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Edition 1.0 2019-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Car multimedia systems and equipment – Drive monitoring system
Part 3: Measurement methods

Systèmes et équipements multimédias pour automobiles – Système de surveillance de la conduite
Partie 3: Méthodes de mesure

IEC 63033-3:2019-09(en-fr)

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CONTENTS

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CAR MULTIMEDIA SYSTEMS AND EQUIPMENT – DRIVE MONITORING SYSTEM

Part 3: Measurement methods

FOREWORD

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

CDV	Report on voting
100/3147/CDV	100/3258/RVC

Full information on the voting for the approval of this International Standard 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.

A list of all parts in the IEC 63033 series, published under the general title *Car multimedia systems and equipment – Drive monitoring system*, can be found on the IEC website.

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- withdrawn,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.

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INTRODUCTION

This document specifies measurement methods for the drive monitoring system that is specified in IEC TS 63033-1:2017. IEC TS 63033-1:2017 specifies the model for generating the surrounding visual image of a drive monitoring system. The system allows drivers to monitor the car's perimeter in real time by using "free eye point" technology, which allows drivers to dynamically change the viewing perspective to obtain the most appropriate views according to the driving situation.

CAR MULTIMEDIA SYSTEMS AND EQUIPMENT – DRIVE MONITORING SYSTEM

Part 3: Measurement methods

1 Scope

This document specifies measurement methods for the drive monitoring system that is specified in IEC TS 63033-1:2017.

2 Normative references

The following documents are referred to in the text in such a way that any 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 TS 63033-1:2017, *Car multimedia system and equipment – Drive monitoring system – Part 1: General*

ISO 16505:2019, *Road vehicles – Ergonomic and performance aspects of Camera Monitor Systems – Requirements and test procedures*

UN Regulation No. 46, *Uniform provisions concerning the approval of devices for indirect vision and of motor vehicles with regards to the installation of these devices*

UN Regulation No. 125, *Uniform provisions concerning the approval of motor vehicles with regards to the forward field of vision of the motor vehicle driver*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

No terms and definitions are listed in this document.

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

3.2 Abbreviated terms

FOV field of view

4 System model

The system model of the drive monitoring system is described in Figure 1. A drive monitoring system shall generate multiple camera composite images and/or single camera images, using cameras that are mounted on the outside the car. The views to be generated by this system shall capture the fields of view specified in Clause 7. This system shall generate multiple views according to the fields of view to be secured. For measurement methods, the system shall refer to ISO 16505 and UN Regulation No. 46. However, the system does not need to fully comply with ISO 16505 and UN Regulation No. 46.

