Fiber optic Converter C37.94 and E1 over Synchronous Ethernet (SyncE)

- IEEE C37.94 and E1 G.703 connection over Synchronous Ethernet
- Standards compliant for power substation installation
- 19” rack mounting with only 173mm depth

Description

SyncE 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.

Usage

SyncE from Fibersystem is intended for interfacing substation tele protection equipment with IEEE C37.94 interfaces to a synchronous ethernet network. The two IEEE C37.94 ports can be used separately or in parallel.

The housing 19” rack mounting is standard 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.

IEEE C37.94

Fiber optic interface according to standard “IEEE C37.94-2002, IEEE Standard for N times 64 Kilobit per second”. C37.94 is transparent to protocols and signalling - All data slots are transferred. Both are transparently converted into UDP packets and back.
E1 describes a galvanic G.703 interface with G.704 frames at 2048 kbps commonly used in telecommunication.

Typical application areas

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

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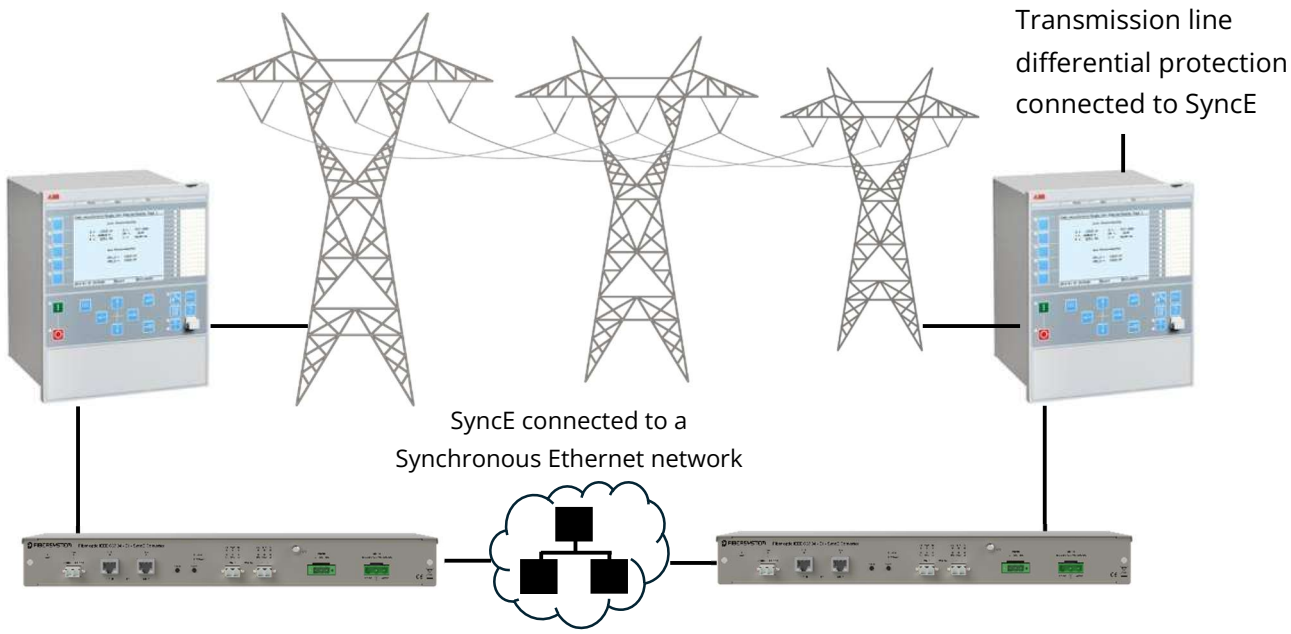
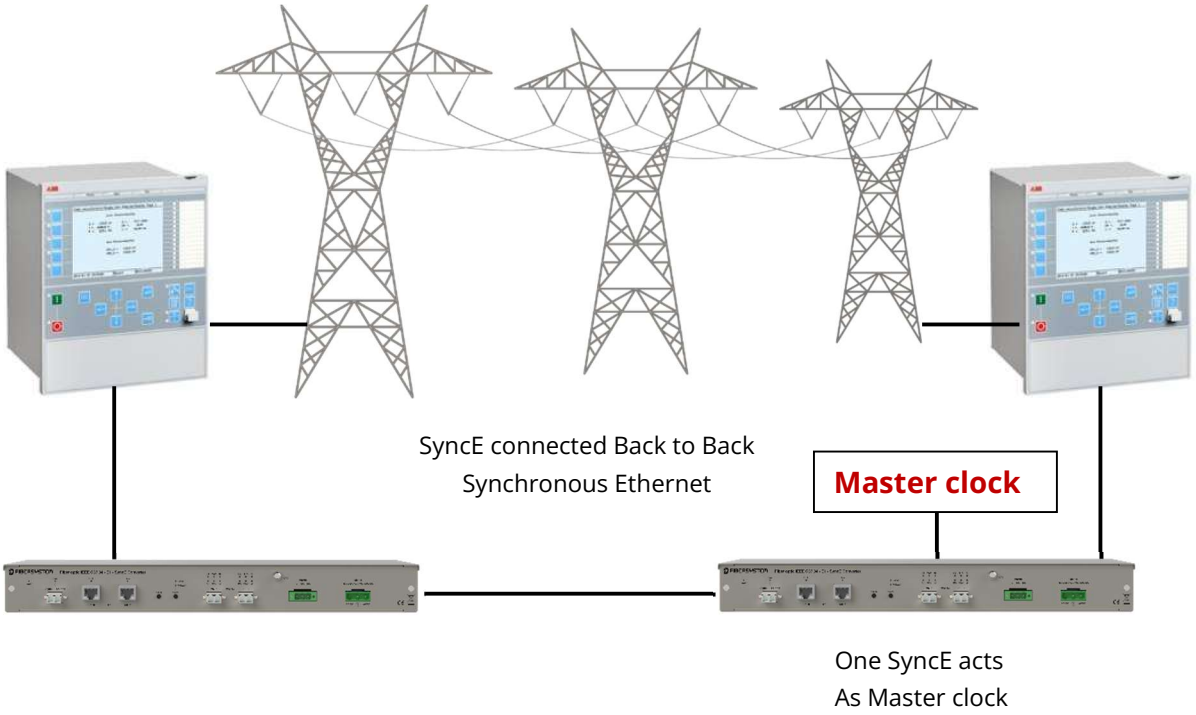
Application examples

