



Features Fiber Optical Delay Unit IEEE C37.94

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

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 intra-substation communication link 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 140 Mbps. G.704 describes frame structures on G.703 interfaces up to 45 Mbps. E1 describes a galvanic G.703 interface with G.704 frames at 2048 kbps 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 2048 kbps PDH compliant clock, enabling it to be used in leased line applications using electrical E1 modems such as SHDSL and the like.

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 64 kbps Codirectional Converter, for instance when the teleprotection equipment lacks IEEE C37.94 ports or when the intermediate SDH/PDH network offers a mixture of E1 G.703/704 ports and 64 kbps 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 offers **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 fiber optic technology in the delivery of solutions fulfilling the customers' multitude of needs.*

Fiber optic link

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

Galvanic

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

Power Supply

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

Environmental

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

Designed to meet CE compliance

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

Designed to meet mechanical

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

Designed to meet EMC compliance

ESD	IEC 60255-22-2 Class 3, contact 6 kV, air 8 kV
Radiated	IEC 60255-22-3 / IEEE/ANSI C37.90.2; 35 V/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; 1 kV

Designed to meet Insulation

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

Dimensions and Weight

Physical size	The unit is intended to be mounted in a 19" rack. By adjusting the mounting brackets the unit can also be mounted on a wall or similar Height 45 mm, width 483 mm (without brackets 380 mm), depth 173 mm
Weight	3 kg

Ordering information

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