



Open Communication Interface for Road Traffic
Control Systems

OCIT-C Center to Center

TSS supply data

OCIT-C_TSS_SupplyData_V1.2_R.1

OCIT Developer Group (ODG) & Partner

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OCIT-C Center to Center

TSS supply data

Document: OCIT-C_TSS_SupplyData_V1.2_R.1

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Document history

Version Issue	Date	Distribution List	Comment
V1.1_R1	30.10.2014	PUBLIC	Version 1.1 Issue 1
			<p>Fig1: without local TSS system access</p> <p>3.4.5: Reporting points of a reporting section</p> <p>3.4.10.2: Control clock priority 1 supply for special interval</p> <p>3.4.14: Switching time not compulsorily at the zero second. Optionally however, the zero second can be specified.</p> <p>3.4.14: Switch time 1...254</p> <p>3.4.17: Notes on the description of the offset versions in OCIT-O_TSC_V3.0.</p> <p>4.3.1.1: OITD number in IP notation</p> <p>4.3.1.2: The ShortName must be the OITD number</p> <p>Referencing changed from OCIT-I to OCIT-C</p>
V1.2_R1	16.12.2016	PUBLIC	Version 1.2 Issue 1

1 Introduction

This document describes the OCIT-C communication module for the TSS supply data.

It is aimed at all persons who deal with the implementation or application of an OCIT-C interface for the exchange of OCIT supply data in the scope of application of the traffic signal control

The TSS supply data communication module is used for supplying data to traffic signal systems. The data is communicated using the OCIT-C protocol.

1.1 OCIT-C documentation

The present document is part of the OCIT-C definitions, which are listed in the document "OCIT-C_Release_Notes".

The specification of the OCIT-C communication module for TSS supply data comprises the document OCIT-C TSS Supply data and the schema definitions:

- intersection_config_data.xsd (basic data supply of traffic signal controllers)
- intersection_config_data_ap_values.xsd (data catalogue of AP values)
- intersection_config_data_block_assignment.xsd (block assignment)
- intersection_config_data_block_assignment.xml (block assignment)
- intersection_config_data_communication.xsd (communication protocol).

In order to gain a deeper understanding, the documents OCIT-C data and OCIT-C protocol, as well as the additional OCIT-O documents are necessary:

Short name	Title	Contents
OCIT-C Release Notes	OCIT-Center to Center Release Notes	List of all OCIT-C specifications
OCIT-O system	Introduction to the System	Stipulations for the specification and documentation of OCIT-O interfaces.
OCIT-O Protocol	Rules and protocols	Stipulations for the realisation of the OCIT Outstations protocols.
OCIT-O Basis	Basic definitions for traffic signal controllers	Stipulations of the basic interfaces and device functions for devices with OCIT-O interface.
OCIT-O TSC	Traffic Signal Controllers	Stipulations of the special interfaces and device functions for traffic signal controllers.

1.2 Terms and Abbreviations

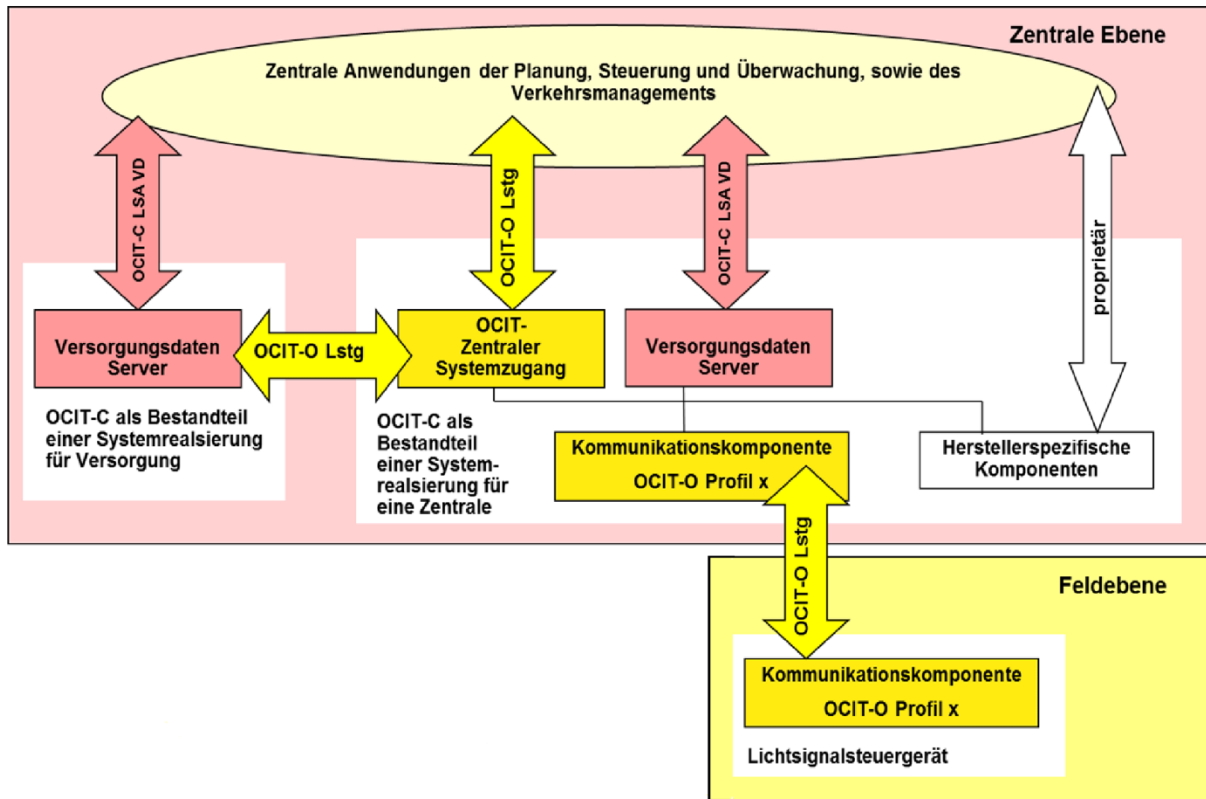
Term / Abbreviation	Description
AP	User program
Client	A program which wishes to use services offered by other (servers) and actively opens them to do so.
DATEX II	Specifications of Technical Committee 278 of the European Committee for Standardization (CEN) for the exchange of traffic-related data between traffic control centers.
DM	Data Model and objects
FTP	File Transfer Protocol, a network protocol for transferring files
http	HyperText Transfer Protocol, a protocol for transferring data over a network.
ISO	International Organization for Standardization
IV	Individual traffic
TSS	Traffic signal system
Method	The algorithms assigned to a class of objects. Also used as a synonym for function, procedure, command, action.
OCA	Open Traffic City Association
OCIT	Open Communication Interface for Road Traffic Control Systems
OCIT-C	Open Communication Interface for Road Traffic Control Systems - Center to Center. OCIT-C covers the functions for communicating between the central traffic control and traffic guidance systems.
OCIT-O	OCIT outstations Interface between traffic control centres and traffic signal controllers for controlling and supplying the traffic signal controllers.
ODG	OCIT Developer Group
OITD	OCIT Instations Traffic Data
OSI	Open Systems Interconnection Reference Model, a communication model of the International Organization for Standardization (ISO) for communication protocols in computer networks.
PT	Public transport
PD	Process data
Protocolmanager	Protocol layer used for implementing commands in the buffer

Server	A program that offers certain services and passively waits on incoming calls (from clients) to do so.
SGR	Signal group
SOAP	Simple Object Access Protocol, it is a protocol which enables data to be exchanged between systems. SOAP uses the "Remote Procedure Call", through which it enables the functions in other computers to be called. See http://www.w3.org/TR/SOAP
Soap-Client-Interface	Soap and Protocolmanager on the client side
Soap-Server-Interface	Soap and Protocolmanager on the server side
SP	Interfaces and Protocols
SSL	Secure Socket Layer.
TCP / IP	Transmission Control Protocol / Internet Protocol, a family of network protocols for the Internet.
TLS	Technical delivery terms for roadway stations. The TLS are a standard for the structure of traffic control systems on major German Federal highways. Editor: German Federal Highway Research Institute
TU	Cycle time
URL	Uniform Resource Locator
UTC	Coordinated Universal Time
VA	Traffic actuation
VD	Supply data
VDV	Verband Deutscher Verkehrsunternehmer (Association of German Transportation Companies)
WSDL	Web Services Description Language, a platform / programme language and protocol-independent description language for network services (web services) for exchanging messages based on XML.
XML	Extensible Markup Language, a markup language for presenting structured data in the form of text. XML is used among other things for a platform and implementation-independent exchange of data between computer systems. An XML document is made up of text characters, in the most basic case in ASCII coding, and is therefore machine-readable. It does not contain binary data. The XML specification is published by the World Wide Web Consortium (W3C) as a recommendation.
XSD	XML schema, a recommendation of the World Wide Web Consortium (W3C) for defining structures for XML documents. The structure is described in the form of an XML document. Furthermore, it supports a large number of data types. The XSD schema language describes data types, individual XML schema instances (documents) and groups of such instances. A specific XML schema is called an XSD (XML Schema

Defintion) and the file usually has the ending ".xsd".

1.3 Arrangement in the level schema of a traffic signal control system with OCIT interfaces

The following diagram shows the OCIT interfaces located at the central level and at the field level. The OCIT-C interface with the communication module for TSS supply data is referred to here in the short form as OCIT-C TSS VD.



Zentrale Ebene	Central level
Zentrale Anwendungen der Planung, Steuerung und Überwachung, sowie des Verkehrsmanagements	Centralized applications of planning, control, monitoring as well traffic management
OCIT-C LSA VD	OCIT-I TSS VD
OCIT-O Lstg	OCIT-O TSC
Versorgungsdaten Server	Supply data server
OCIT-Zentraler Systemzugang	OCIT central system access
proprietär	proprietary
OCIT-C als Bestandteil einer Systemrealisierung für Versorgung	OCIT-C as part of a system setup for data supply
OCIT-C als Bestandteil einer Systemrealisierung für eine Zentrale	OCIT-C as part of a system setup for a control center
Kommunikationskomponente OCIT-O Profil x	Communication component OCIT-O profile x
Herstellerspezifische Komponenten	Manufacturer-specific components
Feldebene	Field level
Kommunikationskomponente OCIT-O Profil x	Communication component OCIT-O profile x
Lichtsignalsteuergerät	Traffic signal controller

Figure 1: Arrangement of the OCIT-C TSS VD interface in the level schema of a traffic signal control system with OCIT interfaces

2 Data model

The data source is responsible for the data defined in the `intersection_config_data.xsd` data model. It is assumed that no data will be interpreted, controlled or modified for transport. The intuitiveness of the data is also not checked at any point within the data model.

In addition to the TSS basic data supply, the data model contains a framework for supplying traffic-procedures as well as a checksum list, which the supply program is able to use to check the affected parts of the basic supply using checksums.

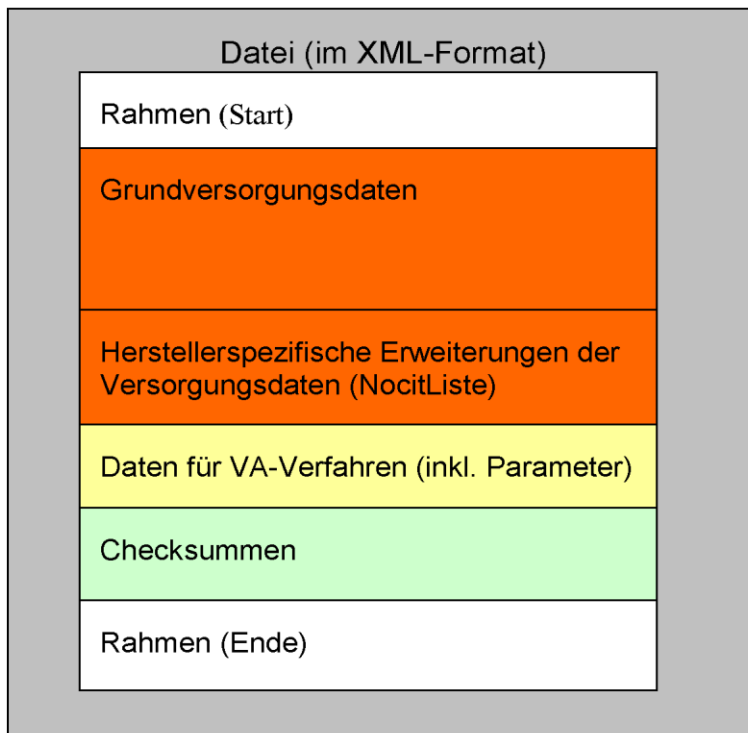
The first part of this document describes the structure of the basic data supply. It should be noticed here in particular that not all elements of this basic data supply can also be supplied remotely. The second part describes the framework and the checksums of the data. The structure is basically used to facilitate the following activities:

1. The representation of the traffic, device and safety technology as a basis for planning.
2. The user supply of traffic signal controllers with OCIT-O interfaces through appropriate control centers or supply tools.
3. The return documentation of a supply from the traffic signal controller. In the event of such a reconstruction, it may be the case that not all the data that was created during the planning stage are reconstructed. This concerns all data, which had not been transferred to the traffic signal controller and therefore are not available.
4. The data exchange between planning tools. In the format described here, the purely planning-related data are only standardised to an extremely small extent.

The OCIT-C interface described here for TSS supply data is designed for tasks 1 and 4. Cases 2 and 3 are not included here and will be handled by the supply data server (see fig. 1).

2.1 Structure of the file `intersection_config_data.xsd`

The structure of the file can be summarised as follows:



Datei (im XML-Format)	File (in XML format)
Rahmen (Start)	Frame (start)
Grundversorgungsdaten	Basic supply data
Herstellerspezifische Erweiterungen der Versorgungsdaten (NocitListe)	Manufacturer-specific supply data expansions (NocitList)
Daten für VA-Verfahren (inkl. Parameter)	Data for TA procedures (incl. parameters)
Checksummen	Checksums
Rahmen (Ende)	Frame (end)

Figure 2: Structure of the supply file

2.2 Distribution of the planning and supply data

All of the supply data to be transferred is distributed into various blocks. After consultation with the participating work groups, a partial supply must always relate to one of the blocks. The following table (next page) shows the required structuring of the data in blocks.

In OCIT-C LSA Versorgungsdaten standardisierte Versorgungsdaten, herstellerübergreifend versorgbar und auslesbar Anwenderversorgung			
Verkehrstechnik			
Verkehrs-technische Grunddaten / Festzeit	Daten mit Netzbezug	VA-Steuerverfahren	VA-Parameter
.....
.....
.....
OCIT-O Checksumen Server ⁴⁾	OCIT-O Checksumen Server ⁴⁾	OCIT-O Checksumen Server ⁴⁾	OCIT-O Checksumen Server ⁴⁾
OCIT-C Version ¹⁾	OCIT-C Version ¹⁾	OCIT-C Version ¹⁾	OCIT-C Version ¹⁾
OCIT-C Checksumme ¹⁾	OCIT-C Checksumme ¹⁾	OCIT-C Checksumme ¹⁾	OCIT-C Checksumme ¹⁾
Auftraggeber ¹⁾	Auftraggeber ¹⁾	Auftraggeber ¹⁾	Auftraggeber ¹⁾
OCIT-O Checksumme Gerät ³⁾	OCIT-O Checksumme Gerät ³⁾	OCIT-O Checksumen Gerät ³⁾	OCIT-O Checksumme Gerät ³⁾
Build-Nr. ³⁾	Build-Nr. ³⁾	Build-Nr. ³⁾	Build-Nr. ³⁾
Session-ID ⁵⁾	Session-ID ⁵⁾	Session-ID ⁵⁾	Session-ID ⁵⁾
Zeitstempel Übertragung beendet ³⁾	Zeitstempel Übertragung beendet ³⁾	Zeitstempel Übertragung beendet ³⁾	Zeitstempel Übertragung beendet ³⁾
Zeitstempel Aktivierung ³⁾	Zeitstempel Aktivierung ³⁾	Zeitstempel Aktivierung ³⁾	Zeitstempel Aktivierung ³⁾
Fully Qualified Domain Name ³⁾	Fully Qualified Domain Name ³⁾	Fully Qualified Domain Name ³⁾	Fully Qualified Domain Name ³⁾
OCIT-O Checksum. Gerät Gesamt ³⁾			
Build-Nr. Gesamt ³⁾			

In OCIT-C LSA Versorgungsdaten standardisierte Versorgungsdaten, herstellerübergreifend versorgbar und auslesbar Anwenderversorgung	Supply data standardized in OCIT-C TSA supply data, user supply that can be provided and read out for multiple manufacturers
Verkehrstechnik	Traffic control system
Verkehrs-technische Grunddaten / Festzeit	Basic traffic-related data / fixed time
Daten mit Netzbezug	Data with network reference
VA-Steuerverfahren	TA control process
VA-Parameter	TA parameters
OCIT-O Checksumen Server ⁴⁾	OCIT-O checksums server ⁴⁾
OCIT-C Version ¹⁾	OCIT-C version ¹⁾
OCIT-C Checksumme ¹⁾	OCIT-C check sum ¹⁾
Auftraggeber ¹⁾	Customer ¹⁾
OCIT-O Checksumme Gerät ³⁾	OCIT-O check sum device ³⁾

Build-Nr. 3)	Build No. 3)
Session-ID 5)	Session ID 5)
Zeitstempel Übertragung beendet 3)	Timestamp Transmission Complete 3)
Zeitstempel Aktivierung 3)	Timestamp activation 3)
Fully Qualified Domain Name 3)	Fully Qualified Domain Name 3)
OCIT-O Checksum. Gerät Gesamt 3)	OCIT-O Checksum. Complete Device 3)
Build-Nr. Gesamt 3)	Complete Build No. 3)

Figure 3: Diagram of the supply data blocks and version data of the user supply

- 1) Generated by the TEWS and saved in the traffic signal controller.
- 2) Generated by the manufacturer's tool and saved in the traffic signal controller.
- 3) Generated in the traffic signal controller and saved.
- 4) Generated in the VD server and saved.
- 5) Generated in the VD server and saved in the traffic signal controller.

Outlined in blue: Version data of OCIT-C VD server that are managed in OCIT-C components.

In OCIT-C LSA Versorgungsdaten teilweise stand. Versorgungsdaten, nur proprietär versorgbar und auslesbar Herstellerversorgung			
Gerätetechnik		Sicherheitstechnik	
OCIT-C Versorgungsdaten	Proprietäre Daten	OCIT-C Sicherheitsdaten	Proprietäre Daten
.....
.....
.....
Hersteller-Version 2)		Hersteller-Version 2)	
Hersteller-Checksumme 2)		Hersteller-Checksumme 2)	
Hersteller-Checksumme Gerät 3)		Hersteller-Checksumme Gerät 3)	
Build-Nr. 3)		Build-Nr. 3)	
OCIT-O Checksum. Gerät Gesamt 3)			
Build-Nr. Gesamt 3)			

In OCIT-C LSA Versorgungsdaten teilweise stand. Versorgungsdaten, nur proprietär versorgbar und auslesbar Herstellerversorgung	In OCIT-C TSS supply data are partially standardized Supply data, that can only be supplied and read out proprietarily
Gerätetechnik	Controller system
Sicherheitstechnik	Security technology
OCIT-C Versorgungsdaten	OCIT-C supply data
Proprietäre Daten	Proprietary data
Hersteller-Version 2)	Manufacturer Version 2)
Hersteller-Checksumme 2)	Manufacturer Checksum 2)
Hersteller-Checksumme Gerät 3)	Manufacturer Checksum Device 3)
Build-Nr. 3)	Build No. 3)
OCIT-O Checksum. Gerät Gesamt 3)	OCIT-O Checksum. Complete Device 3)

Build-Nr. Gesamt 3)	Complete Build No. 3)
---------------------	-----------------------

Figure 4: Schema of the supply data blocks and version data of the manufacturer supply

- 2) Generated by the manufacturer's tool and saved in the traffic signal controller.
- 3) Generated in the traffic signal controller and saved.

Anwenderversorgung		Herstellerversorgung	
Verkehrstechnik	Topologie	Gerätetechnik	Sicherheitstechnik
OCIT-O Checksum. Gerät Gesamt 3)			
Build-Nr. Gesamt 3)			

Anwenderversorgung	User supply
Herstellerversorgung	Manufacturer supply
Verkehrstechnik	Traffic control system
Topologie	Topology
Gerätetechnik	Controller system
Sicherheitstechnik	Security technology
OCIT-O Checksum. Gerät Gesamt 3)	OCIT-O Checksum. Complete Device 3)
Build-Nr. Gesamt 3)	Complete Build No. 3)

Figure 5: Schema of the version data

Outlined in black: Version data that are managed in the traffic signal controller (OCIT-O object version)

There is a complete controller supply from the data of the user supply with:

- Basic traffic-related data / fixed time
These are all data which directly correspond to the hardware of the traffic signal controller.
- Data for traffic-actuated control.
These are data and parameters for the TA control procedure.
- Data with network reference.
These are data from the OCIT control center, such as the 12 month automatic routine.
- Manufacturer data.
These are non-standardised data (also referred to as Nocit = No OCIT data).
Not all of these data can be supplied by the user.

