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INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Configurable car infotainment services (CCIS) – Part 1: General

Services d'infodivertissements configurables pour les véhicules (CCIS) – Partie 1: Généralités

IEC 63246-1:2021-08(en-fr)

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Services d'infodivertissements configurables pour les véhicules (CCIS) – Partie 1: Généralités

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CONFIGURABLE CAR INFOTAINMENT SERVICES (CCIS) –

Part 1: General

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

CDV	Report on voting
100/3414/CDV	100/3538/RVC

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.

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A list of all parts in the IEC 63246 series, published under the general title *Configurable car infotainment services (CCIS),* can be found on the IEC website.

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INTRODUCTION

The market for car infotainment services (also known as "in-vehicle infotainment systems") has been growing rapidly, as reflected by the growth of the associated industries. It is expected that a variety of car infotainment (or multimedia) devices and services will be developed in the future. Such devices include navigation, cameras, speakers, headrest displays, air-conditioners, thermometers, heated seats, and lights. It is also expected that some devices will be developed to provide 4-dimensional experiences for users.

Car infotainment systems typically include A/V features (such as standard radio and CD players), and two-way communications tools, as well as hands-free phone connections, vehicle voice commands, and other types of interactive audios or videos. Car infotainment systems have evolved to allow passengers to watch movies and other visual media (for example, DVD players installed on the rear seats). Another distinctive feature of future car infotainment systems is mobile device connectivity. Newer vehicles provide a wide range of systems that allow devices (e.g. smartphones and laptops) to be connected to a variety of services embedded in the vehicle.

From this observation, there is a crucial need for standardization to provide car infotainment users with more enhanced services so as to easily manage and control infotainment devices as well as content within a car.

The purpose of the IEC 63246 series is to specify the general considerations, requirements, framework, and protocols to provide car users with the functionality of managing and controlling device and content resources within a car.

The IEC 63246 series consists of the following parts:

– Part 1: General;
– Part 2: Requirements;
– Part 3: Framework; and
– Part 4: Protocol.

IEC 63246-1 describes the general considerations of CCIS, which includes the CCIS system model and the types of CCIS users with the associated service flows.

IEC 63246-2 describes the requirements for CCIS, which include the CCIS functional entities, the communication model, and the functional requirements.

IEC 63246-3 describes the CCIS framework, which includes the information flows between functional entities and the CCIS operations, such as registration, device monitoring and control, and data transfer.

IEC 63246-4 describes the CCIS protocol, which includes the protocol messages and parameters, protocol procedures, implementation guidelines, etc.

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CONFIGURABLE CAR INFOTAINMENT SERVICES (CCIS) –

Part 1: General

1 Scope

This part of IEC 63246 describes the general considerations of CCIS, which include the system model of the CCIS and the types of CCIS clients with the associated service flows.

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:

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

3.1
CCIS
configurable car infotainment services
service to manage and use a variety of devices within a car and to provide device control functionality for clients

Note 1 to entry: This note applies to the French language only.

3.2
CCIS user
user that can use and control the CCIS devices within the car with the help of the CCIS master

Note 1 to entry: CCIS users are classified as follows: car owner, temporary owner, public client, and private client.

3.3
CCIS device
device within the car that can be controlled and managed by the CCIS master, which can be a device (smart phone, speaker, multimedia player, etc.) or content (music, video, etc.) on a device

Note 1 to entry: Each CCIS device may be shared by one or more CCIS users.

3.4
CCIS master
central device to provide overall management and control functions for CCIS services and users

3.5
CCIS content
content comprising information and experience that are directed towards a CCIS user, which can be video, audio, still images, graphics, and data streams taken together to form a single identifiable unit

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3.6
CCIS profile
information (metadata of device, service level, etc.) and set of parameters in which pre-configured settings or the CCIS user can provide specific instructions to the CCIS device (destination of navigation, sound size, brightness, screen size, air conditioner temperature setting, etc.)

