



# SLOVENSKI STANDARD

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>Uj b]dfYj cn!'Ja Ygb]\_nU]bZfa ]fUb^Yj 'fYU'Ya ` Ugi `nUdcHfYVY'XY'cj Ub^U  
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Public transport - Service interface for real-time information relating to public transport operations - Part 3: Functional service interfaces

Öffentlicher Verkehr - Dienstleistungsschnittstelle für zeitnahe Informationen zum Betrieb des öffentlichen Verkehrs - Teil 3: Funktionale Dienstleistungsschnittstellen

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### ICS:

35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade
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SPÉCIFICATION TECHNIQUE  
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**CEN/TS 15531-3**

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English Version

Public transport - Service interface for real-time information  
relating to public transport operations - Part 3: Functional  
service interfaces

Öffentlicher Verkehr - Dienstleistungsschnittstelle für  
zeitnahe Informationen zum Betrieb des öffentlichen  
Verkehrs - Teil 3: Funktionale Dienstleistungsschnittstellen

This Technical Specification (CEN/TS) was approved by CEN on 23 October 2006 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.

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**CEN/TS 15531-3:2007 (E)****Foreword**

This document (CEN/TS 15531-3:2007) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN.

This presents Part 3 of the European Technical Specification known as "SIRI". 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.

SIRI 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 (Part 3).

The XML schema can be downloaded from <http://www.siri.org.uk/>, along with available guidance on its use, example XML files, and case studies of national and local deployments.

It is recognised that SIRI is not complete as it stands, and there will be a substantial amount of work required to continue to develop SIRI over the coming years. It is therefore intended that a SIRI Management Group should continue to exist, at European level, based on the composition of SG7.

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



## 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 Technical Specification 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 utilise 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 standardised 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 functions.

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

- Interoperability – the Technical Specification 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 Technical Specification 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 Technical Specification will assist the economic provision of improved data by: (i) enabling the gathering and exchange of real-time data between VAMS systems; (ii) providing standardised, well defined interfaces that can be used to deliver data to a wide variety of distribution channels.

Technical advantages include the following:

- Reusing a common communication layer for all the various technical services enables cost-effective implementations, and makes the Technical Specification readily extensible in future.

**CEN/TS 15531-3:2007 (E)****1 Scope**

There are many potential ways for passenger transport operations centres to interact. The approach taken by SIRI is for an open-ended set of standard data structures, carried over a communications channel constructed using one of a small number of specific options.

Part 2 of this Technical Specification specifies the communications channel. This section specifies a number of functional modules, based on the 'use cases' identified in Annex B to Part 1:

- Production Timetable (PT): this service enables the provision of information on the planned progress of vehicles operating a specific service, identified by the vehicle time of arrival and departure at specific stops on a planned route for a particular Operational Day.
- Estimated Timetable (ET): this service enables the provision of information on the actual progress of Vehicle Journeys operating specific service Lines, detailing expected arrival and departure times at specific stops on a planned route. There will be recorded data for stops which have been passed, and predicted data for stops not yet passed. In addition the Estimated Timetable service allows Vehicle Journeys to be cancelled, added or changed.
- Stop Timetable (ST): this service provides a stop-centric view of timetabled vehicle arrivals and departures at a designated stop. It can be used to reduce the amount of information that needs to be transmitted in real-time to stops and displays, as reference data for a Stop Monitoring Service; and provides a data feed of the static timetables.
- Stop Monitoring (SM): this service provides a stop-centric view of vehicle arrivals and departures at a designated stop. It can be used by displays and other presentation services to provide departure board and other presentations of timetable and real-time journey information both at stops and at a distance.
- Vehicle Monitoring (VM): this service enables the provision of information on the current location and status of a set of vehicles. It does not relate to specific stops. It provides all the current relevant information from one AVMS relating to all vehicles fulfilling a set of selection criteria.
- Connection Timetable (CT): this service may be used to provide information about the scheduled arrivals of a feeder vehicle to the operator of a connecting distributor service. The distributor operator can then plan how to guarantee the connection, either with the expected vehicle or a different vehicle.
- Connection Monitoring (CM): this service is used to provide information about the expected arrival of a feeder vehicle to the operator of a connecting distributor service. The distributor operator can then manage the service to guarantee the connection, based on actual vehicle running.
- General Message (GM): the SIRI "General Message" service is used to exchange informative messages between identified individuals in free or an arbitrary structured format. It enables messages to be sent and to be revoked. Messages are assigned validity periods in addition to the actual content.

