay Unit IEEE C37.94