

© Copyright SEK. Reproduction in any form without permission is prohibited.

## Strömförsörjningsdon för bärbara datorer – Identifiering och interoperabilitet

*Identification and communication interoperability method for  
external power supplies used with portable computing devices*

Som svensk standard gäller europastandarden EN 63002:2017. Den svenska standarden innehåller den officiella engelska språkversionen av EN 63002:2017.

### Nationellt förord

Europastandarden EN 63002:2017

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 63002, First edition, 2016 - Identification and communication interoperability method for external power supplies used with portable computing devices**

utarbetad inom International Electrotechnical Commission, IEC.

---

ICS 31.020.00; 35.200.00

---

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](mailto:sek@elstandard.se). Internet: [www.elstandard.se](http://www.elstandard.se)

---

### *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar 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](http://www.elstandard.se)

English Version

**Identification and communication interoperability method for  
external power supplies used with portable computing devices  
(IEC 63002:2016)**

Méthode d'identification et d'interopérabilité des  
communications des alimentations externes utilisées avec  
les dispositifs informatiques portatifs  
(IEC 63002:2016)

Identifikation und Kommunikation Interoperabilitäts-  
Verfahren für externe Netzteile in tragbaren Computern  
(IEC 63002:2016)

This European Standard was approved by CENELEC on 2016-11-09. 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## European foreword

The text of document 100/2595A/CDV, future edition 1 of IEC 63002, prepared by Technical Area 14 "Interfaces and methods of measurement for personal computing equipment", of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 63002:2017.

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) 2017-09-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-03-03

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 63002:2016 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:

IEC 61000-4-11:2004	NOTE	Harmonized as EN 61000-4-11:2004 (not modified).
IEC 62623	NOTE	Harmonized as EN 62623.
IEC 62680-1-1	NOTE	Harmonized as EN 62680-1-1.
IEC 62680-1-2	NOTE	Harmonized as EN 62680-1-2.
IEC 62680-1-3	NOTE	Harmonized as EN 62680-1-3.
IEC 62680-2-1	NOTE	Harmonized as EN 62680-2-1.
IEC 62680-3-1	NOTE	Harmonized as EN 62680-3-1 <sup>1)</sup> .
IEC 62684	NOTE	Harmonized as EN 62684.

---

1) To be published.

## Annex ZA

(normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60950-1	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 62368-1	-	Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN 62368-1	-
IEC 62680-1-2	-	Universal serial bus interfaces for data and power - Part 1-2: Common components - USB Power Delivery specification	EN 62680-1-2	-
IEC 62680-1-3	-	Universal serial bus interfaces for data and power - Part 1-3: Universal Serial Bus interfaces - Common components - USB Type-C™ cable and connector specification	EN 62680-1-3	-

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	8
3 Terms, definitions and abbreviated terms .....	8
3.1 Terms and definitions .....	8
3.2 Abbreviated terms .....	9
4 Important characteristics of an external power supply .....	9
4.1 General.....	9
4.2 Positive identification of a unique EPS model.....	9
4.3 Static characteristics of the external power supply performance and design .....	10
4.3.1 General .....	10
4.3.2 Load current step performance of the EPS.....	10
4.3.3 Holdup time .....	10
4.3.4 Limited power source (LPS) compliance .....	11
4.3.5 Touch current .....	11
4.3.6 Minimum capabilities for peak current and overcurrent protection .....	11
4.3.7 Surface temperature of the enclosure of the EPS.....	12
4.3.8 Overvoltage protection in the EPS .....	12
Annex A (informative) Open issues related to arbitrary combinations of EPS and portable computing device .....	13
A.1 EMC, safety and performance .....	13
A.2 Authentication, attestation, and data integrity protection.....	13
A.3 Conducted noise from the EPS .....	13
Annex B (informative) Considerations regarding EPS cable .....	14
Annex C (informative) Recommended capabilities for EPS and legacy support.....	15
Annex D (informative) Example usage scenarios of enhanced reporting from the EPS.....	16
D.1 General.....	16
D.2 Unique identification of the EPS .....	16
D.3 Identification of voltage regulation, load current step and slew rate .....	16
D.4 Load current step magnitude and slew rate capability .....	16
D.5 Holdup time .....	17
D.6 Low touch current reporting.....	17
D.7 Peak current capability .....	17
D.8 Surface temperature of the EPS .....	17
Annex E (informative) Common charging interoperability use cases .....	18
E.1 General.....	18
E.2 Examples of device use cases .....	18
E.2.1 Smartphone .....	18
E.2.2 Higher power portable computing devices (tablets, notebook computers, etc.).....	18
E.3 Examples of consumer use cases.....	18
Annex F (informative) Conformance and market considerations .....	20
F.1 General.....	20
F.2 Summary of reported items and test references .....	20

