TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN/TS 15531-4

December 2021

ICS 35.240.60

Supersedes CEN/TS 15531-4:2011

English Version

Public transport - Service interface for real-time information relating to public transport operations - Part 4: Functional service interfaces: Facility monitoring

Transport public - Interface de service pour les informations en temps réel relatives aux opérations de transport public - Partie 4: Interfaces de service fonctionnel: Supervision des services et des équipements

Öffentlicher Verkehr - Servicescnittstelle für Echtzeitinformation bezogen auf Operationen in öffentlichen Verkehr - Teil 4: Funktionale Dienst-Schnittstellen: Anlagenüberwachung

This Technical Specification (CEN/TS) was approved by CEN on 22 November 2021 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of 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 United Kingdom.

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2021 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. CEN/TS 15531-4:2021 E

Contents

Page

European foreword 4
Introduction 5
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Symbols and abbreviations 7
5 Business Context 7
5.1 General 7
5.2 Overview of service function 7
5.3 Examples of Service Function 8
5.4 Use Cases 9
5.5 Use Cases: Capture and Origination of Facility Condition 10
5.5.1 General 10
5.5.2 CAPT#01 Facility Condition entered manually by operator staff 10
5.5.3 CAPT#02 Facility Condition updated manually by operator staff 10
5.5.4 CAPT#03 Facility Condition arising from automatic Facility Monitoring device (e.g. lift failure) 10
5.5.5 CAPT#04 Facility Condition being generated automatically from a situation 10
5.5.6 CAPT#05 Workflow for verification, validation and editorial correction 10
5.5.7 CAPT#06 Providing of collective guidance of passengers 10
5.5.8 CAPT#07 Audit trails, retrospectives and process views 11
5.6 Use Cases: Relating Facility Conditions to other SIRI services 11
5.6.1 General 11
5.6.2 XREF#01 Problem affecting a specific vehicle journey 11
5.6.3 XREF#02 Problem at a stop place affecting some or all journeys for some or all modes 11
5.6.4 XREF#03 Problems affecting an interchange 11
5.6.5 XREF#04 Problems affecting particular classes of users, e.g. impaired mobility 11
5.7 Use Cases: Onwards Distribution to other systems (e.g. in TPEG and Datex2) 11
5.7.1 General 11
5.7.2 DIST#01 Distribution of Facility Condition to displays 12
5.7.3 DIST#02 Distribution of Facility Condition to staff 12
5.7.4 DIST#03 Distribution of Facility Condition to external Systems 12
5.7.5 DIST#04 Distribution of Facility Condition to journey planners 12
5.7.6 DIST#04 Distribution of Facility Condition for recording Facility Failures 12
5.7.7 DIST#05 Distribution of Facility Condition to other systems 12
5.8 Use Cases: New Modes and Counting 12
5.8.1 General 12
5.8.2 NM#01 Provision of information about available vehicles and devices 12
5.8.3 NM#02 Provision of information about available spaces to bring a vehicle or a device back 13
5.8.4 NM#03 Provision of information about the updated location of a facility 13
6 Modelling Facilities in SIRI 13

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop

6.1 General 13
6.2 Facility Model Overview 13
6.3 Facility Model Details 14
6.4 Facility Model Elements 16
6.4.1 General 16
6.4.2 Facility Condition 16
6.4.3 Facility 16
6.4.4 Facility Status 17
6.4.5 Remedy 18
6.4.6 Monitoring Info 18
6.4.7 Facility Monitored Counting 18
6.4.8 Facility Updated Position 19
6.4.9 Facility Types 19

