



SLOVENSKI STANDARD
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Specifikacije in komunikacijske metode medobratovnosti zunanjih napajalnikov, ki se uporabljajo pri računalniških in potrošniških elektronskih napravah

Interoperability specifications and communication method for external power supplies used with computing and consumer electronics devices

Interoperabilitäts-Spezifikationen und Kommunikationsverfahren für externe Stromversorgungen zur Anwendung für Computer- und Unterhaltungselektronikgeräte

Spécifications d'interopérabilité et méthode de communication pour les alimentations externes utilisées avec les dispositifs informatiques et les dispositifs électroniques grand public

Ta slovenski standard je istoveten z: EN prEN IEC 63002:2024

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TITLE:

Interoperability specifications and communication method for external power supplies used with computing and consumer electronics devices

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**INTEROPERABILITY SPECIFICATIONS AND COMMUNICATION METHOD
FOR EXTERNAL POWER SUPPLIES USED WITH COMPUTING AND
CONSUMER ELECTRONICS DEVICES**

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FOREWORD

104 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising
105 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international
106 co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in
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135 This document has been prepared by technical area 18: Multimedia home systems and
136 applications for end-user networks, of IEC technical committee 100: Audio, video and
137 multimedia systems and equipment. It is an International Standard.

138 This third edition cancels and replaces the second edition published in 2021. This edition
139 constitutes a technical revision.

140 This edition includes the following significant technical changes with respect to the previous
141 edition:

142 a) Power range is increased to 240 W.

143 b) AVS mode is introduced.

144 c) Annex A updates issues of arbitrary combinations of AC adapter and device.

145 d) Annex B describes new safeguards for EPR mode.

146 e) Annexes C and D are updated.

147 The text of this International Standard is based on the following documents:

CDV	Report on voting
100/3463/CDV	100/3540B/RVC

148
149 Full information on the voting for its approval can be found in the report on voting indicated in
150 the above table.

151 The language used for the development of this International Standard is English.

152 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
153 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available
154 at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are
155 described in greater detail at www.iec.ch/standardsdev/publications.

156 The committee has decided that the contents of this document will remain unchanged until the
157 stability date indicated on the IEC website under webstore.iec.ch in the data related to the
158 specific document. At this date, the document will be

- 159 • reconfirmed,
- 160 • withdrawn,
- 161 • replaced by a revised edition, or
- 162 • amended.

163

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INTRODUCTION

167 The objective of this document is to enable common charging interoperability of external power
168 supplies (EPSs) used with the increasing variety of computing and consumer electronics
169 devices that implement IEC 62680-1-3 (USB Type-C¹ Cable and Connector Specification) and
170 IEC 62680-1-2 (USB Power Delivery). Broad market adoption of this document is expected to
171 make a significant contribution to the global goals of consumer convenience and re-usability of
172 power supplies by expanding common charging interoperability across different product
173 categories while preserving backwards compatibility with the installed base of billions of
174 IEC 62680 compliant devices worldwide.

175 This document specifies the minimum technical requirements for interoperability and includes
176 recommendations for EPS functionality when used with computing and electronics devices. The
177 approach taken by this document, focused on enabling common charging interoperability, can
178 allow manufacturers to innovate in aspects such as technical design, system performance, and
179 energy efficiency. Furthermore, common charging interoperability enables manufacturers to
180 design specific EPSs that match the requirements of target devices (functionality, cost, etc.)
181 and use cases, while at the same time enables consumers to use the EPS for charging other
182 IEC 62680 USB compliant devices, across various product types.

183 IEC 62680-1-3 adoption is well underway in global markets for a wide range of devices using
184 as much as 240 W, including notebook computers, tablets, smartphones, small form-factor
185 desktop computers, and other consumer electronics devices. This document enables the
186 reporting of the identity and power characteristics of power sources (EPSs and other Sources)
187 supported by IEC 62680-1-3 (USB Type-C) and specifies interoperability guidelines when using
188 IEC 62680-1-2 (USB Power Delivery). The method for identification of a specific power source
189 can enable equipment manufacturers to ensure compliant operation using these specifications
190 and promotes data communication that can be used by the device to predict and mitigate
191 interoperability concerns when an unfamiliar or incompatible EPS is connected to the device.

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

194 Other international and regional standards, and government policies for "universal" or "common
195 power adapters" that reference this document are expected to take into account open technical
196 and regulatory compliance issues that are associated with untested or arbitrary combinations
197 of EPSs and devices such as those identified in Annex A. As well, the limitations and issues
198 with approaches to define "common chargers" should be considered compared with the benefits
199 of this documents' approach with focus on enabling common charging interoperability. For
200 clarity, this document focuses on interoperability specifications in order to support global
201 industry in developing safe, innovative, environmentally conscious, and end-to-end
202 interoperable charging solutions that meet regulatory requirements and evolving market needs.

