IEC 63033-2

INTERNATIONAL STANDARD

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Multimedia systems and equipment for vehicles – Surround view system – Part 2: Recording methods of the surround view system

Systèmes et équipements multimédias pour véhicules – Système de vision panoramique –
Partie 2: Méthodes d'enregistrement du système de vision panoramique

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MULTIMEDIA SYSTEMS AND EQUIPMENT FOR VEHICLES – SURROUND VIEW SYSTEM –

Part 2: Recording methods of the surround view system

FOREWORD

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IEC 63033-2 has been prepared by technical area 17: Multimedia systems and equipment for vehicles, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) updates to the text and the title to reflect the change of the scope of the IEC 63033 series.

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

Draft	Report on voting
100/3733/FDIS	100/3752/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.

A list of all parts in the IEC 63033 series, published under the general title *Multimedia systems and equipment for vehicles – Surround view system*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under 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- withdrawn,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 recording methods of the surround view system specified in IEC 63033-1, which also specifies the model for generating the surrounding visual image of the surround view system. The system allows drivers to monitor the vehicle's perimeter in real time by using "free eye point" technology, which allows drivers to dynamically change the viewing perspective, offering the most appropriate views according to the driving situation.

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MULTIMEDIA SYSTEMS AND EQUIPMENT FOR VEHICLES – SURROUND VIEW SYSTEM –

Part 2: Recording methods of the surround view system

1 Scope

This part of IEC 63033 specifies recording methods of the surround view system that is specified in IEC 63033-1 in order to view the video file recorded with "free eye point" technology.

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.

IEC 63033-1, *Multimedia systems and equipment for vehicles – Surround view system – Part 1: General*

3 Terms, definitions and abbreviated terms

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

3.1 Abbreviated terms

SIM   stream information and metadata

GNSS   global navigation satellite system

4 System model

4.1 General

This document specifies the recording methods of footage obtained from a vehicle-mounted camera that is part of the surround view system, and also specifies a model for the replay of the recorded video. The replay of the recorded video can serve a number of purposes, such as the verification of the reasons of an accident, as legal proof, for reviewing driving behaviour, and use at educational sites.

There are two types of recorded videos: recording of each camera image (referred to as "recording 1"), and recording of the composite image (referred to as "recording 2"). For use when the recorded videos are played back, the related metadata (refer to 4.2.2.3 and 4.2.3.3) is simultaneously saved in recording 1 and recording 2. These recorded files are transferred by a portable recording medium or via a network, where they can be later played back by the user. The user can also recreate the composite image by using the stored metadata by using the free eye point function in the viewer (refer to Clause 5).
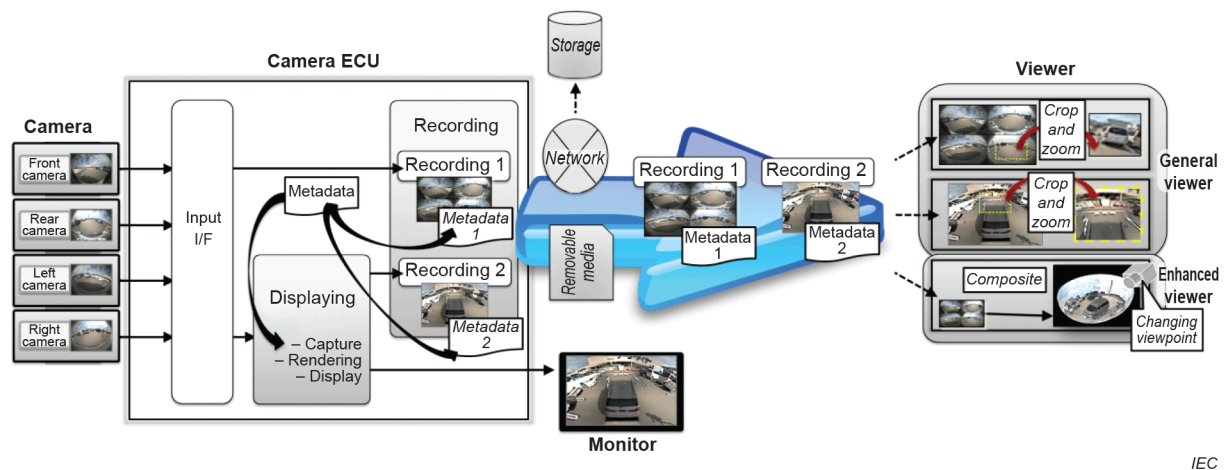
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Figure 1 – Display and recording system model of surround view system

4.2 Video recording

4.2.1 General

There are two types of recording files provided by the driver monitor system and as shown Figure 1: recording 1 and recording 2.