The distribution above is also the basis of the version concept. The following requirements apply to this:

- A full supply will be distributed into six data blocks. It must be possible to individually version each individual block, the blocks must also be summarised by a complete version.
- Each change, even just a single datum within a block, leads to an immediate updating of the version.
- All tools involved with the creation and supply of data must use the same versioning principles. This makes it possible to carry out a simplified check by comparing the version numbers, if the version numbering is subject to generally applicable rules.

- Each tool which modifies the data of a data block must be capable of documenting the complete data block. (Applies for block TA only with the restriction that each tool is responsible for its part of the block). This is not an obstacle, as the block TA in the event of multiple TA procedures present in the traffic signal controller (e.g. control process and local traffic model) are also strictly speaking divided into corresponding number of independent TA blocks). All pages of the documentation must hold the classification of the individual documents and version.
- Each central system must know which version is in operation in the devices within reach at all times.

3 Basic supply data for TSS

The data for the device supply and the standardises program supplies are saved together in a structure, which is depicted in red in chapter 2.1. The <NocitList> is used to be able to save manufacturer data, all other entries are fully standardised. Strings must be coded in UTF-8.

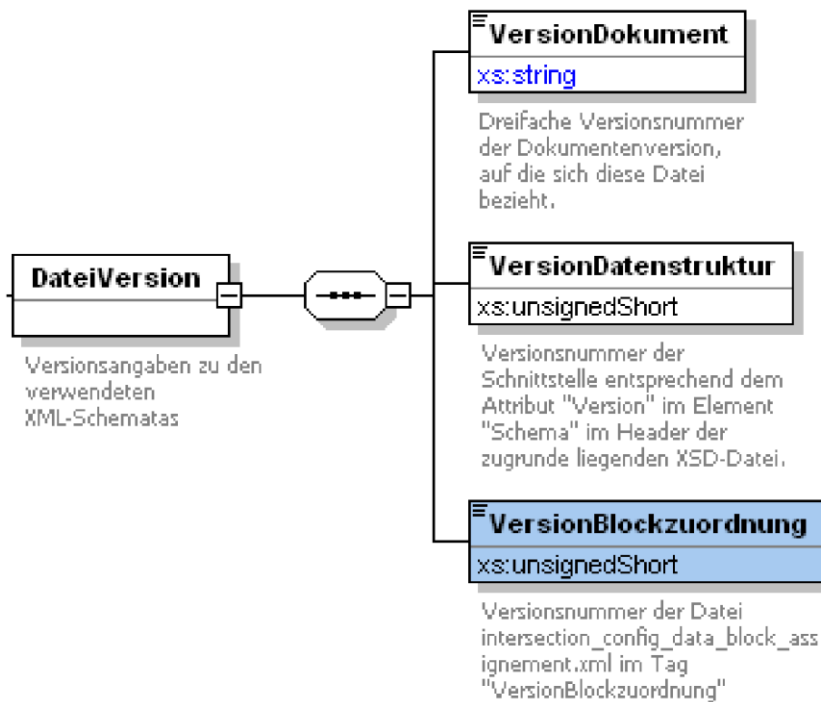
3.1 Version information of the XML schemata

Version information about the XML schema used are specified under the datum <FileVersion>.

The three-digit version number of the document to which the file refers is entered into <VersionDocument>. In this, the first place is for changes to existing elements (not backwards compatible). The second place changes in the event of expansions to the schema and the third place shows editorial changes which do not constitute a schema change (e.g. notes).

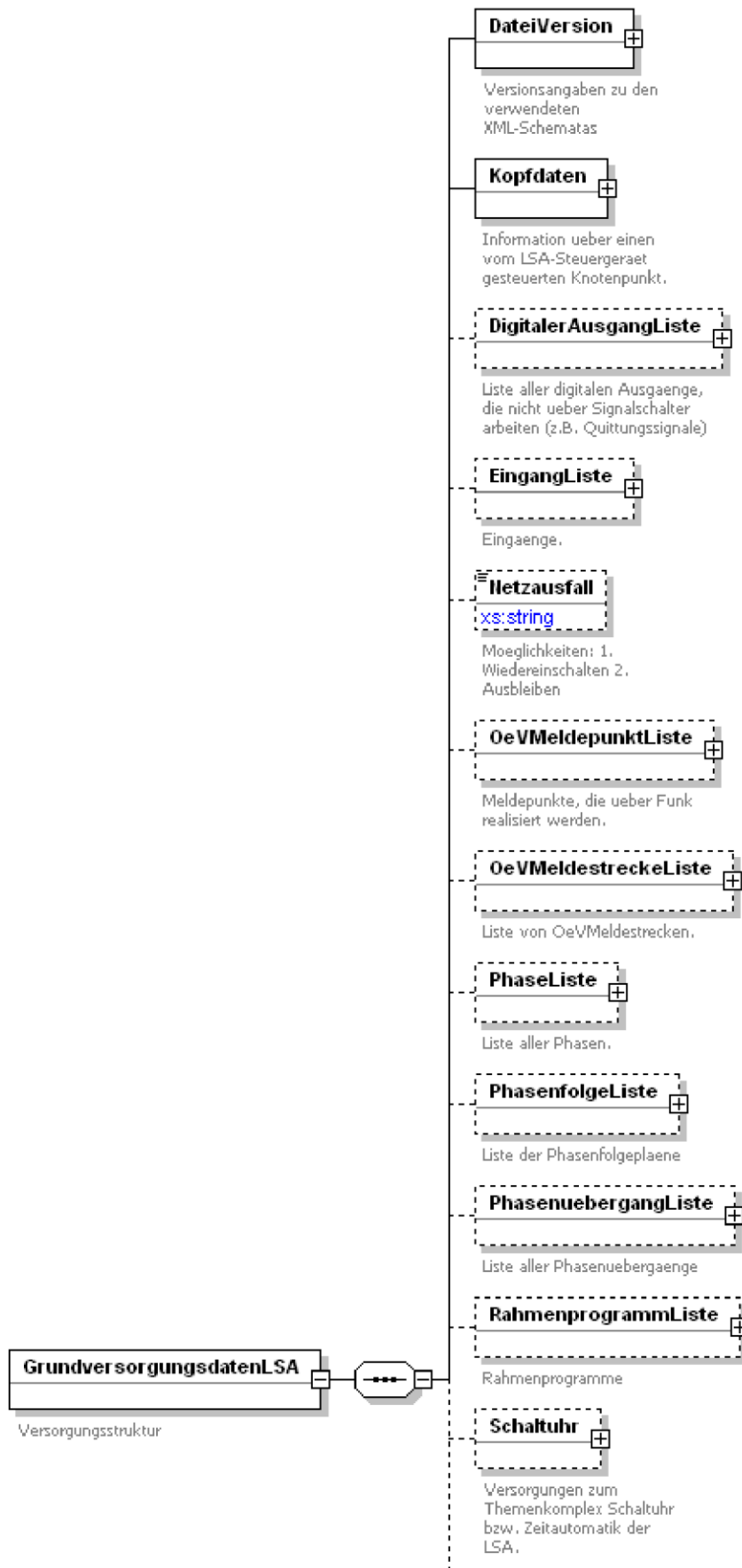
The <VersionDataStructure> contains the version of the schema file, to which the XML file relates. The version of the schema file is located in the "Version" attribute of the <Schema> element (header of the underlying XSD file).

The <VersionBlockAssignment> contains the version of the XML file, in which the block assignment is specified. The version of the XML file is in the <VersionBlockAssignment> datum. The block assignment is clarified in Chapter 4.4.



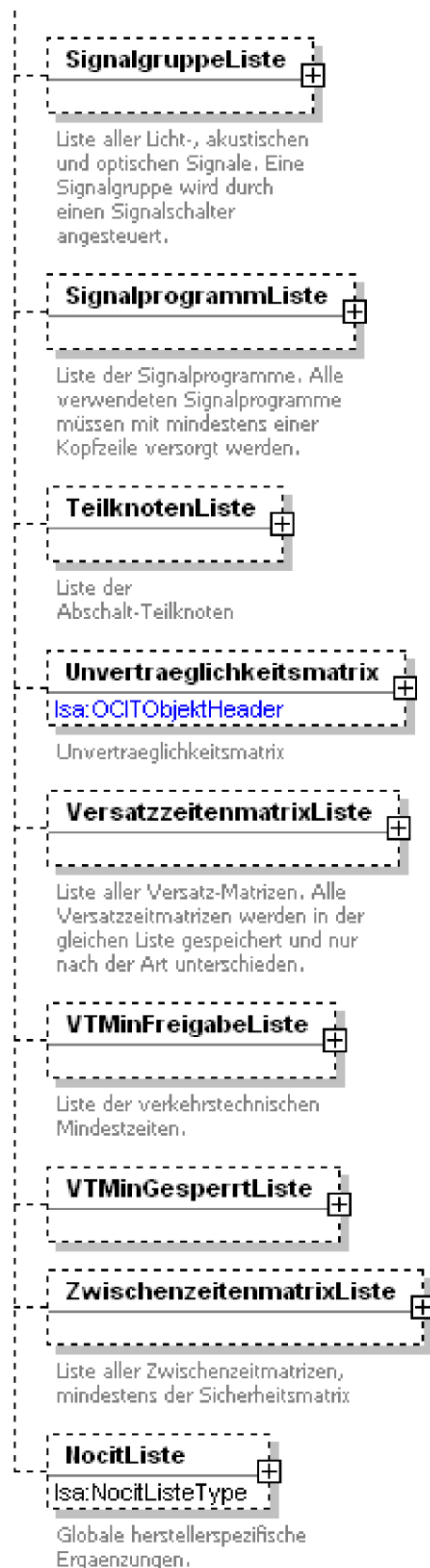
DateiVersion	FileVersion
Versionsangaben zu den verwendeten XML-Schematas	Version information about the XML schemata used
VersionDokument	VersionDocument
xs:string	xs:string
Dreifache Versionsnummer der Dokumentenversion, auf die sich diese Datei bezieht.	Three-digit version number of the document version which this file refers to.
VersionDatenstruktur	VersionDataStructure

xs:unsignedShort	xs:unsignedShort
Versionsnummer der Schnittstelle entsprechend dem Attribut "Version" im Element "Schema" im Header der zugrunde liegenden XSD-Datei.	Version number of the interface in accordance with corresponding with the "Version" attribute in the "Schema" element in the header of the underlying XSD file.
VersionBlockzuordnung	VersionBlockAssignment
xs:unsignedShort	xs:unsignedShort
Versionsnummer der Datei intersection_config_data_block_assignment. xml im Tag "VersionBlockzuordnung"	Version number of the file intersection_config_data_block_assignment. xml in the tag "VersionBlockAssignment"



GrundversorgungsdatenLSA	BasicSupplyDataTSS
Versorgungsstruktur	Supply structure

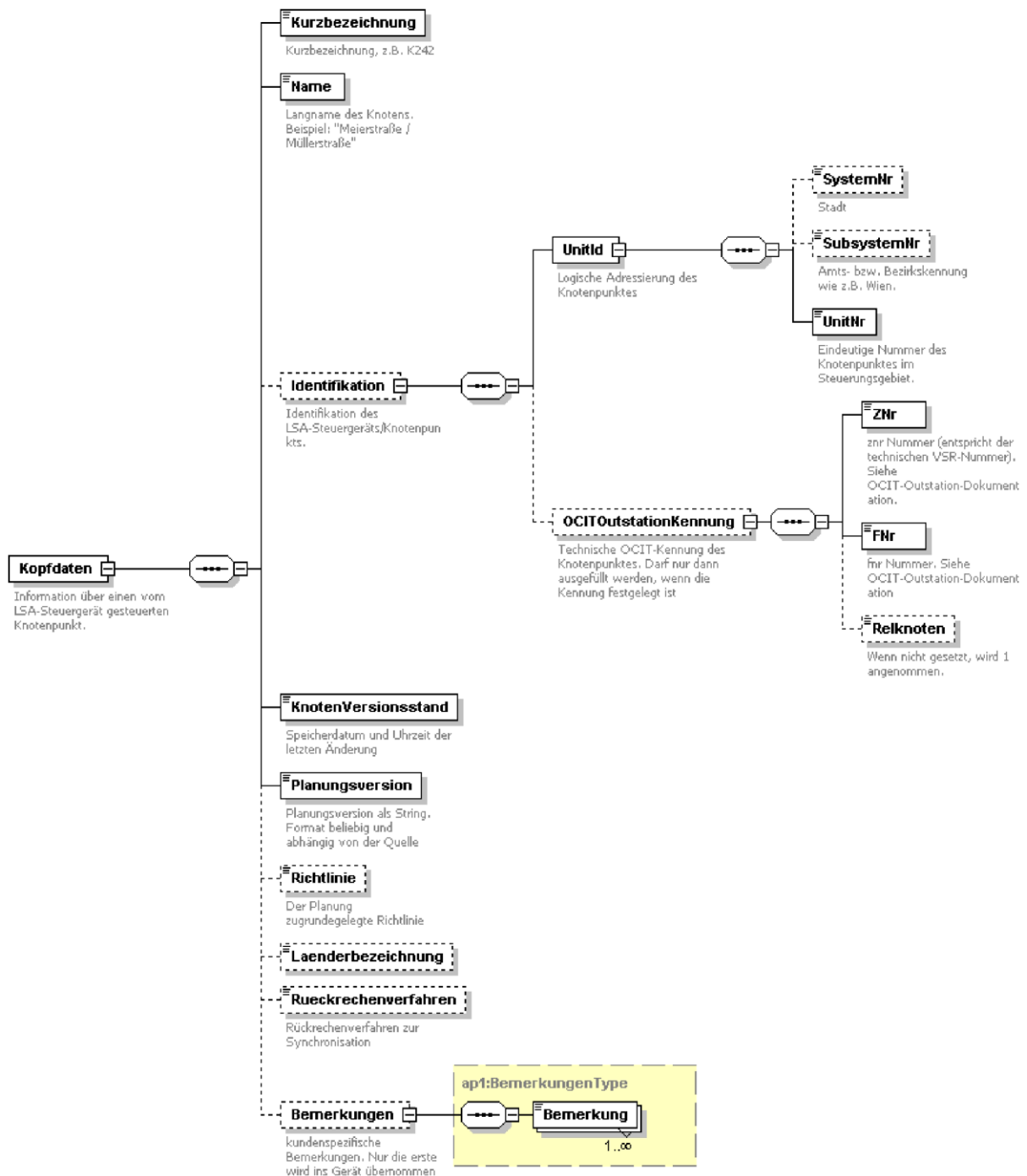
DateiVersion	FileVersion
Versionsangaben zu den verwendeten XML-Schematas	Version information about the XML schemata used
Kopfdaten	Header data
Information ueber einen vom LSA-Steuengerat gesteuerten Knotenpunkt.	Information about an intersection point controlled by a TSS controller.
DigitalerAusgangListe	DigitalOutputList
Liste aller digitalen Ausgaenge, die nicht ueber Signalschalter arbeiten (z.B. Quittungssignale)	List of all digital outputs that do not work via signal switches (e.g. confirmation signals)
EingangListe	InputList
Eingaenge.	Inputs.
Netzausfall	Power outage
xs:string	xs:string
Moeglichkeiten: 1.	Options: 1. Switch back on 2nd Remain off
Wiedereinschalten 2.	PTReportingPointList
Ausbleiben	Reporting points which are implemented via radio.
OeVMeldepunktListe	PTReportingSectionList
Meldepunkte, die ueber Funk realisiert werden.	List of PT reporting sections.
OeVMeldestreckeListe	StageList
Liste von OeVMeldestrecken.	List of all stages.
PhaseListe	StageSequenceList
Liste aller Phasen.	List of stage sequence plans
PhasenfolgeListe	StageTransitionList
Liste der Phasenfolgeplaene	List of all stage transitions
PhasenuebergangListe	FrameworkProgramList
Liste aller Phasenuebergaenge	FrameworkProgram
RahmenprogrammListe	Control clock
Rahmenprogramme	Supplies on the range of topics relating to the control clock or the automatic time function of the TSS.



SignalgruppeListe	SignalGroupList
Liste aller Licht-, akustischen und optischen Signale. Eine Signalgruppe wird durch einen Signalschalter angesteuert.	List of all light, acoustic and optical signals. A signal group is controlled by a signal switch.
SignalprogrammListe	SignalProgramList
Liste der Signalprogramme. Alle verwendeten Signalprogramme müssen mit mindestens einer Kopfzeile versorgt werden.	List of the signal programs. All signal programs used must be supplied with at least one header.

TeilknotenListe	PartialIntersectionList
Liste der Abschalt-Teilknoten	List of the switch off partial intersections
Unvertraeglichkeitsmatrix	Incompatibility matrix
Isa:OCITObjectHeader	tss:OCITObjectHeader
Unvertraeglichkeitsmatrix	Incompatibility matrix
VersatzzeitenmatrixListe	OffsetTimeMatrixList
Liste aller Versatz-Matrizen. Alle Versatzzeitmatrizen werden in der gleichen Liste gespeichert und nur nach der Art unterschieden.	List of all offset matrices. All offset time matrices are saved in the same list and only distinguished by type.
VTMinFreigabeListe	VTMinGreenList
Liste der verkehrstechnischen Mindestzeiten.	List of the minimum traffic times.
VTMinGesperrtListe	VTMinRedList
ZwischenzeitenmatrixListe	IntergreenTimeMatrixList
Liste aller Zwischenzeitmatrizen, mindestens der Sicherheitsmatrix	List of all intergreen time matrices, at least the safety matrix
NocitListe	NocitList
Isa:NocitListeType	tss:NocitListType
Globale herstellerspezifische Ergaenzungen.	Global manufacturer-specific supplements.

3.2 Header data



Kopfdaten	Header data
Information über einen vom LSA-Steuergerät gesteuerten Knotenpunkt.	Information about an intersection point controlled by the TSS controller.
Kurzbezeichnung	Short name
Kurzbezeichnung, z.B. K242	Short name, e.g. K242
Name	Name
Langname des Knotens. Beispiel: "Meierstraße / Müllerstraße"	Long name of the intersection. Example: "Meierstraße / Müllerstraße"
Identifikation	Identification
Identifikation des LSA-Steuergeräts/Knotenpunkts.	Identification of the TSS controller/ intersection point.
KnotenVersionsstand	IntersectionVersionStatus

Speicherdatum und Uhrzeit der letzten Änderung	Time and date of the last change saved
Planungsversion	Planning version
Planungsversion als String. Format beliebig und abhängig von der Quelle	Planning version as string. Format optional and dependent on the source
Richtlinie	Guideline
Der Planung zugrundegelegte Richtlinie	The directive on which the plan was based.
Laenderbezeichnung	Country name
Rueckrechenverfahren	BackCalculationMethod
Rückrechenverfahren zur Synchronisation	Back-calculation method for synchronisation
Bemerkungen	Comments
kundenspezifische Bemerkungen. Nur die erste wird ins Gerat übernommen	Customer-specific comments. Only the first one is transferred into the device
ap1:BemerkungenType	ap1:CommentTypes
Bemerkung	Comment
Unitld	Unitld
Logische Adressierung des Knotenpunktes	Logical address of the intersection
OCITOutstationKennung	OCITOutstationIdentification
Technische OCIT-Kennung des Knotenpunktes. Darf nur dann ausgefüllt werden, wenn die Kennung festgelegt ist	Technical OCIT identifier of the intersection point. May only be filled out if the identifier is specified
SystemNr	SystemNr
Stadt	City
SubsystemNr	SubSystemNo.
Amts- bzw. Bezirkskennung wie z.B. Wien.	Official or district identifier such as Vienna.
UnitNr	UnitNr
Eindeutige Nummer des Knotenpunktes im Steuerungsgebiet.	Unique number of the intersection in the control area.
ZNr	ZNr
znr Nummer (entspricht der technischen VSR-Nummer). Siehe OCIT-Outstation-Dokumentation.	znr number (corresponds to the technical VSR number). See OCIT Outstation documentation.
FNr	FNr
fnr Nummer. Siehe OCIT-Outstation-Dokumentation	fnr number See OCIT Outstation documentation
Relknoten	RelIntersection
Wenn nicht gesetzt, wird 1 angenommen.	If not set, 1 is assumed.

The header data includes all information that describe the intersection point itself.

- **Short name** - is the short name of the intersection point provided by the client with a maximum length of 10 characters. The short name is inside the key file. The identification is absolutely necessary for a supply. The short name can be used for example in structures which overlap intersections (which are currently not standardised). The short name is used for reference within the XML file.