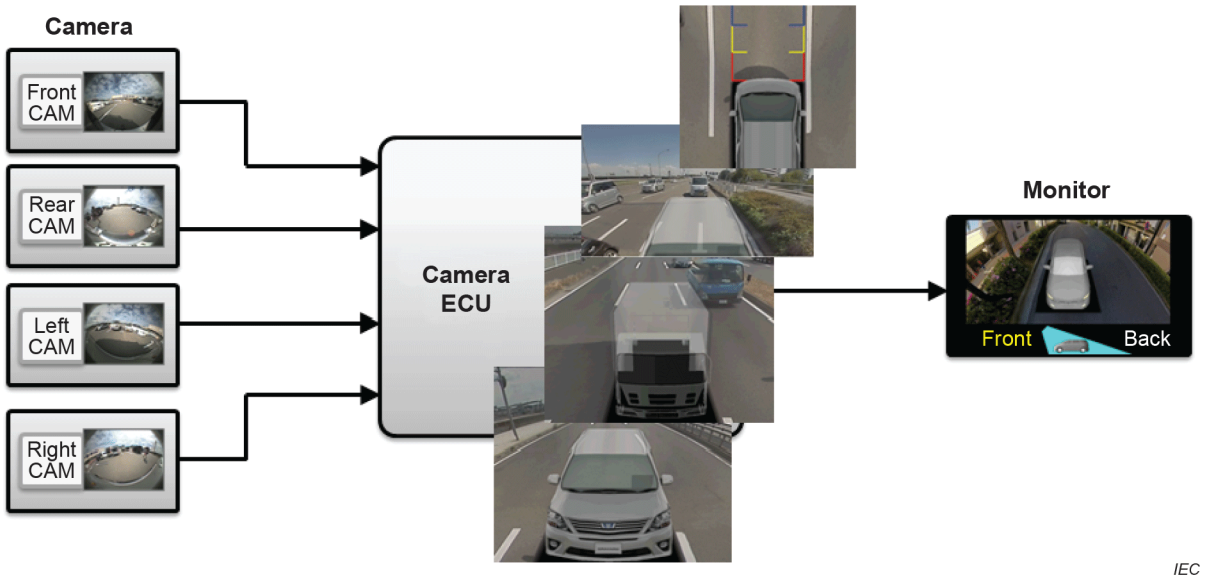

Figure 1 – System model of drive monitoring system

5 Camera image quality

5.1 Camera resolution

The resolution of the camera shall be 300 000 pixels or more.

5.2 Camera image quality

The camera's image quality shall comply with ISO 16505:2019, 6.8, and shall be measured as specified in ISO 16505:2019, 7.8. The monitor image quality shall comply with ISO 16505:2019, 6.8, and shall be measured as specified in ISO 16505:2019, 7.8, as well. For the measurement of the camera's image quality, a monitor that complies with ISO 16505:2019, 6.8, shall be used.

6 Camera calibration

6.1 General

The calibration of the camera shall be performed as specified in Annex C of IEC TS 63033-1:2017.

6.2 Verification

Draw an orthogonal frame at a distance of 1,5 m from the outline of the vehicle; this frame is to be captured within the camera's image. This frame is shown in Figure 2 and can be seen on the captured camera image. The guideline shown in Figure 3 representing the frame 1,5 m around the car's body that is later drawn on the composite video shall match up within a tolerance of 10 cm.

Dimensions in metres

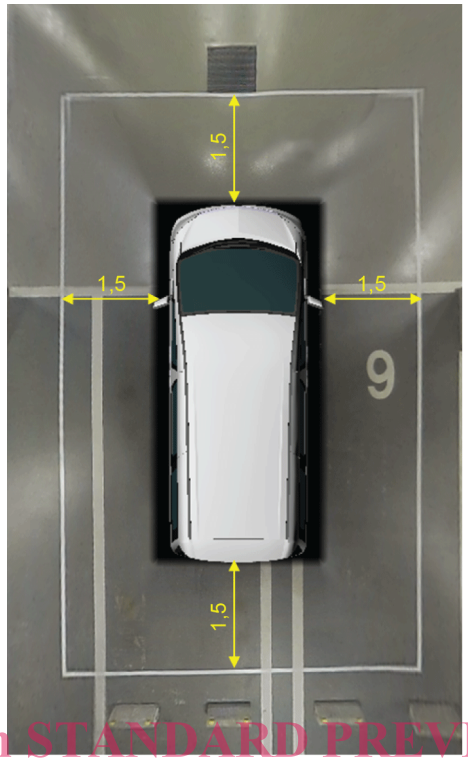

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Figure 2 – Orthogonal reference

Dimensions in metres

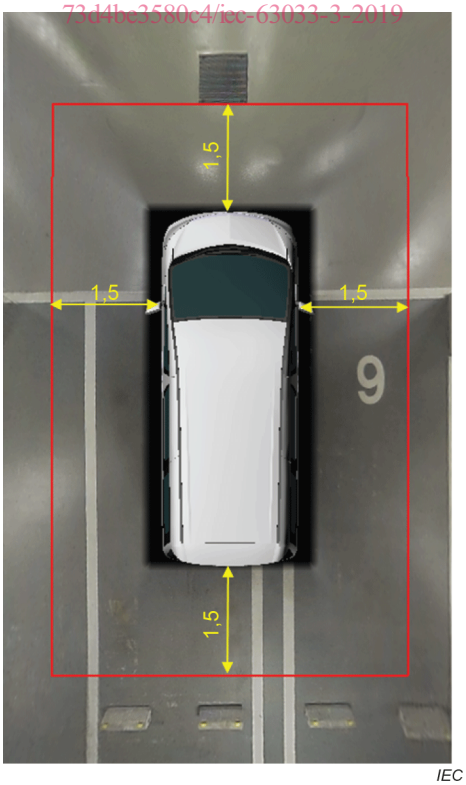

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Figure 3 – Reference guideline