**2 Normative references**

Not applicable.

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in CEN/TS 15531-1:2007 apply.

## 4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in CEN/TS 15531-1:2007 apply.

## 5 Production Timetable Service [PT]

### 5.1 Purpose

The SIRI Production Timetable Service transmits daily timetables that include any planned updates that are known about at the time of transmission. The service is used typically to communicate between Scheduling systems and AVMS systems, and also between AVMS systems and intelligent clients of the AVMS system. The timetables exchanged should cover all lines covered by the AVMS system.

The SIRI Production Timetable Service is also used to transmit the planned interchanges between journeys, including information about the linking of vehicle parts through the interchange, such as whether passengers are able to remain seated in the vehicle.

The provision of known updates gives a more accurate data set of journeys for the SIRI Estimated Timetable Service to reference, allowing a more efficient real-time exchange of content. However, the provision of a Production Timetable Service is not absolutely essential for the functioning of the Estimated Timetable service.

Because of the enhanced quality of data given by an increased integration with operational and back-office scheduling systems, SIRI implementations that are able to obtain production timetables should always provide and make use of a SIRI Production Timetable Service.

Note that an AVMS system may be aware of additional operational journeys and calls such as dead runs, and layovers. As the schedule information system usually only knows about vehicle journeys that are relevant to the passenger, the AVMS should only transmit passenger carrying vehicle journeys to the schedule information system.

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### 5.2 Capability and Permission Matrices

#### 5.2.1 Capability Matrix

Table 1 shows the set of required and optional capabilities is defined for the Production Timetable service.

If the service supports Capability Discovery the **ProductionTimetableCapabilitiesRequest** / **ProductionTimetableCapabilitiesResponse** message pair can be used to determine the implementation's capabilities.

**Table 1 — ProductionTimetableCapabilities Matrix**

<b>ProductionTimetableCapabilities</b>			<b>+Structure</b>	Capabilities describing implementation of Production Timetable service
<i>inherit</i>	:::	1:1	See xxx- <i>Capability-Response</i>	See SIRI Part 2-12.4 for Common Capability attributes.
<i>Topic</i>	<b>TopicFiltering</b>	0:1	<b>+Structure</b>	Which optional filtering features are supported.
	<b>FilterByValidityPeriod</b>	1:1	<i>xsd:boolean</i>	Whether results can be filtered by Validity Period. Required Facility: Fixed is <i>true</i> .
	<b>FilterByOperatorRef</b>	1:1	<i>xsd:boolean</i>	Whether results can be filtered by Operator. Default is <i>true</i> .
	<b>FilterByLineRef</b>	1:1	<i>xsd:boolean</i>	Whether results can be filtered by Line. Default is <i>true</i> .
	<b>FilterByVersionRef</b>	1:1	<i>xsd:boolean</i>	Whether results can be filtered by Timetable Version. Default is <i>true</i> .

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<i>Request Policy</i>	<b>RequestPolicy</b>	0:1	+Structure	Which features of Request Policy are supported by the service?
	<b>Language</b>	1:*	<i>xsd:language</i>	National languages used by service.
			<i>choice</i>	Location reference system for coordinates.
	<b>a GmlCoordinateFormat</b>	0:1	<i>SrsNameType</i>	Default coordinate format is given by a GML value.
	<b>b WgsDecimalDegrees</b>		<i>EmptyType</i>	Default coordinate data system is WGS 84 latitude and longitude.
<i>Sub- scription Policy</i>	<b>SubscriptionPolicy</b>	0:1	+Structure	Which features of Subscription Policy are supported by the service?
	<b>HasIncremental- Updates</b>	0:1	<i>xsd:boolean</i>	Whether incremental updates can be specified for updates. Default is <i>true</i> .
<i>Access Control</i>	<b>AccessControl</b>	0:1	+Structure	Which optional Access Control features are supported by service?
	<b>RequestChecking</b>	0:1	<i>xsd:boolean</i>	Whether access control of requests is supported. Default is <i>false</i> .
	<b>CheckOperatorRef</b>	0:1	<i>xsd:boolean</i>	If access control is supported, whether access control by Operator is supported. Default is <i>true</i> .
	<b>CheckLineRef</b>	0:1	<i>xsd:boolean</i>	If access control is supported, whether access control by Line is supported. Default is <i>true</i> .
	<b>CheckConnection- Link_Ref</b>	0:1	<i>xsd:boolean</i>	If access control is supported, whether access control by <b>ConnectionLink</b> is supported. Default is <i>true</i> .
any	<b>Extensions</b>	0:1	any	Placeholder for user extensions.

