TECHNICAL SPECIFICATIONS

— Line Interfaces

SDH

Line interface	STM-4/STM-1
Synchronization	internal, STM, E1
Protection	SNCP, MSP-ring

Tributary interfaces

E1 / G.703	2 × 12 E1 (per module)
Eth	4 × 10/100/1G (per module)

Ethernet

E1 over IP	
Eth	10/100
Sync	internal, E1, T12
Encapsulation	AAL1, CESoPSN.
Framing	unstruct, struct Nx64/CAS
Tributary interface	
E1	external/internal

PDH

Line interface	E1 / G.703
Signalization	CAS
Frame composion	G.704
Performance monitoring	G.706, (CDC-4)
Line code	G.703, HDB3
Impedance	120 Ω
Synchronization	internal, E1, external, T12

Optical interface for PDH or SDH

Optical interface	SFP modules
Wavelength	820/1310/1550 nm WDM 1310/1550 nm (1 fiber)
Distance	up to 180 km

SHDSL

Mode	2 x 1-pair (1xE1 + 1xEth 5 Mbit/s)
Modulation	16/32 TC PAM
HDLC channel	nx 64 kbit/s (for n=3-32)

— Teleprotection Interfaces

Commands

Nominal voltage	220, 110 VDC
Input treshold	158-170 / 79-85 VDC
Input current	20 - 25 mA
Output switch. current	2 (4) ADC
Channels per module	10 / 4
Transmission time	1 - 9 ms

2 w 50/60 Hz (DZL-2)

Nominal voltage	60 Vrms

Digital teleprotection

General	IEE C37.94
ABB	REL551, RED670
Siemens	7SD5111, 7SD512, 7SD523, 7SD61
SEL	SEL311L
Wavelength	820 nm / 1310 nm

4 w 50/60 Hz

Input voltage	57.7 / 100 V RMS
Output voltage (2 kΩ load)	27 - 50 / 54 - 100 Vrms

— Voice and Data Interfaces

Data

Data channel interfaces	RS232/V.28, RS422/V.11, RS-485-4w, RS485-2w, V.35, V.36, RS449, RS530, optical 820 nm
Types and bit rates	Sync. or async. up to 64 kbit/s, Nx 64 kbit/s, N = 2, 4, 8
Ethernet L1	Nx 64 kbit/s, N = 1 to 30 Nx VC12, Nx VC3
Codirectional	64 kbit/s G.703

Voice

FXO	
FXS (CB / LB)	
Coding	G.711 / A law
Max. loop impedance	1400 Ω
4w / 2w with E&M	
ISDN remote S0	
FXS, 4w with galvanic separation	

— Management, Ethernet L2

Management

Local	Windows oriented, IP access
Network	SNMP EC 60870-5-104
Central	TopoNet (HP, LINUX oriented)
	Server backup, NBI interface, workstations Windows, IP access

Ethernet L2

Nx 64 kbit/s, N = 1 to 30 Nx VC12, Nx VC3
10 / 100 / 1000
L2 switch
point to point

TTCMARCONI

PCM30U-OCH

COMMUNICATION SYSTEM WITH A TELEPROTECTION FUNCTION

PCM30U-OCH is a family of transmission systems based on PDH and SDH multiplexers, transmitting standard telecommunication signals, such as voice, data and Ethernet (bridge) as well as protection relay commands, either in the form of analogue binary commands or in the digital form using various protocols (such as C37.94). In addition, the system provides 50 Hz frequency transmission for specific solutions.

- **FLEXIBILITY**
  Modular and scalable
- **SERVICES**
  Teleprotection, Voice and Data
- **SPEED**
  Guaranteed delay not exceeding 2 ms
- **TRANSMISSION**
  SDH, PDH, IP/Ethernet, optical fibre, data
- **RELIABILITY**
  Secured transport, backup options

Contacts

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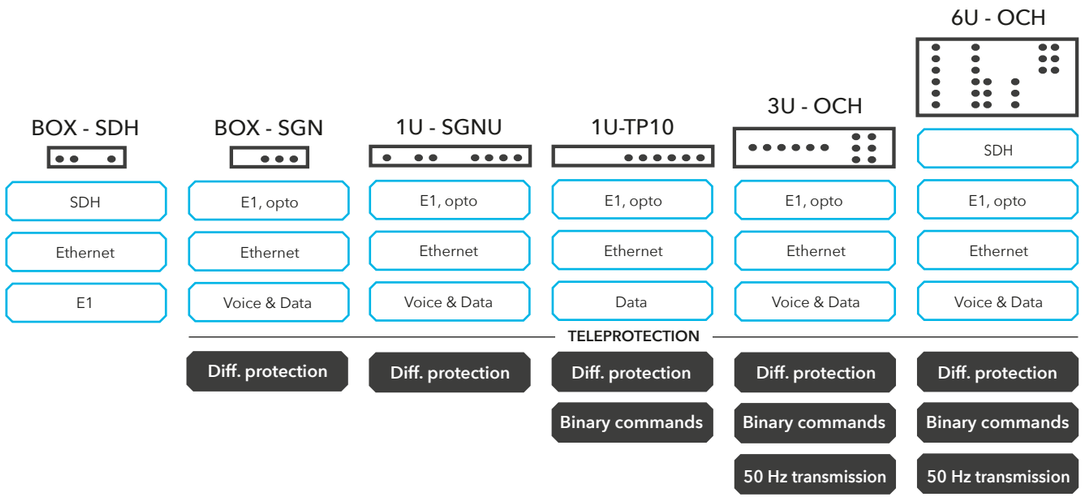
POWER ENGINEERING · PIPELINES · TRANSPORT INFRASTRUCTURE · MANUFACTURING SYSTEM · SECURITY APPLICATIONS

