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IBIS-IP Beschreibung der Dienste

Dienst CustomerInformationService

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IBIS-IP Beschreibung der Dienste

Dienst CustomerInformationService

Sachbearbeitung

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Vorwort

Diese VDV-Schrift wurde aus der VDV-301-2 separiert, um Anpassungen an einzelnen IBIS-IP-Diensten unabhängig von anderen IBIS-IP-Diensten vornehmen zu können.

In der VDV-301-2 werden die technischen Grundlagen wie auch die Basisdienste, welche die Grundlagen eines IBIS-IP-Systems bilden, beschrieben. In dieser VDV-Schrift sind der CustomerInformationService und seine spezifischen Datenstrukturen beschrieben.

Diese VDV-Schrift wird zweisprachig veröffentlicht. Dabei ist zu beachten, dass Erläuterungen in Deutsch und Englisch verfasst sind, während die technischen Operationen und zugehörigen Datenstrukturen, die sich an Softwareentwickler richten, nur in Englisch beschrieben sind.

Foreword

This VDV-requirement document has been separated from the VDV-301-2 in order to make adjustments to individual IBIS IP services independent from other IBIS IP services.

The technical basics as well as the basic services of the IBIS-IP systems are described in the VDV-301-2. The VDV 301-2-3 describes the PassengerInformationService and its specific data structures.

This VDV publication is published in two languages. It should be noted that explanations are written in German and English, while the technical operations and data structures related to software developers are described in English only.

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Abkürzungen

CIS	Kunden Informations Dienst	Customer Information Service
IBIS	Integriertes Bordinformationssystem	Integrated Board Information System
IBIS-IP	Internetprotokoll basiertes IBIS	Internet protocol based IBIS
HTTP	Hypertext-Übertragungsprotokoll	Hypertext Transfer Protocol

1 Dienst CustomerInformationService

1.1 Aufgaben des Dienstes und die Nutzung

Der *CustomerInformationService* repräsentiert als Dienst die Fachkomponente FahrgastInformationsErmittlung. Hauptaufgabe des *CustomerInformationService* ist die Bereitstellung aller inhaltlichen Informationen, die für die Fahrgastinformation im und am Fahrzeug erforderlich sind. Insbesondere soll es für keine Fahrgastinformationskomponente im Fahrzeug (z.B. TFT-Monitore, Ansagegeräte, Frontanzeigen etc.) erforderlich sein, inhaltliche Informationen bei anderen Diensten im Fahrzeugnetzwerk abzurufen bzw. zusammenzusuchen. Der *CustomerInformationService* spielt sozusagen die Rolle des Pressesprechers bzgl. der Fahrgastinformation. Konzeptioneller Hintergrund dieser Architektur ist der Wunsch nach Konsistenz, der anderenfalls, beim Nutzen verschiedener Informationsquellen von verschiedenen Diensteanbietern, verloren ginge.

Informationen zum Layout bzw. zur Darstellung der Informationen liefert der *CustomerInformationService* nicht. Diese Informationen müssen entweder im darstellenden Gerät hinterlegt sein oder man nutzt den *HTMLDisplayService* bzw. den *MatrixDisplayService*, die inhaltlich beide auf dem *CustomerInformationService* aufbauen, aber zusätzliche Layoutinformationen zur Verfügung stellen.

Die Informationen des Dienstes stammen teils aus Plandaten, teils aus Echtzeitdaten und aus Echtzeitdaten zu Fahrzeugzuständen. Dazu zählen u.a. textuelle (ggf. mehrsprachige) und teils akustische Informationen, z. B. zu Zielanzeigen, Liniennummern, Fahrwegverläufe mit Haltestellenamen und Ankunfts-/Abfahrtszeiten, aktuelle/nächste Haltestelle, planmäßige Umsteigemöglichkeiten, Echtzeitinformationen zu Anschlussbeziehungen an (nachfolgenden) Haltestellen, Türstatus oder Haltewunsch.

