

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Configurable car infotainment services (CCIS) –
Part 3: Framework**

**Services d'infodivertissements configurables pour les véhicules (CCIS) –
Partie 3: Cadre**

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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 63246 series, published under the general title *Configurable car infotainment services (CCIS)*, 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.

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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 will 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.

CONFIGURABLE CAR INFOTAINMENT SERVICES (CCIS) –

Part 3: Framework

1 Scope

This part of IEC 63246 describes the CCIS framework, which includes the information flows for registration, device monitoring and control, and content delivery between CCIS functional entities.

2 Normative references

The following document is 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 63246-1, *Configurable car infotainment services – Part 1: General*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 63246-1 apply.

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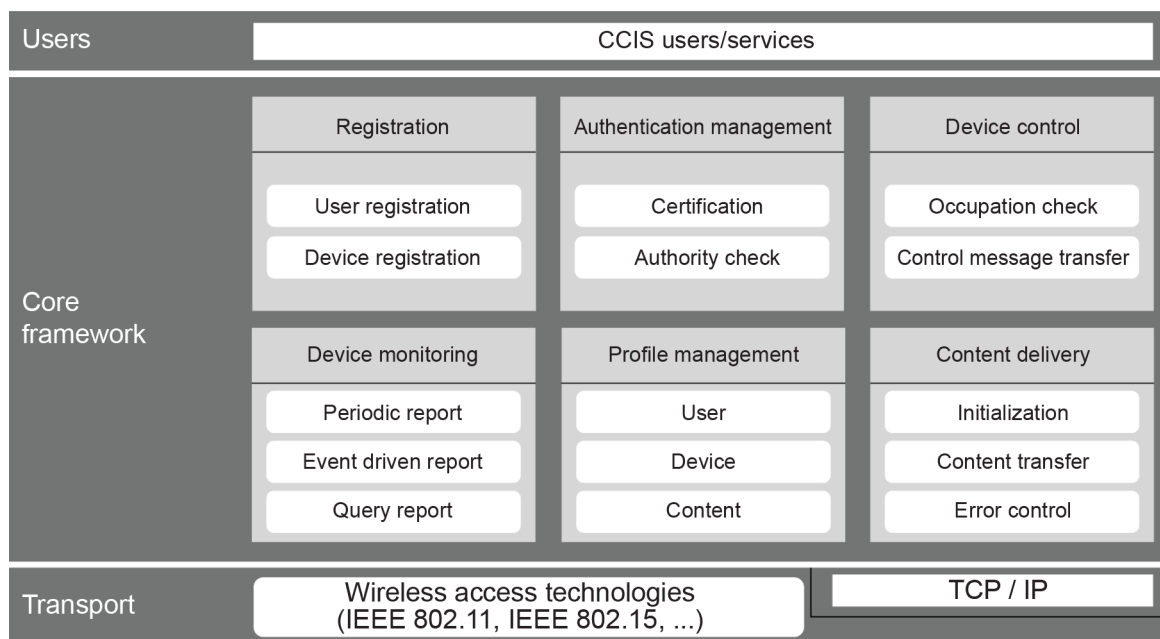
- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Reference functional architecture

4.1 CCIS functions

4.1.1 General

CCIS functions are divided into several functional blocks as depicted in Figure 1: registration, authentication, device control, device monitoring, profile management, and content delivery.



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Figure 1 – CCIS functional blocks

4.1.2 Registration

There are many users and devices in the CCIS system. The CCIS master performs the registration function to manage users and devices, which may include the provision of services by authority and automatic certification by storing the profile of registered users and devices.

4.1.3 Authentication management

CCIS can provide different level of services as per the level of authority of the CCIS user. The CCIS master performs the authority check for users by using an authentication key. For this purpose, a CCIS user shall obtain the authentication key from the CCIS master.

4.1.4 Device control

CCIS users can control CCIS devices. To control a specific CCIS device, its occupation status needs to be checked, since a CCIS device can be occupied by another user. When the device is available, the user can transmit a control message to the device via the CCIS master.

4.1.5 Device monitoring

Each device shall report its latest profile information to the CCIS master. Such status reports may be generated periodically or by a specific event. The periodic report is generated based on a timer, whereas the event-driven report is generated when the device status is changed. In certain cases, the CCIS master can first send a query message to a device.

4.1.6 Profile management

For effective support of CCIS services, the CCIS master shall store and manage the profile information, such as metadata of the registered users and devices. This profile information will be referred to during the functional operations of the CCIS.

4.1.7 Content delivery

CCIS provides a content delivery function for exchange of contents, such as multimedia data, between users and devices via the CCIS master. The content delivery function may include the content delivery initialization and the content transfer. The content delivery initialization is

performed to check the authority of the concerned user to use the content delivery service. The error control operation can be performed to provide reliability for content transfer between the device and the master, and between the user and the master.

4.2 Functional interworking model

Each CCIS function is performed between the CCIS functional entities by interworking with the other functions, as shown in Figure 2, in which the authentication function is interworking with the registration, device control and content delivery functions.