7 Communication Infrastructure 24
7.1 General 24
7.2 SIRI Service Request table 24
7.3 Communications Bandwidth 26

8 Facilities Monitoring Service [FM] 26
8.1 Purpose 26
8.2 UML Diagrams of Request and Response 27
8.2.1 SIRI-FM Request – Summary 27
8.2.2 SIRI-FM Request – Detail 28
8.2.3 SIRI-FM Delivery – Summary 30
8.2.4 SIRI-FM Delivery – Detail 31
8.3 Reference Data 31
8.4 Capability and Permission Matrices 32
8.4.1 Capability Matrix 32
8.4.2 Permission Matrix 33
8.5 FacilityMonitoringRequest 33
8.5.1 FacilityMonitoringRequest Definition 33
8.5.2 FacilityMonitoringRequest Example 36
8.6 FacilityMonitoringSubscriptionRequest 36
8.6.1 FacilityMonitoringSubscriptionRequest Definition 36
8.6.2 FacilityMonitoringSubscriptionRequest Example 37
8.7 FacilityMonitoringDelivery 38
8.7.1 General 38
8.7.2 ServiceDelivery with a FacilityMonitoringDelivery 38
8.7.3 FacilityMonitoringDelivery Element 38
8.7.4 FacilityCondition Element 39
8.7.5 FacilityMonitoringDelivery Example 56

Bibliography 58

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop

European foreword

This document (CEN/TS 15531-4:2021) has been prepared by Technical Committee CEN/TC 278 “Road transport and traffic telematics”, 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 supersedes CEN/TS 15531-4:2011.

SIRI (CEN/TS 15531-1:2007) has been a CEN Technical Specification since 2007 and a European normative standard since 2013 and has been widely used in Europe and elsewhere and proven its usefulness. This document proposes a revised version of SIRI as a European Standard and is currently submitted to the Formal Vote. The proposed revisions are minor enhancements arising from experience of the deployment of SIRI in many live systems. This document also clarifies the relationship of SIRI to NeTEx, the CEN Technical Standard for the XML exchange of Public Transport Reference data based on the Transmodel CEN European Standard.

The SIRI Facility Monitoring service (SIRI-FM) is an additional service, part 4, based on the European Technical Specification known as “SIRI” − Service Interface for Real-time Information. SIRI provides a framework for specifying communications and data exchange protocols for organisations wishing to exchange Real-time Information (RTI) relating to public transport operations.

The SIRI European Standard is presented in three parts:

— context and framework, including background, scope and role, normative references, terms and definitions, symbols and abbreviations, business context and use cases (Part 1),

— the mechanisms to be adopted for data exchange communications links (Part 2),

— data structures for a series of individual application interface modules PT, ET, ST, SM, VM, CT, CM, GM (Part 3).

Two additional parts define additional functional services as CEN Technical Specifications:

— additional data structures for additional application interface module FM (Part 4),

— additional data structures for additional application interface module SX (Part 5).

The XML schema can be downloaded from https://github.com/SIRI-CEN/SIRI, guidance on its use, example XML files, and case studies of national and local deployments is located at http://siri-cen.eu/.

It is recognized that SIRI is not complete as it stands, and from time to time will need to continue to be enhanced to add additional capabilities. It is therefore intended that a SIRI Management Group should continue to exist, at European level, based on the composition of SG7.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: 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 15531-4:2021 - Preview only Copy via ILNAS e-Shop

Introduction

Public transport services rely increasingly on information systems to ensure reliable, efficient operation and widely accessible, accurate passenger information. These systems are used for a range of specific purposes: setting schedules and timetables; managing vehicle fleets; issuing tickets and receipts; providing real-time information on service running, and so on.

This document specifies a Service Interface for Real-time Information (SIRI) about Public Transport. It is intended to be used to exchange information between servers containing real-time public transport vehicle or journey time data. These include the control centres of transport operators and information systems that utilize real-time vehicle information, for example, to deliver services such as travel information.

Well-defined, open interfaces have a crucial role in improving the economic and technical viability of Public Transport Information Systems of all kinds. Using standardized interfaces, systems can be implemented as discrete pluggable modules that can be chosen from a wide variety of suppliers in a competitive market, rather than as monolithic proprietary systems from a single supplier. Interfaces also allow the systematic automated testing of each functional module, vital for managing the complexity of increasing large and dynamic systems. Furthermore, individual functional modules can be replaced or evolved, without unexpected breakages of obscurely dependent function.

This document will improve a number of features of public transport information and service management:

— Interoperability – the European Standard will facilitate interoperability between information processing systems of the transport operators by: (i) introducing common architectures for message exchange; (ii) introducing a modular set of compatible information services for real-time vehicle information; (iii) using common data models and schemas for the messages exchanged for each service; and (iv) introducing a consistent approach to data management.