Der *CustomerInformationService* wird in IBIS-IP als HTTP-Dienst zur Verfügung gestellt

Tasks of the Service and its Usage

The *CustomerInformationService* represents the functional component Customer Information Determination. The main task of *CustomerInformationService* is the provision of all content information required for passenger information in and on the vehicle. In particular, it should not be necessary for any passenger information component in the vehicle (e.g. TFT monitors, announcement devices, front displays, etc.) to retrieve or compile content information from other services in the vehicle network. The *CustomerInformationService* plays, so to speak, the role of the press spokesman for passenger information. The conceptual background of this architecture is the higher consistency, which would be spoiled if information were retrieved from different service providers.

The *CustomerInformationService* does not provide information about the layout or the presentation of the information. This information must either be stored in the display device itself or must be requested from the *HTMLDisplayService* or the *MatrixDisplayService*, both of which are based on the *CustomerInformationService* but provide additional layout information.

The information of the service comes partly from planned data, partly from real-time data as well as from real-time data on vehicle status, all of which could be of interest for passengers inside

the vehicle. These include, among others, textual (possibly multi-lingual) and partly acoustic information, e.g. about the destination, the line number, the course of the route with the stop names, the arrival / departure times, the current / the next stop, the scheduled connection possibilities, the real-time information on the connections at (subsequent) stops, the door status or the holding request.

The *CustomerInformationService* is in IBIS-IP provided as an HTTP service.

1.2 Operations of the CustomerInformationService

The CustomerInformationService uses the GetAllData/SubscribeAllData operations to provide all the information the CustomerInformationService has at the time of the request. This ensures the best possible consistency of the information. In many cases, the provision of this one operation is sufficient to supply all devices in the vehicle. However, a fairly large XML structure has to be parsed in order to determine small changes originating from the movement of the vehicle along the road. The CustomerInformationService therefore also offers some operations to make partial amounts of the data available and, in particular, to allow low-performing devices to determine the relevant data more easily.

Subsequently the functional purpose of the operations of the Customer InformationService are shortly described. Subscribe-operations and Unsubscribe-operations are not explicitly mentioned, but only the Get-operation related to the same data structure.

Operation	Functional purpose
GetAllData	Provides ALL information the Customer Information Service has at the moment of the request.
GetCurrentAnnouncement	Provides information on the current passenger announcement (acoustic)
GetCurrentConnectionInformation	Provides information on current connections (planned or based on real-time information) at a stop
GetCurrentDisplayContent	Provides information primarily for low performing displays, in particular it does not provide information about the route of a journey
GetCurrentStopPoint	Provides information on the current stop point only
GetCurrentStopIndex	Provides information on the index of the current stop point with respect to the route
GetTripData	Provides information on the route, the current position along the route and the deviation with respect to the timetable
GetVehicleData	Provides vehicle related information like the door status and a passenger's stop request
RetrievePartialStopSequence	<i>Provides information on a part of the route, depending on the request parameters</i>

In the following all operations of the CustomerInformationService and their relations to the datatypes/datastructures are listed. Thereafter follows a detailed technical description of the operations and the datatypes/data structures used.

Operation	Request/ Response	Used Datatype, Datastructure
GetAllData	Req.	-
	Resp.	CustomerInformationService. GetAllDataResponseStructure
SubscribeAllData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeAllData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentAnnouncement	Req.	-
	Resp.	CustomerInformationService. GetCurrentAnnouncementResponseStructure
SubscribeCurrentAnnouncement	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentAnnouncement	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentConnectionInformation	Req.	-
	Resp.	CustomerInformationService. GetCurrentConnectionInformationResponseStructure
SubscribeCurrentConnectionInformation	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentConnectionInformation	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentDisplayContent	Req.	-
	Resp.	CustomerInformationService. GetCurrentDisplayContentResponseStructure
SubscribeCurrentDisplayContent	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentDisplayContent	Req.	UnsubscribeRequestStructure

