



TP 10

Transmission of digital protection commands and differential protection signals via optical fibre, Eth/PDH/SDH Network

TELEPROTECTION AND COMMUNICATION SYSTEM

TP10 equipment is intended for the transmission of 10 bi-directional commands within power grids, and, in addition, of digital teleprotection signals on optical interfaces. Aggregated signal is transmitted via optical cable or Eth/SDH network. Its reliability can be enhanced by making the transmission path redundant, 1+1.

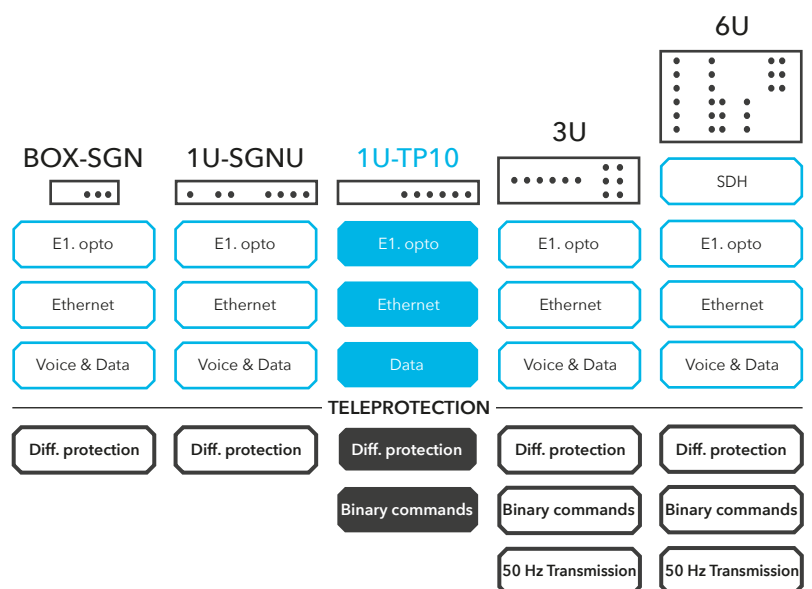
KEY BENEFITS

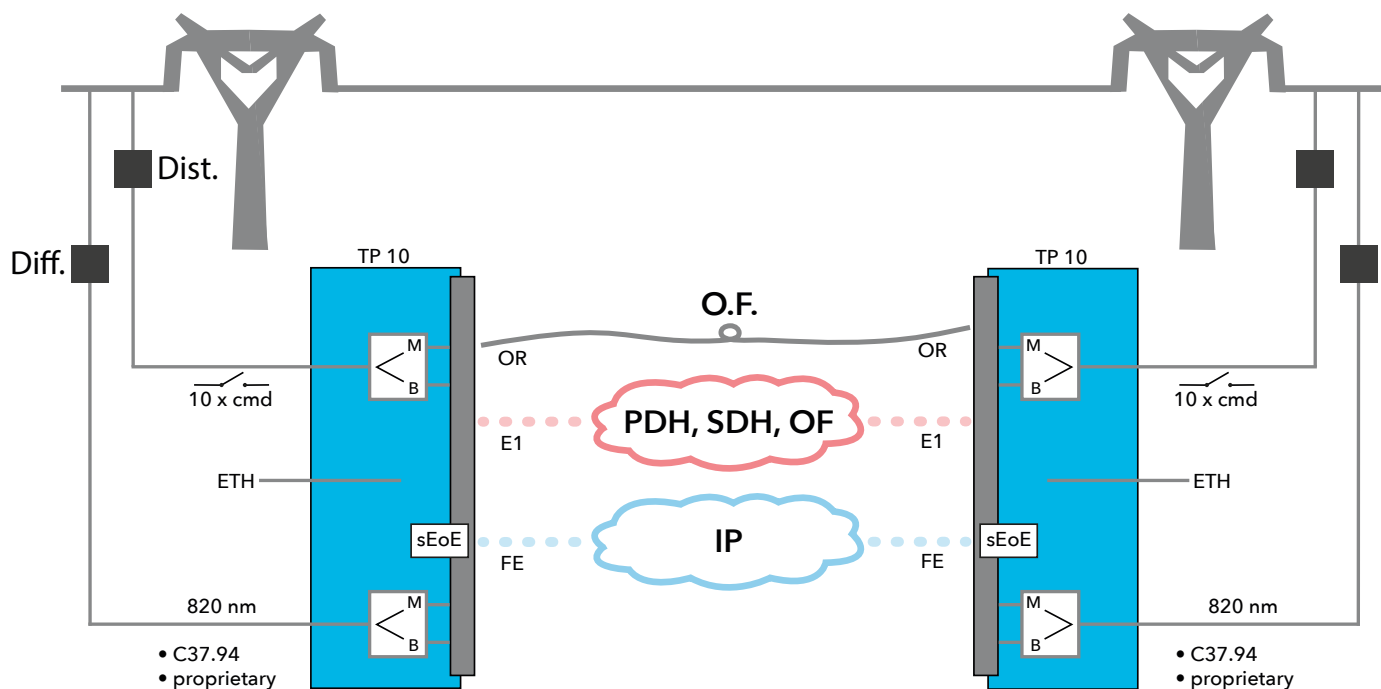
- Low input impedance increases immunity to distortion
- Voltage and time filtering
- Galvanically separated inputs and outputs
- 8 bit security addressing
- Cross-connect and drop-insert for command groups
- Continuous check of transmission time and connection
- Transmission up to 4 directions
- Transmission time from 1 ms
- Command log accuracy 1 ms (command + alarm + time)
- Independent command configuration (DT/P/B), filtering