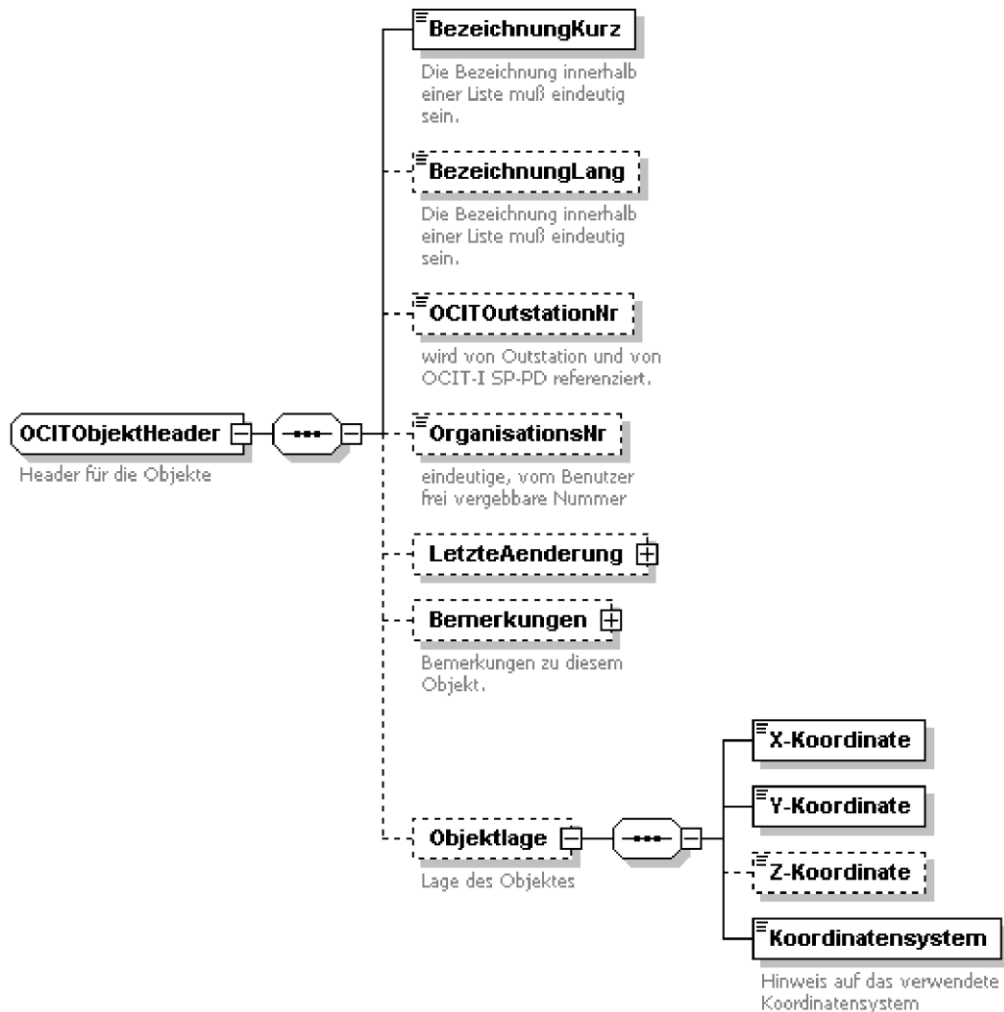
It has the following restrictions:

- The short name may include:
 - Uppercase and lowercase letters, but not "umlauts" or the "ß" character

- Numbers 0 through 9
 - Spaces
 - The special characters . , - + / _ =: () ? ! | # < >
- Leading or trailing blanks are not permitted.
- Two consecutive blanks are not permitted.
- The short name must begin with an alphabetic character.
- The following regular expression defines precisely these restrictions:
`[A-Za-z]([A-Za-z0-9\., -+/_=: \()?!|#<&>];)`
- **Name** - is the name of the intersection point with a max. 250 character long text. Control symbols (line breaks, tabulators, etc.) are not permitted.
- **Identification** - identifies the intersection point, In the purely planning stage, the element can be done away with to start off if the UnitId has not been specified. There are two different types of identification in the OCIT world. The OCIT Outstations identification is made up of the "ZNr", "FNr" and the "RelIntersection", is for technical reasons and can be modified during the life of the intersection point. The identification must be present for each device connected via an outstation. If the numbers are not recognised, the entry is omitted. The OCIT-C identification is made up of a system and subsystem number as well as the actual UnitId. The system and subsystem number is required for large systems, in which the overall system is structured. In such a case, the values must be entered.
- The "**IntersectionVersionStatus**" and the planning version relate to the tool which performed the last change. Both pieces of data are not transferred to the controller.
- The "**directive**" is auxiliary information which states the directive which was applied for the planning. If none of the directives listed apply, leave the field empty.
- The "**CountryName**" contains the country for which the planning was carried out and thus an indirect reference to the necessary directive.
- The "**Back calculation method**" is a number code, which describes the method for determining the start of the cycle. The code is the same code as used in OCIT Outstations. If the back calculation method is unknown, leave the field empty.
 - 0 = None or unknown
 - 1 = Coordinated universal time (UTC)
 - 2 = 1.1. current year
 - 3 = 1.1.1980
 - 4 = 0:00 o'clock of the current day
- Optionally, "**Comments**" can be specified. For the user supply of the controller however, only the first comment is transferred. Regardless of how many comments there are present. Further comments are therefore only used for the exchange between planning tools.

3.3 The OCITObjectHeader

A great number of elements must be identified in the basic data supply. For this reason, a basic structure has been created, with which these objects "begin" and which contains the identification. This standard header is described here:



Kopfdaten	OCITObjectHeader
Information über einen vom LSA-Steuergerät gesteuerten Knotenpunkt.	Header for the objects
Kurzbezeichnung	Short name
Kurzbezeichnung, z.B. K242	The name must be unique within the list.
Name	Long name
Langname des Knotens. Beispiel: "Meierstraße / Müllerstraße"	The name must be unique within the list.
Identifikation	OCITOutstationNo
Identifikation des LSA-Steuergeräts/Knotenpunkts.	Is referenced by the Outstation and by OCIT-I SP-PD.
KnotenVersionsstand	OrganisationsNo
Speicherdatum und Uhrzeit der letzten Änderung	unique, number freely definable by the user
Planungsversion	LastChange
Planungsversion als String. Format beliebig und abhängig von der Quelle	Comments
Richtlinie	Comments on this object.
Der Planung zugrundegelegte Richtlinie	Object position
Laenderbezeichnung	Position of the object
Rueckrechenverfahren	X coordinate:
Rückrechenverfahren zur Synchronisation	Y coordinate
Bemerkungen	Z coordinate
kundenspezifische Bemerkungen. Nur die	Coordinate system

erste wird ins Gerat übernommen	
ap1:BemerkungenType	Note on coordinate system used

The "**NameShort**" is the short name of the object. It is familiar to the user and can change over time. This name is used as a reference within the XML structure. This makes the standardised data structure significantly easier to understand. The "NameShort" may only be used once within the same list. Upper and lower case is distinguished between. Therefore, the object "a1" is different from the object "A1".

The "**NameLong**" is the complete object name, is not used any further and is therefore freely definable. This name must also be unique within the same list. It is not compulsory for the "NameLong" to be set.

The "**OCITOutstationNo**" (without 0) is the number which is used to identify the object when communicating via OCIT Outstations. Under normal circumstances, this number must be set. There are merely the following exceptions:

- In the first stage of planning, the technical connection of the intersection point is not known to the OCIT control center. In this stage, the OCIT number is yet to be set.
- Certain objects with the OCITObjectHeader are not addressed in the OCIT Outstations protocol. The number is not necessary for these objects and may be left empty.
- Traffic signal controllers which are not connected via OCIT Outstations do not require the number.

Even in the exceptions specified here, the number can be set. In this case, the number must also be retained by the tools for which it has no meaning.

The "**OrganisationNo**" (without 0) is a number assigned by the user. It must be unique within the list. Tools which do not use any OrganisationNo must retain an existing, supplied OrganisationNo. The OrganisationNo is optional. Tools which require such a number, these must be added if necessary.

The "**LastChange**" is optional and comprises the editor which carried out the last change, as well as a time stamp of when the last change was carried out. The entry is optional. Tools which do not contain this entry must delete this entry when there is a change to this object. (It goes without saying that the entry must be retained, if no change is made to the object.)

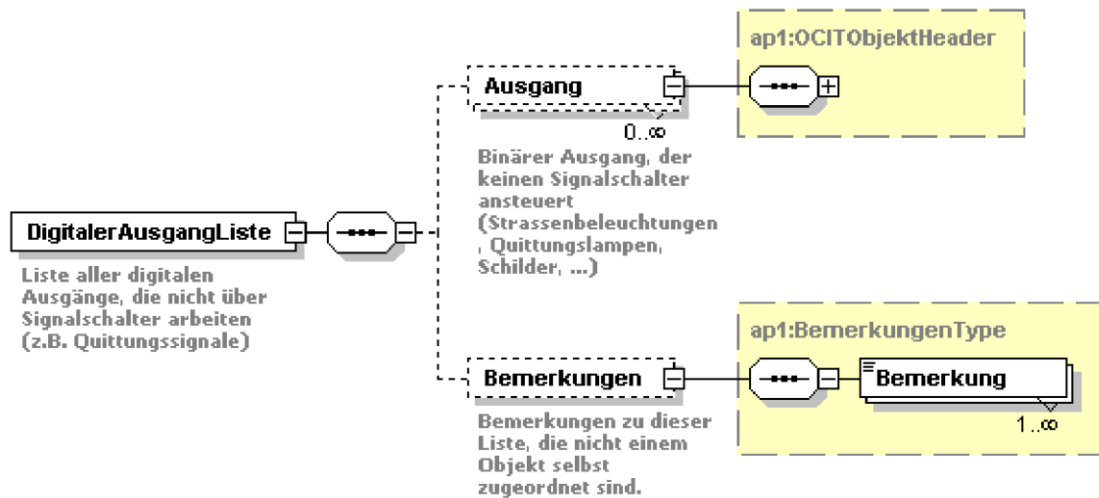
The "**Comments**" field contains a list of comments that have been created for this object by the client and must be completely editable by the client. Tools which do not contain this field must retain the contents in full. It is not permitted for individual tools to use the entries in the comments to save additional parameters which are not standardised¹.

The "**Object location**" is used for saving the coordinates for the position of the object. This information however is not transferred to the controller. The coordinate system used must be specified to allow correct interpretation of the coordinates by various engineering offices.

¹ Such parameters can be saved as Nocit objects.

3.4 Standardised objects

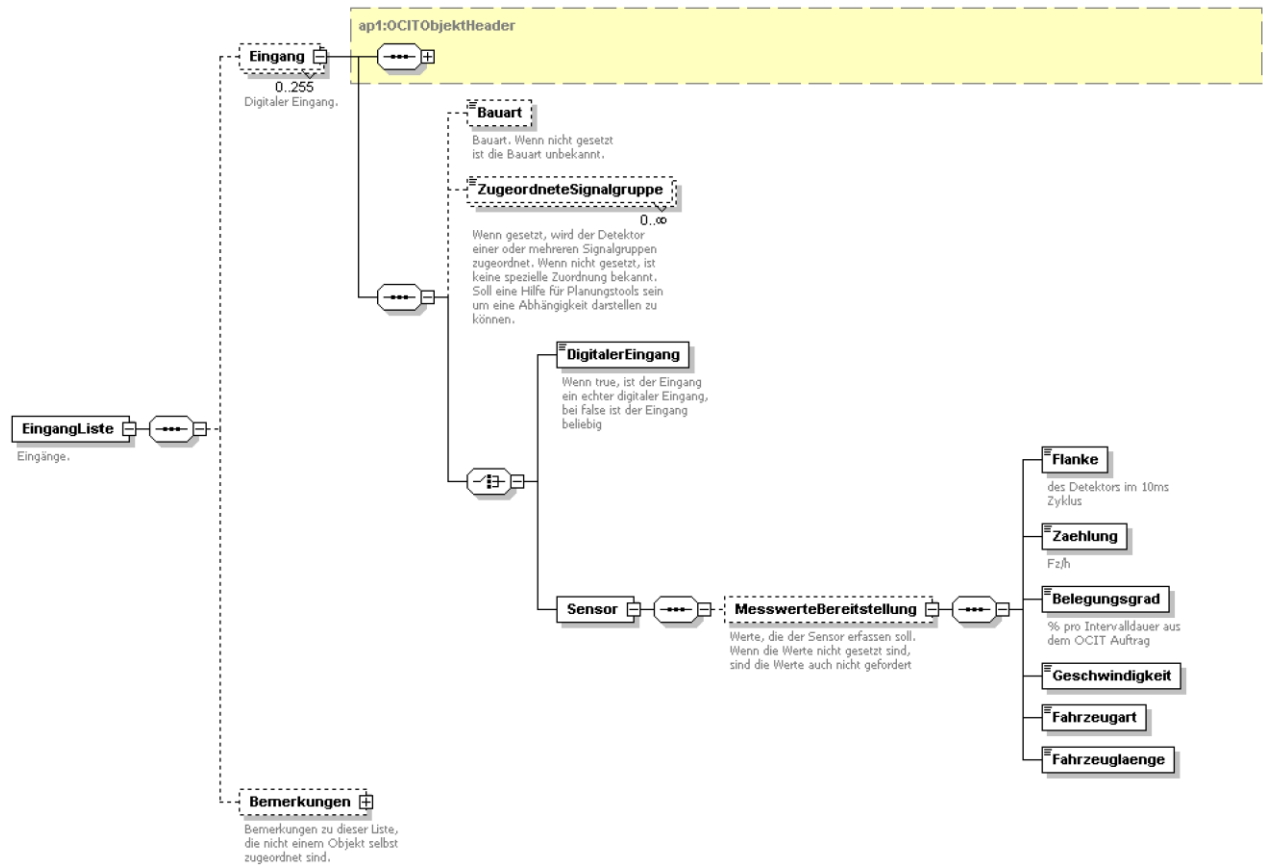
3.4.1 Digital outputs



DigitalerAusgangListe	DigitalOutputList
Liste aller digitalen Ausgänge, die nicht über Signalschalter arbeiten (z.B. Quittungssignale)	List of all digital outputs that do not work via signal switches (e.g. confirmation signals)
Ausgang	Output
Binärer Ausgang, der keinen Signalschalter ansteuert Strassenbeleuchtungen, Quittungslampen, Schilder,...)	Binary output which doesn't control any signal switch (street lighting, acknowledgement lamps, signs, etc.)
Bemerkungen	Comments
Bemerkungen zu dieser Liste, die nicht einem Objekt selbst zugeordnet sind.	Comments about this list which are not assigned to an object itself.
ap1:OCITObjektHeader	ap1:OCITObjectHeader
ap1:BemerkungenType	ap1:CommentTypes
Bemerkung	Comment

OCIT Outstations manage digital outputs in the number range from 1 to 255. The number area is (in contrast to previous versions) independent of the number range of the signal groups.

3.4.2 Inputs



EingangListe	InputList
Eingänge.	Inputs
Eingang	Input
Digitaler Eingang.	Digital input.
Bemerkungen	Comments
Bemerkungen zu dieser Liste, die nicht einem Objekt selbst zugeordnet sind.	Comments about this list which are not assigned to an object itself.
ap1:OCITObjectHeader	ap1:OCITObjectHeader
Bauart	Type
Bauart. Wenn nicht gesetzt ist die Bauart unbekannt.	Type. If this is not set, the type is unknown.
ZugeordneteSignalgruppe	AssignedSignalGroup
Wenn gesetzt, wird der Detektor einer oder mehreren Signalgruppen zugeordnet. Wenn nicht gesetzt, ist keine spezielle Zuordnung bekannt. Soll eine Hilfe Für Planungstools sein um eine Abhängigkeit darstellen zu können.	If set, the detector is assigned to one or more signal groups. If it is not set, no special assignment is recognised. It should be an aid for planning tools in order to be able to represent a dependency.
DigitalerEingang	DigitalInput
Wenn true, ist der Eingang ein echter digitaler Eingang, beliebig	If true, the input is a real digital input, any
Sensor	Sensor
MesswerteBereitstellung	MeasurementProvision
Werte, die der Sensor erfassen soll. Wenn die Werte nicht gesetzt sind, sind die Werte auch nicht gefordert	Values that the sensor should capture. If the values are not set, the values are also not requested.
Flanke	Edge
des Detektors im 10ms Zyklus	of the detector in the 10ms cycle

Zaehlung	Count
Fz/h	Veh/h
Belegungsgrad	Degree of occupancy
% pro Intervalldauer aus dem OCIT Auftrag	% per interval duration from the OCIT order
Geschwindigkeit	Speed
Fahrzeugart	Vehicle type
Fahrzeuglaenge	Vehicle length

All inputs are supplied in the input list. This applies for both sensors as well as any digital inputs, which are not used as sensors.

The **type** of the input specifies the type of input. The following types are standardised:

- Button
- Loop
- Double Loop
- Contact
- Radio
- Infrared
- Video
- Laser
- Radar
- Error input
- Miscellaneous

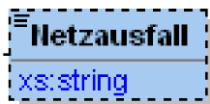
If the type is not recognised, the entry is omitted. If the type is known, it does however not belong to the list of normal elements, "Miscellaneous" is specified.

Additional information can be entered for inputs which are used as sensors:

- Which values does the sensor provide? This does not mean that the sensor constantly sends these values, as these must first be requested. It only means that these values can be requested. The individual fields below the "**MeasurementProvision**" are logical values which may be either "true" or "false".
- **Assigned signal group:** Which signal groups is the detector assigned to? If a detector is assigned to a signal group, this means that the traffic flow detected by the detector is controlled using the signal group. However, a reverse conclusion must not be come to: If there is no assignment present, this does not mean that the detector is not assigned to a signal group.

Further comments which relate to the list as a whole can be entered into the "**Comments**" field.

3.4.3 Power outage



Moeglichkeiten: 1.
Wiedereinschalten 2.
Ausbleiben

Netzausfall	Power outage
xs:string	xs:string
Moeglichkeiten: 1.	Options: 1. Switch back on 2nd Remain off

This datum is only used to define which behaviour the controller should display following a network failure. There are only two options:

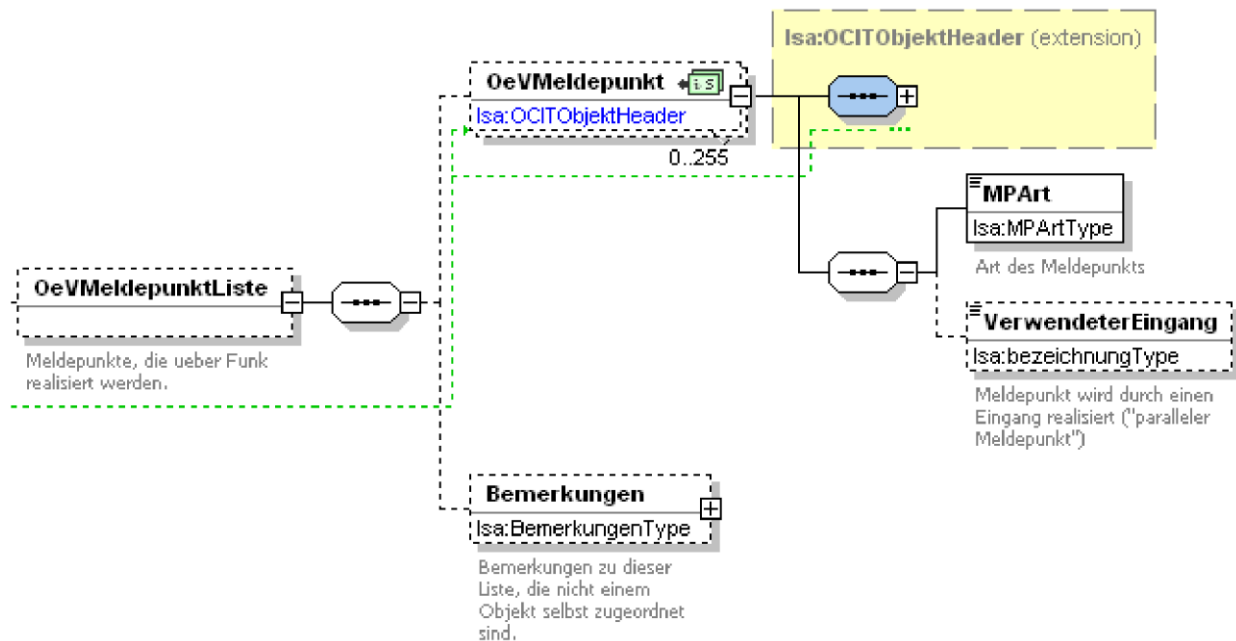
- 1.) Switch back on
- 2.) Remain off

3.4.4 PT reporting points

PT reporting points are triggered by a radio telegram or an input and can be used within a PT reporting section. The PT reporting point provides information about the triggering PT vehicle is on a clearly specific route, direction and distance from the stop line at this point in time. Within the PT reporting section, the PT reporting point is referenced by the NameShort.

The PT ReportingPointList ensures that the PT reporting point can also be defined without knowledge of the PT reporting point section.

The PT reporting point can be triggered by a sensor (<input>). In this case, the PT reporting point is entered both into the input list as well as into the reporting point list.