4.2.2 Recording 1

4.2.2.1 General

Recording 1 consists of both the raw video data (before the composite image is created) as obtained by each camera, and the related metadata (refer to 4.2.2.3). Using both the video data and the metadata enables the user to create a new composite image. The user can change the viewpoint freely while viewing the composite image. In addition, they can also see a vehicle's surroundings instantly in a single composite image.

4.2.2.2 Video data

The raw video data obtained from the vehicle-mounted cameras is recorded. The raw video data example is described in Figure 2.

Since the recording is pre-composition, there is no distortion, and the image cut-off is as directly input from each vehicle-mounted camera. This method allows for the full image to be transferred, thus keeping most of the original image information.

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Figure 2 – Raw video data example of recording 1 – Images before composition

4.2.2.3 Metadata for recording 1

The metadata listed in Table 1 and Table 2 shall be saved together with the video data. Some metadata will be included in the SIM source packet.

Table 1 – Metadata for recording 1

| Metadata	Explanation	Mandatory
Timestamp	It is necessary to identify the exact time when a certain event occurred. The time information is generally extracted from GNSS. If GNSS is not included in the system, the time information can be extracted from another system equivalent to GNSS.	✔
GNSS	It is necessary to identify details about the location and the exact time when a certain event occurred.	✔
ID data	It is necessary to specify which vehicle the recorded file came from.	✔
Orientation	It is necessary to identify details about orientation when a certain event occurred.	✔

Table 2 – Metadata for dependent part of video data 1

Metadata	Explanation	Mandatory
Optical axis shift data	The optical axis shift adjusts the central coordinates and the captured image's width and height. For details, see IEC 63033-1.	✔
Lens distortion data	Distortion data of the lens used for each camera. For details, see IEC 63033-1.	✔
Camera position and direction data	Camera position information consisting of mounted camera position (X, Y, Z) at the optics' centre (mm) and camera angle (tilt angle ψ, rot angle φ, pan angle θ) at optical axis direction (°). For details, see IEC 63033-1.	✔
Viewpoint position and direction data	The same viewpoint position data as registered to make the existing composite image. It contains the virtual viewpoint position (X, Y, Z), angle, and virtual 3D projection surface.	Preferable to be saved
3D vehicle model data and size	The same 3D vehicle model data and size as registered to make the existing composite image. It contains 3D model data, transparency, and the vehicle dimensions of the drawing representing the model of the vehicle (left, front, right, bottom, tail, top) expressed in mm.	Preferable to be saved

4.2.3   Recording 2

4.2.3.1   General

Recording 2 records both the composite image video data and the related metadata (refer to 4.2.3.3) at the same time. The composite image video data example is described in Figure 3.

Users cannot change the viewpoint while viewing the composite image. However, the user can instantly view the vehicle's surroundings through a specific pre-set composite image regardless of the viewer used (see Clause 5 for details).
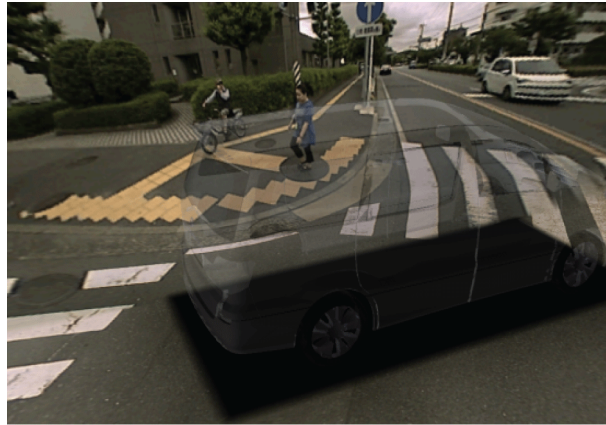
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Figure 3 – The composite video data example of recording 2

4.2.3.2　Video data

The composite video data obtained from vehicle-mounted cameras is recorded.

Compared to the case of recording the raw video data captured by all the cameras, it can reduce the data size and memory required since only the composite result is recorded. On the other hand, the image information from each camera that has not been used in the composite image will be lost.

4.2.3.3　Metadata for recording 2

The metadata listed in Table 1 shall be saved together with the video data. Some metadata will be included in the SIM source packet.

Since users cannot create a composite image in recording 2, only the metadata given in Table 3 is required.

Table 3 – Metadata for dependent part of video data 2

Metadata	Explanation	Mandatory
Viewpoint position and direction data	The same viewpoint position data as registered to make the existing composite image. It contains the virtual viewpoint position (X, Y, Z), angle, and the virtual 3D projection surface.	Preferable to be saved