4 System model

The CCIS service or system provides the CCIS users with a communication interface to easily manage and control a variety of CCIS devices and CCIS profiles within the car, with the help of the CCIS master, as shown in Figure 1. The CCIS system may be equipped within the car as a built-in platform or by a software upgrade.

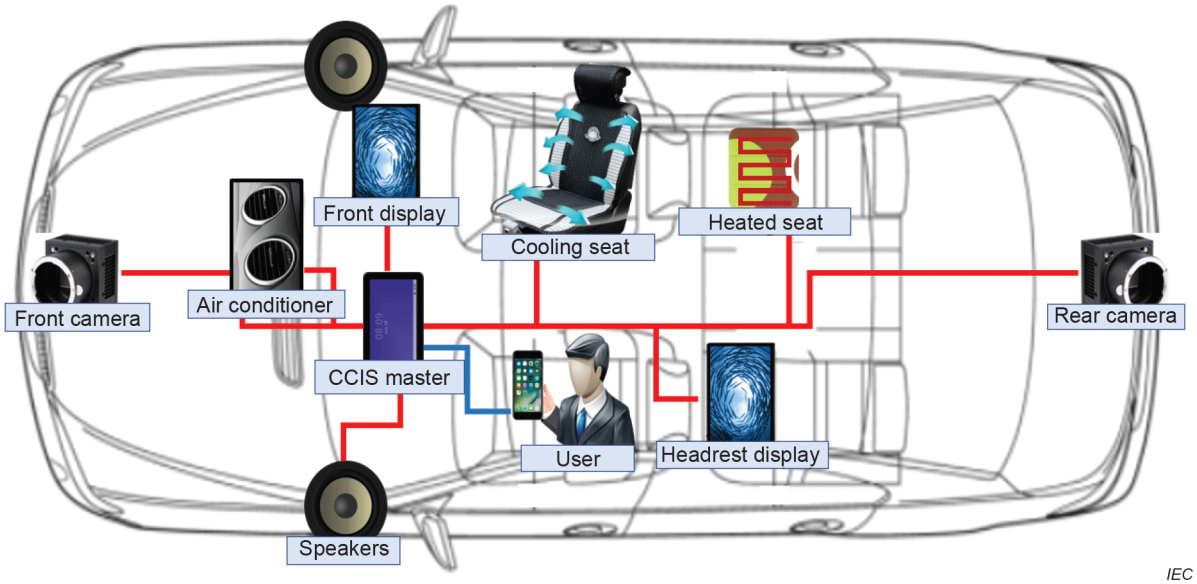

Figure 1 – CCIS environment

Figure 2 illustrates the system model of CCIS. The CCIS system connects the CCIS master to a variety of CCIS devices within a car to manage and control the CCIS devices. The CCIS users can use CCIS services through a communication interface with the CCIS master, in which a CCIS user can control a CCIS device or enjoy the CCIS content contained in the device. For this purpose, the CCIS master shall manage CCIS devices and CCIS profiles, such as device status and availability, and a CCIS user can access CCIS devices via appropriate registration and authentication processes with the CCIS master. A CCIS user can be categorized as follows: car owner, temporary owner, private client, and public client.

