International Standard

ISO 13140

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 13141

Perception de télépéage — Évaluation des équipements embarqués et en bord de route quant à la conformité avec ISO 13141

First edition
2025-07

Reference number
ISO 13140:2025(en)

© ISO 2025



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025
All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ... **iv**
Introduction ... **v**
1 Scope ... **1**
2 Normative references ... **1**
3 Terms and definitions ... **1**
4 Abbreviated terms ... **2**
5 Conformance ... **3**
6 Test suite structure ... **3**
6.1 Structure ... 3
6.2 Reference to conformance test specifications ... 3
6.3 Test purposes ... 4
6.3.1 TP definition conventions ... 4
6.3.2 TP naming conventions ... 4
Annex A (normative) **Test purposes for on-board equipment** ... **6**
Annex B (normative) **Test purposes for roadside equipment** ... **21**
Annex C (normative) **PCTR proforma for on-board equipment** ... **27**
Annex D (normative) **PCTR proforma for roadside equipment** ... **33**
Bibliography ... **38**

© ISO 2025 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent Transport Systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition cancels and replaces the first edition (ISO 13140-1:2016), which has been technically revised.

The main changes are as follows:

— as a result of the withdrawal of ISO 13140-2, the title of this document has been updated.

— amendments have been made to reflect changes to ISO 13141, which makes reference to ISO 17573-3 as the primary source of data specifications;

— terms and definitions have been updated and ISO/TS 17573-2 has been included as the primary source for harmonized terminology across electronic fee collection (EFC) standards.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2025 – All rights reserved

Introduction

On-board equipment (OBE) that uses satellite-based positioning technology to collect data required for charging for the use of roads operates in an autonomous way (i.e. without relying on dedicated roadside infrastructure). The OBE records the amount of road usage in all toll charging systems it passes through. For this purpose, an autonomously operating OBE needs real-time and precise information about its location. Location information is provided by satellite-based systems, optionally supported by on-board sensors. Occasionally, location information can also be provided by fixed roadside infrastructure, by means of DSRC-based localization augmentation communication (LAC).

This document specifies the process and tests for evaluation of OBE and roadside equipment (RSE) for conformity to ISO 13141.

ISO 13141 specifies requirements for dedicated short-range communication (DSRC) between OBE and an interrogator for the purpose of localization augmentation. It assumes an electronic fee collection (EFC) services architecture according to ISO 17573-1.

This document is intended to:

— assess OBE and RSE capabilities;

— assess OBE and RSE behaviour;

— serve as a guide for OBE and RSE conformance evaluation and type approval;

— achieve comparability between the results of the corresponding tests applied at different locations and at different times;

— facilitate communications between parties.

© ISO 2025 – All rights reserved

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 13141

1 Scope

This document specifies the test suite structure (TSS) and test purposes (TP) to evaluate the conformity of on-board equipment (OBE) and roadside equipment (RSE) to ISO 13141.

It provides a basis for conformance tests for dedicated short-range communication (DSRC) equipment to support interoperability between different equipment supplied by different manufacturers.

ISO 13141 specifies requirements for the localization augmentation communication (LAC) interface level, but not for the OBE or RSE internal functional behaviour. Consequently, tests regarding OBE and RSE functional behaviour remain outside the scope of this document.

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.

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO 13141:2024, *Electronic fee collection — Localization augmentation communication for autonomous systems*

ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 14907-2:2021, *Electronic fee collection — Test procedures for user and fixed equipment — Part 2: Conformance test for the on-board unit application interface*

ISO/TS 17573-2, *Electronic fee collection — System architecture for vehicle related tolling — Part 2: Vocabulary*

EN 12834:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

EN 13372:2004, *Road Transport and Traffic Telematics (RTTT) — Dedicated short-range communication — Profiles for RTTT applications*

EN 15509:2023, *Electronic fee collection — Interoperability application profile for DSRC*

EN 15876, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509*

ETSI/TS 102 486-2-2:2008, *Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/TS 17573-2 and the following apply.

© ISO 2025 – All rights reserved