



Features 21-219 Fiber optic IEEE C37.94 - G.703 E1/X.21 Mux - Secure Series

- Fiber optic transmission, immune to EMI and RFI
- Standards compliant for power substation installation
- ½ 19" mounting, 2 units can be mounted side-by-side
- Wide range of PSU options available, from 36VDC to 230VAC
- Optional extra removable power supply for redundancy

Secure Series features

- Optional extra removable power supply DC or AC for redundancy
- Tampering proof casing to prevent external sabotage or change of software
- Alarm function, signals if G.703 or C37.94 link is down

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", a fiber optic intrasubstation 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 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.

X.21

The ITU-standard X.21 is an interface primarily used in telecom for connection of "customers (DTE) equipment" to "carrier's (DCE) equipment". All signals are balanced.

Function

The 21-219 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. 21-219 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 21-219 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 21-219 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.

Fiber Optical Link Multi Mode

Data speed	2048kbps
Protocol	IEEE C37.94
Fiber Multi Mode	Multi Mode 50/125um or 62.5/125um, LC connector
Wavelength Options	850nm
Typical distance	0 - 2km

Fiber Optical Link Single Mode

Data speed	2048kbps
Protocol	IEEE C37.94
Fiber Single Mode	Single Mode 9/125um, LC connector
Wavelength Options	1310nm or 1550nm
Typical distance 1310nm	20km, 40km or 60km (selectable when ordering)
Typical distance 1550nm	80km or 120km (selectable when ordering)

Galvanic G.703 E1

Data speed	64kbps
Connector	2 x BNC (unbalanced), RJ45 (balanced)

Galvanic X.21

Data speed	4.8-704kbps
Connector	DB-15 D-sub Female

Power Supply

DC input	36-75VDC Connector, Terminal block with plug
AC input	85-264 VAC, 50-60 Hz, + 20%, or 120-370 VDC AC-connector IEC 320, 3pin, locking

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

The 21-219 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 21-219 product has been **tested and approved** to be used with the REL and RED product lines from ABB Power Technologies.

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	Height 44 mm, Width 221 mm, Depth 228 mm
Weight	1,4 kg

The unit is intended to be mounted in a 19" rack. It is delivered with an Angle Bracket Kit and Single Mounting Bracket that fits 19" rack. Double Mounting Kit is available as an accessory for mounting two in parallel. By adjusting the mount brackets the unit can also be mounted on a wall or similar.

Ordering information

Product number	Model	Description
60-00-7452	21-219	Fiberoptic C.37.94-E1/X.21 Converter 1310nm SM