OeVMeldepunktListe	PTReportingPointList
Meldepunkte, die lieber Funk realisiert werden.	Reporting points, that are preferably realised via radio.
OeVMeldepunkt	PT reporting point
i S	i S
Isa:OCITObjektHeader	tss:OCITObjectHeader
Bemerkungen	Comments
Isa:BemerkungenType	tss:CommentsType
Bemerkungen zu dieser Liste, die nicht einem Objekt selbst zugeordnet sind.	Comments about this list which are not assigned to an object itself.
Isa:OCITObjektHeader (extension)	tss:OCITObjectHeader (extension)
MPart	RPTType
Isa:MPArtType	tss:RPTType
Art des Meldepunkts	Type of reporting point
VerwendeterEingang	UsedInput
Isa:bezeichnungType	tss:nameType
Meldepunkt wird durch einen Eingang realisiert ("paralleler Meldepunkt")	Reporting point is realised by an input ("parallel reporting point")

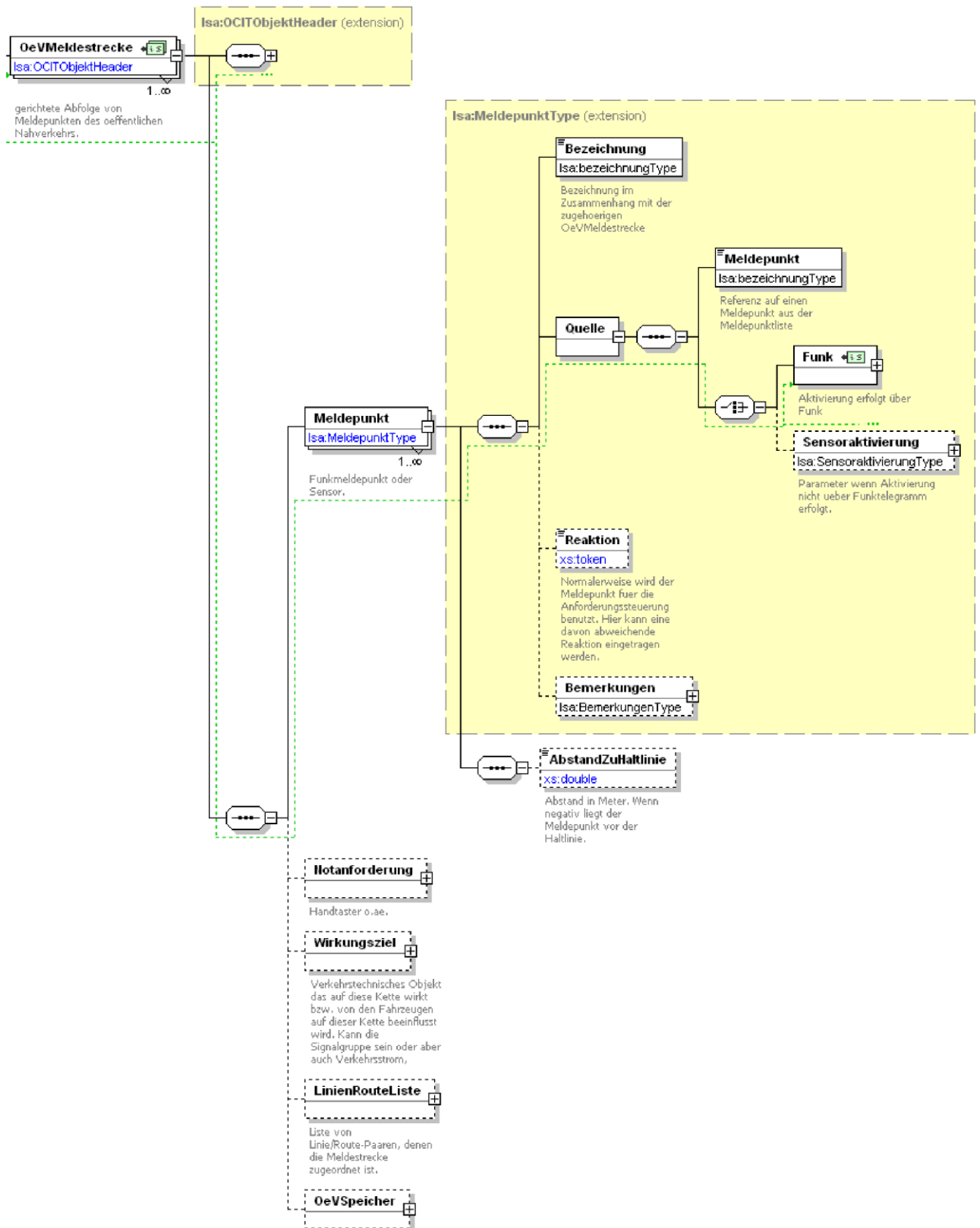
The type of reporting point is defined in "RPTType" The following values are approved:

- Parallel impulse
- Serial

- ParallelGaps
- SerialOnTA
- Miscellaneous
- NotAvailable

3.4.5 PT reporting sections

Each PT reporting section is made up of a series of reporting sections which refer to a stop line. The distance to the stop line is positive if the point is located behind the stop line (always viewed in the direction of travel) and negative if the point is past the stop line.



OeVMeldestrecke	PTReportingSections
i S	i S
Isa:OCITObjektHeader	tss:OCITObjektHeader
gerichtete Abfolge von Meldepunkten des öffentlichen Nahverkehrs.	targeted sequence of reporting points from the public transport service.
Isa:OCITObjektHeader (extension)	tss:OCITObjektHeader (extension)

Meldepunkt	Reporting Point
Isa:MeldepunktType	Tss:ReportingPointTypes
Funkmeldepunkt oder Sensor.	Radio reporting point or sensor.
Notanforderung	Emergency request
Handtaster o.ae.	Hand switch or similar
Wirkungsziel	Outcome objective
Verkehrstechnisches Objekt das auf diese Kette wirkt bzw. von den Fahrzeugen auf dieser Kette beeinflusst wird. Kann die Signalgruppe sein oder aber auch Verkehrsstrom.	Traffic-related object that has an effect on this chain or is affected by the vehicles in this chain. It may be the signal group, but also the traffic flow.
LinienRouteListe	LineRouteList
Liste von Linie/Route-Paaren, denen die Meldestrecke zugeordnet ist.	List of line/route pairs assigned to the reporting section.
OeVSpeicher	PTMemory
Isa:MeldepunktType (extension)	Tss:ReportingPointTypes (extension)
Bezeichnung	Name
Isa:bezeichnungType	tss:nameType
Bezeichnung im Zusammenhang mit der zugehoerigen OeVMeldestrecke	Name in conjunction with the associated PT reporting section
Quelle	Source
Reaktion	Response
xs:token	xs:token
Normalerweise wird der Meldepunkt fuer die Anforderungs Steuerung benutzt. Hier kann eine davon abweichende Reaktion eingetragen werden.	Normally the reporting point is used for controlling requests. Here however, it is possible to enter a different response.
Bemerkungen	Comments
Isa:BemerkungenType	tss:CommentsType
AbstandZuHattlinie	DistanceToStopLine
xs:double	xs:double
Abstand in Meter. Wenn negativ liegt der Meldepunkt vor der Haltlinie.	Distance in metres. If negative, the reporting point is past the stop line.
Meldepunkt	Reporting Point
Isa:bezeichnungType	tss:nameType
Referenz auf einen Meldepunkt aus der Meldepunktliste	Reference to a reporting point from the reporting point list.
Funk	Radio
i S	i S
Aktivierung erfolgt über Funk	Activation occurs via radio
Sensoraktivierung	Sensor activation
Isa:SensoraktivierungType	tss:SensorActivationType
Parameter wenn Aktivierung nicht ueber Funktelegramm erfolgt.	Parameters if activation is not done via the radio telegram.

The "Response" field can be used to make statements about the effects caused by the reporting point in the traffic-actuated control. If this field is missing, then the following "standard" behaviour is expressed. The reporting point with the greatest distance to the stop line is the de-registration point; all other reporting points are, with increasing distance to the de-registration point, counted as the registration points. Should a structure differing from this be described, then the "Response" field is used. The values, that the field is able to take on, are not prescribed by the OCIT Standard, rather they are specified depending on the control process. The "function" field plays a similar role in the data structure "PT memory".

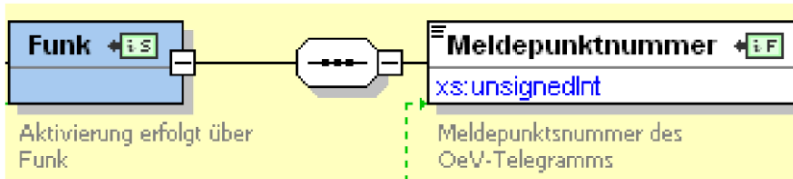
The PT reporting section always refers to one PT reporting point. The PT reporting point itself

can be triggered by radio telegrams or by sensors (<Input>).

The reporting points of a PT reporting section (<Reporting point>) always relate to a PT reporting point (<PTreporting point>) from the PT reporting point list <PTReportingPointList>. The PT reporting point itself can be triggered by radio telegrams or by sensors (<Input>). The name of the reporting point in a PT reporting section must not be the same as the name of the reference PT reporting point <PTReportingPoint>.

3.4.5.1 Reporting points that can be triggered by radio

Reporting points that can be triggered by radio telegrams contain the reporting point number sent in the radio telegram.

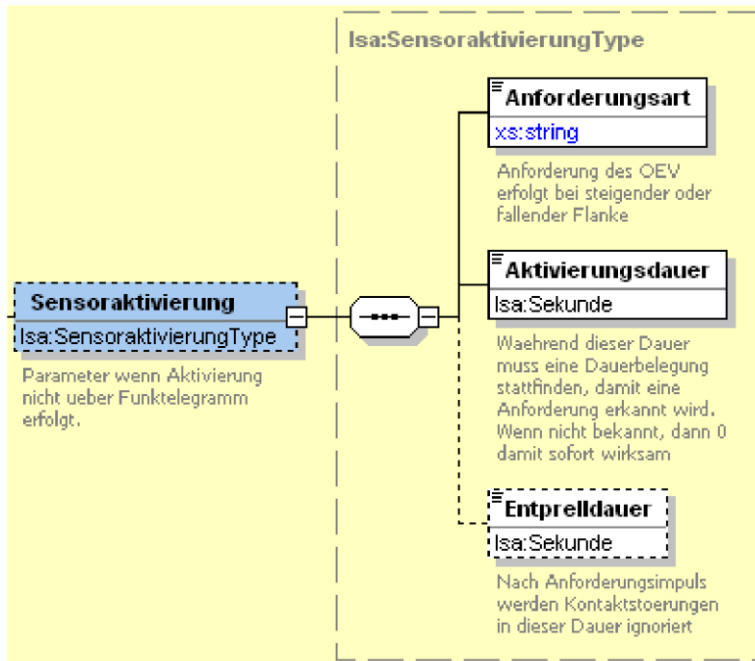


Funk	Radio
i S	i S
Aktivierung erfolgt über Funk	Activation occurs via radio
Meldepunktnummer	Reporting point number
i F	i F
xs:unsignedInt	xs:unsignedInt
Meldepunktnummer des OeV-Telegramms	Reporting point number of the PT telegram

3.4.5.2 Reporting points that can be triggered by sensors

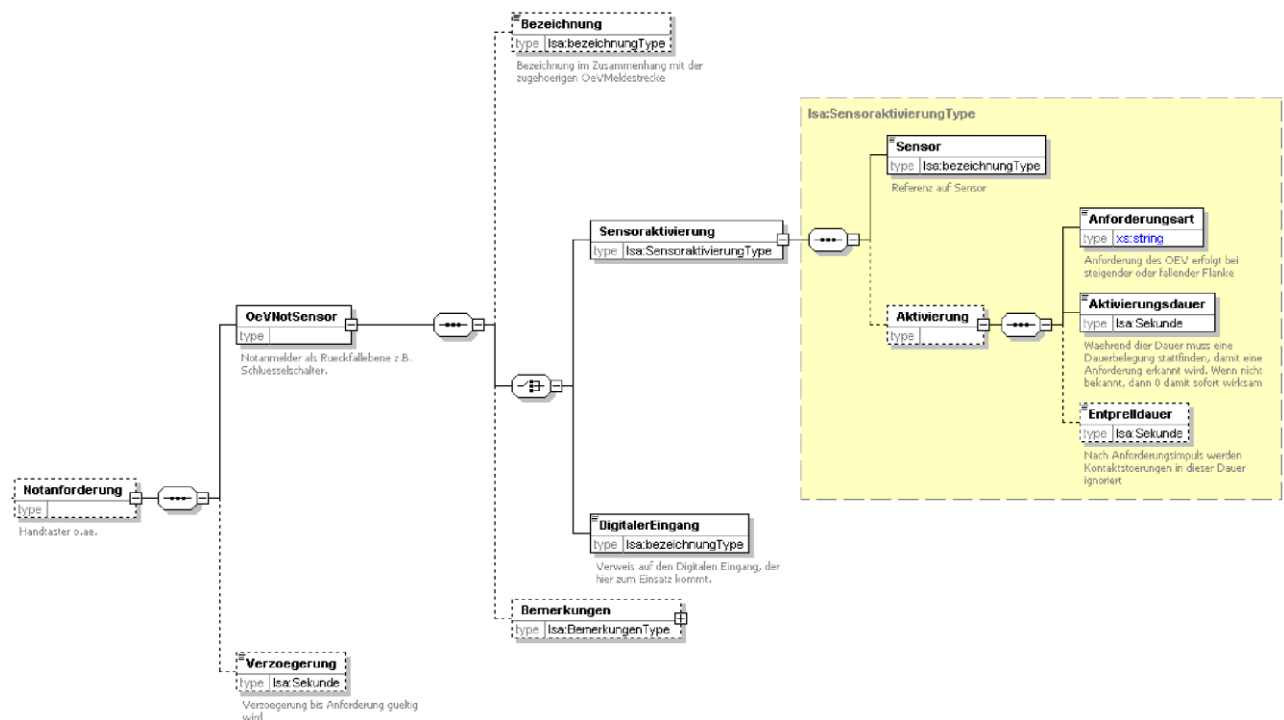
Individual reporting points can also be triggered by sensors instead of by radio telegrams. Also regarding the sensor, parameters can be specified which related to the activation of the sensor. "RisingFlank" or "fallingFlank" are possible as the type of activation, the activation and debouncing period are specified in seconds.

For the second values, the seconds may also contain decimal places. The precision of the value used is up to the manufacturer of the traffic signal controller.



Sensoraktivierung	Sensor activation
Isa:SensoraktivierungType	tss:SensorActivationType
Parameter wenn Aktivierung nicht ueber Funktelegramm erfolgt.	Parameters if activation is not done via the radio telegram.
Allforderungsart	Request type
xs:string	xs:string
Anforderung des OEV erfolgt bei steigender oder fallender Flanke	Request of the PT takes place at the rising or falling flank
Aktivierungsdauer	Activation length
Isa:Sekunde	Tss:Second
Waehrend dieser Dauer muss eine Dauerbelegung stattfinden, damit eine Anforderung erkannt wird. Wenn nicht bekannt, dann 0 damit sofort wirksam	Long-term occupation must take place during this period, so that a request can be detected. If it is not known, than 0 is thus effective immediately.
Entprelldauer	Debouncing period
Nach Anforderungsimpuls werden Kontaktstoerungen in dieser Dauer ignoriert	After the request impulse, the contact faults in this period are ignored.

3.4.5.3 Emergency request



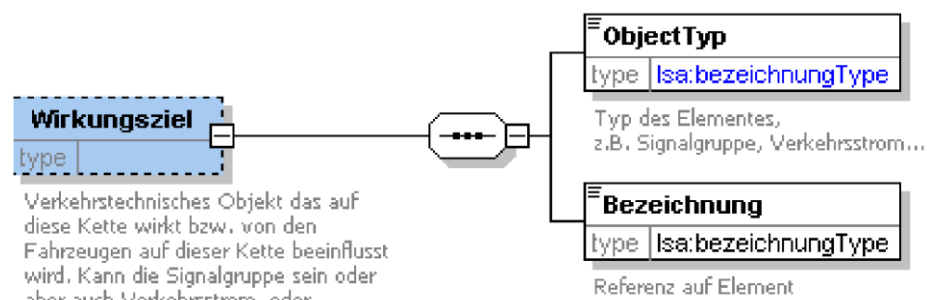
Notanforderung	Emergency request
Handtaster o.ae.	Hand switch or similar
OeVNotSensor	PTEmergencySensor
type	type
Notanmelder als Rueck-fallebene z.B, Schluesselschalter.	Emergency registration point as a fallback level, e.g. key switch.
Verzoegerung	Delay
Isa:Sekunde	Tss:Second
Verzoegerung bis Anforderung gueltig	Delay until the request is valid
Bezeichnung	Name
Isa:bezeichnungType	tss:nameType
Bezeichnung im Zusammenhang mit der zugehoerigen OeVMeldestrecke	Name in conjunction with the associated PT reporting section
Sensoraktivierung	Sensor activation
Isa:SensoraktivierungType	tss:SensorActivationType
DigitalerEingang	DigitalInput
Isa:bezeichnungType	tss:nameType
Verweis auf den Digitalen Eingang, der hier zum Einsatz kommt.	Reference to the digital input which is used here.
Bemerkungen	Comments
Isa:BemerkungenType	tss:CommentsType
Isa:SensoraktivierungType	tss:SensorActivationType
Sensor	Sensor
Isa:bezeichnungType	tss:nameType
Referenz auf Sensor	Reference to sensor
Aktivierung	activation
Anforderungsart	Demand type
xs:string	xs:string
Anforderung des OEV erfolgt bei steigender oder Fallender Flanke	Request of the PT takes place at the rising or falling flank
Aktivierungsdauer	Activation length
Waehrend der Dauer muss eine	Long-term occupation must take place during

Dauerbelegung stattfinden, damit eine Anforderung erkannt wird. Wenn nicht bekannt, dann 0 damit sofort wirksam	this period, so that a request can be detected. If it is not known, than 0 is thus effective immediately.
Entprelldauer	Debouncing period
Nach Anforderungsimpuls werden Kontaktstoerungen in dieser Dauer ignoriert	After the request impulse, the contact faults in this period are ignored.

The emergency request is a special sensor - e.g. a button which can be used to request the reporting section regardless of the other reporting points. In any case, the emergency request is a sensor or another digital input.

If no emergency request exists, leave the entry empty.

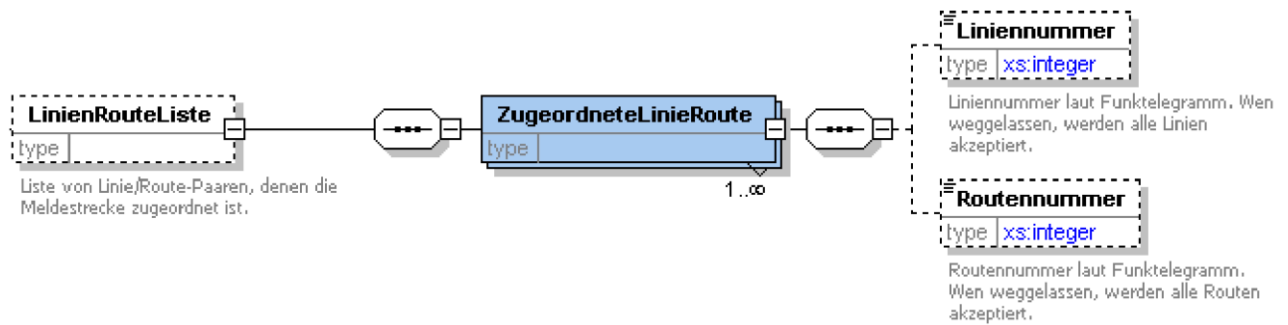
3.4.5.4 Outcome objective



Wirkungsziel	Outcome objective
type	type
Verkehrstechnisches Objekt das auf diese Kette wirkt bzw. von den Fahrzeugen auf dieser Kette beeinflusst wird. Kann die Signalgruppe sein oder aber auch Verkehrsstrom, oder....	Traffic-related object that has an effect on this chain or is affected by the vehicles in this chain. It may be the signal group, but also the traffic flow, or ...
ObjectTyp	ObjectType
Isa:bezeichnungType	tss:nameType
Typ des Elementes, z.B. Signalgruppe, Verkehrsstrom...	Type of element, e.g. signal group, traffic flow, etc.
Bezeichnung	Name
Referenz auf Element	Reference to element

The outcome objective specifies the traffic object the PT reporting section relates to. In most cases, this is a stage transition, however it can also be a traffic flow, a stage or a stage transition. If the outcome objective is not known, leave it empty.

