ENVIRONMENTAL FEATURES

HIGH FREQUENCY SECTION (HF)

HF bandwidth	40 ÷ 500 kHz
Output power (P.E.P.)	2-80 W
Line impedance (2 wired)	50, 75 Ω unbalanced and 124,150 Ω balanced
AGC	available

DIGITAL APPLICATION

Modulation	TCM-QAM
Interfaces	V.11/X21 up to 92.8 kb/s, G.703 codirectional to 64 kb/s (plotted and unplotted), Ethernet 10/100 BaseT (Bridging IEEE 802.1d or Routing) up to 92.8 kb/s
Bandwidth	4-8-16 kHz
Transmission capacity	up to 92,8 kb/s (also with overlapping bands)
FEC (Forward Error Connection)	schedulable
Adaptive speed	available
Channel equalization	adaptive
Echo deleting	adaptive

Integrated multiplexer performances

Data interfaces	X.20bis/V.28 (synchronous) and X.21bis/V.28 (asynchronous) from 1.2 kb/s to 19.2 kb/s
Data channels	up to 20
Connections	Point-Point and Point-Multipoint
Voice interfaces	E/M (2/4 wires), FXS, FXO
Voice channels	up to 6
Voice compression	ITU-T G.729A (8 kb/s) or G.726 ADPCM (16, 24, 32, 40 kb/s)
Echo canceller	G.168

ANALOG APPLICATION

User Interfaces

Voice, telegraphic ch., low/high-speed data, teleprotection signalling

Channels number	up to 4
Effective BF bandwidth	300 ÷ 3720 Hz
Transmission type	SSB
Bandwidth	4 kHz
Canalization	Tx/Rx on adjacent or on spaced bandwidths
Modulation type	FSK, OOK
Transit functionality	available
Equalisation	automatic/user-configurable

Voice section

Available phonic bandwidth (programmable) 300÷2000; 300÷2200 Hz; 300÷2400; 300÷3400 Hz

Interface	E/M (2/4 wires), FXS, FXO, BC e BL
Impendance	600 Ω balanced
Compandor features	excludable via programming or external control
Telecommunication service (EOR)	available

Telegraphic transit

N° of channels	1 to 3
Selectable bandwidth	2160÷3400 Hz; 2240÷3720; 2440÷3720 Hz;2640÷3720; 300÷3720 Hz
Interface	4 wires
I/O Impedance	600 Ω balanced

Asynchronous data interface

Interface	ITU-T V.24/EIA RS232
Speed	50/100/200/600/1200 Bd
Standard	ENEL, ITU-T (R.35, R.37, R.38 A/B e V.23)

ANALOG INTERFACE TOWARDS TELEPROTECTIONS SELTA TPS-NU/TPS-3000 (TPU-BF)

Interface type	4 wires
Transmission/reception bandwidth	300 ÷ 3720 Hz/12300 ÷ 15720 Hz
Impedance	600 Ω unbalanced
OCV link operating bandwidth	4; 8 ;16 kHz

DIGITAL INTERFACE TOWARDS SELTA TPS-NU/TPS-3000 TELEPROTECTIONS (TPU-POF)

Interface type	POF (Plastic Optical Fiber)
OCV link operating bandwidth	8 and 16 kHz con TPS-NU 4, 8 e 16 kHz con TPS-3000

INTEGRATED TELEPROTECTION

Controls	4/8
Starter management (START):	available
Canalization	R.37 e R.35

SECURITY

SSH SECURE communication session with Authentication at Local Server or Radius Server

DIAGNOSTIC AND MAINTENANCE

On line diagnostic	configuration control, Tx HF power control, line attenuation and S/N ratio measurement, alarms monitoring, line measures
Agent SNMP	SNMP_v3 (CMU-adv)

POWERING

Input voltage	48 Vcc - 110 Vcc (+ 20%, -15%)
Consumption	≤ 400 Watt (with full equipment with P=80 W)

ENVIRONMENTAL FEATURES

Temperature	-5 ÷ 55 °C
Relative humidity	93% at 40°C (compliant with IEC 721-3-3)

MECHANICAL FEATURES

Dimensions up to P.E.P. 40W	D 483 x H 400 x W 280 mm.
Dimensions up to P.E.P. 80W	D 483 x H 487 x W 280 mm.
Weight	< 14 Kg fully equipped

CERTIFICATIONS

TYPE	MAIN REFERENCE STANDARDS	
FUNCTIONAL	IEC 60495	IEC 62488-1
EMC and ISOLATION	IEC 62488-1 IEC 61000-6-5 IEC 60255-26 IEC 60870-2-1	EN 61000-6-2 EN 61000-6-4 IEC 60255-27 IEC 60834-1
CLIMATIC	IEC 62488-2 IEC 60068-2-1 IEC 60068-2-2	IEC 60068-2-78 IEC 60068-2-14 IEC 60068-2-30
MECHANICAL	IEC 62488-2 IEC 60068-2-6 IEC 60068-2-27	IEC 60068-2-31 IEC 60068-2-32 IEC 60068-2-64
ELECTRICAL SAFETY	IEC 62368-1	