Operation	Request/ Response	Used Datatype, Datastructure
	Resp.	UnsubscribeResponseStructure
GetCurrentStopPoint	Req.	-
	Resp.	CustomerInformationService. GetCurrentStopPointResponseStructure
SubscribeCurrentStopPoint	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentStopPoint	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetCurrentStopIndex	Req.	-
	Resp.	CustomerInformationService. GetCurrentStopIndexResponseStructure
SubscribeCurrentStopIndex	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeCurrentStopIndex	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetTripData	Req.	-
	Resp.	CustomerInformationService. GetTripDataResponseStructure
SubscribeTripData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeTripData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure
GetVehicleData	Req.	-
	Resp.	CustomerInformationService. GetVehicleDataResponseStructure
SubscribeVehicleData	Req.	SubscribeRequestStructure
	Resp.	SubscribeResponseStructure
UnsubscribeVehicleData	Req.	UnsubscribeRequestStructure
	Resp.	UnsubscribeResponseStructure

Operation	Request/ Response	Used Datatype, Datastructure
RetrievePartialStopSequence	Req.	CustomerInformationService. RetrievePartialStopSequenceRequestStructure
	Resp.	CustomerInformationService. RetrievePartialStopSequenceResponseStructure

Table 1: Description of CustomerInformationService Operations

1.3 Data Structure of GetAllData Operation

1.3.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.3.2 Response

<i>CustomerInformationService. GetAllDataResponse</i>			<i>+Structure</i>	Response structure for the GetAllData request
			<i>choice</i>	One of the following structures
<i>a</i>	AllData	-1:1	<i>+CustomerInformationService. AllData</i>	Detailed response (cf. table below)
<i>b</i>	OperationErrorMessage		<i>IBIS-IP.string</i>	Error message

Table 2: Description of CustomerInformationService.GetAllDataResponse

<i>CustomerInformationService.AllData</i>			<i>+Structure</i>	Response structure for all data of the CustomerInformationService
	TimeStamp	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	VehicleRef	1:1	<i>IBIS-IP.NMOKEN</i>	Reference to the vehicle-ID
	DefaultLanguage	1:1	<i>IBIS-IP.language</i>	Definition of the default language
	TripInformation	1:2	<i>+TripInformation</i>	Trip information (cf. also VDV 301-2-1, "tripInformation")
	CurrentStopIndex	1:1	<i>IBIS-IP.int</i>	Index of the current stop
<i>VehicleInformationGroup</i>	RouteDeviation	1:1	<i>RouteDeviationEnumeration</i>	Information, if there exists a deviation of the planned route (cf. also VDV 301-2-1, "RouteDeviationEnumeration").
	<i>DoorState</i>	0:1	<i>DoorOpenStateEnumeration</i>	Information about the door state (cf. also VDV 301-2-1, „DoorOpenStateEnumeration“)
	<i>InPanic</i>	0:1	<i>IBIS-IP.boolean</i>	Information about the panic button state
	<i>VehicleStopRequested</i>	0:1	<i>IBIS-IP.boolean</i>	Stop request status information
	<i>ExitSide</i>	0:1	<i>ExitSideEnumeration</i>	Exit side information (cf. also VDV 301-2-1, „ExitSide“)
	<i>MovingDirectionForward</i>	0:1	<i>IBIS-IP.boolean</i>	Information about the moving direction
	<i>VehicleMode</i>	0:1	<i>VehicleModeEnumeration</i>	Vehicle mode information (cf. also VDV 301-2-1, „VehicleModeEnumeration“)
	<i>SpeakerActive</i>	0:1	<i>IBIS-IP.boolean</i>	Information, whether an acoustic passenger announcement is active right now
<i>StopInformationActive</i>	0:1	<i>IBIS-IP.boolean</i>	Used to switch on/off the passenger information intentionally (e.g. in case the planned route is left)	

Table 3: Description of *CustomerInformationService.AllData*

1.4 Data Structures of **SubscribeAllData** Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" *ibid.*).

1.5 Data Structures of **UnsubscribeAllData** Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" *ibid.*).

1.6 Data Structure of **GetCurrentAnnouncement** Operation

1.6.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.6.2 Response

<i>CustomerInformationService. GetCurrentAnnouncementResponse</i>			<i>+Structure</i>	Response structure for the current announcement request
			<i>Choice</i>	One of the following structures
<i>a</i>	<i>CurrentAnnouncementData</i>	-1:1	<i>+CustomerInformationService.CurrentAnnouncementData</i>	Detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 4: Description of CustomerInformationService.GetCurrentAnnouncementResponse