3.4.5.5 Line / route list



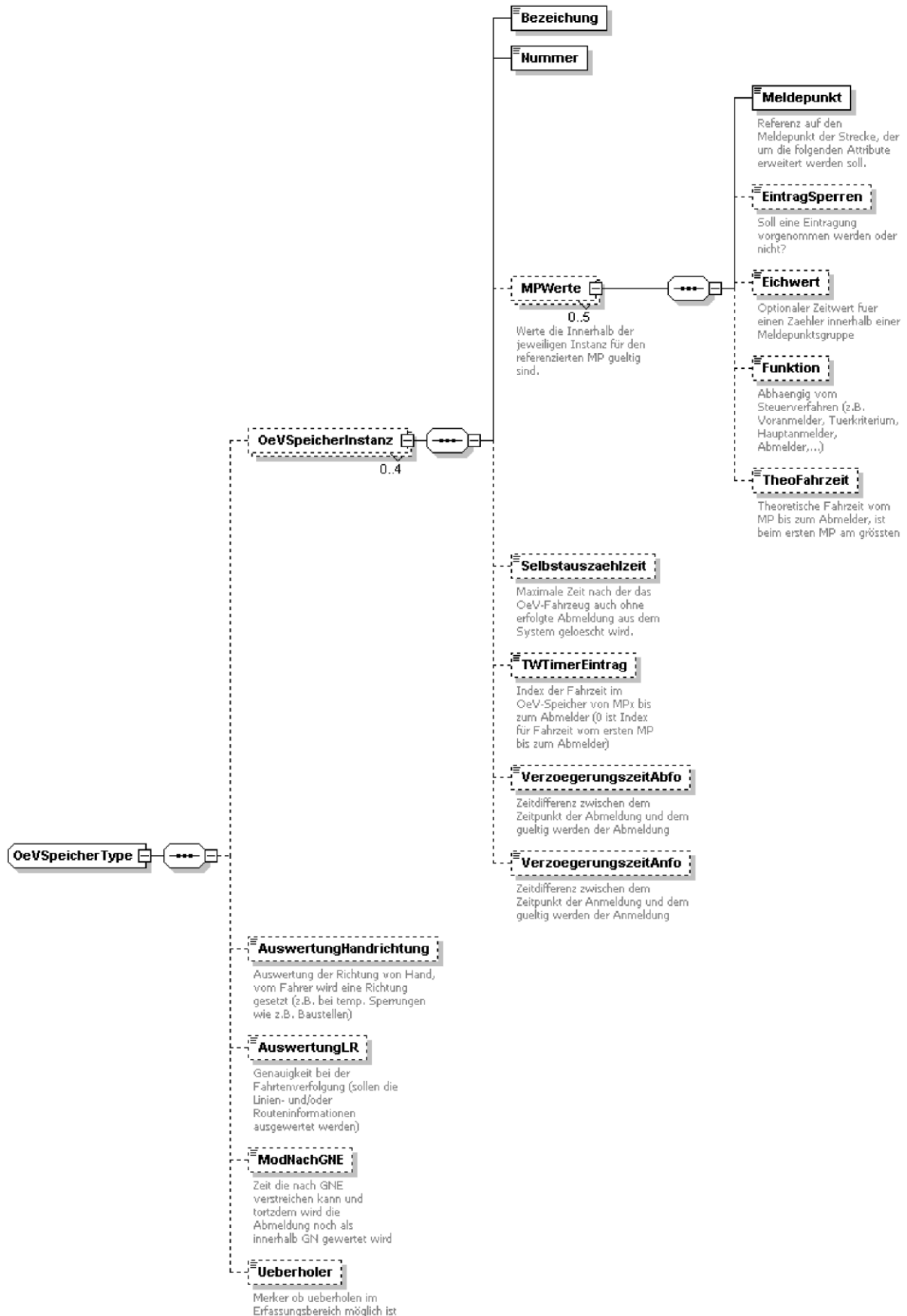
LinienRouteListe	LineRouteList
type	type
Liste von Linie/Route-Paaren, denen die Meldestrecke zugeordnet ist.	List of line/route pairs assigned to the reporting section.
ZugeordneteLinieRoute	AssignedLineRoute
Liniennummer	Line number
xs:integer	xs:integer
Liniennummer laut Funktelegramm. Wenn weggelassen, werden alle Linien akzeptiert.	Line number according to the radio telegram. If empty, all lines are accepted.
Routennummer	Route number
Routennummer laut Funktelegramm. Wenn weggelassen, werden alle Routen akzeptiert.	Route number according to the radio telegram. If empty, all routes are accepted.

The line/route list is a filter which only relates to radio telegrams. In addition to the reporting point number, these also contain a line and route identifier.

If a line/route list is set, the entries only apply if at least a "AssignedLineRoute" is filled in. An AssignedLineRoute in this case is either an exact pair of numbers or an element which includes all lines of a route or all routes of a line. In the case of all lines of a route, the line entry is left empty, for all routes of a line, the route entry.

3.4.5.6 PT memory

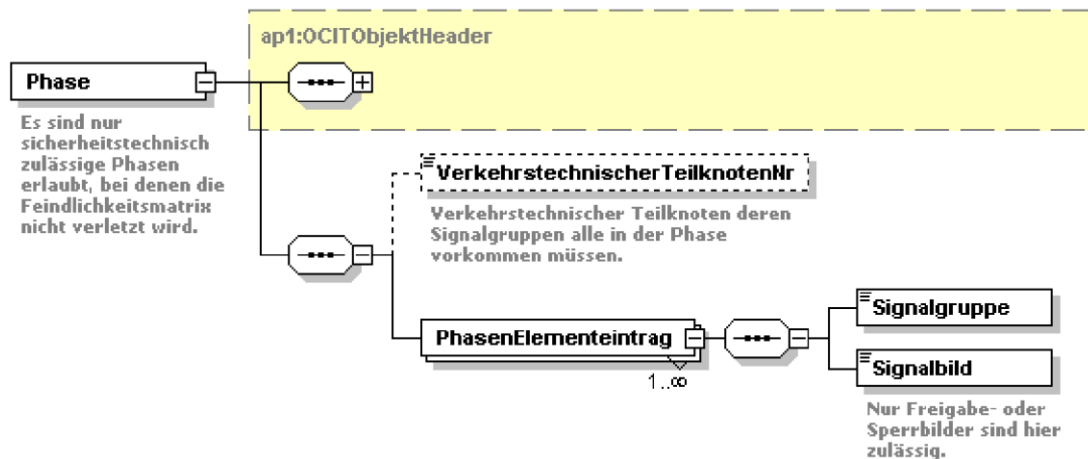
The PT memory is an area which only comes into effect with public transport modules similar to the PT memory. It contains additional data which are necessary for the configuration of this PT memory. The values declared here are not required for the basic description of the reporting section.



OeV Speicher Type	PTMemoryType
OeV Speicher Instanz	PTMemoryInstance
Auswertung Handrichtung	ManualDirectionEvaluation

Auswertung der Richtung von Hand, vom Fahrer wird eine Richtung gesetzt (z.B. bei temp. Sperrungen wie z.B. Baustellen)	Manual direction evaluation, a direction is set by the driver (e.g. for temporary closures such as roadworks)
AuswertungLR	EvaluationsLR
Genauigkeit bei der Fahrtenverfolgung (sollen die Linien- und/oder Routeninformationen ausgewertet werden)	Accuracy when tracking the journey (the line and/or route information should be evaluated)
ModNachGHE	ModNachGHE
Zeit die nach GNE verstreichen kann und trotzdem wird die Abmeldung noch als innerhalb GM gewertet wird	Time that is able to elapse after the GNE and the cancellation nevertheless will still be considered as within GM.
Ueberholer	Passing vehicle
Merker ob ueberholen im Eifassungsbereich möglich ist	Flag whether passing is possible in the detection area
Bezeichnung	Designation
Nummer	Number
MPWerte	MP values
Werte die Innerhalb der jeweiligen Instanz für den referenzierten MP gueltig sind.	Values that within the respective instance are valid for the referenced reporting point
Selbstauszählzeit	Self count-out time
Maximale Zeit nach der das OeV-Fahrzeug auch ohne erfolgte Abmeldung aus dem System gelöscht wird.	Maximum time after which the PT vehicle is deleted from the system even without de-registering.
TWTimerEintrag	TWTimerEntry
Index der Fahrzeit im OeV-Speicher von MPx bis zum Abmelder (0 ist Index für Fahrzeit vom ersten MP bis zum Abmelder)	Index of the travel time in the PT memory from reporting point x until the de-registration point (0 is the travel time index from the first reporting point to the deregistration point)
VerzoegerungszeitAbfo	DelayTimeRequest
Zeitdifferenz zwischen dem Zeitpunkt der Abmeldung und dem gueltig werden der Abmeldung	Time difference between the time of de-registration and when the de-registration comes into effect
VerzoegerungszeitAnfo	DelayTimeDemand
Zeitdifferenz zwischen dem Zeitpunkt der Anmeldung und dem gueltig werden der Anmeldung	Time difference between the time of registration and when the registration comes into effect
Meldepunkt	Reporting Point
Referenz auf den Meldepunkt der Strecke., der um die folgenden Attribute erweitert werden soll.	Reference to the reporting point on the road, which the following attributes should be added to.
EintragSperrern	LockEntry
Soll eine Eintragung vorgenommen werden oder nicht?	Should an entry be carried out or not?
Eichwert	Eich value
Optionaler Zeitwert fuer einen Zaehler innerhalb einer Meldepunktsguppe	Optional time value for a counter within a reporting point group
Funktion	Function
Abhaengig vom Steuerverfahren (z.B. Voranmelder, Tuerkriterium, Hauptanmelde, Abmelder,...)	Dependent on control method (e.g. pre-registration points, door criteria, main registration point, de-registration point, etc.)
TheoFahrzeit	TheoTravelTime
Theoretische Fahrzeit vom MP bis zum Abmelder, ist beim ersten MP am grössten	Theoretical travel time from reporting point to the de-registration point, largest at the first reporting point

3.4.6 Stage



Phase	Stage
Es sind nur Sicherheitstechnisch zulässige Phasen erlaubt, bei denen die Feindlichkeitsmatrix nicht verletzt wird.	Only safety-related permissible stages in which the hostility matrix is not violated are permitted.
ap1:OCITObjektHeader	ap1:OCITObjectHeader
VerkehrstechnischerTeilknotenNr	TrafficEngineeringPartialIntersectionNo
Verkehrstechnischer Teilknoten deren Signalgruppen alle in der Phase vorkommen müssen.	Traffic-related partial intersections whose signal groups must all be abandoned in the stage.
PhasenElementeintrag	StageElementEntry
Signalgruppe	Signal group
Signalbild	Signal aspect
Nur Freigabe- oder Sperrbilder sind hier zulässig.	Only green or red patterns are permitted here.

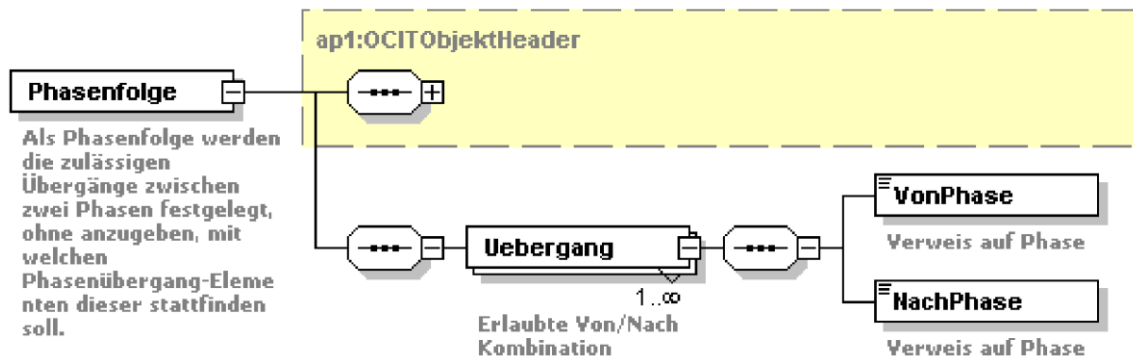
Stages are symbolised by the signal aspects of the signal group from which the traffic conditions can be derived. The stage list is purely used for exchanging between the planning tools and is not transferred to the controller.

It allows two types of stages to be modelled: Standard green patterns and standard red patterns are used for the classic traffic stages. For signal groups which have more than one signal aspect for the same condition – such as "dark" and "green" for locked - a stage exists with the signal aspect "dark" and another stage with the signal aspect "green" for the same signal group. The hexadecimal codes as per OCIT-O must be entered as the signal aspect (see Signal group):

A traffic-engineering partial intersection can be entered. The existence depends on the method.

Only stages in which the hostility matrix is not violated may be supplied. Traffic procedures which work with "pseudo-stages", in which for example all signal groups are entered as "free", do not save any standardised pseudo-stages. It is instead permissible to do away with a start and end stage in stage transitions, if it would be necessary to set up a pseudo-stage here.

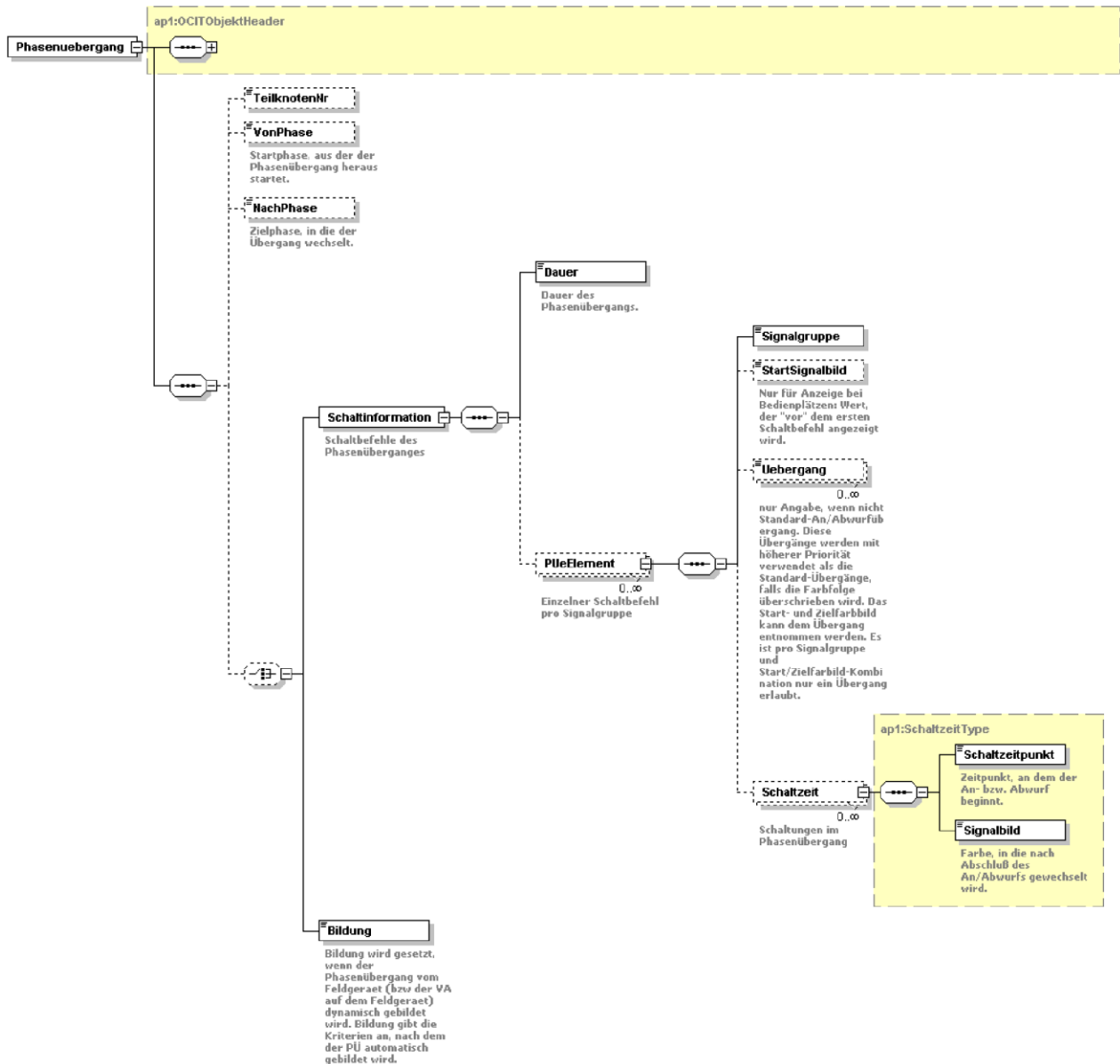
3.4.7 Stage sequence



Phasenfolge	Stage sequence
Als Phasenfolge werden die zulässigen Übergänge zwischen zwei Phasen festgelegt, ohne anzugeben, mit welchen Phasenübergang-Elementen dieser stattfinden soll.	The permissible transitions between two stages are set as the stage sequence, without specifying the stage transition elements with which this should take place.
ap1:OCITObjektHeader	ap1:OCITObjektHeader
Uebergang	Transition
Erlaubte Von/Nach Kombination	Permitted from/after combination
VonPhase	FromStage
Verweis auf Phase	Reference to stage
NachPhase	ToStage

A stage sequence is made up of a quantity of all permissible from-stage / after-stage combinations. No specification is made about which stage transitions of this change should take place between stages. The stage sequence list is purely used for exchanging between the planning tools and is not transferred to the controller.

3.4.8 Stage transition



Phasenuebergang	Stage transition
ap1:OCITObjektHeader	ap1:OCITObjectHeader
TeilknotenNr	PartialIntersectionNo
VonPhase	FromStage
Startphase aus der der Phasenuebergang heraus startet.	Start stage from which the stage transition starts.
NachPhase	ToStage
Zielphase, in die der Übergang wechselt.	Target stage, which the transition switches to.
Schaltinformation	Switching information
Schaltbefehle des Phasenueberganges	Stage transition switching commands
Bildung	Creation
Bildung wird gesetzt, wenn der Phasenuebergang vom Feldgeraet (bzw der VA auf dem Feldgeraet) dynamisch gebildet wird. Bildung gibt die Kriterien an, nach dem der PÜ automatisch gebildet wird.	Formation is set if the stage transition is dynamically formulated by the field device (or the TA on the field device). The formation specifies the criteria by which the stage transition is automatically formed.
Dauer	Duration
Dauer des Phasenuebergangs.	Duration of the stage transition.
PUElement	StageTransitionElement

Einzelner Schaltbefehl pro Signalgruppe	Individual switching command per signal group
Signalgruppe	Signal group
StartSignalbild	StartSignalAspect
Nur für Anzeige bei Bedienplätzen: Wert, der "vor" dem ersten Schaltbefehl angezeigt wird.	Only for display on workstations: Value that is displayed "before" the first switching command.
Uebergang	Transition
nur Angabe, wenn nicht Standard-An/Abwurfübergang. Diese Übergänge werden mit höherer Priorität verwendet als die Standard-Übergänge, falls die Farbfolge überschrieben wird. Das Start- und Zielfarbbild kann dem Übergang entnommen werden. Es ist pro Signalgruppe	only an indication, if not a standard An/Abwurfübergang. These transitions are used with a higher priority than the standard transitions, if the colour pattern is overwritten. The start and end colour pattern can be taken from the transition. It is per signal group
Schaltzeit	SwitchTime
Schaltungen im Phasenübergang	Switching operations in the stage transition
ap1:SchaltzeitType	ap1:SwitchTimeType
Schaltzeitpunkt	SwitchTime
Zeitpunkt, an dem der An- bzw. Abwurf beginnt.	Time at which the An or Abwurf starts.
Signalbild	Signal aspect
Farbe, in die nach Abschluß des An/Abwurfs gewechselt wird.	Colour to be switched to after the An/Abwurf has finished.

In the stage transition, the way in which it can be switched from a certain stage to another stage is specified. The stage transition list is purely used for exchanging between the planning tools and is not transferred to the controller.

"FromStage" indicates which stage it is switched from and "ToStage" indicates which stage is switched to. Some traffic procedures use stage transitions, in which there is not a known valid start or target stage. Even these stage transitions can be standardised, you just need to remove the "FromStage" or "ToStage" entry.

There is the option to create empty stage transitions, in which there is no additional information. In this case, it is the information of the traffic procedure for executing the stage transition. It goes without saying that this type of stage transition can not be displayed with its contents by other tools.

Stage transitions may also be automatically generated by a traffic procedure. The cases "IGMinimumGreen", "IGWithoutMinimumGreen" and "TASpecific" are envisaged for this.

The "switch information" is filled in for fixed stage transitions. It contains the complete duration of the stage transition,

The "duration" of the stage transition is indicated in seconds. All "switching times" must be smaller or equal to the duration.

The switching times are specified for each signal group. Signal groups which are not switched on can be entered nonetheless (without switching time), in order to meet the partial intersection condition.

