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Multimedia systems and equipment for vehicles - External visual systems of external human-machine interfaces (eHMI) for automated vehicles - Part 1: General

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Multimedia systems and equipment for vehicles - External visual systems of external human-machine interfaces (eHMI) for automated vehicles - Part 1: General

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IEC TR 63676-1 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
100/4530/DTR	100/4583/RVDTR

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 Technical Report is English.

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 https://www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at https://www.iec.ch/publications.

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– reconfirmed,
– withdrawn, or
– revised.

INTRODUCTION

The concept of an external human-machine interface (eHMI) multimedia system in automated vehicles involves using external displays or communication channels to interact with pedestrians or other road users. The eHMI aims to enhance communication, safety, and mutual understanding between automated vehicles and their surroundings.

An example of an eHMI multimedia system could be external displays on the vehicle's exterior, such as LED panels, OLED displays, LCDs, or projection systems, to convey messages or signals to pedestrians. For instance, an automated vehicle might display a message or animation on its external display, indicating that it has detected other road users and will yield the right of way. This helps pedestrians and road users understand the vehicle’s intentions and facilitates safer interactions on the road.

It is intended that this series of documents consist of the following parts:

1. Overview of the eHMI for automated vehicles as a first part and it is a Technical Report:

This document introduces the eHMI concept and its importance in the context of automated vehicles. It highlights the major components of the system and discusses the performance of implementing external visual systems in such vehicles.

2. Multimedia system process as a second part:

It is intended that this part describes the architecture of external visual systems used in the eHMI multimedia systems. This could involve discussing the integration of external displays, LED panels, OLED displays, LCDs, projection systems, and other visual communication methods into vehicle design.

3. Multimedia system requirements for human factors and user experience as a third part:

It is intended that this part addresses human factors considerations, such as the legibility, visibility, and comprehension of the displayed information by pedestrians and other road users. It discusses design principles and guidelines to ensure effective communication and user-friendly experiences.

Overall, eHMI multimedia systems in automated vehicles aim to build trust, enhance communication, and improve safety between vehicles and their external environment by using visual, auditory, or other interactive means to convey information effectively.

This document introduces various external visual systems for multimedia services in automated vehicles, explains how to assess the impact during development, and summarises new work items in the near future.

1 Scope

This document describes the system overview of external visual systems of external human-machine interfaces (eHMIs). These systems are specifically designed for use in automated vehicles. It provides an introduction and background information on the concept of eHMIs, highlighting their significance in the context of automated vehicles. Additionally, it describes the architecture and key components of external visual systems used in eHMI multimedia systems.

It does not deal with:

a) external display usage scenario;
b) UX and UI of external display;
c) hardware performance of eHMI;
d) eHMI regulation of automated vehicle;
e) special vehicle conditions that use eHMI external displays, such as trucks, ambulances, fire engines, buses, and taxis.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 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:

– IEC Electropedia: available at https://www.electropedia.org
– ISO Online browsing platform: available at https://www.iso.org/obp

3.2
viewing angle
maximum angle at which the screen can be viewed with acceptable visual performance

3.3 Abbreviated terms

eHMI	external human-machine interface
ADS	automated driving system
CVD	colour vision deficiency
CHMSL	centre high-mounted stop light
LED	light-emitting diode
RCL	rear combination lights
SAE	Society of Automotive Engineers
SDV	software defined vehicle
UNECE	United Nations Economic Commission for Europe
V2P	vehicle to pedestrian