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## 5.2.2 Permission Matrix

If the implementation supports both Capability Discovery and Access Controls, then the **ProductionTimetableCapabilitiesResponse** response can include the access permissions for the requestor participant to access data. Table 2 shows this.

Table 2 — Production Timetable Service Permissions

<b>ProductionTimetablePermission</b>			+Structure	Permissions to use implementation of Production Timetable service.
In-herit	:::	1:1	<i>xxxService-Permissions</i>	See SIRI Part 2-12.5 for Common Permission elements.
<i>Topic</i>	<b>OperatorPermissions</b>	0:1	+Structure	Operator permissions for participant. See Part 2.
	<b>LinePermissions</b>	0:1	+Structure	Line permissions for participant. See Part 2.
	<b>ConnectionLinkPermissions</b>	0:1	+Structure	ConnectionLink permissions for participant. See Part 2.

## 5.3 ProductionTimetableRequest

### 5.3.1 ProductionTimetableRequest Definition

The **ProductionTimetableRequest** states which timetables should be returned – see Table 3.

Table 3 — ProductionTimetableRequest Parameters

<b>ProductionTimetableRequest</b>			+Structure	Request for daily production timetables
Attributes	<b>version</b>	1:1	VersionString	Version Identifier of <i>Production Timetable</i> Service, e.g. 1.0c
Endpoint Properties	<b>Request-Timestamp</b>	1:1	xsd:dateTime	See SIRI Part 2 for common properties of SIRI Functional Service Requests.
	<b>Message-Identifier</b>	0:1	Message-Qualifier	
Topic	<b>ValidityPeriod</b>	0:1	ClosedDate-Range-Structure	Start and end of timetable validity (time window) of journeys for which schedules are to be returned. Refers to the departure time at the first stop of each vehicle journey. If blank the configured data horizon will be used.
	<b>Start</b>	1:1	xsd:dateTime	The (inclusive) start time.
	<b>End</b>	1:1	xsd:dateTime	The (inclusive) end time.
	<b>Timetable-VersionRef</b>	0:1	xsd:string	Communicate only differences to the timetable specified by this version of the timetable.
	<b>OperatorRef</b>	0:*	→Operator-Code	Filter the results to include only results for the specified operator or operators. Optional SIRI capability: <i>TopicFiltering / ByOperator</i> .
	<b>LineRef</b>	0:1	→LineCode	Filter the results to include only results for the given line or lines.
	<b>DirectionRef</b>	0:1	→Direction-Code	Filter the results to include only journeys for vehicles running in a specific relative direction. Optional SIRI capability: <i>TopicFiltering / ByDirection</i> .
Policy	<b>Language</b>	0:1	xml:lang	Preferred language in which to return text values. Optional SIRI capability: <i>NationalLanguage</i> .
	<b>Incremental-Updates</b>	0:1	xsd:boolean	Whether the producer should return the complete set of current data, or only provide updates to the last timetable returned, i.e. additions, modifications and deletions, as indicated by the <b>TimetableVersionRef</b> . If <i>false</i> each subscription response will contain the full information as specified in this request.
any	<b>Extensions</b>	0:1	any	Placeholder for user extensions.

The **ProductionTimetableRequest** can be used in both a direct request, and for a subscription. If used for a subscription, additional **ProductionTimetableSubscriptionPolicy** parameters can be specified.

The primary *Topic* term on the request is the time window for which timetables are to be returned. Additional topic filtering on line and timetable version is also allowed. If filtering is not specified, all lines known to the AVMS are transmitted.

If the timetable version is not available an error code is returned **NoInfoForTopic**. In this situation a subscription is not set up.

### 5.3.2 ProductionTimetableRequest Example

The following is an example of a **ProductionTimetableRequest**.

```
<ServiceRequest>
  <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
  <RequestorRef>NADER</RequestorRef>
  <ProductionTimetableRequest version="1.0">
```

