SVENSK STANDARD SS-EN 62488-1

Fastställd	Utgåva	Sida	Ansvarig kommitté
2014-06-11	1	1 (1+122)	SEK TK 57

System för kommunikation på elnätet – Del 1: Planering av analoga och digitala bärfrekvenssystem på hög-och mellanspänningsnät

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

Som svensk standard gäller europastandarden EN 62488-1:2013. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62488-1:2013.

Nationellt förord

Europastandarden EN 62488-1:2013

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62488-1, First edition, 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**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60495, utgåva 1, 1994 gäller ej fr o m 2016-01-03.

ICS 33.200.00

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard
Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62488-1

March 2013

ICS 33.200

Supersedes EN 60495:1994

English version

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

(IEC 62488-1:2012)

Systèmes de communication sur lignes d'énergie pour les applications des compagnies d'électricité -
Partie 1: Conception des systèmes à courants porteurs de lignes d'énergie analogiques et numériques fonctionnant sur des réseaux d'électricité EHT/HT/MT
(CEI 62488-1:2012)

Systeme zur Kommunikation über Hochspannungsleitungen für Anwendungen der elektrischen Energieversorgung -
Teil 1: Planung von Systemen zur analogen und digitalen Nachrichtenübertragung über Hochspannungsleitungen
(IEC 62488-1:2012)

This European Standard was approved by CENELEC on 2013-01-03. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 62488-1:2013 E

SEK Svensk Elstandard

Foreword

The text of document 57/1279/FDIS, future edition 1 of IEC 62488-1, 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 62488-1:2013.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-10-03
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-01-03

This document supersedes EN 60495:1994.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62488-1:2012 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

CISPR 22:2008	NOTE	Harmonised as EN 55022:2010 (modified).
IEC 60038:2009	NOTE	Harmonised as EN 60038:2011 (modified).
IEC 60044-1:1996	NOTE	Harmonised as EN 60044-1:1999 (modified).
IEC 60255-5:2000	NOTE	Harmonised as EN 60255-5:2001 (not modified).
IEC 60255-22-1:2007	NOTE	Harmonised as EN 60255-22-1:2008 (not modified).
IEC 60255-151:2009	NOTE	Harmonised as EN 60255-151:2009 (not modified).
IEC 60358-1:2012	NOTE	Harmonised as EN 60358-1:2012 (not modified).
IEC 60721-3-1:1987 + A1:1991	NOTE	Harmonised as EN 60721-3-1:1993 (not modified).
IEC 60721-3-2:1997	NOTE	Harmonised as EN 60721-3-2:1997 (not modified).
IEC 60721-3-3:1994	NOTE	Harmonised as EN 60721-3-3:1995 (not modified).
IEC 60721-3-4:1995	NOTE	Harmonised as EN 60721-3-4:1995 (not modified).
IEC 60834-1:1999	NOTE	Harmonised as EN 60834-1:1999 (not modified).
IEC 60870-5-101	NOTE	Harmonised as EN 60870-5-101.
IEC 60870-5-104	NOTE	Harmonised as EN 60870-5-104.
IEC 61000-4-1	NOTE	Harmonised as EN 61000-4-1.
IEC 61000-4-2	NOTE	Harmonised as EN 61000-4-2.
IEC 61000-4-3	NOTE	Harmonised as EN 61000-4-3.
IEC 61000-4-4	NOTE	Harmonised as EN 61000-4-4.
IEC 61000-4-5	NOTE	Harmonised as EN 61000-4-5.

CONTENTS

INTRODUCTION

The complexity and extensive size of present-day electricity generation, transmission and distribution systems are such that it is possible to control them only by means of an associated and often equally large and complex telecommunication system having a high order of reliability.

The control of electrical networks and transmission and reception of data are through a combination of analogue and digital communication systems controlling devices and systems distributed throughout the electrical network.

The emergence of digital communication systems for controlling the devices of the electrical distribution network enables faster data transmission. The ability to represent the various electrical parameters as an analogue signal and or digital signal ensures the quality and quantitative aspects of seamless communication to be maintained throughout the electrical power network.

Therefore, by using either analogue power line communication (APLC) or digital power line communication (DPLC) or a combination of both types of system, seamless efficient communication may be maintained throughout the power network.

The development of digital techniques for communications in the electrical distribution networks is now very widespread along with other applications in electronics. This is especially relevant for the electrical distribution network where many of the devices have built into them analogue to digital converters, together with digital signal processing enabling them to perform many functions and offer fast seamless communication. The conversion of the analogue signal into a binary signal requires the binary digits to be formed into a code for the transmission of the information. These codes take different forms to represent the information to be transmitted. However, the main advantage for this is that digital signals compared with analogue signals provide for virtually error free transmission and the minimum errors that do arise may be detected and corrected by using suitable data encoding techniques. Further, digital transmission circuits generally are compatible with the digital devices in the communications circuit. The most commonly used multiplex systems are frequency division multiplex (FDM) and time division multiplex (TDM).

The development of the technical report “Planning of power line carrier systems” was first produced by the International Electrotechnical Commission through publication IEC 60663 in 1980 entitled Planning of (single sideband) power line carrier systems. In 1993, the International Electrotechnical Commission produced IEC 60495 “Single sideband power-line carrier terminals”. In the intervening years, electronic systems and the associated communications systems for electronic devices evolved and developed considerably. The introduction of digital transmission and reception techniques improved the quality of transmission and reception within electronic devices, enabling them to provide more detailed quality analysis and control of the data being communicated throughout the electricity distribution network, from control centre to service provider.

Both of these standards, IEC 60663 and IEC 60495, are being updated and replaced by the following: IEC 60663 is replaced by IEC 62488-1 and IEC 60495 is replaced by IEC 62488-2, IEC 62488-3, IEC 62488-4, covering respectively analogue, digital power line carrier and broadband power line terminals.

The first part of this series is IEC 62488-1. Following this standard, parts IEC 62488-2, IEC 62488-3, IEC 62488-4 will follow. During the development of the above mentioned standards, the existing standards IEC 60663 and IEC 60495 will be maintained in use. They will be subsequently phased out at a date to be agreed by the International Electrotechnical Commission in conjunction with IEC technical committee 57.

These international standards apply to power line carrier (PLC) terminals used to transmit information over power networks including extra high, high and medium voltage (EHV/HV/MV) power lines. Both analogue and digital modulation systems will be included.

IEC 62488 series consists of the following parts under the general title: 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;

Part 2: Analogue power line terminals or APLC;

Part 3: Digital power line carrier terminals or DPLC;

Part 4: Broadband power line systems or BPL.

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

1 Scope

This part of IEC 62488 applies to the planning of analogue and digital power line carrier systems operating over EHV/HV/MV electricity grids. The object of this standard is to establish the planning of the services and performance parameters for the operational requirements to transmit and receive data efficiently over Power Networks.

The transmission media used by the different electricity supply industries will include analogue and digital systems together with more common communication services including national telecommunications authorities, radio links and fibre optic networks and satellite networks. With the developments in communication infrastructures over the last two decades and the ability of devices connected in the electricity communications network to internally and externally communicate, there is a variety of architectures to use in the electricity distribution network to provide efficient seamless communications.

These series of standards for the planning of power line carrier systems will also be an integral part of the development of the overall architecture, standard IEC 61850 developed within IEC TC57 which provides the fundamental architecture for the formation of the smart grid.