<i>CustomerInformationService. CurrentAnnouncementData</i>			<i>+Structure</i>	Detailed Response structure for the current announcement request
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>CurrentAnnouncement</i>	1:1	<i>+Announcement</i>	Announcement information (cf. VDV 301-2-1, "Announcement")

Table 5: Description of CustomerInformationService.CurrentAnnouncementData

1.7 Data Structure of SubscribeCurrentAnnouncement Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" *ibid.*).

1.8 Data Structure of UnsubscribeCurrentAnnouncement Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" *ibid.*).

1.9 Data Structure of GetCurrentConnectionInformation Operation

1.9.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.9.2 Response

<i>CustomerInformationService. GetCurrentConnectionResponse</i>			<i>+Structure</i>	Response structure for information at current connection
			<i>Choice</i>	One of the structures below
<i>a</i>	<i>CurrentConnectionData</i>	-1:1	<i>+CustomerInformationService.CurrentConnectionData</i>	Detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 6: Description von CustomerInformationService.GetCurrentConnectionResponse

<i>CustomerInformationService. CurrentConnectionData</i>			<i>+Structure</i>	Response structure for the request of the current connection
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>CurrentConnection</i>	0:*	<i>+Connection</i>	Information about the connection (cf. VDV 301-2-1, "Connection")

Table 7: Description of CustomerInformationService.CurrentConnectionData

1.10 Data Structure of SubscribeCurrentConnectionInformation Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" *ibid.*).

1.11 Data Structure of UnsubscribeCurrentConnectionInformation Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" *ibid.*).

1.12 Data Structure of GetCurrentDisplayContent Operation

1.12.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.12.2 Response

<i>CustomerInformationService. GetCurrentDisplayContentResponse</i>			<i>+Structure</i>	Structure with the response with the current display content
			<i>Choice</i>	One of the structures below
<i>a</i>	<i>CurrentDisplayContentData</i>	-1:1	<i>+CustomerInformationService.CurrentDisplayContentData</i>	detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 8: Description of CustomerInformationService.GetCurrentDisplayContentResponse

<i>CustomerInformationService. CurrentDisplayContentData</i>			<i>+Structure</i>	Response structure with the current data content for displays
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>CurrentDisplayContent</i>	1:1	<i>+DisplayContent</i>	Data content structure for displays (cf. VDV 301-2-1, "DisplayContent")

Table 9: Description of CustomerInformationService.CurrentDisplayContentData

1.13 Data Structure of SubscribeCurrentDisplayContent Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" *ibid.*).

1.14 Data Structure of UnsubscribeCurrentDisplayContent Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" *ibid.*).

1.15 Data Structure of GetCurrentStopPoint Operation

1.15.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.15.2 Response

<i>CustomerInformationService. GetCurrentStopPointResponse</i>			<i>+Structure</i>	Response structure with information about the current stop point
			<i>Choice</i>	One of the structures below
<i>a</i>	CurrentStopPointData	-1:1	<i>+CustomerInformationService.CurrentStopPointData</i>	detailed response structure (cf. below)
<i>b</i>	OperationErrorMessage		<i>IBIS-IP.string</i>	Error message

Table 10: Description of CustomerInformationService.GetCurrentStopPointResponse

<i>CustomerInformationService. CurrentStopPointData</i>			<i>+Structure</i>	Response structure which describes the current stop point data
	TimeStamp	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	CurrentStopPoint	1:1	<i>+StopInformation</i>	Information to the current stop point (cf. VDV 301-2-1, "StopInformation")

Table 11: Description of CustomerInformationService.CurrentStopPointData

1.16 Data Structure of SubscribeCurrentStopPoint Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "SubscribeRequest" and "SubscribeResponse" *ibid.*).