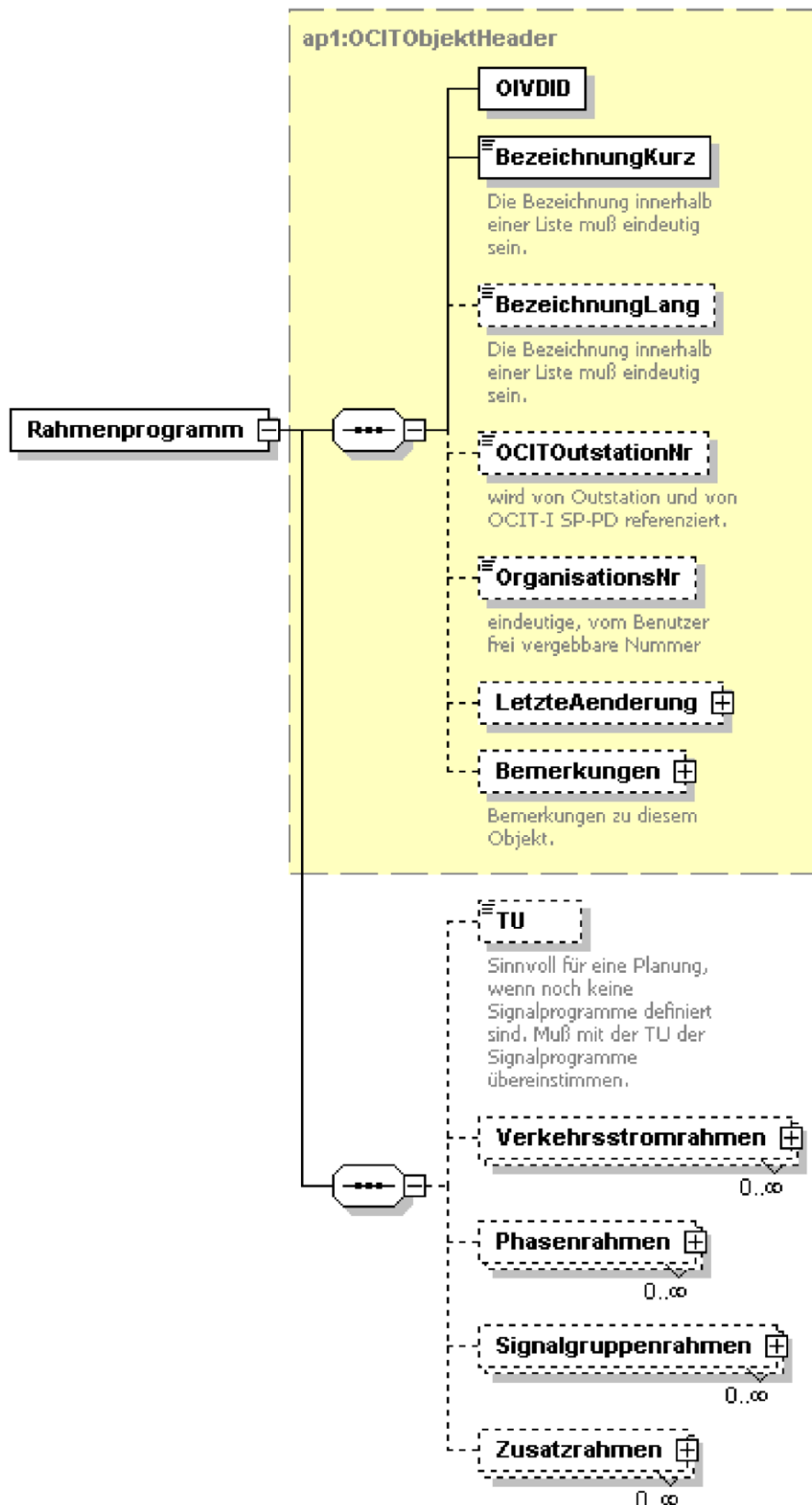
- The StartSignalAspect is only used for presentation purposes. In this case, the StartSignalAspect is displayed in a graphic editor before the first switching operation. If the StartSignalAspect is missing, the associated colour from the corresponding start stage entry is taken. If both entries are missing, the display of the graphic editor is undefined.

- Transition entries are only necessary if the standard An or Abwurf should not be used for switching between the signal aspects. In this case, please refer here to the desired transition. A transition from the release to the blocked condition is not permitted.
- The switching time specifies the start of the switchover and the desired target colour. If a specific transition entry is missing between the current and the target colour, the standard An or Abwurf is used.
Example: In a stage transition, the lights should switch from "green" to "yellow" after 2 seconds and from "yellow" to "red" after 5 seconds. The standard Abwurf is 3 seconds yellow. "2" is entered as the switching time and "red" as the signal aspect.
It is possible, that at the "Continuous" time (see above), not all of the changes initiated have been completed.
- There is the possibility of entering more than one switching time per signal group. The number of permissible entries is dependent on the traffic signal controller. If switching times are specified, that follow so closely after one another that the change has not completely finished, this type of traffic signal controller behaviour is not standardised and depends on the type of traffic signal controller.

3.4.9 Framework program

A framework program is a framework list to which one or more signal programs are assigned. Framework programme are generally used in coordinated traffic-actuated controls. However, a supply of the framework plans is only used for exchanging between planning tools, since the framework plans cannot be transferred into the controller in a standardised format.

Frameworks are standardised periods of time within a signal program, which can be applied to various traffic objects. These are traffic flows, stages, signal groups and furthermore, it is possible to define additional frameworks without further reference. They are labelled by start and end of the period or may be continuously on or continuously off.

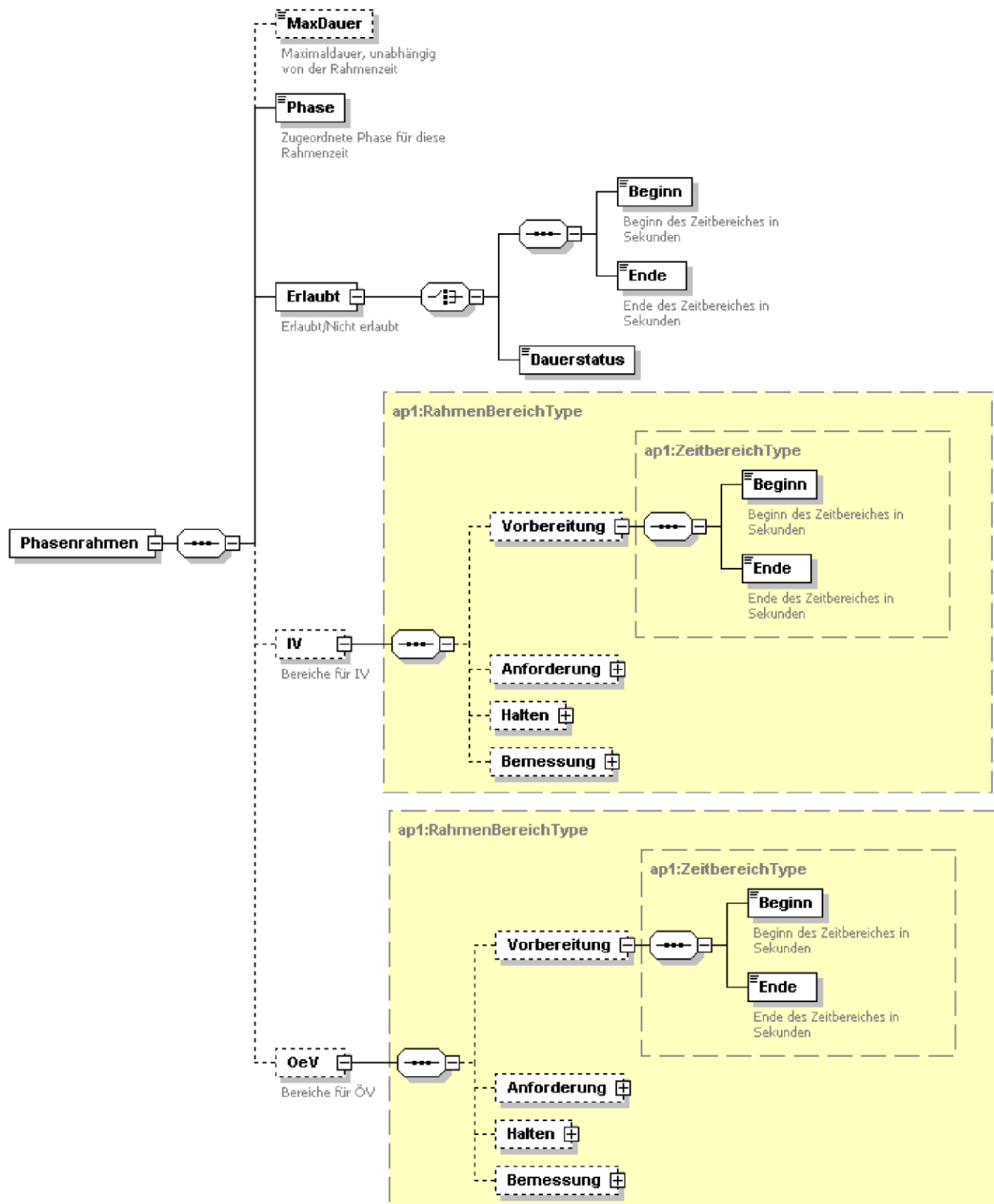


Rahmenprogramm	Framework program
ap1:OCITObjektHeader	ap1:OCITObjectHeader
OIVDID	OIVDID
BezeichnungKurz	Short name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.

BezeichnungLang	Long name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.
OCITOutstationNr	OCITOutstationNo
wird von Outstation und von OCIT-I SP-PD referenziert.	Is referenced by the Outstation and by OCIT-I SP-PD.
OrganisationsNr	OrganisationsNo
eindeutige, vom Benutzer frei vergebbare Nummer	unique, number freely definable by the user
LetzteAenderung	LastChange
Bemerkungen	Comments
Bemerkungen zu diesem Objekt.	Comments on this object.
TU	TU
Sinnvoll für eine Planung, wenn noch keine Signalprogramme definiert sind. Muß mit der TU der Signalprogramme übereinstimmen.	Useful for a plan, if no signal programs have been defined yet. Must match the TU of the signal program
Verkehrsstromrahmen	Traffic flow frames
Phasenrahmen	Stage frame
Signalgruppenrahmen	SignalGroupFrame
Zusatzrahmen	Additional frame

3.4.9.1 Stage frame plan

Within the stage frame, it is possible to specify additional separate frame areas for public and private transport.

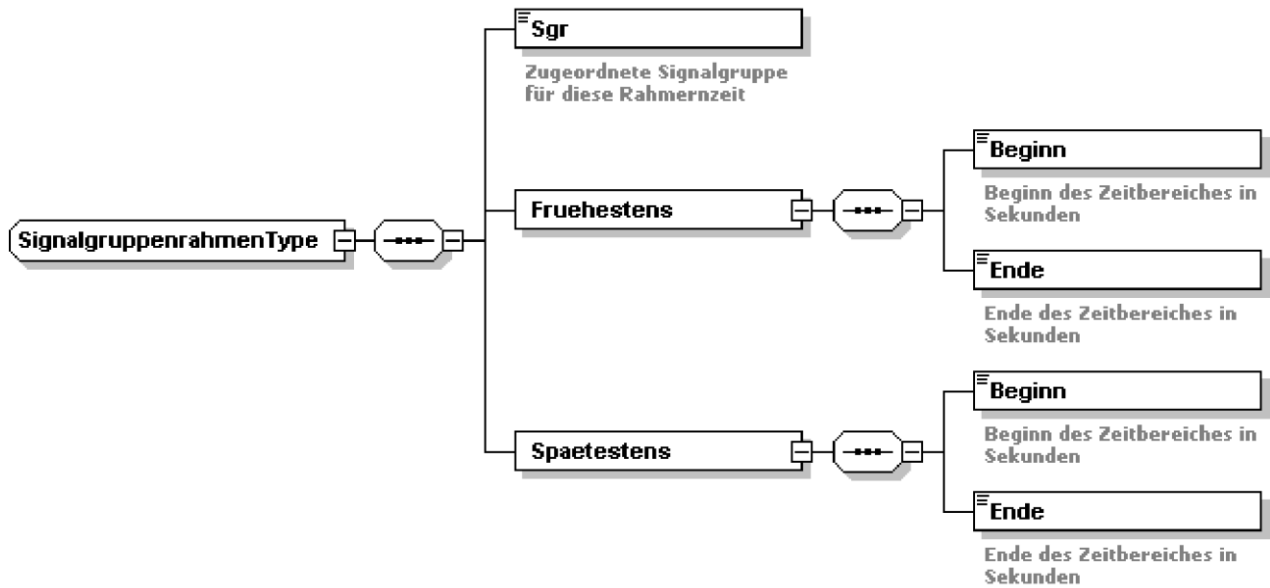


Phasenrahmen	Stage frame
MaxDauer	MaxDuration
Maximaldauer, unabhängig von der Rahmenzeit	Maximum duration, regardless of the frame time
Phase	Stage

Zugeordnete Phase für diese Rahmenzeit	Assigned stage for this frame time
Erlaubt	Permitted
Erlaubt/Nicht erlaubt	Permitted/not permitted
IV	IV
Bereiche für IV	Areas for private transport
OeV	PT
Bereiche für ÖV	Areas for PT
Beginn	Start
Beginn des Zeitbereiches in Sekunden	Start of time range in seconds
Ende	Finish
Ende des Zeitbereiches in Sekunden	End of time range in seconds
Dauerstatus	Continuous status
ap1:RahmenBereichType	ap1:FrameAreaTypes
ap1:ZeitbereichType	ap1:TimeAreaTypes
Vorbereitung	Preparation
Anforderung	Requirement
Halten	Stop
Bemessung	apportionment

3.4.9.2 Signal group frame plan

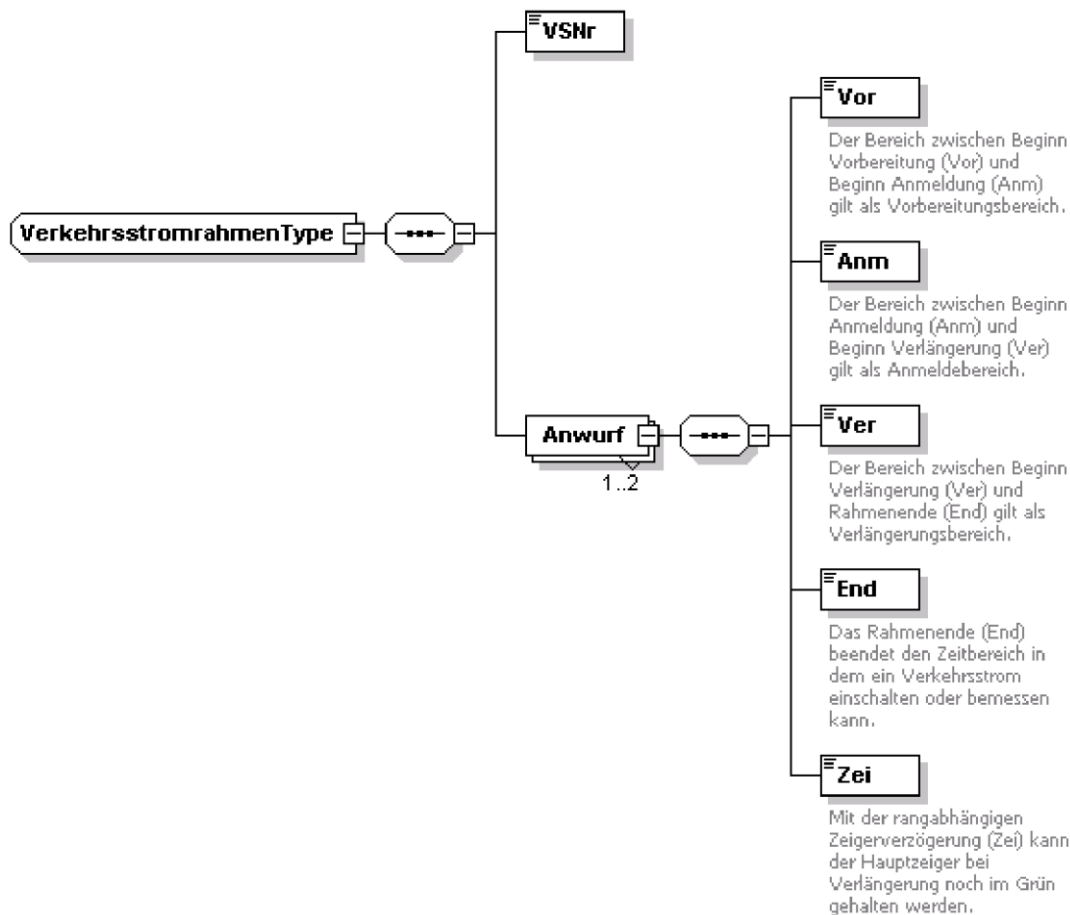
Signal group frames specify time periods in which signal groups are able to receive a green.



SignalgruppenrahmenType	SignalGroupFrameTypes
Sgr	Sgr
Zugeordnete Signalgruppe für diese Rahmernzeit	Signal group assigned for this frame time
Fruehestens	Earliest
Spaetestens	Latest
Beginn	Start
Beginn des Zeitbereiches in Sekunden	Start of time range in seconds
Ende	Finish

3.4.9.3 Traffic flow frame plan

The traffic flow frame plan, which contains the parameters that the TA procedure VS-PLUS requires, is also contained.



VerkehrsstromrahmenType	TrafficFlowFrameType
VSNr	Traffic flow number
Anwurf	Multiple switching operation
Vor	Pre-
Der Bereich zwischen Beginn Vorbereitung (Vor) und Beginn Anmeldung (Anm) gilt als Vorbereitungsbereich.	The time between the start of preparation (before) and start of the registration point (Reg) is regarded as the preparation period.
Anm	Comment
Der Bereich zwischen Beginn Anmeldung (Anm) und Beginn Verlängerung (Ver) gilt als Anmeldebereich.	The time between the start of registration (Reg) and start of the extension (Ext) is regarded as the registration period.
Ver	Ver
Der Bereich zwischen Beginn Verlängerung (Ver) und Rahmenende (End) gilt als Verlängerungsbereich.	The time between the start of extension (Ext) and start of the frame end (End) is regarded as the extension period.
End	End
Das Rahmenende (End) beendet den Zeitbereich in dem ein Verkehrsstrom einschalten oder bemessen kann.	The frame end (End) ends the time period in which the traffic flow can be switched on or measured.
Zei	Time
Mit der rangabhängigen Zeigerverzögerung (Zei) kann der Hauptzeiger bei Verlängerung noch im Grün gehalten werden.	The main pointer can still be kept green when extended using the rank-dependent time delay (time).

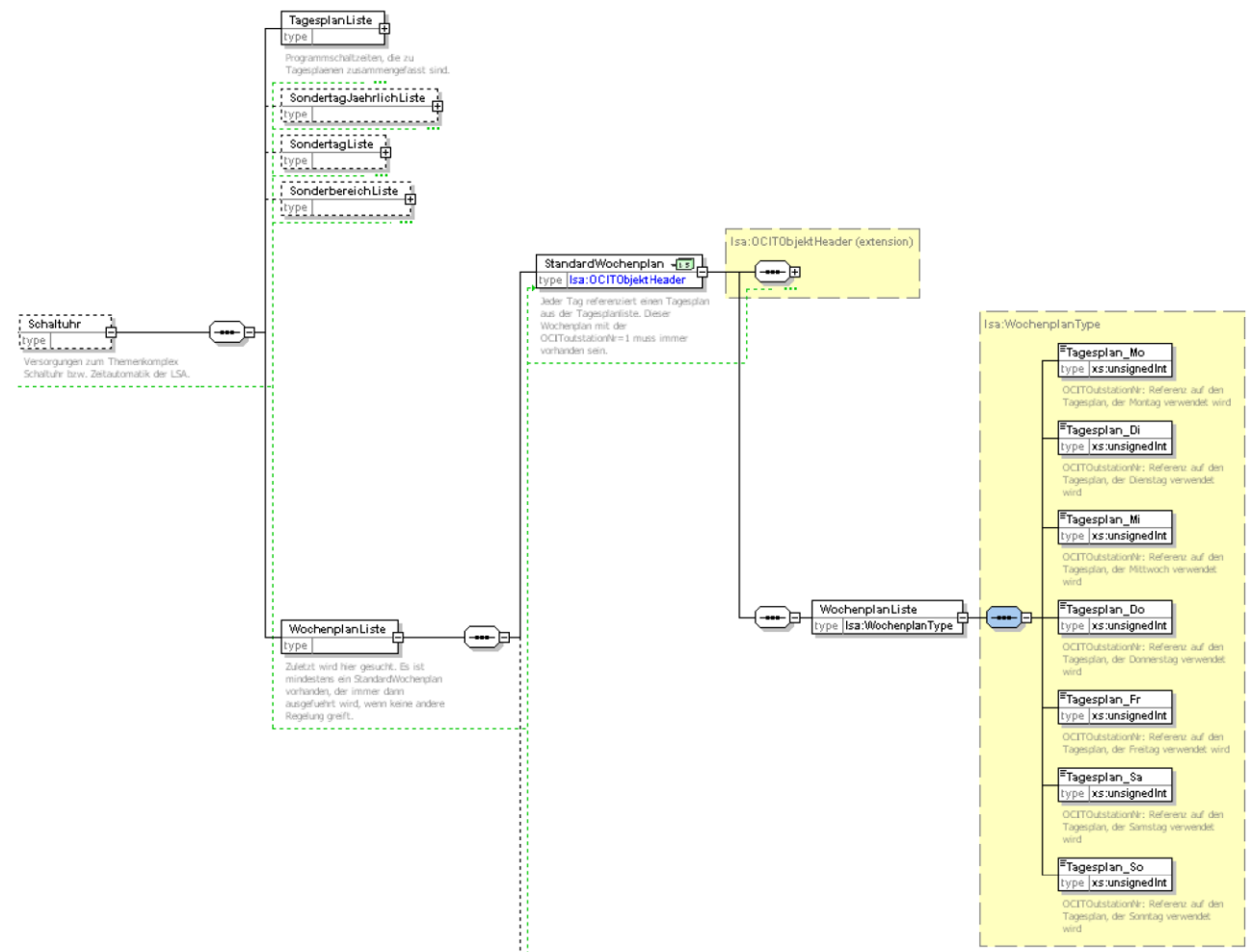
3.4.10 Control clock

The supply of the control clock consists of two parts: The specification of which commands should be executed at which local time is made in the "day plans".