— Improved operations management – the European Standard will assist in better vehicle management by (i) allowing the precise tracking of both local and roaming vehicles; (ii) providing data that can be used to improve performance, such as the measurement of schedule adherence; and (iii) allowing the distribution of schedule updates and other messages in real-time.

— Delivery of real-time information to end-users – the European Standard will assist the economic provision of improved data by; (i) enabling the gathering and exchange of real-time data between AVMS systems; (ii) providing standardized, well defined interfaces that can be used to deliver data to a wide variety of distribution channels. Version 2.0 of SIRI includes a new Simple Web Service designed to support the widespread, massively scalable use of mobile devices and web browsers and other applications to display public transport data directly to users.

Technical advantages include the following:

— Reusing a common communication layer for all the various technical services enables cost-effective implementations and makes the European Standard readily extensible in future.

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop

History

Version 1.0 of SIRI was developed in 2004-2005 and submitted to vote, eventually passing through the CEN process to become an approved CEN Technical Specification in 2007. As well as the normative Version 1.0 XSD schema, successive informal working versions of the schema (v 1.1 – 1.4) were released to allow for fixes and to implement some very minor enhancements agreed by the working group. A WSDL version was also developed.

Version 2.0 of SIRI was developed in 2012 to coincide with making the SIRI standard a full CEN norm.

SIRI includes a Simple Web Services "SIRI-LITE" as an additional transport method and a WSDL document literal version and a WSDL2 version.

Version 2.1 of SIRI was developed in 2020/21 to address lessons from the now widespread implementation of SIRI.

The changes in SIRI version 2.1 include:

— remove the direct relationship with TPEG and other standards to enable support as the other standards change;

— support for new modes in line with TRANSMODEL and NeTEx;

— support for the Reason / Effect / Advice structure for disruptions in SIRI SX;

— increased granularity for occupancy data and Vehicle structures;

— improved subscription renewal options and filtering options;

— additional options and flexibility for STOP POINTS and relationships between journeys;

— migration of XSD to Github to improve access and change control processes.

Compatibility with previous versions

All changes in version 2.1 are intended to be fully backwards compatible, that is to say, existing documents that validate against earlier versions of the schema will also validate against the 2.1 schema without alteration (other than to schema version numbers), and version 2.1 documents that do not use new features will validate against earlier versions. Version 2.1 documents that use new features will not be backwards compatible.

The SIRI **Facility Monitoring (SIRI-FM)** service defined in this document enables the exchange of information on the current status of facilities. It provides a short description of the facility itself, the availability status and specifically the impact of the availability status for various categories of disabled or incapacitated people. The service provides all the current relevant information relating to all facilities fulfilling a set of selection criteria. Both query and publish subscribe interactions are supported. Initially released in 2007, was enhanced in 2011 and has been again in 2021 the latest update providing generic counting information to fulfil, amongst other services, the needs of new modes of transport (vehicle sharing, vehicle pooling, etc.).

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop

1 Scope

This document specifies an additional SIRI functional service to exchange information about changes to availability of facilities, between monitoring systems and servers containing real-time public transport vehicle or journey time data. These include the control centres of transport operators, as well as information systems that deliver passenger travel information services. As for Transmodel, public transport modes include new modes of transport (vehicle sharing, vehicle pooling, etc.).

This document describes the SIRI Facility Monitoring service, one of a modular set of services for the exchange of Real-time information. The Facility Monitoring service (SIRI-FM) is concerned with the exchange of information about alterations to the availability of facilities for passengers among systems, including equipment monitoring, real-time management and dissemination systems.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 15531-1:—[1], *Public transport — Service interface for real-time information relating to public transport operations — Part 1: Context and framework*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15531-1:—[1] apply.

4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in EN 15531-1:—[1] apply.

5 Business Context

5.1 General

This section is a complement to the Annex B “Business Context”, in Part 1 of the SIRI document set.

5.2 Overview of service function

The facility monitoring service allows the rapid real-time exchange of equipment and services (facilities) status data.

[1] Under preparation. Stage at the time of publication: prEN 15531-1.

CEN/TS 15531-4:2021 - Preview only Copy via ILNAS e-Shop