

TECHNICAL REPORT



Power supplying scheme for wearable systems and equipment
(standards.iteh.ai)

IEC TR 63071:2016

<https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016>



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
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

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

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 It also gives information on projects, replaced and withdrawn publications.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

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

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

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

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

IEC STANDARD PREVIEW
(standards.iec.ch)
IEC TR 63011:2016
https://standards.iec.ch/catalog/standards/csc@iec.ch
c17545ea348/iec-tr-63011-2016

TECHNICAL REPORT



Power supplying scheme for wearable systems and equipment
(standards.iteh.ai)

[IEC TR 63071:2016](https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016)

<https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.200

ISBN 978-2-8322-3685-7

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

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 System model.....	6
4.1 General.....	6
4.2 Existing model	6
4.3 System models of wearable devices.....	7
4.3.1 Wearable devices	7
4.3.2 Charging and connections	8
4.3.3 Generator utilizing physical activity of organism.....	8
5 Use case	9
5.1 General.....	9
5.2 Use case examples.....	9
5.2.1 Generator in shoes	9
5.2.2 Animal tracking.....	9
6 Interface.....	10
7 Measurement method	10
Bibliography.....	12
Figure 1 – Solar cell with a secondary battery wristwatch.....	7
Figure 2 – Generator with secondary battery.....	7
Figure 3 – Generator in shoe	9
Figure 4 – Animal use	10

INTERNATIONAL ELECTROTECHNICAL COMMISSION

POWER SUPPLYING SCHEME FOR WEARABLE SYSTEMS AND EQUIPMENT

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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a Technical Report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 63071, which is a Technical Report, has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
100/2751/DTR	100/2816/RVC

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

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

The committee has decided that the contents of this document 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.

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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC TR 63071:2016](#)

<https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016>

INTRODUCTION

Wearable devices are being introduced into the market, but each device employs its own power charging method and power source device. Wearable devices are used to support human life and health. The duration and life of the power source, as well as easy charging and replacing of a power source, is a crucial factor for wearable devices that are primarily powered by batteries. A power generator is one solution for this power duration or life, since it provides power generated by user activities and/or also from environmental sources. Also, connectivity and compatibility of power and data transmission is important.

This Technical Report does not specify the power generating or energy harvesting methods and devices themselves, but focuses on interoperability and measurement methods of power-supplying devices and systems.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC TR 63071:2016](https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016)

<https://standards.iteh.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c17545ea348/iec-tr-63071-2016>

POWER SUPPLYING SCHEME FOR WEARABLE SYSTEMS AND EQUIPMENT

1 Scope

This document provides models and frameworks for the power-supplying scheme for wearable systems and equipment. This document does not specify power generating or energy harvesting methods and the devices themselves.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 energy harvest

technique to obtain energy from surroundings such as electric power from the activity of organisms

3.2 kinetic generator

generator that utilizes kinetic energy to generate electric power

4 System model

4.1 General

The power-supplying system for audio, video and multimedia systems and equipment can be applicable to wearable systems and equipment. Among them, the power supplying systems of energy harvesting devices or systems are suitable for the wearable devices because they generate energy.

Energy-harvesting devices or systems have already been used in various pieces of equipment such as electronic wrist watches. The existing model is described in 4.2.

4.2 Existing model

A major existing model of wearable equipment and power supply is the electronic wristwatch. Power supply methods for electronic wristwatches include:

- primary batteries,
- secondary batteries,
- solar cells with secondary batteries,

- a generator with a secondary battery.

To charge the secondary battery, wired power transfer is a common method. Its connector is for example a USB connector specified in the IEC 62680 series or other type of dedicated connector.

Wireless power transfer is not a common method for wristwatches, but it is applied for health band type wearable equipment that has also a watch function. However, wireless power transfer is not applied when a wristwatch is worn but applied when it is taken off and when it is charging.

Figure 1 shows the example of a solar cell with a secondary battery.

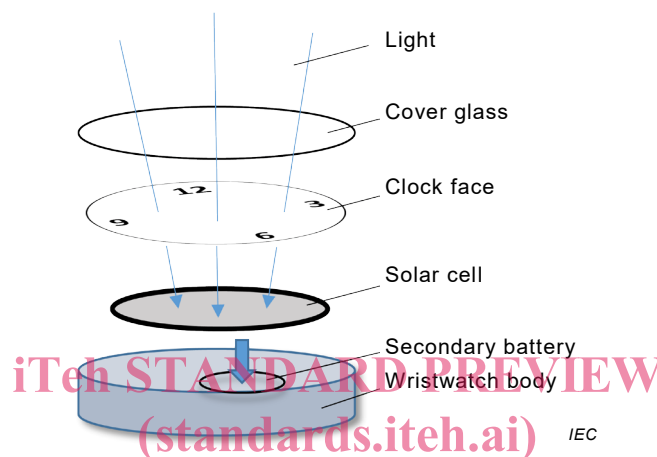


Figure 1 – Solar cell with a secondary battery wristwatch

<https://standards.itech.ai/catalog/standards/sist/b0221c6a-bd14-402b-9cdc-c8c1f0000000/iec-tr-63071-2016>

Figure 2 shows the example of a kinetic generator with a secondary battery. The source of this generator is the arm movement. A variation of this type of generator is a stem winding method. It powers a spring that rotates a rotor.

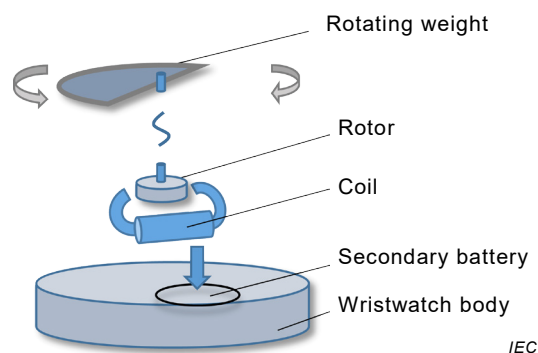


Figure 2 – Generator with secondary battery

4.3 System models of wearable devices

4.3.1 Wearable devices

Typical wearable devices are:

- wristwatches,
- eyeglasses,
- headsets,