The other entries stipulate which day plan should be executed.

3.4.10.1 Week plans

The week plans contain information about which day plan should be executed on which day. A reference is provided for each week day. A special position accepts the "StandardWeekPlan". It is then always executed if there are no exceptions. The remaining week plans are only then used if they are selected by a "special interval". The OCITOutstationNo of the standard week plan must always be 1.



Schaltuhr	Control clock
type	type
Versorgungen zum Themenkomplex Schaltuhr bzw. Zelautomatik der LSA.	Supplies to the range of topics on the control clock or automatic time function of the TSS.
TagesplanListe	DayPlanList
Programmschalzeiten, die zu Tagesplaenen zusammengefasst sind.	Program switching times which are summarised into day plans.
SondertagJaehrlichListe	SpecialDayAnnualList
SondertagListe	SpecialDayList
SonderbereichListe	SpecialIntervallList
WocheplanListe	WeekPlanList
Zuletzt wird hier gesucht. Es ist mindestens	Here is the last place to search. There is at

ein StandardWochenplan vorhanden, der immer dann ausgefuehrt wird, wenn keine andere Regelung greift.	least one standard week plan present which is executed if no other control takes effect.
StandardWochenplan	StandardWeekPlan
Isa:OCITObjektHeader	tss:OCITObjectHeader
Jeder Tag referenziert einen Tagesplan aus der Tagesplanliste. Dieser Wochenplan mit der OCIToutstationNr=1 muss immer vorhanden sein.	Each day references a day plan fro the day plan list This week plan with the OCIToutstationNo.=1 must always be present.
Isa:OCITObjektHeader (extension)	tss:OCITObjectHeader (extension)
Isa: WochenplanType	Tss: WeekPlanTypes
Tagesplan_Mo	DayPlan_Mon
OCITOutsationNr: Referenz auf den Tagesplan, der Montag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Mondays.
Tagesplan_Di	DayPlan_Tue
OCITOutsationNr: Referenz auf den Tagesplan, der Dienstag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Tuesdays.
Tagesplan_Mi	DayPlan_Wed
OCITOutsationNr: Referenz auf den Tagesplan, der Mittwoch verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Wednesdays.
Tagesplan_Do	DayPlan_Thu
OCITOutsationNr: Referenz auf den Tagesplan, der Donnerstag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Thursdays.
Tagesplan_Fr	DayPlan_Fri
OCITOutsationNr: Referenz auf den Tagesplan, der Freitag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Fridays.
Tagesplan_Sa	DayPlan_Sat
OCITOutsationNr: Referenz auf den Tagesplan, der Samstag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Saturdays.
Tagesplan_So	DayPlan_Sun
OCITOutsationNr: Referenz auf den Tagesplan, der Sonntag verwendet wird	OCITOutstationNo: Reference to the day plan to be used on Sundays.

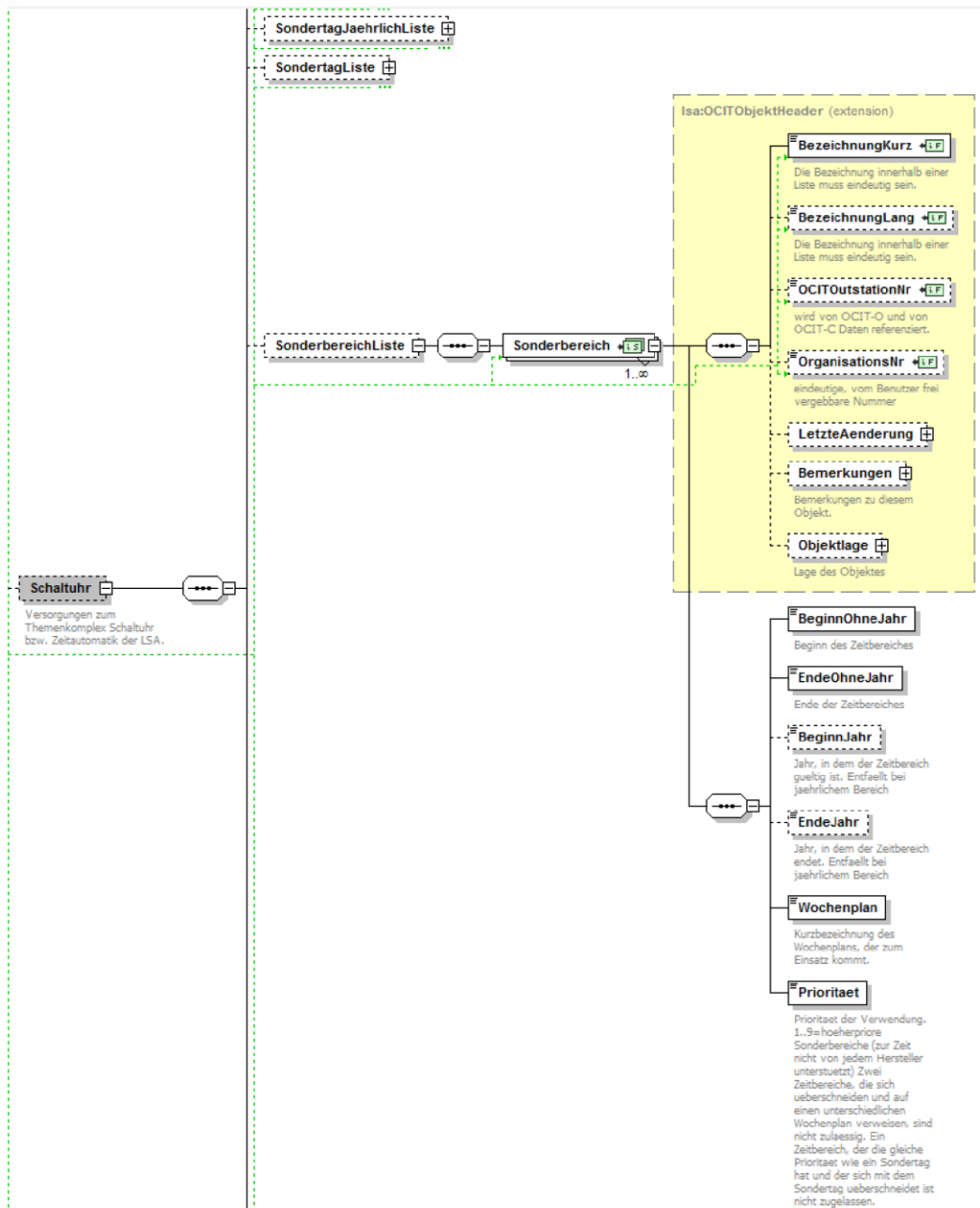
3.4.10.2 Special intervals

Special intervals are periods of time for which other week plans are activated. A special interval has a name and a time period. A time period can be once or valid for every year.

The priority specifies which priority the special interval takes when selecting the daily schedule.

To select the day plan, all special days and special intervals that apply for a day are used to determine the element with the highest priority. It is not permissible for a day to have two elements with the same priority level. If this should be the case, the selection of a day plan is manufacturer-specific. In any case, only one day plan is started.

The priority 1, i.e. the lowest priority is set by default. This priority is supported by all manufacturers. It is possible that manufacturers also support higher priorities.



Schaltuhr	Control clock
Versorgungen zum Themenkomplex Schaltuhr bzw. Zeitautomatik der LSA.	Supplies on the range of topics relating to the control clock or the automatic time function of

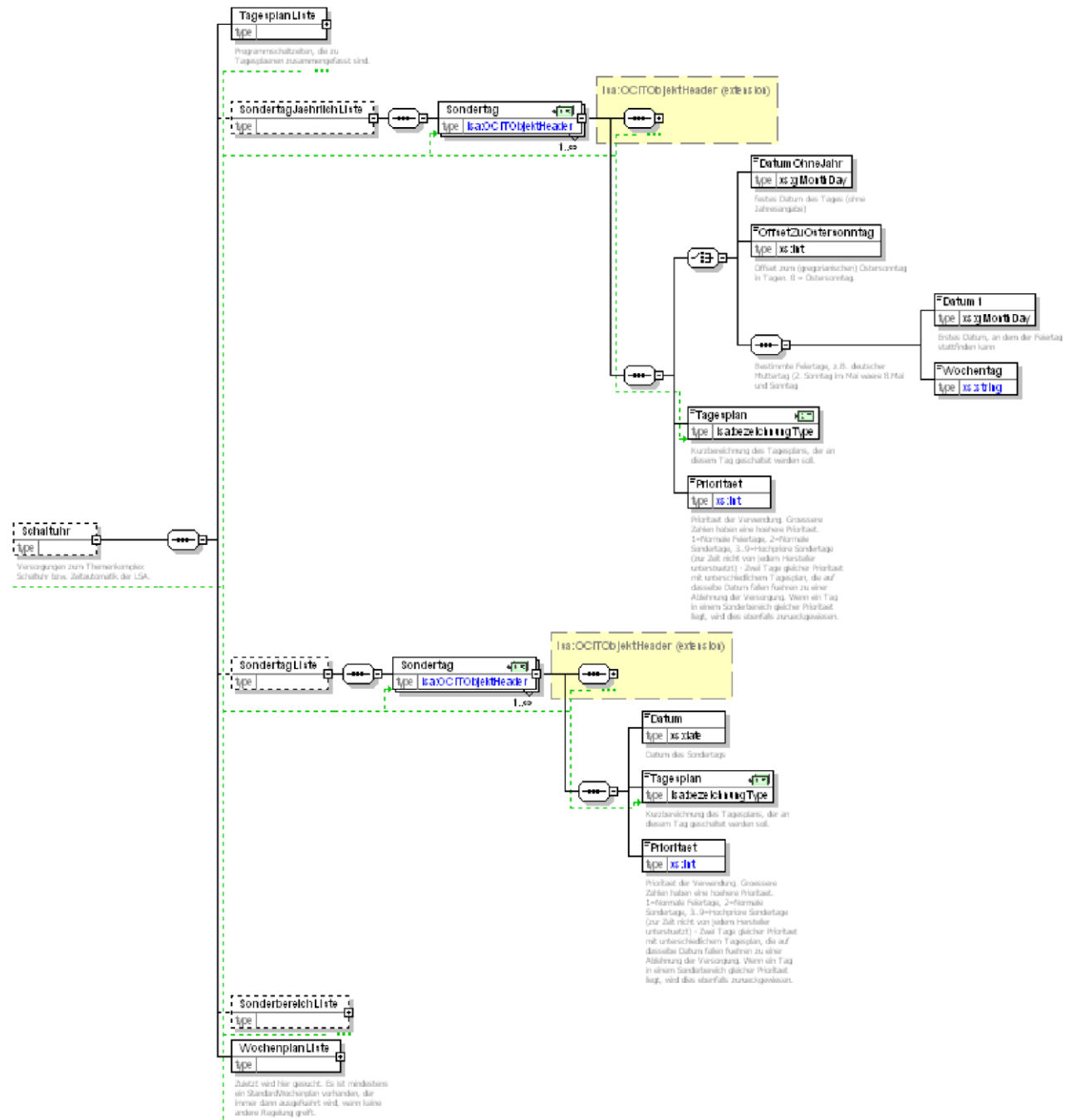
	the TSS.
SondertagJaehrlichListe	SpecialDayAnnualList
SondertagListe	SpecialDayList
SonderbereichListe	SpecialIntervalList
Sonderbereich	Special interval
Isa:OCITObjektHeader (extension)	tss:OCITObjektHeader (extension)
BezeichnungKurz	Short name
I F	I F
Die Bezeichnung innerhalb einer Liste muss eindeutig sein.	The name must be unique within a list.
BezeichnungLang	Long name
OCITOutstationNr	OCITOutstationNo
wird von OCIT-O und von OCIT-C Daten referenziert.	is referenced by OCIT-O and OCIT-C data.
OrganisationsNr	OrganisationsNo
eindeutige, vom Benutzer frei vergebbare Nummer	unique, number freely definable by the user
LetzteAenderung	LastChange
Bemerkungen	Comments
Bemerkungen zu diesem Objekt.	Comments on this object.
Objektlage	Object position
Lage des Objektes	Position of the object
BeginnOhneJahr	StartWithoutYear
Beginn des Zeitbereiches	Start of the time range
EndeOhneJahr	EndWithoutYear
Ende der Zeitbereiches	End of the time period
BeginnJahr	StartYear
Jahr, in dem der Zeitbereich gueltig ist. Entfaellt bei jaehrlichem Bereich	Year in which the time period is valid. Omitted from the yearly area
EndeJahr	EndYear
Jahr, in dem der Zeitbereich endet. Entfaellt bei jaehrlichem Bereich	Year in which the time period finishes. Omitted from the yearly area
Wochenplan	Week plan
Kurzbezeichnung des Wochenplans, der zum Einsatz kommt.	Name of the week plan to be used.
Prioritaet	Priority
Prioritaet der Verwendung. 1..9=hoeherpriore Sonderbereiche (zur Zeit nicht von jedem Hersteller unterstuetzt) Zwei Zeitbereiche, die sich ueberschneiden und auf einen unterschiedliehen Wochenplan verweisen, sind nicht zulaessig. Ein Zeitbereich, der die gleiche Prioritaet wie ein Sondertag hat und der sich mit dem Sondertag ueberschneidet ist nicht zugelassen.	Priority of the use. 1..9=higher priority special intervals (currently not supported by all manufacturers). Two time intervals, which overlap and refer to different week plans are not permitted. A time period which has the same priority as a special day and overlaps the special day is not permitted.

3.4.10.3 Special days

Special days are individual days on which special day plans are activated.

There are three ways to define a special day: On the one hand as a fixed date and the other as an offset for Easter, as makes sense for many church holidays, the third is as a fixed weekday after a certain date (i.e. third Wednesday in November or expressed otherwise: the next Wednesday after 15 November or Sunday after 27/11).

The priority is equivalent to the priority of the special days. The priorities 1 for normal holidays and 2 for special days are supported by all manufacturers. Other priorities up to 9 are possible on a manufacturer-specific basis. It also applies here that two entries which refer to the same day must have a different priority, otherwise the selection of the day plan is undefined.

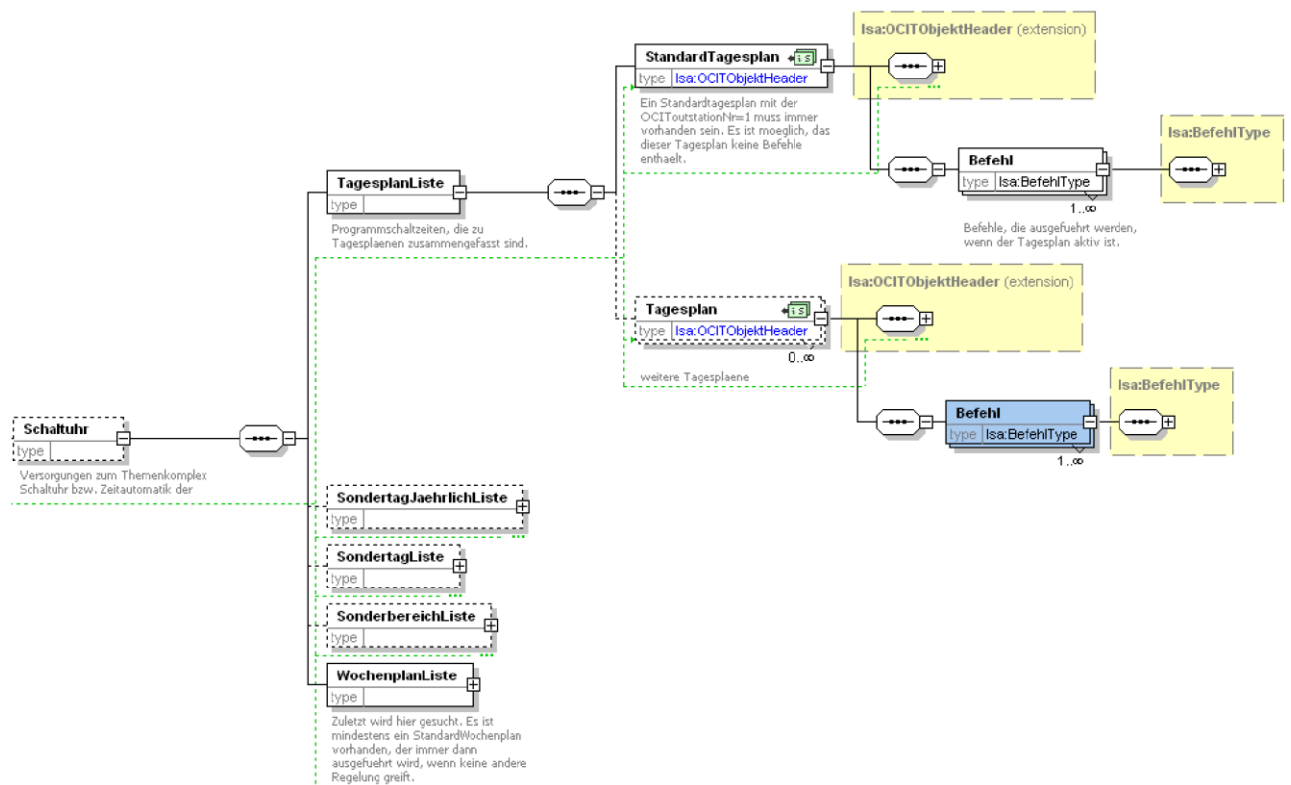


Schaltuhr type	Control clock type
Versorgungen zum Themenkomplex Schaltuhr bzw. Zelautomatik der LSA.	Supplies to the range of topics on the control clock or automatic time function of the TSS.
TagesplanListe	DayPlanList
Programmschaltzeiten, die zu Tagesplänen zusammengefasst sind.	Program switching times which are summarised into day plans.
SondertagJaehrlichListe	SpecialDayAnnualList

SondertagListe	SpecialDayList
SonderbereichListe	SpecialIntervalList
WochenplanListe	WeekPlanList
Zuletzt wird hier gesucht. Es ist mindestens ein StandardWochenplan vorhanden, der immer dann ausgeführt wird, wenn keine andere Regelung greift.	Here is the last place to search. There is at least one standard week plan present which is executed if no other control takes effect.
Sondertag	Special Day
Isa:OCITObjektHeader	tss:OCITObjectHeader
Isa:OCITObjektHeader (extension)	tss:OCITObjectHeader (extension)
DatumOhneJahr	DateWithoutYear
xs:[...]MonthDay	xs:[...]MonthDay
[illegible]	[illegible]
OffsetZuO[...]ersonntag	OffsetToE[...]sterSunday
xs:Int	xs:Int
[illegible]	[illegible]
[illegible]	[illegible]
Tagesplan	Day plan
Isa:[...]Type	Tss:[...]Type
Prioritaet	Priority
[illegible]	[illegible]
Datum	Date
xs:date	xs:date
Datum 1	Date 1
[illegible]	[illegible]
Wochentag	Day of the week
xs:string	xs:string

3.4.10.4 Day plans

Commands that are spread throughout the day are saved in day plans. At least a standard day plan must be present. At least one command must be defined for each day plan. The OCITOutstationNo of the standard day plan must always be 1.



Schaltuhr	Control clock
type	type
Versorgungsungen zum Themenkomplex Schaltuhr bzw. Zelautomatik der LSA.	Supplies to the range of topics on the control clock or automatic time function of the TSS.
TagesplanListe	DayPlanList
Programmschalzeiten, die zu Tagesplaenen zusammengefasst sind.	Program switching times which are summarised into day plans.
SondertagJaehrlichListe	SpecialDayAnnualList
SondertagListe	SpecialDayList
SonderbereichListe	SpecialIntervalList
WochenplanListe	WeekPlanList
Zuletzt wird hier gesucht. Es ist mindestens ein StandardWochenplan vorhanden, der immer dann ausgefuehrt wird, wenn keine andere Regelung greift.	Here is the last place to search. There is at least one standard week plan present which is executed if no other control takes effect.
StandardTagesplan	StandardDayPlan
Isa:OCITObjektHeader	tss:OCITObjectHeader
Ein StandardTagesplan mit der OCIToutstationNr=1 muss immer vorhanden sein. Es ist moeglich, das dieser Tagesplan keine Befehle enthaelt.	A standard day plan with the OCIToutstationNo.=1 must always be present. It is possible that this day plan does not contain any commands.
Tagesplan	Day plan
weitere Tagesplan	further day plans
Isa:OCITObjektHeader (extension)	tss:OCITObjectHeader (extension)
Befehl	Command
Isa: BefehlType	Tss: CommandTypes
Befehle, die ausgefuehrt werden, wenn der Tagesplan aktiv ist.	Commands that can be executed if the day plan is active.

