SLOVENSKI STANDARD
SIST-TS CEN/TS 13149-10:2020

01-julij-2020

Javni prevoz - Sistemi za časovno razporejanje in nadzor cestnih vozil - 10. del: Lokacijska storitev

Public transport - Road vehicle scheduling and control systems - Part 10: Location service

Öffentlicher Verkehr - Planungs- und Steuerungssysteme für Straßenfahrzeuge - Teil 10: Positionsdienst

Transport public - Systèmes de planification et de contrôle des véhicules routiers - Partie 10 : Service de localisation

Ta slovenski standard je istoveten z: **CEN/TS 13149-10:2020**

__ICS:__

03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems

SIST-TS CEN/TS 13149-10:2020   en,fr,de

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TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 13149-10

May 2020

ICS 43.040.15; 35.240.60

English Version

Public transport - Road vehicle scheduling and control systems - Part 10: Location service

Transport public - Systèmes de planification et de contrôle des véhicules routiers - Partie 10 : Service de localisation

Öffentlicher Verkehr - Planungs- und Steuerungssysteme für Straßenfahrzeuge - Teil 10: Positionsdienst

This Technical Specification (CEN/TS) was approved by CEN on 8 December 2019 for provisional application.

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Ref. No. CEN/TS 13149-10:2020 E

CEN/TS 13149-10:2020 (E)

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European foreword

This document (CEN/TS 13149-10:2020) has been prepared by Technical Committee CEN/TC 278 "Intelligent transport systems", the secretariat of which is held by NEN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document is Part 10 of a series of European Standards and Technical Specifications that includes:

— CEN/TS 13149-7, *Public transport – Road vehicle scheduling and control systems – Part 7: System and network architecture*;

— CEN/TS 13149-8, *Public transport – Road vehicle scheduling and control systems – Part 8: Physical layer for IP communication*;

— CEN/TS 13149-9, *Public transport – Road vehicle scheduling and control systems – Part 9: Time service* [currently at voting stage];

— CEN/TS 13149-10, *Public transport – Road vehicle scheduling and control systems – Part 10: Location service*;

— CEN/TS 13149-11, *Public transport – Road vehicle scheduling and control systems – Part 11: Vehicle platform interface service* [currently at voting stage].

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this document: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CEN/TS 13149-10:2020 (E)

Introduction

This Technical Specification is Part 10 of a series of European Standards and Technical Specifications. The scope of this series is on-board data communication systems on public transport vehicles.

Public Transport (PT) vehicles have an increasing array of information and communications systems, including ticket machines, Automated Vehicle Location (AVL) systems, destination displays, passenger announcement systems, vehicle monitoring systems, etc. Other systems are beginning to be included such as advertising screens, tourist guides, WiFi "hotspots" and infotainment.

In addition, equipped PT vehicle will usually have a communications facility to enable voice and data to be exchanged with the control centre, other PT vehicles, PT infrastructure and roadside devices for instance in requesting priority at traffic signals. Many types of communication channel are used including public and private wireless communication networks.

These systems may be provided by a number of different suppliers and may need to be integrated. For instance:

— a ticket machine may need location information to update fare stages;

— next-stop and destination information may be drawn from schedule information held in the ticket machine;

— vehicle location systems may be used to drive signal priority requests.

As data exchange between functional units becomes more widespread, a networked approach begins to become efficient. With standardized underlying technology, the PT vehicle begins to look like a local area network: making use of IEEE 802 communications and the Internet Protocol (IP) suite.

Without a clear technology framework, integrating these systems would require complex technical discussions every time a device is procured. The existing EN 13149 standards recognized this long ago in respect of the core vehicle systems, but these have not been adapted to IP networking.

Six historical parts of EN 13149, namely Parts 1 to 6, have now been withdrawn in favour of the new IP-based approach. The core of this new approach was specified in two Technical Specifications (TS):

— CEN/TS 13149-7 specifies the Network and System Architecture for on board equipment. It describes basic principles of communications including a general description of the network topology, addresses schematics, basic network services, a system overview and basic module architecture.

— CEN/TS 13149-8 specifies the Physical Layer for IP-communication networks on board PT vehicles. This part specifies the cables, connectors and other equipment including pin assignment and environmental requirements.

Building on this, a series of specific services are being specified:

— CEN/TS 13149-9, specifying the structure to be used by a service providing time data to the on-bus network;

— CEN/TS 13149-10, specifying the structure to be used by a service providing location data to the on-bus network, specifically relating to Global Navigational Satellite Systems (GNSS);

— CEN/TS 13149-11, specifying the structure to be used by a service providing data from the vehicle platform to the on-bus network, using the Fleet Management System (FMS) for source data.