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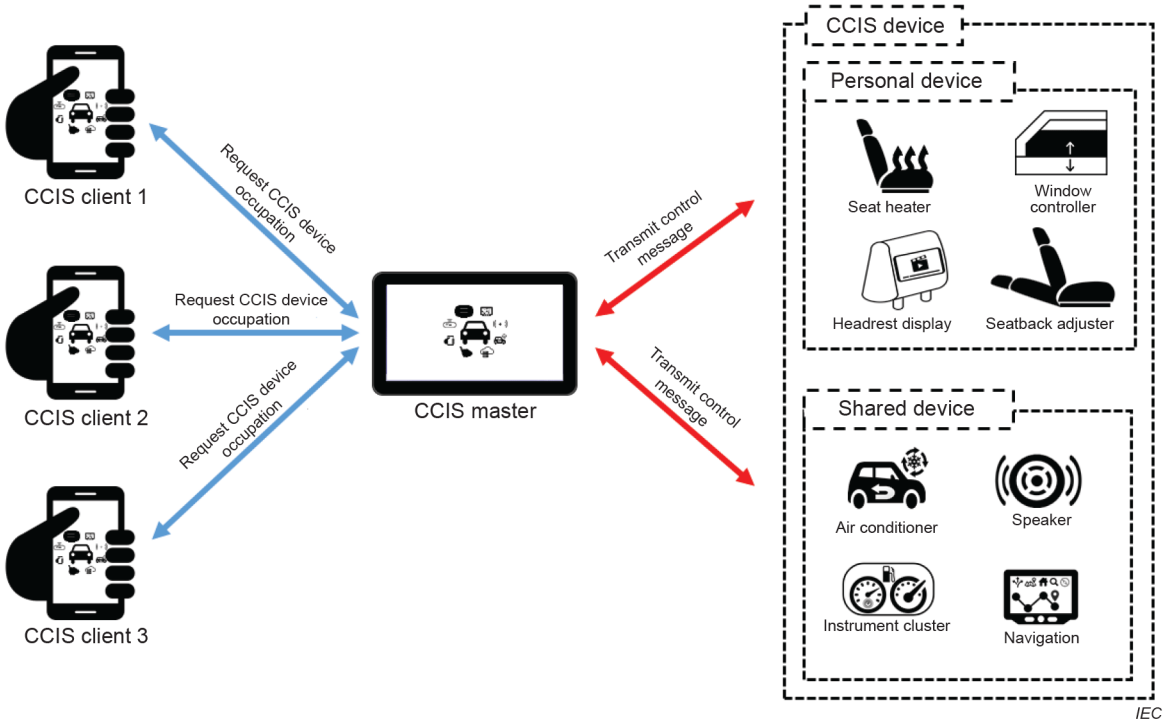

Figure 2 – System model of CCIS

5 CCIS users and service flows

5.1 Types of CCIS users

There is expected to be a wide variety of smart devices and CCIS profiles in the car. Depending on the type of CCIS user, some devices can be allowed, whereas the others can be restricted for use as CCIS services. In this respect, the types of CCIS users are categorized into the four cases, as shown in Table 1.

Table 1 – Types of CCIS users

Classification	Long-term use	Short-term use
Owner (authentication not required)	Car owner	Temporary owner
Client (authentication required)	Private client	Public client

As shown in Table 1, a CCIS user is categorized into car owner, temporary owner, private client, and public client, based on ownership and usage period, as follows:

– Car owner: a user who owns the car with a CCIS master and has the overall authority for CCIS functions and services. Ownership of the car is long-term.

– Temporary owner: a user who takes the ownership from car owner temporarily (e.g. a car-sharing or rental service user). The specific level of authority for use of CCIS services that is given to a temporary owner may be pre-specified by the car owner.

– Private client: a user who can utilize the CCIS services in the long-term without ownership (e.g., a family member of the car owner). The specific level of authority for use of CCIS services that is given to a private client may be pre-specified by the car owner.

– Public client: a user who is not authenticated by the CCIS master yet (e.g. a guest). A public client shall perform the registration and authentication process with the CCIS master.

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The CCIS devices may be shared or not, depending on their features as follows:

– CCIS device sharing allowed (shared device): device shared by one or more users in the car (e.g. air-conditioner and speaker);
– CCIS device sharing not allowed (personal device): device dedicated only to a particular user type (e.g. headrest display and heated seat).

5.2 Service flows for Car Owner

5.2.1 Description

Figure 3 shows the service model, in which the car owner uses their own CCIS devices and CCIS content.