Substation environment - Differential Relay protection over Ethernet networks

A. SyncE connected to a Synchronous Ethernet network



B. SyncE connected Back to Back Synchronous Ethernet with one SyncE as Master clock



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Tecnichal data

I/O ports	Description	Connector	No
SyncE	Synchronous ethernet 1000Base-SX	LC	1
E1	E1, G.703 (Ch 0)	RJ48	1
E1	E1, G.703 (Ch 1)	RJ48	1
C37.94	IEEE C37.94 (Ch 0)	LC	1
C37.94	IEEE C37.94 (Ch 1)	LC	1
Alarm	Relay output	Terminal block, 3pin, 5mm pitch	1
Power	Power inlet	Terminal block, 3pin, 7.5mm pitch	1

Fiberoptic and data transfer protocol	Description
Data speed	2048kbps
Protocol	IEEE C37.94
Optical data	Multi Mode 850nm 50/125um or 62.5/125um
Fiber optical connector	LC
Optical system budget	13dB in 62.5/um. 9dB in 50/125um fiber
Typical distance	2km 3dB system margin for 50/125um and 6dB for 62.5/125um
Fiberoptic Synchronous Ethernet link	**Description**
Data speed	1000Base-SX
Protocol	SyncE according to ITU-T (G.8261, G.8262, G.8264) standard network with transference of clock signals over Ethernet
Connector	LC
Prerequisites	Each network element along a synchronization path must support Synchronous Ethernet
Galvanic E1-link	**Description**
Data speed	2048 kbps
Protocol	G.703, E1
Connector	120 ohm, RJ48
Clock input/output	**Description**
Clock frequency out	Based on clock frequency in
Clock frequency in	Selectable between Network and Local Oscillator
Alarm output data	**Description**
Output	Galvanic isolated, with three connectors, normally open or normally closed Selectable
Electrical performance	Max 60VDC or max 40VAC.
Power supply	**Description**
AC supply range	40VAC to 265VAC, 50Hz/60Hz
DC supply range	40VDC to 300VDC
Power consumption typical	10 W
Power consumption max	15 W

Mechanics and Environment	Description
Hight	45 mm
Width	483 mm (380 mm without rack mount brackets)
Depth	173 mm (from front to back, connectors excluded)
Weight	3 kg
Operating temperature	-25 °C to 55 °C, at 10-90%RH relative humidity, non-condensing
Storage temperature	-40 °C to 85 °C, at 10-90%RH relative humidity, non-condensing
CE compliance	**Description**
LVD	EN 50178, RIV = 250V OVC = III
EMC	IEC 60255-26
EMC compliance	**Description**
Radiated Emission	CISPR 11, CISPR 32
Conducted Emission	CISPR 32
Immunity	IEC 61000-4-3
ESD	IEC 61000-4-2, contact 6kV, air 8kV
Burst Power	IEC 61000-4-4
Burst Communication	IEC 61000-4-4
Fast transient Power	IEC 61000-4-4
Fast transient Communication	IEC 61000-4-4
Conducted disturbance	IEC 61000-4-6
Electrical fast transients/burst	IEC 61000-4-4
Damped oscillatory waves	IEC 61000-4-18
Surge	IEC 61000-4-5
AC and DC dips	IEC 61000-4-11 and IEC 61000-4-29
AC and DC voltage interrupts	IEC 61000-4-11 and IEC 61000-4-29
Ripple DC input power immunity	IEC 61000-4-17
Power frequency magnetic field	IEC 61000-4-8
Mechanical compliance	**Description**
Vibration	IEC 60255-21-1 Class 2
Shock	IEC 60255-21-2 Class 2
Insulation	**Description**
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

Order Information

Product	Product No
SyncE, Fo Converter C37.94 and E1 over Synchronous Ethernet	60-00-9166

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