



Fiber Optical Converter C37.94 and E1 G.703 over Synchronous Ethernet

Features

- IEEE C37.94 and E1 G.703 connection over Synchronous Ethernet
- New security functions
- Standards compliant for power substation installation
- 19" rack mounting with only 228mm depth
- Web interface for monitoring and management

IEEE C37.94 and E1

Fiber optic interface according to standard "IEEE C37.94-2002, IEEE Standard for N times 64 Kilobit per Second". C37.94 and E1 G.703 channel is transparent to protocols and signalling - All data slots are transferred. Both are transparently converted into UDP packets and back.

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.

New security functions

- Optional extra removable power supply for redundancy
- Optional encryption (AES) of traffic
- Tampering protected casing

Functions

The 21-225 is an electro optical converter between two IEEE C37.94 optical ports and/or G.703/704 E1 and Synchronous Ethernet and reverse. Both channels are transparently converted into UDP packets and back.

Clock synchronisation is selectable between SyncE network, E1 input, C37.94 input or a clock feed from a reference. The 21-225 includes a web interface for monitoring and management, which enables:

- Configuration and setup
- Event monitoring
- Monitor alarm
- Firmware upgrade
- Filtering of traffic (optional)

Usage

The 21-225 Fiber optic IEEE C37.94 / E1 G.703 to Synchronous Ethernet converter from Fibersystem is intended for interfacing substation tele protection equipment with IEEE C37.94 interfaces to a synchronous ethernet network. The two ports, IEEE C37.94 ports and E1 can be used separately or in parallel. Destinations and IP-addresses are defined in the web interface.

The 21-225 has a new design of mechanical housing for 19" rack mounting. The housing is standards compliant for power substation installation and can be equipped with two removable power supplies for redundancy, from 48VDC or 230VAC. Fibersystem products for substation use is built for demanding environments and can withstand 4kV bursts.

Typical application areas

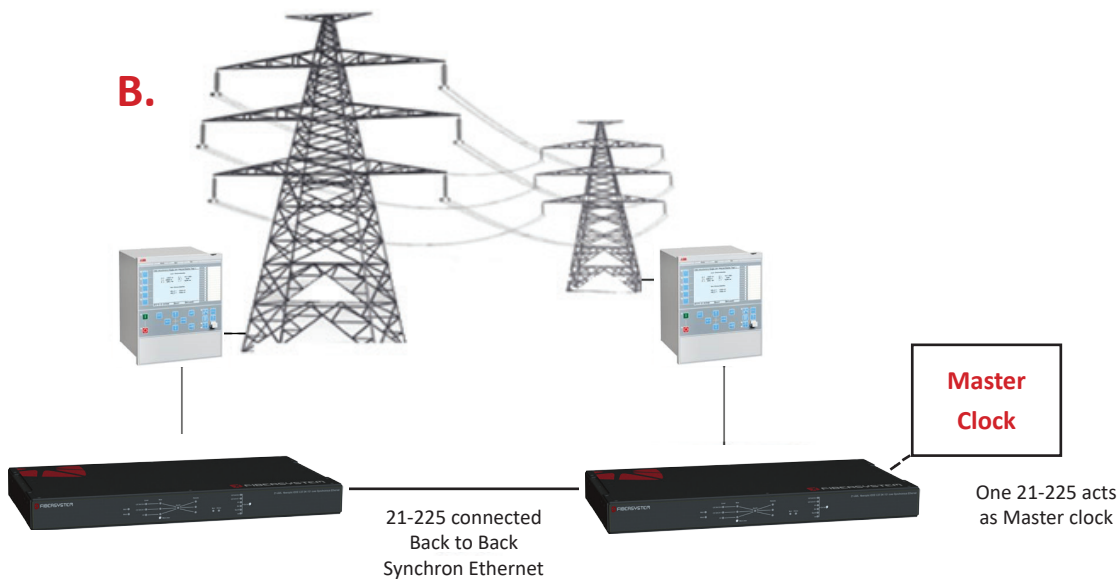
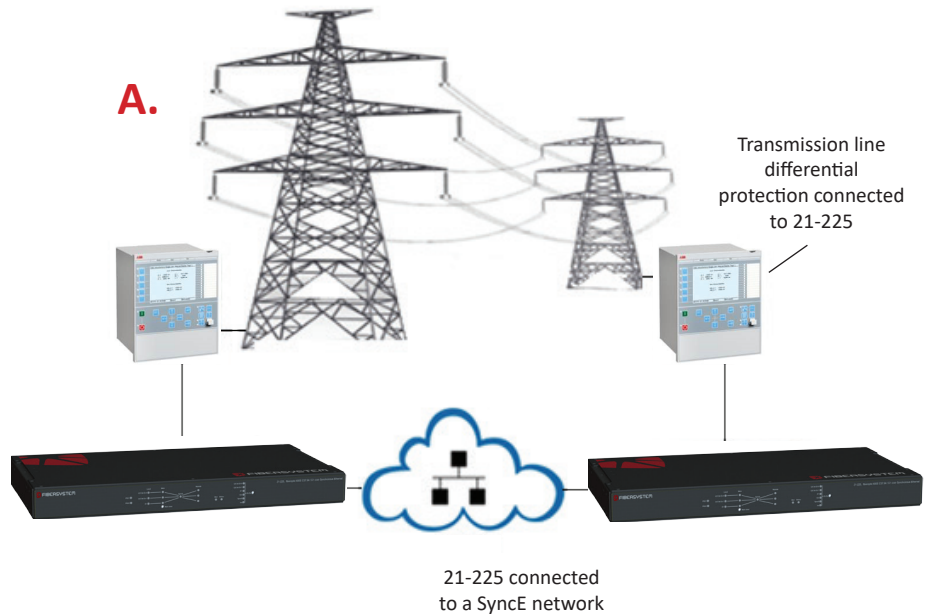
- Substation environment - Differential Relay protection over Ethernet networks
- Industrial communication
- Clock synchronisation
- Telecom
- Broadcasting

Application examples

Substation environment - Differential Relay protection over Ethernet networks

A. 21-225 connected to a SyncE network

B. 21-225 connected Back to Back Synchron Ethernet with one 21-225 as Master clock



Fiber Optical C37.94 link

Data speed	2048kbps
Protocol	IEEE C37.94
Fiber	Multi Mode 850nm 50/125um or 62.5/125um, LC-connector (ruggedized) Other fiber optical components available as option
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 E1 link

Data speed	2048kbps
Protocol	G.703, E1
Connector	120 ohm, RJ45 (BNC connector available)

Galvanic Synchronous Ethernet link

Data speed	1000 BaseT
Protocol	SyncE according to ITU-T (G.8261, G.8262, G.8264) standardized network with transference of clock signals over Ethernet physical layer
Connector	RJ45 cat 6
Prerequisites	Each network element along a synchronization path must support SyncE

Clock input/output

Clock frequency out	Selectable
Clock frequency in	Selectable
Connector	SMA

Power Supply

DC	36-75VDC
AC	85-264VAC, 50-60 Hz or 120-370VDC.
AC-connector	IEC 320, 3pin, locking IEC

Environmental

Operating temperature range	25 to +55°C
Storage temperature range	40 to +85°C
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

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

Mechanical compliance

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

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

The unit is intended for mounting in a 19" rack.	
Height	44 mm (1u)
Width	444 mm
Depth	227 mm
Weight	3 kg

Ordering information

Product number	Model	Description
60-00-7248	21-225	IEEE C37.94 and E1 G.703 connection over Synchronous Ethernet