TYPES AND FUNCTIONS



6U/19" - „all in one solution"

Offers maximum versatility and complex solution up to 80 TP commands capacity in the subrack. Transmission via optical fibres E1, STM1/4, SM/MM, IP / FE or metallic cable.

3U/19" - „economic solution"

Offers a spatially and cost-effective solution in less complex applications. Transmission of 20 TP commands in the subrack via E1, optical fibers SM/MM, IP / FE or metallic cable.

1U/19" - „specific solution"

Systems designated for only a certain category of services with maximum cost savings (i.e. only teleprotection or voice / data transfers). The capacity for teleprotection is 10 commands within E1 transmission, SM / MM optical fibers, IP / FE or metallic cable.

BOX - „terminal solution"

Offers end-user services with TDM or IP capabilities. The main applications are intended for transmission from RTU (serial data / voice, Ethernet IP L2 / VLAN services) to central nodes through IP, TDM or hybrid networks. Another type in the BOX solution is the SDH system for E1 transmission services or Ethernet.

KEY BENEFITS

High flexibility and reliability. The PCM30U-OCH solution enables cost optimization in line with individual functional variants in view of the specific needs of the customer. The system is focused on high reliability for critical signal transmissions.

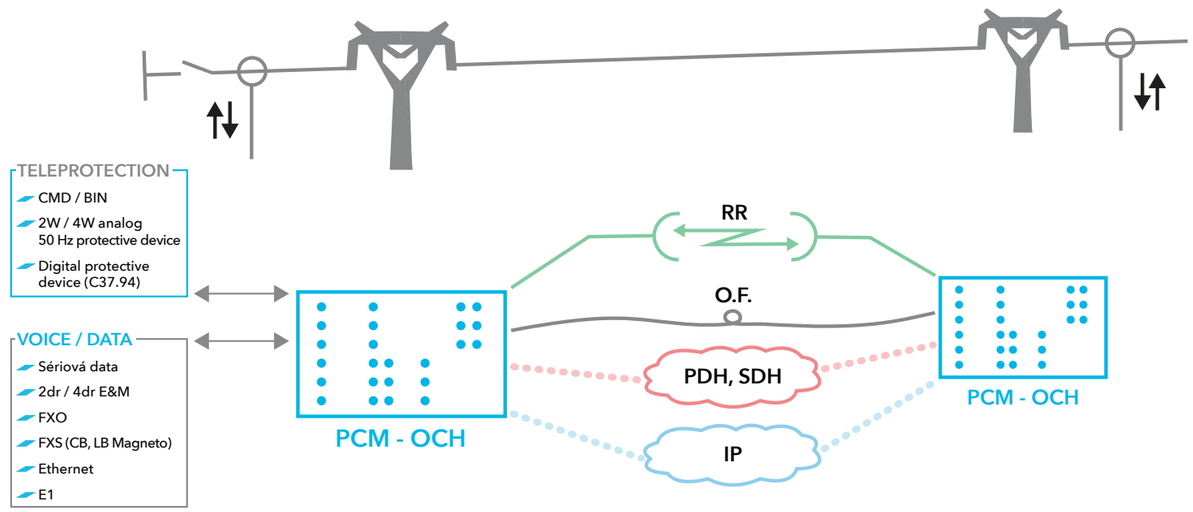
Full compatibility with analog and digital protection systems of third parties provides networking for optical interfaces of differential protection systems ABB, SEL, SIEMENS differential protection system.

Protecting future investments is ensured by the open modularity of PCM30U-OCH system, while the technology development and the need to concentrate a wide range of services do not limit further development of customer's network to one supplier.

- fast and reliable command transmission
- remote or central administration of supported network elements
- the ability to fast backup the channel-level system without interruption
- enhanced EMC resistance and low emission

APPLICATIONS

MULTIFUNCTIONAL SOLUTION (SERVICES AND TRANSPORT)



BASIC FEATURES

TELEPROTECTION SERVICES

- **Differential (C37.94) and distance (binary commands) protection**

OPEN MODULARITY

- **Future investment protection:** the system enables collaboration with third-party devices
- Progressive network development at expanding the services provided
- Customer solutions for emerging user needs

BACKUP OPTIONS

- **Line signal protection** (the cheapest solution, 50 ms switching time)
- **Path signal protection** (dual mux in one subrack, 5 ms switching time)
- **Double system protection** (high reliability, used for power plant - substation connection)

SUPPORT OF VARIOUS TOPOLOGICAL STRUCTURES

- **Mesh, Ring, Midspan, Terminal, T-Line**