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Power Line Communication

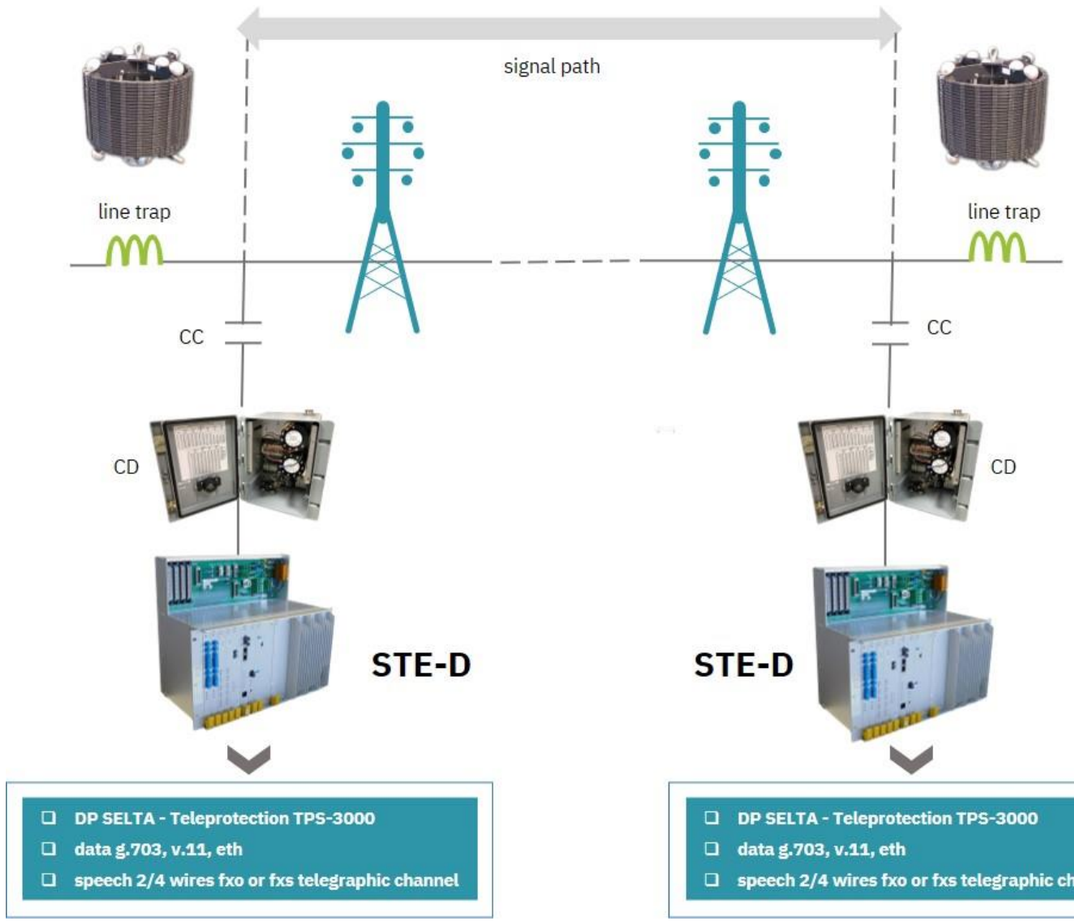
STE-D

Hybrid Analog/Digital Power Line Carrier (ADPLC)

+PLC

BENEFITS

- ‘Cost attractiveness’ in case of transmission of small to medium information flows over medium/long distances
- high reliability for service operation communications (in particular voice, remote control and teleprotection) through the use of HV and HHV power lines
- establishment of a network as back-up bearer to increase the availability of telecommunication service
- back-up application with high availability
- security of maintenance and configuration through Radius authentication and SSH support



PLC UNIVERSAL EQUIPMENT

STE-D can be configured through a dedicated tool depending on customer’s need:

- it can be used as an access node in TDM networks through a multiplexer with drop/insert function
- it can be employed in IP networks through an integrated router
- it works as analogue or as hybrid analog/ digital PLC equipment with a dedicated BBPU (Base Band Processing Unit)
- an interface for teleprotection reduces costs and manages 1 to 8 commands

STE-D integrates the key applications of energy utilities:

- transparent transmission of voice-frequency signals, such as band limited speech with superimposed remote operation
- transmission of up to 4 voice channels not compressed
- fully transparent transmission of asynchronous data up to 19200 bps with minimum delay in point-multipoint applications, typical of SCADA polling
- synchronous data transmission from 1,2 kbps up to 92,8 kbps
- ethernet/IP routing/bridging for LAN interconnections
- easy connection of external switches, multiplexers and routers for network integration, service aggregation and traffic management via standard interfaces

STE-D can transmit at different bit rates with error correction through the Trellis Code Modulation and the use of FEC (Forward Error Correction) technologies.

INTEGRATED REMOTE PROTECTION

The STE-D device integrates a remote protection unit capable of managing up to 8 commands, offering several advantages:

- complete configurability of both use and command priority
- independent and / or simultaneous management of commands
- different configurable protection regimes, with reliability, safety and transmission times compliant with IEC 60834-1
- extensive programming of command parameters
- Set-reset command (continuous commands)
- configurability of alarms
- recording of events in non-volatile memory (2048 events: commands and alarms, 1ms resolution)
- command analysis and statistics
- TAC test (Command Crossing Time)
- LAN interface for configuration and diagnostics
- time synchronization via IRIG-B and NTP

SCA COUPLING DEVICE

The SCA/SGA universal coupling device allows the connection between PLC equipment and the power line. It is one of the main equipment for the PLC systems, offering very important advantages:

- efficient carrier frequency signal transmission between the PLC equipment and the power line
- highest protection of the low voltage equipment from the power frequency voltage and transient overvoltage
- easy to program and to install
- maximum operating safety
- 500 W PEP Power rating
- IEC-481 compliant
- long life for outdoor installation
- phase-to-ground and phase-to-phase coupling

LINE TRAP

PLC devices are part of a communication system and are aimed at providing voice and data transmission functions enabling, e.g.: remote control, teleprotection, telephony which are needed in utilities network infrastructures.
PLC Line Traps, like Selta-DP SBS-N, are used to limit the PLC signals transmission vs undesidered networks directions enabling reuse of power network frequency bands.