Alice is working in the sales department of her company. The characteristics of her work lead her to spend a lot of time in her car. Accordingly, she equipped her car with various devices, such as an event video data recorder for road vehicle accidents (EVDR, see the IEC 63005 series), smart mirrors, cameras, a headrest display, and so on. In addition, she installed a CCIS master to efficiently manage those devices.

One day, Alice made an appointment to sign a contract with her client. She jumped into her car for a meeting. When she gets in the car, her smartphone automatically connects to the CCIS master, and she asks a list of available CCIS devices and CCIS content from the CCIS master. The CCIS master sends the available resource list of available CCIS devices and CCIS content to Alice's smartphone. Because Alice wants to play her favourite music files stored in her smartphone, she chooses to play the music files during her drive. After Alice arrived at the meeting place, she closed the connection with the CCIS master and headed to the conference room.

In this service model, there can be a security issue. An external user, who has not been registered and authorized, can try to access the CCIS master, and then the external user can try to add or remove a CCIS device with the authority of the car owner. Thus, the registration and authorization with the CCIS master should be provided for the car owner.

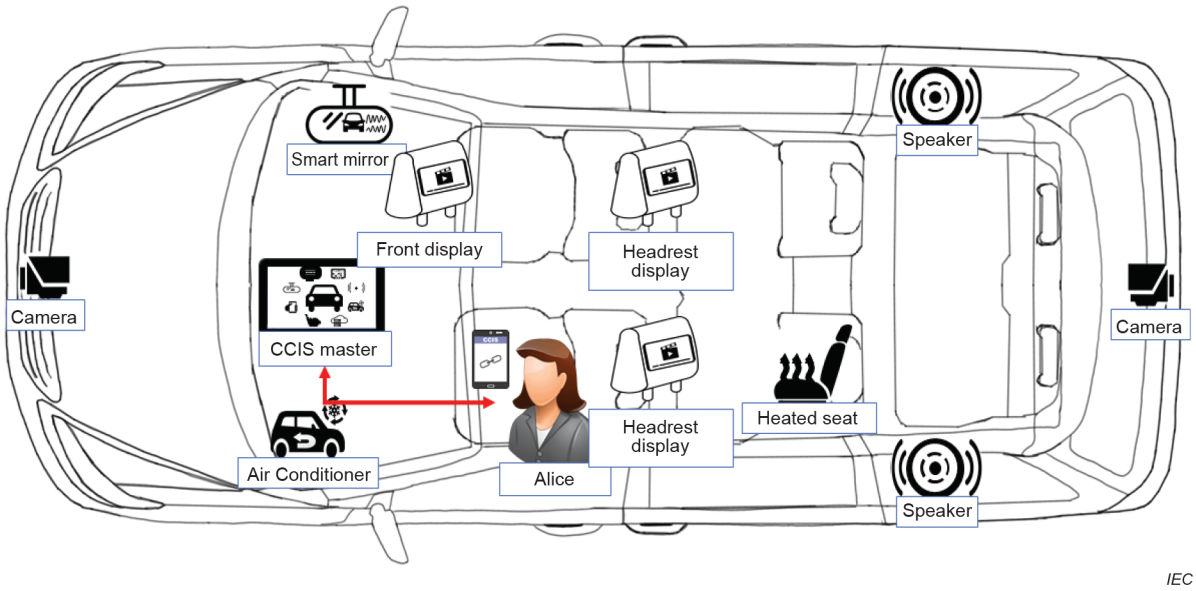

Figure 3 – CCIS model for car owner

5.2.2 Service flows

Figure 4 shows the service flows associated with the service example in 5.2.1.