F.3	USB-IF Compliance Program.....	21
F.4	General regulatory compliance for EPS .....	21
F.5	Other considerations for system testing .....	22
F.6	After-market firmware updates to EPS .....	22
	Bibliography .....	23
	Figure 1 – Scope of the identification and communication method.....	7
	Figure 2 – Measurement of holdup time.....	11
	Table F.1 – Summary of reported parameters from EPS to portable computing device.....	20
	Table F.2 – Examples of current regulations and standards in the US and EU applicable to external power supplies used with portable computing devices (non- exhaustive list) .....	22

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**IDENTIFICATION AND COMMUNICATION INTEROPERABILITY  
METHOD FOR EXTERNAL POWER SUPPLIES USED  
WITH PORTABLE COMPUTING DEVICES**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 63002 has been prepared by technical area 14: Interfaces and methods of measurement for personal computing equipment, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

CDV	Report on voting
100/2595A/CDV	100/2700/RVC

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.



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

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

## INTRODUCTION

The objective of this International Standard is to support interoperability of external power supplies used with the increasing variety of portable computing devices that implement the IEC 62680-1-2: USB Power Delivery with the IEC 62680-1-3: USB Type-C™<sup>1</sup> connector standards. Broad market adoption of this International Standard is expected to make a significant contribution to the global goals of consumer convenience and re-usability of power supplies by building on the global market ecosystem of IEC 62680 compliant devices and facilitating interoperability across different product categories.

IEC 62680-1-2 is expected to enjoy significant adoption in global markets for all kinds of portable computing devices requiring less than 100 watts including notebook computers, tablets, smartphones and other related devices. This International Standard enables the reporting of the identity and power characteristics of external supplies supported by IEC 62680-1-2 (USB Power Delivery) and specifies additional interoperability guidelines for external power. The method for identification of a specific external power supply (EPS) will enable equipment manufacturers to ensure compliant operation of an EPS using IEC 62680-1-2; and promotes data communication that can be used by the portable computing device to predict and mitigate interoperability concerns when an unfamiliar or incompatible external power supply is connected to the device by a user.

This International Standard specifies the minimum technical requirements for interoperability and includes recommendations for EPS functionality and the portable computing device. The approach taken by this International Standard, focusing on common charging interoperability, will allow manufacturers to innovate in aspects such as design, system performance, and energy efficiency.

This International Standard also provides important information regarding consumer safety, system reliability as well as relevant global standards and regulatory compliance.

Other international and regional standards, recommendations and regulatory policies for “universal adapters” or “common product chargers” that reference this International Standard should take into account open technical and regulatory compliance issues that are associated with untested or arbitrary combinations of EPS and devices such as those identified in Annex A. For clarity, this International Standard does not take the approach of specifying “universal” or “common product adapters” because of these open issues and limitations to satisfy market requirements. Instead, it focuses on interoperability specifications in order to support global industry in developing interoperable charging solutions that meet regulatory compliance and market requirements.