203

204

¹ USB4® and USB Type-C® are trademarks of the Universal Serial Bus Implementers Forum (USB-IF). This information is given for the convenience of users of this document and does not constitute an endorsement by IEC.

239 **2 Normative references**

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

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

245 IEC 60990, *Methods of measurement of touch current and protective conductor current*

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

248 IEC 62680-1-1, *Universal Serial Bus interfaces for data and power – Part 1-1: Common
249 components – USB Battery Charging Specification, Revision 1.2*

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

252 IEC 62680-1-3, *Universal Serial Bus interfaces for data and power – Part 1-3: Common
253 components – USB Type-C Cable and Connector Specification*

254 **3 Terms, definitions and abbreviated terms**

255 **3.1 Terms and definitions**

256 For the purposes of this document, the following terms and definitions apply.

257 ISO and IEC maintain terminological databases for use in standardization at the following
258 addresses:

- 259 • IEC Electropedia: available at <http://www.electropedia.org/>
- 260 • ISO Online browsing platform: available at <http://www.iso.org/obp>

261 **3.1.1**

262 **vendor identification**

263 **VID**

264 unique 16-bit unsigned value assigned by the USB-IF to a given vendor

265 **3.1.2**

266 **Source**

267 **power supply**

268 **power source**

269 device designed to comply with IEC 62680-1-2 that supplies power over V_{BUS}

270 EXAMPLE A USB connector on a PC, laptop computer, vehicle, AC outlet, docking station, battery pack, or EPS.

271 **3.1.3**

272 **Sink**

273 **power sink**

274 device designed to comply with IEC 62680-1-2 that receives and consumes power over V_{BUS}

275 EXAMPLE A computing device.

276 Note 1 to entry: Sometimes referred to as the device.

277 **3.1.4**

278 **charging**

279 **charge**

280 transfer of power over USB connector and cable

281 Note 1 to entry; “battery charging” is a specific use by a Sink that is enabled by “charging”

282

3.1.5**external power supply****EPS**

power source contained in a separate physical enclosure external to the device casing and designed to convert mains power supply to lower DC voltage(s) for the purpose of powering the device

EXAMPLE A charging block or a power adapter.

3.1.6**Programmable Power Supply****PPS**

optional capability in IEC 62680-1-2 where a device (Sink) can adaptively adjust the SPR EPS (Source) output voltage in small increments and set maximum current within its advertised range

Note 1 to entry: In IEC 62680-1-2, an EPS that supports PPS is called a "Fast Charger."

3.1.7**Fixed Supply**

power source whose output voltage is regulated at certain voltages

Note 1 to entry: Standardized voltages in IEC 62680-1-2 are 5 V, 9 V, 15 V and 20 V for SPR and 28 V, 36 V, and 48 V for EPR.

3.1.8**USB PD power****PDP**

nominal power capacity of the charger defined by IEC 62680-1-2 for use to indicate to consumers

Note 1 to entry: The PDP rating is indicated both on the USB charger certification logo and within the USB PD Source capabilities advertisement to the Sink. For any given PDP rating, the minimum capabilities in terms of supported voltages and currents are deterministic, as defined in IEC 62680-1-2.

3.1.9**charging cable**

cable used between the EPS and device to be charged

Note 1 to entry: The cable connection to the EPS is a USB Type-C plug in accordance with IEC 62680-1-3. The cable connection to the device can be either a USB Type-C plug, a legacy USB plug (e.g. USB Micro-B in accordance with IEC 62680-2-2), or a non-USB device-specific connection (either permanent or detachable). Charging cables can be application-specific to enable interoperability between the USB Type-C-based EPS defined by this document and both existing and future devices and including devices that are not able to accommodate USB Type-C receptacles, e.g. smart watches.

3.1.10**captive cable****permanently attached cable**

cable that has a USB Type-C plug on one end and is either hard-wired into a device on the other end or has a device-specific plug on the other end

Note 1 to entry: When a device-specific plug is used on one end, the cable can be detachable in a physical sense but is considered "functionally captive" to the device given it does not use a USB-defined connector on the device end but otherwise functions as a USB device. This definition has remained the USB definition in IEC 62680-2-1 (USB 2.0).

3.1.11**standard power range****SPR**

USB power source limited to 20 V and 100 W or less

3.1.12**extended power range****EPR**

USB power source up to 48 V and 240 W