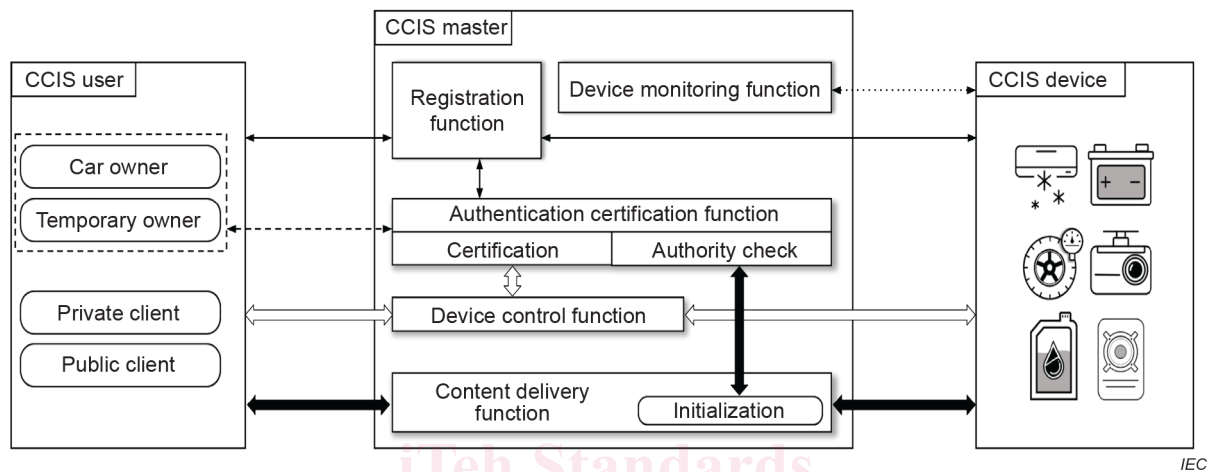


Figure 2 – Interworking of CCIS functions

The registration function is applied to users and devices. All users and devices shall be registered with the CCIS master. In the registration process, the authentication/certification function is used to check the identity or authority. In particular, the registration of private/public clients and CCIS devices needs the authentication check and admission by the car owner or the temporary owner.

The CCIS users perform the device control and content delivery functions with the CCIS devices with the help of the CCIS master, in which the authentication process with the owners is performed. The device monitoring function is performed between the devices and the CCIS master.

4.3 Service level configuration

CCIS may provide different service levels for CCIS users. For this purpose, each CCIS service is categorized into "service level high", "service level medium", and "service level low". Table 1 shows an example of the service level configurations, in which each CCIS service is classified as one of three levels (high, medium, low), by considering the service features (mission-critical or not) and the overall impact on the CCIS system.

Table 1 – CCIS service level configuration

CCIS services	Service level high	Service level medium	Service level low
System settings	✓		
Device registration and deregistration	✓		
Authority check		✓	
Client registration and deregistration		✓	
Usage of shared service		✓	
Usage of high-level personal service	✓		
Usage of medium-level personal service		✓	
Usage of low-level personal service			✓

In general, car owners will use all services with the high, medium, and low levels. Temporary owners can use the services with the medium and low levels, whereas private clients and public clients can use only the services with the low level.

5 Information flows for functional operations

5.1 Owner initialization

The CCIS owner, car owner and temporary owner, shall be registered with the CCIS master in the owner initialization operation, before the CCIS service begins. This is because all CCIS services are performed with the control of the CCIS owner.

Figure 3 shows the information flows for CCIS owner registration. The CCIS master periodically broadcasts its general information that includes its own identification or the contact address for registration. A CCIS user, who wishes to be the CCIS owner, transmits the registration request message to the CCIS master. Then, the CCIS master sends the owner the response message that contains the owner ID generated at the time of registration. After that, the certification information request and response messages are exchanged between the owner and the master in which the certification-related information and the authentication key will be exchanged.

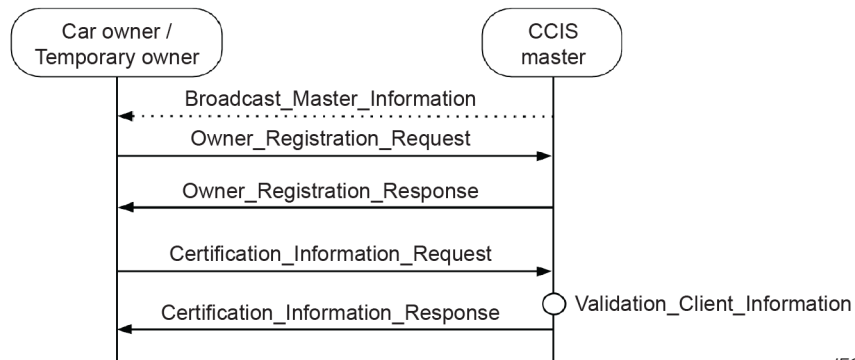


Figure 3 – Registration of CCIS owners

5.2 Client registration

5.2.1 General

Car owners and temporary owners shall be registered with the CCIS master in the initialization operation before CCIS services begins. In the meantime, the client (private client or public client)