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1) When Alice is in the vehicle, her smart device is connected to the CCIS master and retrieves a list of CCIS devices.
2) Alice selects a speaker from the CCIS device and the CCIS content list and sends an occupancy request message to the CCIS master. Upon the request, the CCIS master sends an occupancy notification to the speaker, and the speaker will respond with an occupancy response to inform that the connection is ready. The CCIS master sends a device seize acknowledgment to Alice. Alice plays music files that are stored in the smart device through the speaker.
3) Alice releases the occupancy of the speaker, and terminates the connection with the CCIS master. Then, the CCIS master changes the status of the speaker to available.

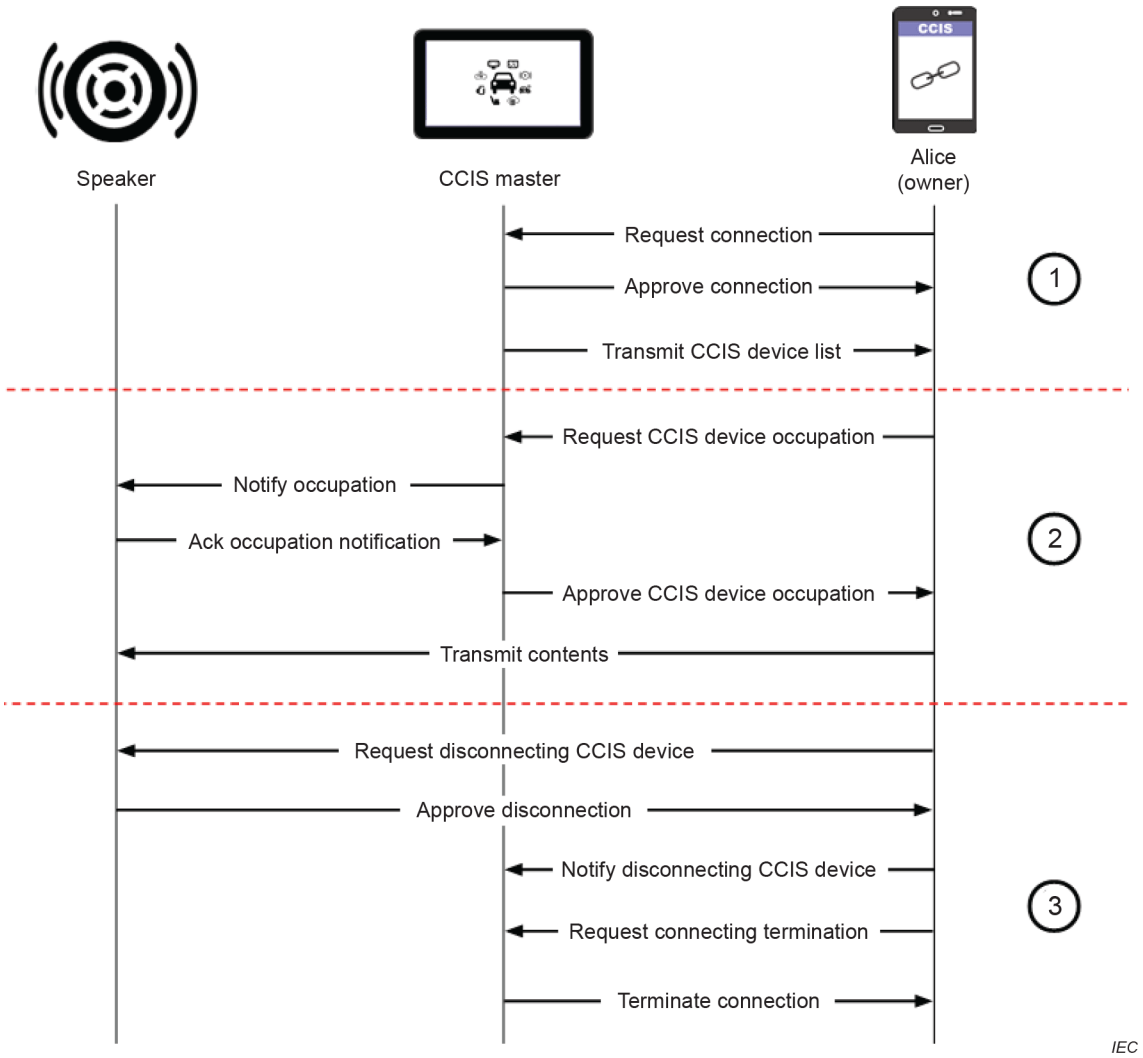

Figure 4 – Service flows for car owner

5.3 Service flows for temporary owners

5.3.1 Description

Figure 5 shows the service model in which the temporary owner is using a CCIS speaker device.

