

Power line communication systems for power utility applications - Part 3: Digital Power Line Carrier (DPLC) terminals and hybrid ADPLC terminals

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62488-3:2021 sisaldab Euroopa standardi EN IEC 62488-3:2021 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62488-3:2021 consists of the English text of the European standard EN IEC 62488-3:2021.
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English Version

Power line communication systems for power utility applications
- Part 3: Digital Power Line Carrier (DPLC) terminals and hybrid
ADPLC terminals
(IEC 62488-3:2021)

Systèmes de communication sur lignes d'énergie pour les
applications des compagnies d'électricité - Partie 3:
Équipements terminaux à courants porteurs sur lignes
d'énergie numériques ou DPLC et équipements terminaux
hybrides ADPLC
(IEC 62488-3:2021)

Systeme zur Kommunikation über Hochspannungsleitungen
für Anwendungen der elektrischen Energieversorgung - Teil
3: Endgeräte für digitale Trägerfrequenzübertragung über
Hochspannungsleitungen (DTFH) oder hybride ADTFH-
Endgeräte
(IEC 62488-3:2021)

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Comité Européen de Normalisation Electrotechnique
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 57/2355/FDIS, future edition 1 of IEC 62488-3, prepared by IEC/TC 57 "Power systems management and associated information exchange" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62488-3:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-02-28 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-05-31 document have to be withdrawn

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In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60358 NOTE Harmonized as HD 597 S1

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60038	-	IEC standard voltages	EN 60038	-
IEC 60050-151	2001	International Electrotechnical Vocabulary - - Part 151: Electrical and magnetic devices		-
IEC 60255-27	2013	Measuring relays and protection equipment EN 60255-27 - Part 27: Product safety requirements		2014
IEC 60529	1989	Degrees of protection provided by EN 60529 enclosures (IP Code)		1991
-	-		+ corrigendum May	1993
IEC 61000-4-2	-	Electromagnetic compatibility (EMC) - Part EN 61000-4-2 4-2: Testing and measurement techniques - Electrostatic discharge immunity test		-
IEC 61000-4-3	-	Electromagnetic compatibility (EMC) - Part EN IEC 61000-4-3 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test		-
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) - Part EN 61000-4-4 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test		-
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part EN 61000-4-5 4-5: Testing and measurement techniques - Surge immunity test		-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part EN IEC 61000-6-2 6-2: Generic standards - Immunity standard for industrial environments		-
IEC 60721-3-1	1997	Classification of environmental conditions - - - Part 3: Classification of groups of environmental parameters and their severities -- Section 1: Storage		-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60721-3-3	2002	Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations		-
IEC 60834-1	1999	Teleprotection equipment of power systems - Performance and testing - Part 1: Command systems	EN 60834-1	1999
IEC 61000-6-4	2018	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments	EN IEC 61000-6-4	2019
IEC 61000-6-5	2015	Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for equipment used in power station and substation environment	EN 61000-6-5	2015
IEC 62488-1	2012	Power line communication systems for power utility applications - Part 1: Planning of analogue and digital power line carrier systems operating over EHV/HV/MV electricity grids	EN 62488-1	2013
IEC/TS 62351-1	2007	Power systems management and - associated information exchange - Data and communications security - Part 1: Communication network and system security - Introduction to security issues		-
IEC/TS 62351-8	2011	Power systems management and - associated information exchange - Data and communications security - Part 8: Role-based access control		-
IEC 62488-2	2017	Power line communication systems for power utility applications - Part 2: Analogue power line carrier terminals or APLC	EN 62488-2	2017
CISPR 32:2015/A1	2019	Electromagnetic compatibility of multimedia equipment – Emission requirements	EN 55032/A1	2020

INTERNATIONAL STANDARD



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Part 3: Digital Power Line Carrier (DPLC) Terminals and hybrid
ADPLC Terminals**



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INTERNATIONAL STANDARD



**Power line communication systems for power utility applications –
Part 3: Digital Power Line Carrier (DPLC) Terminals and hybrid
ADPLC Terminals**

