

OPL-1T

Analog
Power Line Carrier
Terminal



With built-in teleprotection

- 2 or 4 command built-in analog teleprotection system
- Single 5U chassis for 20 W and 40 W and two 5U chassis for 80 W models
- IRIG-B port for GPS time synchronization



OPL-1T

Analog Power Line Carrier Terminal



Key features:

- Single 5U chassis for 20 W and 40 W and two 5U chassis for 80 W models
- Single-channel and twin-channel
- IRIG-B port for GPS time synchronization
- Fully programmable (full coverage of the transmission frequency range thanks to the set of capacitors)
- Internal channel for end-to-end supervision
- Local management system based on a web server
- 2 or 4 command built-in analog teleprotection system
- Up to four physical slots for optional submodules

Description

OPL-1T technology

The OPL-1T system is the result of the combination of the well-proven OPL-1 terminal together with ZIV wide experience in analog teleprotection systems.

Product overview

The OPL-1T architecture is fully modular and provides different services by installing the appropriate modules into the unit.

The OPL-1T offers an optional built-in analog teleprotection system using single tone and up to four physical slots for optional submodules (speech circuit, FSK modem and baseband input/output circuit intended for audiofrequency transit, external modems or external analog teleprotection terminals type TPU-1).

The OPL-1T can have an output power of 20 W, 40 W and 80 W measured at the coaxial-connector output.

The OPL-1T allows one or two standard 4 kHz channels to be transmitted over high-voltage lines. The effectively transmitted frequency band of each channel extends between 300 Hz and 3850 Hz.

The OPL-1T terminals chronologically register all the alarms and events produced in a link. This chronological register of alarms and events of

the OPL-1T terminals is carried out based on its internal real time clock, being able to synchronize it with the GPS system by means of an IRIG-B interface.

The elements necessary for external connection are included in the equipment itself.

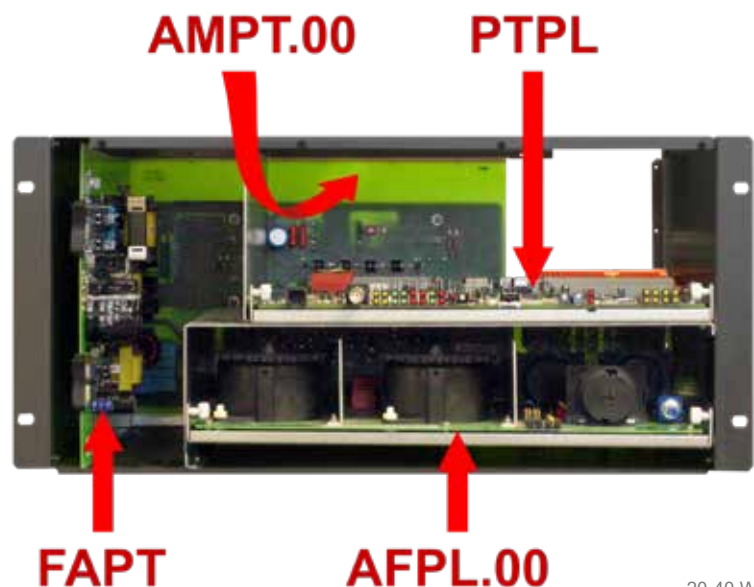
OPL-1T terminals comply with Recommendation IEC 495, regarding PLC equipment, with Recommendation IEC 61000-6-5, and with Recommendation IEC60834-1, which concerns to the optional built-in analog teleprotection system.

Management system

OPL-1T terminals are fully programmable from a Management System based on a web server external to the equipment.

This server is integrated into a software package that must be installed on the management computer, connected to the OPL-1T terminal locally via the USB interface.

An internal data channel allows the remote terminal to be programmed and supervised from the terminal connected to the management system.