MAIN FEATURES

- 10 bi-directional commands
 - Direct Trip/Permissive/Blocking
- Dual power supply 220 VDC / 230 VAC / 48 VDC
- 820 nm optical interface for differential protection
 - C37.94
 - Proprietary
- Local / network management
- NTP / PTP time synchronization
- Line interface (protective switching 1+1)
 - Optical up to 180 km
 - E1
 - Ethernet 100Base - TX

TELEPROTECTION FAMILY





TECHNICAL PARAMETERS

Command interface

10 bidirectional commands +1 acknowledgment input

Inputs	110, 220 VDC
Outputs	220 VDC / 2 A (5 A @ 250 ms)
Two alarm relays	220 VDC / 1 A
Insulating voltage	4 kV
Command log with ± 1 ms accuracy	
Transmission time 0.5 to 3 ms (64 to 512 kbit/s)	

Line interface

Electrical interface	2 x E1 2 x Fast Ethernet (FE)
Optical interface	2 x OI (SFP module)

Optical interface

Wavelength	1310 / 1550 / 850 nm One fibre WDM 1310 / 1550 nm
Distance	up to 120 km

Digital differential protections

IEEE C37.94 (820 nm) - RED670, SEL311L
Proprietary : 7SD511, 7SD512, 7SD523, 7SD61
Serial data (sync. / async.)

User data interface

Electrical data RS422/RS232
Fast Ethernet bridge Nx 64 kbit/s

Standards

EN 60834-1	Teleprotection equipment of power systems
IEC 60870-5-104	Informative interface of protection equipment

General Specifications

Supply voltage	2 x 220 VDC / 230 VAC / 48 VDC / 110 VDC
Power consumption	15 W
Dimensions (w x h x d) mm	482.6 x 43.65 x 285
Subrack design	1U height subrack to be mounted into 19" rack
Operating temperature	-5 to +55 °C
Path backup	switch - over lower than 5 ms (typically 2 ms)

EMC

EN 61000-4-2, 4-3, 4-4, 4-5, 4-6, 4-8, 4-9, 4-12, 4-16, 4-17, 4-18, 4-29	Immunity
EN 6100-6-4	Emission

Environmental

ETSI ETS 300 019 1-3	class 1.1	-5 to +55 °C
IEC 60721-3-3:1996	3K3, 3Z1, 3B1 3C1, 3S1, 3M1	non-condensing

Contacts

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