



Edition 1.0 2022-05

INTERNATIONAL STANDARD

Internet of things (IoT) – IoT applications for electronic label system (ELS)





THIS PUBLICATION IS COPYRIGHT PROTECTED Copyright © 2022 ISO/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 ISO/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.

Tel.: +41 22 919 02 11

IEC Secretariat 3, rue de Varembé CH-1211 Geneva 20 Switzerland

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 corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

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 It also gives information on projects, replaced and withdrawn publications.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 once a month by email.

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: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.



Edition 1.0 2022-05

INTERNATIONAL STANDARD

Internet of things (IoT) – IoT applications for electronic label system (ELS)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.020 ISBN 978-2-8322-1700-9

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

CONTENTS

| F | OREWO | RD | 4 | | |
|---|------------------------|---|----|--|--|
| IN | TRODU | ICTION | 5 | | |
| 1 | Scop | e | 6 | | |
| 2 | Norm | native references | 6 | | |
| 3 | Terms and definitions6 | | | | |
| 4 | Abbr | eviated terms | 7 | | |
| 5 | Motivation | | | | |
| | 5.1 | Background | | | |
| | 5.2 | Purpose and significance | | | |
| 6 | - | em framework and IoT application model | | | |
| | 6.1 | General | | | |
| | 6.2 | System framework | | | |
| | 6.3 | IoT application model | | | |
| | 6.3.1 | General | 9 | | |
| | 6.3.2 | User | 9 | | |
| | 6.3.3 | ELS backend system | 10 | | |
| | 6.3.4 | Database | 11 | | |
| | 6.3.5 | IoT gateway | 11 | | |
| | 6.3.6 | ELs | 12 | | |
| | 6.3.7 | Perception objects | 12 | | |
| 7 | Gene | eral technical requirements | 12 | | |
| | 7.1 | General | 12 | | |
| | 7.2 | Function requirements | 12 | | |
| | 7.2.1 | ELS backend system | 12 | | |
| | 7.2.2 | Database | 14 | | |
| | 7.2.3 | IoT gateway | 14 | | |
| | 7.2.4 | ELs | 14 | | |
| | 7.3 | Interface requirements | 15 | | |
| | 7.3.1 | ELS backend system | 15 | | |
| | 7.3.2 | Database | 15 | | |
| | 7.3.3 | IoT gateway | 16 | | |
| | 7.3.4 | ELs | 16 | | |
| | 7.3.5 | System scalability | 16 | | |
| | 7.4 | Performance requirements | | | |
| | 7.4.1 | , | | | |
| | 7.4.2 | | 16 | | |
| | 7.4.3 | | 17 | | |
| | 7.4.4 | | | | |
| Αı | nnex A (| normative) Reference testing requirements | | | |
| | A.1 | General | | | |
| | A.2 | Mechanical testing of display devices | | | |
| | A.3 | System performance testing | | | |
| Annex B (informative) Application scenarios, and use cases of ELS20 | | | | | |
| | B.1 | Application scenarios | | | |
| | B.1.1 | • | | | |
| | B.1.2 | Staff-oriented representation of merchandise management information | 20 | | |

| B.1.3 | P2P delivery and self pick-up oriented merchandise collection | 21 |
|---------------|---|----|
| B.2 Us | se cases | 21 |
| B.2.1 | Grocery store | 21 |
| B.2.2 | Cosmetics shop | 21 |
| B.2.3 | Fashion shop | 21 |
| B.2.4 | Industry factory | 22 |
| Bibliography | | 23 |
| Figure 1 – S | ystem framework of the IoT applications for ELS | 8 |
| Figure 2 – Ic | T application model of the IoT applications for ELS | g |

INTERNET OF THINGS (IoT) IOT APPLICATIONS FOR ELECTRONIC LABEL SYSTEM (ELS)

FOREWORD

- 1) ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.
- 2) The formal decisions or agreements of IEC and ISO 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 and ISO National bodies.
- 3) IEC and ISO documents have the form of recommendations for international use and are accepted by IEC and ISO National bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC and ISO documents is accurate, IEC and ISO 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 and ISO National bodies undertake to apply IEC and ISO documents transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC and ISO document and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC and ISO do not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC and ISO marks of conformity. IEC and ISO are not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this document.
- 7) No liability shall attach to IEC and ISO or their directors, employees, servants or agents including individual experts and members of its technical committees and IEC and ISO National bodies 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 ISO/IEC document or any other IEC and ISO documents.
- 8) Attention is drawn to the Normative references cited in this document. Use of the referenced publications is indispensable for the correct application of this document.
- 9) Attention is drawn to the possibility that some of the elements of this ISO/IEC document may be the subject of patent rights. IEC and ISO shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 30169 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is an International Standard.

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

| Draft | Report on voting |
|--------------------|-------------------|
| JTC1-SC41/277/FDIS | JTC1-SC41/287/RVD |

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

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

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, available at www.iec.ch/members_experts/refdocs and www.iec.ch/members_exp