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```

<RequestTimestamp>2001-12-17T09:30:47-05:00</RequestTimestamp>
<ValidityPeriod>
  <StartTime>14:20:00</StartTime>
  <EndTime>14:20:00</EndTime>
</ValidityPeriod>
<TimetableVersionRef>002</TimetableVersionRef>
<OperatorRef>Smooth</OperatorRef>
<LineRef>123</LineRef>
<DirectionRef>Outbound</DirectionRef>
</ProductionTimetableRequest>
</ServiceRequest>

```

## 5.4 ProductionTimetableSubscriptionRequest

### 5.4.1 ProductionTimetableSubscriptionRequest Definition

The **ProductionTimetableSubscriptionRequest** (Table 4) requests the asynchronous delivery of the information described by a **ProductionTimetableRequest**. The **ProductionTimetableSubscriptionRequest** Policy parameters control the processing of the subscription.

Table 4 — ProductionTimetableSubscriptionRequest Parameters

<b>ProductionTimetableSubscriptionRequest</b>		+Structure	Request for a subscription to the SIRI Production Timetable Service.
Identity	<b>SubscriberRef</b>	0:1	→ParticipantCode
	<b>SubscriptionIdentifier</b>	1:1	SubscriptionQualifier
Lease	<b>InitialTerminationTime</b>	1:1	xsd:dateTime
Request	<b>ProductionTimetable-Request</b>	1:1	+Structure

### 5.4.2 ProductionTimetableSubscriptionRequest Example

The following is an example of a **ProductionTimetableSubscriptionRequest**.

```

<SubscriptionRequest>
  <RequestTimestamp>2004-12-17T09:30:47-05:00</RequestTimestamp>
  <RequestorRef>NADER</RequestorRef>
  <ProductionTimetableSubscriptionRequest>
    <SubscriberRef>NADER</SubscriberRef>
    <SubscriptionIdentifier>0000456</SubscriptionIdentifier>
    <InitialTerminationTime>2001-12-17T09:30:47-05:00</InitialTerminationTime>
    <ProductionTimetableRequest version="1.0">
      <RequestTimestamp>2001-12-17T09:30:47-05:00</RequestTimestamp>
      <ValidityPeriod>
        <StartTime>14:20:00</StartTime>
        <EndTime>14:20:00</EndTime>
      </ValidityPeriod>
    </ProductionTimetableRequest>
  </ProductionTimetableSubscriptionRequest>
</SubscriptionRequest>

```

```

<TimetableVersionRef>002</TimetableVersionRef>
<OperatorRef>Smooth</OperatorRef>
<LineRef>123</LineRef>
<DirectionRef>Outbound</DirectionRef>
</ProductionTimetableRequest>
</ProductionTimetableSubscriptionRequest>
</SubscriptionRequest>

```

## 5.5 ProductionTimetableDelivery

### 5.5.1 General

The **ProductionTimetableDelivery** returns the position of a vehicle or group of vehicles.

### 5.5.2 ServiceDelivery with a ProductionTimetableDelivery

One or more **ProductionTimetableDelivery** elements may be returned as part of a SIRI Functional ServiceDelivery. Table 5 shows this element.

Table 5 — ServiceDelivery / ProductionTimetableDelivery Elements

<b>ServiceDelivery</b>			+Structure	See SIRI Part 2-7.2.1 <b>ServiceDelivery</b>
HEADER	:::	1:1	See ServiceDelivery	
Payload	<b>ProductionTimetableDelivery</b>	0:*	+Structure	See <b>ProductionTimetableDelivery</b> element.

<https://standards.iteh.ai/catalog/standards/sist/0e9687f8-7d73-48e4-b149-b34690cb45b2/sist-ts-cen-ts-15531-3-2009>

### 5.5.3 ProductionTimetableDelivery Element

Each **ProductionTimetableDelivery** is made up of **DatedTimetableVersionFrame** elements. There will be status messages for any request that could not be returned. Table 6 shows this element.

Table 6 — ProductionTimetableDelivery Elements

<b>ProductionTimetableDelivery</b>			+Structure	Describes one or more Dated Timetables.
Attributes	<b>version</b>	1:1	VersionString	Version Identifier of Production Timetable Service. Fixed, e.g. 1.0.
LEADER	:::	1:1	xxx <b>ServiceDelivery</b>	See SIRI Part 2-7.2.1.1 xxx <b>ServiceDelivery</b> .
Payload	<b>DatedTimetableVersionFrame</b>	0:*	+Structure	A version of the timetable to run on a specified date. See <b>DatedTimetableVersionFrame</b> element.
any	<b>Extensions</b>	0:1	any	Placeholder for user extensions.

### 5.5.4 DatedTimetableVersionFrame Element

#### 5.5.4.1 General

Each production timetable is returned as a **DatedTimetableVersionFrame** element. Each **DatedTimetableVersionFrame** contains a version of the timetable for a line and direction, and comprises one or more **DatedVehicleJourney** elements. Table 7 shows this element.