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ELECTROTECHNICAL
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER LINE COMMUNICATION SYSTEMS
FOR POWER UTILITY APPLICATIONS –****Part 3: Digital Power Line Carrier (DPLC) Terminals
and hybrid ADPLC Terminals**

FOREWORD

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This International Standard has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This first edition of IEC 62488-3 cancels and replaces the relevant parts of IEC TR 60663 and IEC 60495, which will be withdrawn at a later date.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/2355/FDIS	57/2372/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 62488 series, published under the general title *Power line communication systems for power utility applications* can be found on the IEC website

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

Since the first introduction of power line carrier communications in the power systems industry this form of communication has become widely spread throughout the world. This worldwide development will be covered by new standards reflecting the current state of the art in digital PLC communications.

The communication services offered by modern digital power line carrier links and networks enable a high efficiency of data transmission and therefore a low level of operational costs of automation equipment especially for long high-voltage power transmission lines.

Analogue and digital PLC terminals may co-exist using principles of frequency division multiplexing, allowing a successive digitalization of PLC based communications.

Digital PLC terminals may also be combined with traditional analogue PLC transmission paths as hybrid analog & digital PLC equipment, offering reliable and seamless communication for control and/or protection operating at extra high-, high- and medium-voltage levels of the electrical transmission networks and at high-voltage electrical distribution networks.

IEC 62488 consists of four parts dealing with all aspects of power line communication systems operating over electricity power lines.

IEC 62488 applies to power line carrier terminals and systems (PLC) used to transmit information over power networks including extra high, high and medium voltage (EHV/HV/MV) power lines.

Currently this standard series is organised as follows:

- IEC 62488-1, *Planning of analogue and digital power line carrier systems operating over EHV/HV/MV electricity grids*
- IEC 62488-2, *Analogue Power Line Carrier terminals or APLC*
- IEC 62488-3, *Digital Power Line Carrier terminals or DPLC and hybrid ADPLC Terminals*
- IEC 62488-4, *Broadband Power Line systems or BPL*

NOTE IEC 62488-4 has not yet been published.

This document is the third part of IEC 62488 and is composed of the following Clauses:

- Clause 1 – Scope of IEC 62488-3
- Clause 2 – Normative references
- Clause 3 – Terms, definitions and abbreviation contains newly introduce in this document additionally to IEC 62488-1 and IEC 62488-2
- Clause 4 – Introduces generic architectures of DPLC and hybrid ADPLC terminals.
- Clause 5 – Defines access side interfaces of DPLC and hybrid ADPLC terminals.
- Clause 6 – Describes transmission line side high frequency interface and defines related parameters
- Clause 7 – Gives several requirements concerning quality and performance of a single or a couple of interconnected DPLC terminals
- Clause 8 – Defines test setup and describes testing methodology
- Clause 9 – Describes configuration and management requirements for DPLC terminals
- Clause 10 – Describes general requirements regarding cyber security
- Clause 11 – Specifies safety requirements
- Clause 12 – Specifies requirements for storage and transportation, operating conditions, power supply
- Clause 13 – Specifies EMC requirements

POWER LINE COMMUNICATION SYSTEMS FOR POWER UTILITY APPLICATIONS –

Part 3: Digital Power Line Carrier (DPLC) Terminals and hybrid ADPLC Terminals

1 Scope

This part of IEC 62488 applies to power line carrier terminals and networks used to transmit information over power networks including extra high, high and medium voltage (EHV/HV/MV) power lines using both digital and optionally analogue modulation systems in a frequency range between 16 kHz and 1 MHz (see also IEC 62488-1).

In many countries, power line carrier (PLC) channels represent a significant part of the utility-owned telecommunication system. A circuit normally routed via a PLC channel can also be routed via a channel using a different transmission medium such as point to point radio, optical fibre or open wire circuit.

It is therefore important that the input and output interfaces that are used between terminals in the communication system are standardised.

The issues requiring consideration of DPLC and/or APLC devices as parts of a telecommunication network can be found in IEC 62488-1.

Figure 1 shows the correspondence between the elements needed to implement PLC systems and the related International Standards.