7 Field of view

The field of view of the system is the visible area as displayed by composite images (i.e. from the multiple cameras composing the system) or the image captured by any single camera. If the purpose of the application of this system is to replace an existing type approval that is required for vehicular equipment, it shall comply with the respective regulation. For example, the FOV shall capture the respective FOV as defined in UN Regulations No. 46 and No. 125 (Class I to VI) if the system is intended to be used in such an application. Some examples of views representing FOVs of Class I to VI is described in Annex A. The compulsory or optional FOV shall follow the requirement as specified in the table under paragraph 15.2.1.1.1 in UN Regulation No. 46.

8 Time behaviour

8.1 Start-up time

The manufacturer of the camera ECU shall provide information of the start-up time of the system. The start-up time means the time from powering on the ignition to the initial composite view being displayed on the monitor. The start-up time shall be 7 s or less. The start-up time shall be measured as specified in ISO 16505:2019, 7.3.

8.2 Frame rate

The manufacturer of the camera ECU shall provide information on the frame rate of the system. The frame rate shall be more than 30 fps. While manoeuvring at low speed, the frame rate can drop (e.g. owing to image processing) but shall be never be below 15 fps. The frame rate shall be measured as specified in ISO 16505:2019, 7.9.1.

8.3 Latency

The camera's ECU should have a sufficiently short latency to render the image to display at nearly the same time as the camera image is captured. The latency is the time difference from when a light is captured by the camera until the time it becomes visible to the display. The latency shall be lower than 200 ms and shall be measured as specified in ISO 16505:2019, 7.9.3.

Annex A
(informative)

Field of view (FOV)

Figures A.1 to A.8 provide some examples of views representing FOVs of Class I to VI, a larger FOV on the passenger side, and also some example of views as specified within section 5.4.1 of UN Regulation No. 125, using an image generated by more than two cameras comprising a drive monitoring system. However, the generated example views provided in this document do not necessarily comply with uniform provisions as described, for example, in the UN Regulation No. 46 or UN Regulation No. 125. For more details on what can be displayed and what cannot be displayed, it is strongly recommended to check the applicable regulations.

Dimensions in metres

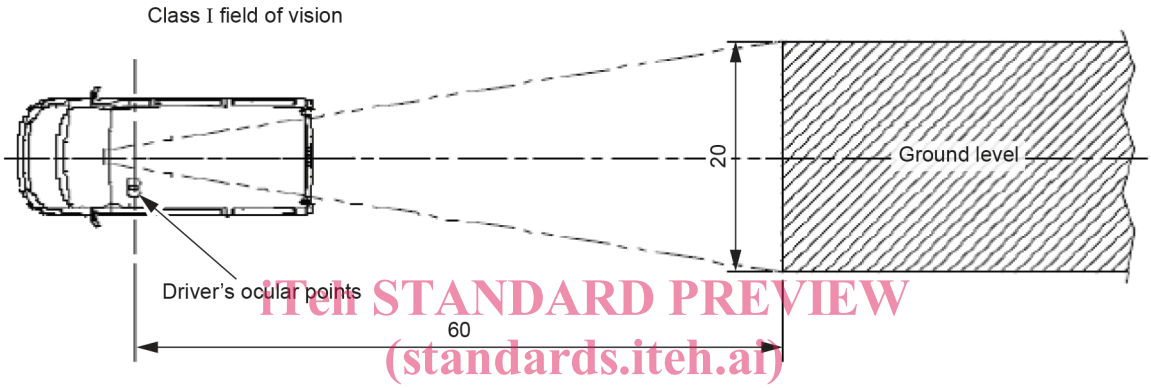

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Figure A.1 – Example view for Class I FOV