



BSI Standards Publication

**Intelligent transport systems — Emergency
electronic brake light systems (EEBL) —
Performance requirements and test procedures**

National foreword

This British Standard is the UK implementation of ISO 20901:2020.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 580 99080 9

ICS 43.040.20; 43.040.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

INTERNATIONAL **ISO 20901** STANDARD

First edition
2020-04-14

Intelligent transport systems — Emergency electronic brake light systems (EEBL) — Performance requirements and test procedures

*Systèmes de transport intelligents — Systèmes de diffusion de
l'information d'un freinage d'urgence (EEBL) — Exigences de
performance et procédures d'essai*



Reference number
ISO 20901:2020(E)

© ISO 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and abbreviated terms	3
5 Specifications and requirements	3
5.1 Basic functions.....	3
5.2 Necessary functions.....	4
5.3 Basic operation principle.....	4
5.3.1 State functional descriptions.....	5
5.3.2 Operational limits.....	6
5.4 Alert functionality.....	6
5.4.1 General.....	6
5.4.2 Generating the message including emergency braking flag for broadcasting.....	6
5.4.3 Judging to issue the alert.....	6
5.5 Alerting element requirements.....	7
5.5.1 EEBL-R output.....	7
5.5.2 Alert modality.....	7
5.5.3 Optional functions of EEBL-R.....	7
5.6 Performance requirement of EEBL.....	8
5.6.1 Minimum communication range.....	8
5.6.2 System delay requirement between FV and SV.....	8
5.7 Driver interface requirements.....	8
5.7.1 Alert output specification.....	8
5.7.2 Fault indication.....	8
6 Performance evaluation test methods	8
6.1 Environmental conditions for test.....	8
6.2 Test course conditions.....	9
6.3 Test system installation and configuration.....	9
6.4 Parameters recoverable from data record.....	9
6.5 Test cases.....	9
6.6 Test procedure.....	10
6.6.1 Test case 1 — FV transmission test and delay measurement.....	10
6.6.2 Test case 2 — False positive test.....	12
6.6.3 Test case 3 — True positive test.....	13
6.6.4 Test case 4 — Test when there is interfering vehicle (IV).....	14
6.6.5 Test case 5 — Basic communication function test.....	16
Bibliography	18

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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*.

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.

Introduction

Emergency Electronic Brake Light systems (EEBL) alert the driver against the danger caused by the emergency braking of a forward vehicle (FV) on the upcoming road. EEBL generates an emergency brake message based on vehicle emergency brake and transmit. The system periodically broadcasts the message to nearby vehicles through vehicle to vehicle (V2V) wireless communication. If the system equipped on an FV detects the emergency braking of its own vehicle, the system generates the emergency braking flag, and sends the message including emergency braking flag. When the system equipped on the subject vehicle (SV) receives the message containing the emergency braking flag, the system judges whether an alert needs to be issued. If the location of the FV is within the specified region of interest (ROI) of the SV, the system provides an alert to the driver to prompt appropriate deceleration for driver safety. The scope of EEBL does not include automated intervention features or means for controlling the vehicle to match a desired speed.

A significant benefit of cooperative safety systems such as EEBL is the significant reduction of the potential risk of collision when a driver cannot see the brake light of an FV that is braking hard. For example, when there is an interfering vehicle between the emergency braking vehicle (FV) and the SV, the driver in the SV can still be alerted through vehicle to vehicle (V2V) wireless communication while on-board sensor-based systems cannot even detect the existence of the FV.

Intelligent transport systems — Emergency electronic brake light systems (EEBL) — Performance requirements and test procedures

1 Scope

This document contains the basic alert strategy, minimum functionality requirements, basic driver interface elements, minimum requirements for diagnostics and reaction to failure, and performance test procedures for Emergency Electronic Brake Light systems (EEBL).

EEBL alerts the driver against danger caused by the emergency braking of an FV on the upcoming road, so that the driver may reduce the speed. The system does not include the means to control the vehicle to meet the desired speed. The responsibility for safe operation of the vehicle always remains with the driver.

The scope of this document does not include performance requirements and test procedures of the wireless communication device used for EEBL. The requirements of communication devices are defined in other standards, e.g. the IEEE series listed in the Bibliography [6] [7] [8]. The test procedure in this document is designed for third party testing of the product while the test procedure can also be used for other stakeholders such as manufacturers or consumer unions.

The document applies to light duty vehicles and heavy vehicles. These systems are not intended for off-road use.

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:

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

3.1

Emergency Electronic Brake Light system

EEBL

system consisting of *EEBL-T* (3.1.1) and *EEBL-R* (3.1.2)

3.1.1

Emergency Electronic Brake Light – Transmitting system

EEBL-T

system capable of detecting the emergency braking of the vehicle where the system is equipped, and capable of transmitting a message including emergency brake flag and other information, e.g. location, speed, to nearby vehicles