1.17 Data Structure of UnsubscribeCurrentStopPoint Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters "UnsubscribeRequest" and "UnsubscribeResponse" *ibid.*).

1.18 Data Structure of GetCurrentStopIndex Operation

1.18.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.18.2 Response

<i>CustomerInformationService. GetCurrentStopIndexResponse</i>			<i>+Structure</i>	Response structure for the current stop point index
			<i>Choice</i>	One of the structures below
<i>a</i>	<i>CurrentStopIndexData</i>	-1:1	<i>+CustomerInformationService.CurrentStopIndexData</i>	detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 12: Description of CustomerInformationService.GetCurrentStopIndexResponse

<i>CustomerInformationService. CurrentStopIndexData</i>			<i>+Structure</i>	Response structure with the data content of the current stop index
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>CurrentStopIndex</i>	1:1	<i>IBIS-IP.int</i>	Stop index information

Table 13: Description of CustomerInformationService.CurrentStopIndexData

1.19 Data Structure of SubscribeCurrentStopIndex Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” *ibid.*).

1.20 Data Structure of UnsubscribeCurrentStopIndex Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” *ibid.*).

1.21 Data Structure of GetTripData Operation

1.21.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.21.2 Response

<i>CustomerInformationService. GetTripDataResponse</i>			<i>+Structure</i>	Response Structure with the current trip data
			<i>Choice</i>	One of the structures below
<i>a</i>	<i>TripData</i>	-1:1	<i>+CustomerInformationService.TripData</i>	detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 14: Description of CustomerInformationService.GetTripDataResponse

<i>CustomerInformationService.TripData</i>			<i>+Structure</i>	Response structure with trip data content
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>VehicleRef</i>	1:1	<i>IBIS-IP.NMToken</i>	Reference at vehicle ID
	<i>DefaultLanguage</i>	1:1	<i>IBIS-IP.language</i>	Information about the default language
	<i>TripInformation</i>	1:1	<i>+TripInformation</i>	Trip information (cf. VDV 301-2-1, „TripInformation“)
	<i>CurrentStopIndex</i>	1:1	<i>IBIS-IP.int</i>	Information for the current stop index

Table 15: Description of CustomerInformationService.TripData

1.22 Data Structure of SubscribeTripData Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” *ibid.*).

1.23 Data Structure of UnsubscribeTripData Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” *ibid.*).

1.24 Data Structure of GetVehicleData Operation

1.24.1 Request

Because of being a Get operation, there is no request structure for this operation.

1.24.2 Response

<i>CustomerInformationService. GetVehicleDataResponse</i>			<i>+Structure</i>	Response structure with vehicle data
			<i>Choice</i>	One of the structures below
<i>a</i>	VehicleData	-1:1	<i>+CustomerInformationService. VehicleData</i>	detailed response structure (cf. below)
<i>b</i>	OperationErrorMessage		<i>IBIS-IP.string</i>	Error message

Table 16: Description of CustomerInformationService.GetVehicleDataResponse

<i>CustomerInformationService.VehicleData</i>			<i>+Structure</i>	Structure with vehicle data content
	TimeStamp	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	VehicleRef	1:1	<i>IBIS-IP.NMToken</i>	Reference at a specific vehicle-ID
<i>VehicleInformationGroup</i>	RouteDeviation	1:1	<i>RouteDeviationEnumeration</i>	Information, if there is a route deviation (cf. VDV 301-2-1, „RouteDeviationInformation“)
	DoorState	0:1	<i>DoorOpenStateEnumeration</i>	Information about the door state (cf. VDV 301-2-1, „DoorStateEnumeration“)
	InPanic	0:1	<i>IBIS-IP.boolean</i>	Information about the panic button state
	VehicleStopRequested	0:1	<i>IBIS-IP.boolean</i>	Stop request status information
	ExitSide	0:1	<i>ExitSideEnumeration</i>	Exit side information (cf. VDV 301-2-1, „ExitSideEnumeration“)
	MovingDirectionForward	0:1	<i>IBIS-IP.boolean</i>	Information about the moving direction
	VehicleMode	0:1	<i>VehicleModeEnumeration</i>	Information about the vehicle mode (cf. VDV 301-2-1, „VehicleModeEnumeration“)
	SpeakerActive	0:1	<i>IBIS-IP.boolean</i>	Information, whether an acoustic passenger announcement is active right now
StopInformationActive	0:1	<i>IBIS-IP.boolean</i>	Used to switch on/off the passenger information intentionally (e.g. in case the planned route is left)	