20-40 W model

Technical specifications

General characteristics

Modulation	Single side-band (SSB) with suppressed carrier
Number of channels	1 or 2
Basic bandwidth	4 kHz per channel
Options available	A built-in analog teleprotection system (PTPL.0#), and up to four physical slots for optional submodules (KCPT: Baseband I/O; KTPT: Speech; KFPT: FSK modem)

High-frequency characteristics

Frequency range	From 40 kHz to 500 kHz
Virtual carrier frequency	Programmable in 1 Hz steps
Tx and Rx bands	Erect or inverted, adjacent or non-adjacent
Nominal impedance	Selectable among 50, 75, 125 and 150 Ω
Return loss	10 dB, in accordance with IEC 495, cls. 5.2.2
Tapping loss	In accordance with IEC 495, figure 5

Transmitter

PEP	20 W, 40 W and 80 W
Spurious emission	In accordance with IEC 495 cls. 5.2.4 and figures 7 and A.2

Receiver

Sensitivity	-30 dBm minimum pilot level for AGC threshold
Selectivity	Higher than 65 dB at 300 Hz, and higher than 75 dB starting from 4 kHz; in accordance with IEC 495 cls. 5.3.1.5

Automatic Gain Control

Dynamics	Better than 55 dB with 10% pilot modulation
Efficiency	± 20 dB input level variations result in variations of less than ± 0.2 dB at the output

Built-in⁽¹⁾ TP (PTPL.0#)

Capacity	From 1 to 4 commands
Security and dependability	In accordance with IEC 60834-1 standard

Base band I/O (KCPT)

Available band	From 300 Hz to 3850 Hz
Interfaces	Two 4-wire whole-band audio interfaces per submodule
Nominal impedance	600 Ω , balanced
Return loss	Better than 14 dB
Nominal level	Programmable between -20 dBm and +6 dBm
External ⁽¹⁾ TP input	Any whole-band input can be used for the transmission of a teleprotection signal, and can be programmed with a modulation percentage of between 10% and 100% in the command signal
Boosting control	By means of optocoupler. Input voltage between 30V and 150V
AF transit	Four programmable band-pass filters. Others filters upon request

Speech (KTPT)

Speech cut-off frequency	Programmable between 2000 Hz and 3400 Hz (5 Hz steps)
Interfaces	4-wire and 2-wire exchange-side, and 2-wire subscriber-side
Nominal impedance	600 Ω , balanced
Return loss	Better than 14 dB
Nominal level	Programmable between -20 dBm and +8dBm

FSK modem (KFPT)

Transmission speed	Programmable from the Management System between 50, 100, 200, 600 or 1200 Bd
--------------------	--

Alarms

3 relays plus 9 relays (**built-in teleprotection**) that can be programmed by the user. All of them with one voltage-free changeover contact. Contact rating: 2A / 250 V_{AC}

Power supply

48 V_{DC} $\pm 20\%$

Maximum consumption

OPL-1T20: 110 W (single channel) and 90 W (twin channel)
OPL1T40: 130 W (single channel) and 100 W (twin channel)
OPL1T80: 240 W (single channel)

Dimensions

483 x 221 x 351 mm (one 19"/5U chassis for 20 W and 40 W)
483 x 443 x 351 mm (two 19"/5U chassis for 80 W)

Weight

~17 kg (20 W and 40 W); ~27 kg (80 W)

Connections

Built-in terminal blocks (cabinet mounting upon request)

Operating conditions

Temperature and humidity: From -5°C to +45°C and relative humidity not greater than 95%, in accordance with IEC 721-3-3 class 3K5 (climatogram 3K5)

Management computer

Microsoft Windows 10. Java virtual machine version 1.8 or higher



OPL-1T enables easy
adaptation to power
utility requirements

⁽¹⁾ The OPL-1T system admits one teleprotection system per channel



www.zivautomation.com

Headquarters

Parque Tecnológico, 210
48170 Zamudio, Bizkaia, Spain
T: +34 94 452 20 03
F: +34 94 452 21 40

ziv@zivautomation.com



7 Manufacturing facilities & 14 Customer support centers

Chicago (USA)
Mexico (MEX)
Niteroi (BRA)

Dublin (IRL)
Newcastle (GBR)

Paris (FRA)

Zamudio (ESP)
Madrid (ESP)
Barcelona (ESP)

Dubai (ARE)
Ryhad (SAU)
Bangalore (IND)
Singapore (SGP)
Yakarta (IDN)

Making the Smart Grid Real ...with you

