

# INTERNATIONAL STANDARD



---

## Wireless power transfer – Management – Part 3: Multiple source control management



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).



IEC 62827-3

Edition 1.0 2016-12

# INTERNATIONAL STANDARD



---

## Wireless power transfer – Management – Part 3: Multiple source control management

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 43.120

ISBN 978-2-8322-3683-3

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

|  |    |
|--|----|
| FOREWORD.....  | 4  |
| INTRODUCTION.....  | 6  |
| 1 Scope.....   | 7  |
| 2 Normative references .....   | 7  |
| 3 Terms, definitions and abbreviated terms .....                             | 7  |
| 3.1 Terms and definitions.....   | 7  |
| 3.2 Abbreviated terms.....   | 9  |
| 4 Basic overview of WPMS.....  | 9  |
| 5 Requirements in WPMSs .....  | 11 |
| 5.1 General model for WPMSs.....   | 11 |
| 5.2 Required functionalities.....  | 11 |
| 5.2.1 General .....  | 11 |
| 5.2.2 Consideration for mismatch of receiving power and required power ..... | 13 |
| 5.2.3 Wireless power distribution .....                                      | 13 |
| 5.3 Message type by WPMS-S.....  | 13 |
| 6 Control and management method on WPMS.....                                 | 14 |
| 6.1 Formation of WPMS-S group.....   | 14 |
| 6.2 Preparation of wireless power transfer for multiple WPMS-Ds.....         | 15 |
| 6.2.1 WPMS-D identification and authentication .....                         | 15 |
| 6.2.2 Reception of power transfer information of WPMS-Ds.....                | 15 |
| 6.2.3 Detection of WPMS-D positions .....                                    | 16 |
| 6.2.4 Setting of the WPMS-S power transmitting condition .....               | 16 |
| 6.3 Wireless power transfer mode.....  | 18 |
| 6.3.1 General .....  | 18 |
| 6.3.2 Wireless power distribution .....                                      | 18 |
| 6.3.3 Synchronizing method of magnetic fields in WPMS.....                   | 18 |
| 6.4 Reconfiguration of WPMS .....  | 19 |
| 6.4.1 General .....  | 19 |
| 6.4.2 Completion and resumption of wireless power transfer .....             | 19 |
| 6.4.3 Appearance and disappearance of WPMS-D.....                            | 20 |
| 6.4.4 Appearance and disappearance of WPMS-S.....                            | 20 |
| 6.5 Power transfer to WPMS-D with a flat battery.....                        | 20 |
| 6.6 Termination of wireless power transfer.....                              | 20 |
| Bibliography.....  | 21 |
| <br>   |    |
| Figure 1 – Conceptual image of WPMS: Example 1 .....                         | 9  |
| Figure 2 – Conceptual image of WPMS: Example 2 .....                         | 10 |
| Figure 3 – Conceptual image of WPMS: Example 3 .....                         | 10 |
| Figure 4 – Structure of a WPMS.....  | 11 |
| Figure 5 – Overall procedure of WPMSs .....                                  | 12 |
| Figure 6 – Reception of power transfer information of WPMS-Ds .....          | 15 |
| Figure 7 – Completion and resumption of wireless power transfer .....        | 19 |
| <br>   |    |
| Table 1 – Message type.....  | 14 |
| Table 2 – Notices of WPMS-S.....   | 15 |

Table 3 – Configuration on mutual work areas ..... 16

Table 4 – Find WPMS-D ..... 16

Table 5 – Request for sending power information ..... 17

Table 6 – Exchange manageable WPMS-D ..... 17

Table 7 – Notify power transfer setting ..... 17

Table 8 – Suspend power transfer ..... 20

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**WIRELESS POWER TRANSFER –  
MANAGEMENT –****Part 3: Multiple source control management**

## 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 62827-3 has been prepared by technical area 15: Wireless power transfer, 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 |
| 100/2604/CDV | 100/2724/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.

A list of all parts in the IEC 62827 series, published under the general title *Wireless power transfer – Management*, 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 publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

Wireless power transfer technology transmits electric power from the power source to the power-consuming device without the use of wire. The most widely used technology is electromagnetic induction technology and magnetic resonance technology. The wireless power transfer system eliminates the need for the user to connect a power cable to the electrical outlet. Through electromagnetic induction technology, users place the power-receiving device within a short distance from the power source in order to charge a battery without removing it from its device.

In parallel to this, magnetic resonance technology for wireless power transfer systems is also being developed. Magnetic resonance technology gives a spatial effect to power transfer. A spatial effect on wireless power transfer enables multiple power sources to deliver electric power to multiple receiving devices at a distance in the same vicinity.

In order to efficiently manage and support the wireless power transfer in spatial space, multiple power sources need to communicate and coordinate with each other.

# WIRELESS POWER TRANSFER – MANAGEMENT –

## Part 3: Multiple source control management

### 1 Scope

This document specifies methods and procedures to form groups for a spatial wireless power-transfer system. The group of spatial wireless power-transfer systems that include multiple power sources provides power transfer to receiving devices based on magnetic resonance technology.

In order to achieve efficient power transfer to multiple receiving devices, this document also specifies methods and procedures to set, share, and control the conditions of power transfer between multiple power sources and receiving devices.

NOTE Expected power-receiving devices are audio, video and multimedia equipment.

### 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 62827-1, *Wireless power transfer – Management – Part 1: Common components*

### 3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms, definitions and abbreviated terms given in IEC 62827-1, and the following apply.

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

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

#### 3.1 Terms and definitions

##### 3.1.1

##### **magnetic resonance**

subset of electromagnetic induction methods utilizing non-radiative, near-field or mid-field resonance coupling between two electromagnetic resonators where the coupling coefficient between the primary or source coil and the secondary or receiving coil is low ( $k$  much less than 1)

##### 3.1.2

##### **spatial wireless power transfer**

concept of wireless power transfer between multiple sources and multiple receiving devices which are placed at a distance within a spatial space