Table 17: Description of CustomerInformationService.VehicleData

1.25 Data Structure of SubscribeVehicleData Operation

For the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “SubscribeRequest” and “SubscribeResponse” *ibid.*).

1.26 Data Structure of UnsubscribeVehicleData Operation

To terminate the subscription the data structures as described in VDV 301-2-1 are used (cf. chapters “UnsubscribeRequest” and “UnsubscribeResponse” *ibid.*).

1.27 Data Structure of RetrievePartialStopSequence Operation

1.27.1 Request

<i>CustomerInformationService. RetrievePartialStopRequest</i>			<i>+Structure</i>	Request structure for an defined part of the stop point sequence
	<i>StartingStopIndex</i>	1:1	<i>IBIS-IP.int</i>	First stop index of the index queue
	<i>NumberOfStopPoints</i>	1:1	<i>IBIS-IP.int</i>	Requested number of stop points

Table 18: Description of CustomerInformationService.RetrievePartialStopRequest

1.27.2 Response

<i>CustomerInformationService. RetrievePartialStopSequenceResponse</i>			<i>+Structure</i>	Response structure for a partial stop point sequence request
			<i>Choice</i>	One of the structures below
<i>a</i>	<i>PartialStopSequenceData</i>	-1:1	<i>+CustomerInformationService.PartialStopSequenceData</i>	detailed response structure (cf. below)
<i>b</i>	<i>OperationErrorMessage</i>		<i>IBIS-IP.string</i>	Error message

Table 19: Description of CustomerInformationService.RetrievePartialStopSequenceResponse

<i>CustomerInformationService. PartialStopSequenceData</i>			<i>+Structure</i>	Response structure with the detailed data content for a partial stop index request
	<i>TimeStamp</i>	1:1	<i>IBIS-IP.dateTime</i>	Response time stamp
	<i>StopSequence</i>	1:1	<i>+StopSequence</i>	Information for a defined stop sequence (cf. VDV 301-2-1, „StopSequence“)

Table 20: Description of CustomerInformationService.PartialStopSequenceData

Regelwerke – Normen und Empfehlungen / Rules and regulations - standards and recommendations

- (1) CEN/TS 13149-7 Öffentlicher Verkehr - Planungs- und Steuerungssysteme für
Straßenfahrzeuge - Teil 7: System- und Netzwerkarchitektur; Englische
Fassung CEN/TS 13149-7:2015 /

Public transport - Road vehicle scheduling and control systems - Part
7: System and Network Architecture
- (2) CEN/TS 13149-8 Öffentlicher Verkehr - Planungs- und Steuerungssysteme für
Straßenfahrzeuge - Teil 8: Physikalische Schicht für IP-Kommunikation;
Englische Fassung CEN/TS 13149-8:2013 /

Public transport - Road vehicle scheduling and control systems - Part
8: Physical layer for IP communication
- (3) VDV 301-1 Internetprotokoll basiertes integriertes Bordinformationssystem IBIS-
IP - Teil 1: Systemarchitektur /

VDV 301-1: IBIS-IP, Part 1: System architecture
- (4) VDV 301-2 Internetprotokoll basiertes integriertes Bordinformationssystem IBIS-
IP - Teil 2: Schnittstellenspezifikation /

VDV 301-2: IBIS-IP, Part 2: Interface Specification V1.0
- (5) VDV 301-2-1 IBIS-IP Beschreibung der Dienste - Gemeinsame Datenstrukturen und
Aufzählungstypen /

IBIS-IP Description of Services – Common Data Structures and
Enumerations

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