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Bob, who travels for a holiday, will rent a car to travel comfortably. Bob, who chose the car, has to go through the registration process as a temporary owner for the car to rent. A rental car service manager with the authority of the car owner changes the mode of the CCIS master to the temporary owner mode. After the mode change, Bob sends a temporary owner registration request to CCIS master. Then, the service manager will set a period, and selectively accessible CCIS device and CCIS content, and approves the request. The approved CCIS master registers Bob as a temporary owner.

In the case of the temporary owner, additional procedures and certifications are required. For example, it is necessary to define the period in which temporary owners can have the authority of the owner and also to classify the CCIS devices and CCIS contents that can be accessed.

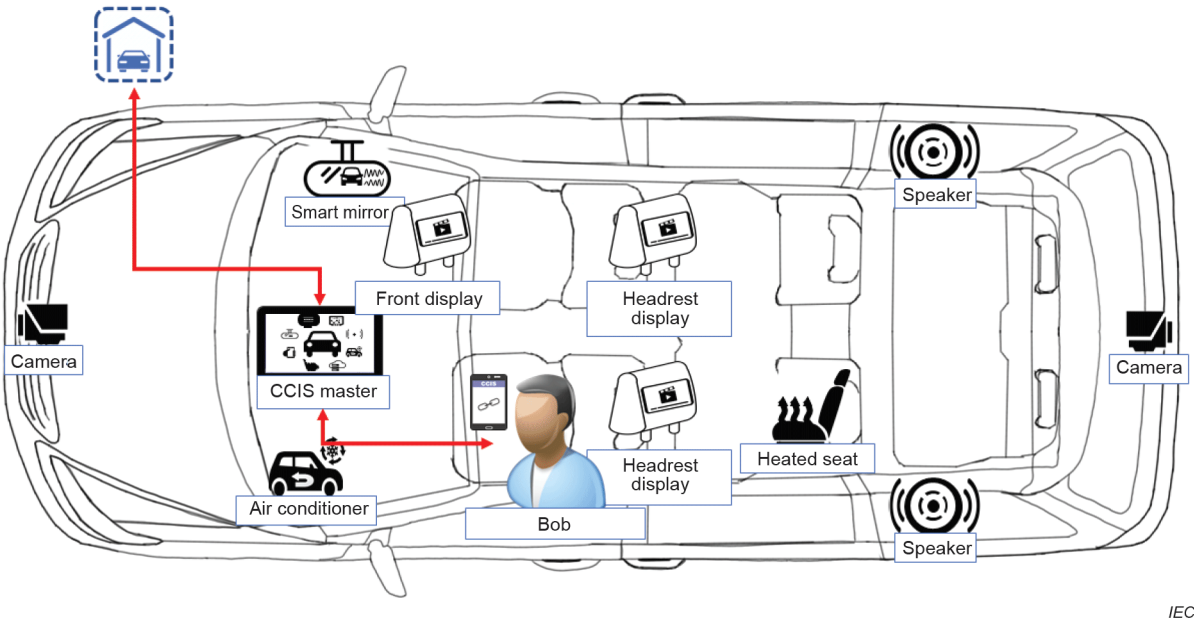

Figure 5 – CCIS model for temporary owner

5.3.2 Service flows

Figure 6 shows the service flows associated with the service example in 5.3.1.

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