These documents draw on large scale trials undertaken within European projects such as EBSF (the "European Bus System of the Future" project) and its successors, together with technical developments which have since been adopted by programmes such as the German IBIS-IP platform [1] and, more recently, the European platform ITxPT [2]. This has ensured not only that the CEN specifications are robustly proved in practice, but also that they have the support of many key system developers and operators.

With these Technical Specifications, it will be easier to achieve:

— more efficient development of PT components;

— lower cost, lower risks and a smoother on board integration of PT equipment;

— more efficient operation and maintenance of on board PT equipment;

— high quality intermodal passenger services based on intermodal PT information;

— integration of new PT services.

CEN/TS 13149-10:2020 (E)

1 Scope

The CEN 13149 series of products concerns on-board data communication systems on public transport vehicles. This series provides for data services that enable open and managed sharing of relevant information.

This document, being Part 10 of the series, specifies a location publication, enabling all on-vehicle services to share a common understanding of the location and orientation of the vehicle, based on inputs taken from global navigational satellite systems (GNSS) such as GPS and Galileo. It covers:

— the functional scope, i.e. which data the service provides, why, when and how often;

— the transport protocol, i.e. how the data are transmitted;

— the service publication, i.e. how the service can be found by other modules or applications;

— the structure of the data, i.e. how the data are structured and how the data elements are named.

This document implements the service framework described in CEN/TS 13149-7.

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.

CEN/TS 13149-7:2020, *Public transport – Road vehicle scheduling and control systems – Part 7: System and network architecture*

3 Terms and definitions

For the purposes of this document, the terms, definitions, symbols, and abbreviations given in CEN/TS 13149-7:2020 apply.

4 Location Service

4.1 Functional Scope / Description & Use-Cases

The purpose of this service is to provide the geolocation data (i.e. basically coordinates) to other applications in a vehicle network.

This geolocation data are issued by GNSS receiver as "raw" location information (even if this information can be already pre-analysed by the receiver). Then such GNSS location data can be used and correlated to any other available data to define a more accurate location information.

— The module hosting the Location Service shall have access to a suitable source of GNSS information, for example through a GPS antenna.

Use cases include the following:

— A ticket machine may need location information to update fare stages.

— Location algorithms use the location data to calculate the position of the vehicle on the public transport network.

— Fleet Management applications use the location data to monitor the vehicles position on the public transport network.

— Passenger Information modules use location data to display vehicle location on the public transport network and next stop onboard the vehicle.

4.2 Architecture and Transport Protocol

The Location Service shall provide its information as multicast over the UDP protocol, following the architecture described in the relevant sections of CEN/TS 13149-7:2020.

NOTE   The use of UDP means that the service provides its data in a "fire and forget" manner. In particular, retransmission of lost packages is unnecessary, since the data are valid only instantaneously anyway.

To access Location Service data, a module shall join the multicast group.

4.3 Service Publication

4.3.1 Published Service Name

The service name of the Location Service shall be GNSSLocationService.

4.3.2 SRV Record

The following attributes of the Location Service SRV record should be implemented as follows:

`<UniqueIdentifier>_<Name>._<Type>._<Protocol>.<Domain> SRV <Port>`

Field	Definition	Value

UniqueIdentifier	A unique identifier to avoid conflicts with ambiguous names
	Can be an arbitrary distinct number, the hostname, the serial number, etc.
		Selected by the implementation – examples might be:
		`0xFD43FE`
		`myComputer`
		`DeviceSN1234`

Name	The Name of the service as defined in 4.3.1	`GNSSLocationService`
Type	Always "en13149_multicast"	`en13149_multicast`
Protocol	Identifies the communication protocol: always "udp" for this service	`udp`
Domain	Always "local." (with a dot at the end)	`local.`
Port	UDP port on which the service is to be found	`14005`

NOTE   The fields "Name" and "UniqueIdentifier" are always connected with an underscore "_". The Fields "type" and "protocol" are always connected with a dot and an underscore "._".

The recommended port for the service is 14005.

Examples of the SRV record for the Location Service are as follows:

```
myComputer_GNSSLocationService._en13149_multicast._udp.local. SRV 14005
DeviceSN1234_GNSSLocationService._en13149_multicast._udp.local. SRV 14005
0xFD43FE_GNSSLocationService._en13149_multicast._udp.local. SRV 14005
```

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