---

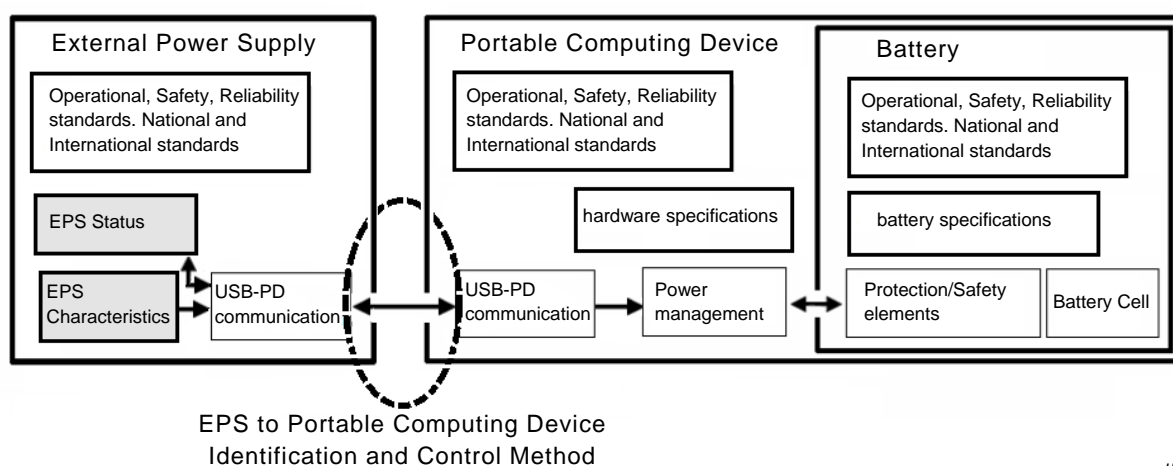
<sup>1</sup> USB Type-C™ and USB-C™ are trademarks of the Universal Serial Bus Implementers Forum (USB-IF).

# IDENTIFICATION AND COMMUNICATION INTEROPERABILITY METHOD FOR EXTERNAL POWER SUPPLIES USED WITH PORTABLE COMPUTING DEVICES

## 1 Scope

This International Standard defines interoperability guidelines for external power supplies used with portable computing devices that implement the IEC 62680-1-2: Universal Serial Bus Power Delivery Specification with the IEC 62680-1-3: Universal Serial Bus Interfaces for data and power-Common Components- Type-C™ Type-C Cable and Connector Specification.

This International Standard defines normative requirements for an EPS to ensure interoperability, in particular it specifies the data communicated from an EPS to a portable computing device (Figure 1). The scope does not apply to all aspects of an EPS. This International Standard does not specify normative requirements for the portable computing device but provides recommendations for the behaviour of a portable computing device when used with an EPS compliant with this International Standard.



**Figure 1 – Scope of the identification and communication method**

This International Standard specifies the data objects used by a portable computing system using IEC 62680-1-2 to understand the identity, design and performance characteristics, and operating status of an external power supply. This International Standard is applicable to external power supplies under 100 watts for portable computing devices, with a focus on power delivery application for notebook computers, tablets, smartphones and other related multimedia devices.

This International Standard relies on established mechanical and electrical specifications, and communication protocols established by IEC 62680-1-2 and IEC 62680-1-3. This International Standard proposes methods supported by IEC 62680-1-2 to mitigate problems caused by the connection of untested combinations of EPS and portable computing devices with the aim of improving consumer satisfaction.

In addition, as given in Annex C, this International Standard provides interoperability guidelines for an EPS supporting charging using USB Type-C current when IEC 62680-1-2 functionality is not enabled. Considerations for captive and removable cable are presented in Annex B.

An EPS is expected to follow the applicable global standards and regulatory compliance requirements. Examples of those standards are given in Annex F.

## 2 Normative references

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.

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*

IEC 62680-1-2, *Universal Serial Bus interfaces for data and power – Part 1-2: Common components – USB Power Delivery Specification*

IEC 62680-1-3, *Universal Serial Bus interfaces for data and power –Part 1-3: Common components –USB Type-C<sup>TM</sup> Cable and Connector Specification*