3.4.10.4.1 Day plan command

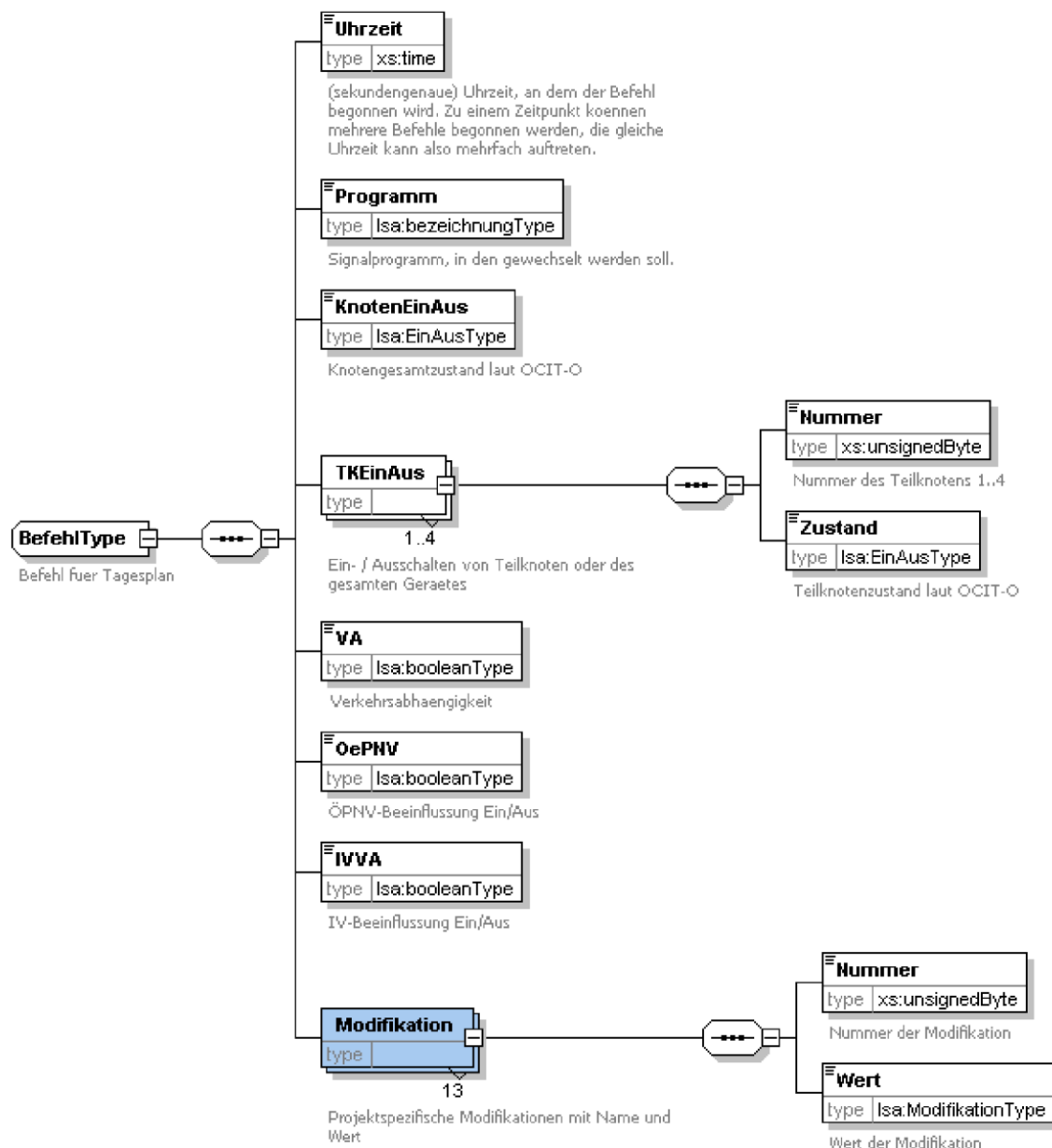
A day plan command consists of a point in time at which the command is started and the following switching options: Program, IntersectionOnOff, PartialIntersection OnOff (all available partial intersections must be specified for this), the TA modifications, PT and private transport actuation, as well as 13 project-specific modifications which must always be specified. If a modification is unknown, it is nevertheless entered with OFF.

It may be the case that the device as of OCIT-O V2.0 A04 acknowledge the command IntersectionOnOff=OffDefault using the actually activated intersection status OffFlashingSecondaryDirection, OffDark or OffFlashingAll.

In total, there are 16 modifications available. 3 modifications (TA, PT, IndividualTrafficOnOff) are already occupied; 13 modifications unoccupied for project-specific use via the control clock. This project-specific modifications each have a number within the range of 0 to 254. Occupancy recommendations are provided for 8 of them. They include the number and the name of the modification. Each project-specific modification can be turned On or Off.

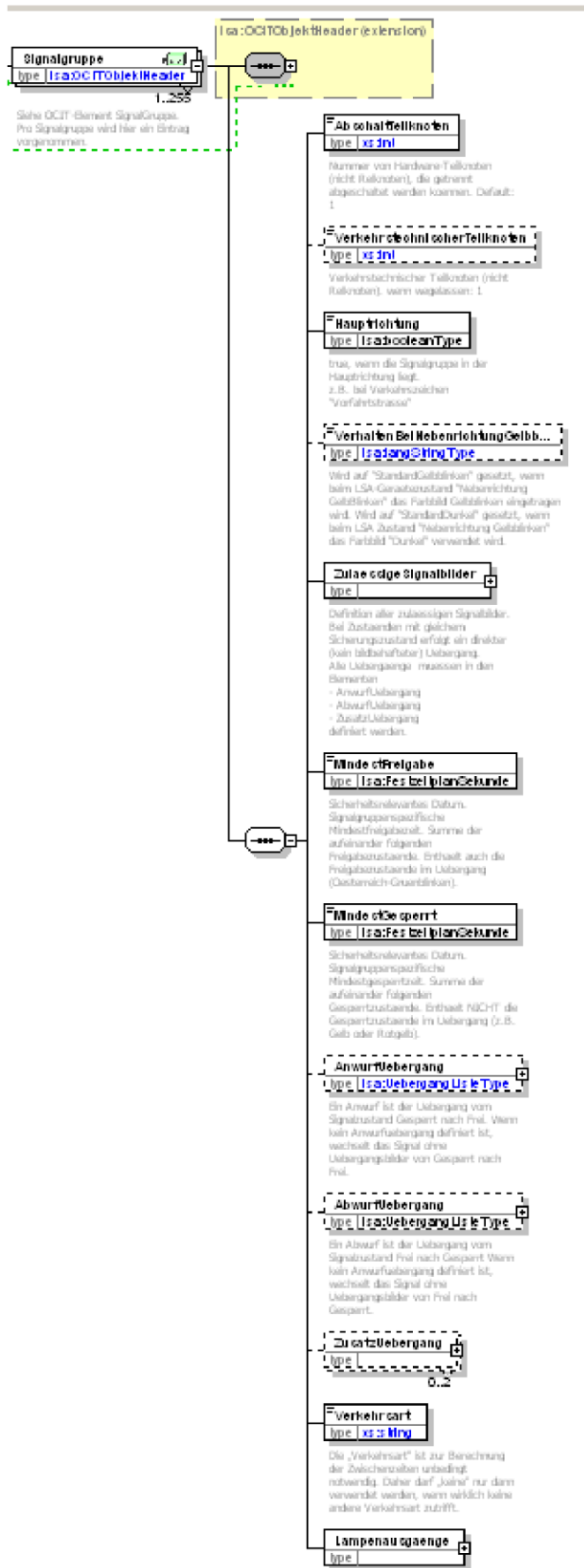
Note: The applications activated with the modifications are not standardized and must be agreed upon on a project-specific basis.

Project-specific modifications to the control clock (occupancy recommendations)		
No.	Name	Comment
1	Orientation tone for auditory assistance for the blind	
2	Green light tone for auditory assistance for the blind	
3	Detector monitoring	If multiple monitoring times—e.g. morning peak, afternoon peak, normal traffic, light traffic—are necessary, then still unoccupied project-specific modifications must be used for this.
4	Digital output A	Indication of the channel numbers and DigOutput: Get is not currently supported.
5	Digital output B	
6	Digital output C	
7	Digital output D	
8	TSS standby	For example, system off or all red.



BefehlType	CommandTypes
Befehl fuer Tagesplan	Command for day plan
Uhrzeit	Time
type	type
xs:time	xs:time
(sekundengenaue) Uhrzeit, an dem der Befehl begonnen wird. Zu einem Zeitpunkt koennen mehrere Befehle begonnen werden, die gleiche Uhrzeit kann also mehrfach auftreten.	(accurate-to-the-second) time at which the command is started. More than one command can be started at the same time, i.e. the same time may occur multiple times.
Programm	Program
Isa:bezeichnungType	tss:nameType
Signalprogramm, in den gewechselt werden soll.	Signal program to which it should be switched.
KnotenEinAus	IntersectionOnOff
Isa:EinAusType	Tss:OnOffTypes
Knotengesamtzustand laut OCIT-O	Overall intersection status as per OCIT-O
TKEinAus	PartialIntersectionOnOff
Ein- / Ausschalten von Teilknoten oder des gesamten Geraetes	Switching partial intersections or the entire device on/off
VA	VA
Isa:booleanType	tss:booleanType
Verkehrsabhaengigkeit	Traffic dependency
OePHV	OePHV
ÖPNV-Beeinflussung Ein/Aus	PT control system On/Off
IVVA	Private transport actuation
IV-Beeinflussung Ein/Aus	Private transport control system On/Off
Modifikation	Modification
Projektspezifische Modifikationen mit Name und Wert	Project-specific modifications with name and value
Nummer	Number
xs:unsignedByte	xs:unsignedByte
Nummer des Teilknotens 1..4	Number of the partial intersection 1 - 4
Zustand	Status
Teilknotenzustand laut OCIT-O	Partial intersection status according to OCIT-O
Nummer der Modifikation	Number of the modification
Wert	Value
Isa:ModifikationType	tss:ModificationType
Wert der Modifikation	Value of the modification

3.4.11 Signal group



Signalgruppe	Signal group
type	type

Isa:OCITObjektHeader	tss:OCITObjectHeader
[illegible]	[illegible]
Isa:OCITObjektHeader (extension)	tss:OCITObjectHeader (extension)
[illegible]	[illegible]
xs:Int	xs:Int
[...]Teilknoten	[...]PartialIntersections
[illegible]	[illegible]
[illegible]	[illegible]
Isa:[...]cleanType	Tss:[...]cleanTypes
[illegible]	[illegible]
Verhalten[...]	Behaviour[...]
Isa:[...]StringType	Tss:[...]StringTypes
[illegible]	[illegible]
[...]Signalbilder	[...]Signal aspects
[illegible]	[illegible]
[illegible]	[illegible]
Isa:[...]planSekunde	Tss:[...]planSecond
[illegible]	[illegible]
AnwurfUebergang	AnwurfUebergang
Isa: UebergangListeType	Tss: TransitionListTypes
[illegible]	[illegible]
AbwurfUebergang	AbwurfUebergang
[illegible]	[illegible]
[...]Uebergang	[...]Transition
[illegible]	[illegible]
Verkehrcart	Traffic cart
xs:[...]	xs:[...]
[illegible]	[illegible]
Lampenauegaenge	Lamp failures

All data necessary for the basic data supply are saved in the signal group. However, there is no explicit signal group type. The reason for this is that different signal group typologies have arisen historically which cannot be modelled directly on top of each other. For this reason, data from which it is possible to deduce all typing has been collected in place of a type. These are in particular:

- The standard green colour and the standard red colour,
- The Anwurf and Abwurf transitions
- The permissible signal aspects and
- The traffic type controlled by the signal group.

The manufacturer-specific typing is not saved. It can be supplied as a Nocit element on a manufacturer-specific basis.

The **SwitchOffPartialIntersections** specifies which signal groups can be switched off together without needing to switch off the entire intersection point. Warning: The SwitchOffPartialIntersections has nothing to do with the so-called "RelIntersections" from OCIT Outstations. The entire basic data supply of an intersection point belongs to such a "RelIntersection". Systems which don't recognise these partial intersections have a 1 here.

A **TrafficRelatedPartialIntersection** stipulates which signal groups belong together from a traffic perspective. If the value is not set, a value of 1 is assumed.

The "**BehaviourWhenSecondaryDirectionFlashingYellow**" is only relevant if the main direction has been set and can otherwise be left empty. If the value has been set, it may not be left empty by planning tools, even if the signal group is in the secondary direction, since

the value may be relevant for the signal group type.

In "**PermissibleSignalAspects**" all signal aspects that may be switched during normal operation are saved. Additionally, the two standard signal aspects of the Off-status are entered here. The structure will be described below in greater detail.

MinimumGreen and **MinimumRed** indicate the minimum times for the green and red statuses. These minimum times are also used in signal monitoring. The minimum green time specification also contains the green conditions of the transition (signal aspect is categorised under "free", "green flashing" would belong to MinimumGreen for example). The minimum red time specification however doesn't contain the red conditions of the transition (e.g. yellow or red yellow).

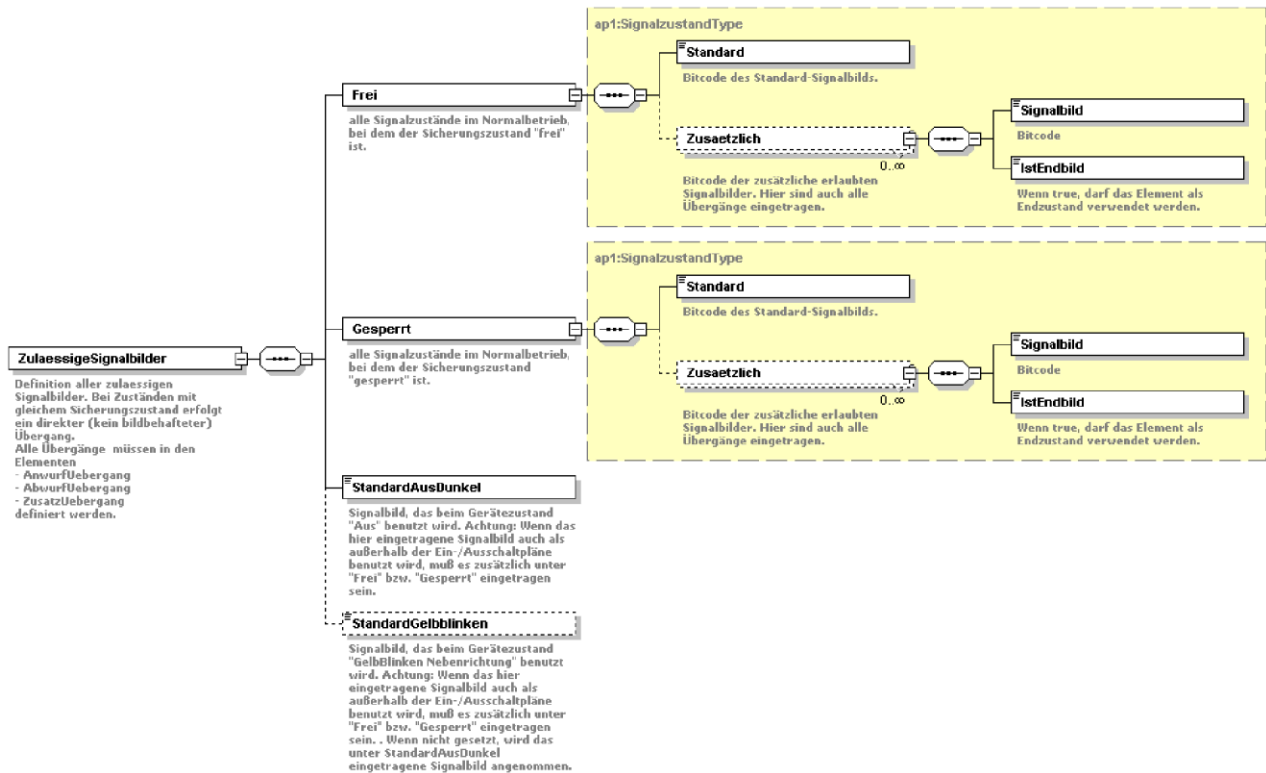
"**AnwurfUebergang**" and "**AbwurfUebergang**" contain the standard transitions in the Anwurf (red to green) or in the Abwurf (green to red). These transitions are always used, if no special transitions are specified. The transitions are made up of the signal colours and the fixed times. If a signal group for example is able to switch with 3 seconds yellow and alternatively with 4 seconds yellow, the normal transition (e.g. 3 seconds yellow) is entered as the AnwurfUebergang and the second transition as the AdditionalTransition (see below).

All transitions that are possible in addition to the AnwurfUebergang or AbwurfUebergang are entered as an "**AdditionalTransition**". This also applies for different colours as well as for different durations for which the colours are displayed. Transitions between a "green" and a "green" condition or transitions between a "red" and a "red" condition are not permitted.

The "**vehicle type**" is crucial for calculating the intergreen times. For this reason, "other" may only be used if absolutely no other vehicle type applies. Otherwise, a smooth exchange of data is not ensured. The follow vehicle types are permitted:

- Motor vehicle
- Bus
- Light-rail vehicle
- Bicycle
- Pedestrians
- Blind people
- None

3.4.11.1 Permitted signal aspects



ZulaessigeSignalbilder	PermittedSignalAspects
Definition aller zulaessigen Signalbilder. Bei Zuständen mit gleichem Sicherheitszustand erfolgt ein direkter (kein bildbehafteter) Übergang.	Definition of all permitted signal aspects. A direct (not pictorial) transition occurs for conditions with the same safety condition. All transitions must be defined in the elements - AnwurfÜebergang - AbwurfÜebergang - AdditionalTransition defined.
Alle Übergänge müssen in den Elementen	Blank
AnwurfÜebergang	all signal statuses in normal operation, in which the safety status is "green".
AbwurfÜebergang	Locked
ZusatzÜebergang definiert werden.	all signal statuses in normal operation, in which the safety status is "red".
Frei	StandardOffDark
alle Signalzustände im Normalbetrieb, bei dem der Sicherheitszustand "frei" ist.	Signal aspect that is used when the device is "off". Warning: If the signal aspect entered here is also used outside the switch on/off plans, it must also be entered under "green" or "red".
Gesperrt	StandardYellowFlashing
alle Signalzustände im Normalbetrieb, bei dem der Sicherheitszustand "gesperrt" ist.	Signal aspect that is used when the device is "FlashingYellow secondary direction". Warning: If the signal aspect entered here is also used outside the switch on/off plans, it must also be entered under "green" or "red". If not set, the signal aspect entered under StandardOffDark will be assumed.
StandardAusDunkel	ap1:SignalStatusType
Signalbild, das beim Gerätezustand "Aus" benutzt wird. Achtung: Wenn das hier	Standard

eingetragene Signalbild auch als außerhalb der Ein-/Ausschaltpläne benutzt wird, muß es zusätzlich unter "Frei" bzw. "Gesperrt" eingetragen sein.	
StandardGelbblinken	Bitcode of the standard signal aspect.
Signalbild, das beim Gerätezustand "GelbBlinken Nebenrichtung" benutzt wird. Achtung: Wenn das hier eingetragene Signalbild auch als außerhalb der Ein-/Ausschaltpläne benutzt wird, muß es zusätzlich unter "Frei" bzw. "Gesperrt" eingetragen sein. . Wenn nicht gesetzt, wird das unter StandardAusDunkel eingetragene Signalbild angenommen.	Additional
ap1:SignalzustandType	Bitcode of the additionally permitted signal aspects. All transitions are also entered here.
Standard	Signal aspect
Bitcode des Standard Signalbilds.	Bitcode
Zusaetzlich	ActualEndPattern
Bitcode der zusätzliche erlaubten Signalbilder. Hier sind auch alle Übergänge eingetragen.	If true, the element may be used as the end status.

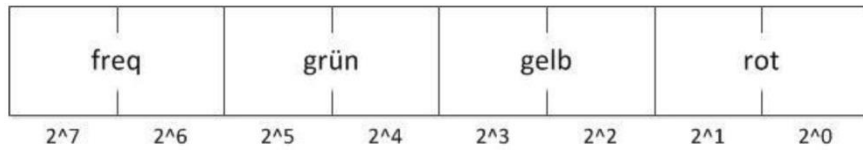
The permitted signal aspects contain all signal aspects, which can be displayed by the signal group, as well as the two signal aspects for the off-status. This also applies for pure transition signal aspects, such as: "RedYellow"

The standardisation only contains models of the "green" and "red" traffic safety conditions, which are also used for intergreen time controls and offset time controls. The current version does not have further modelling of traffic conditions.

Some signal aspects, such as: "Dark" can indicate both "green"and "red", depending on the signal aspect on a different signal group. It must therefore be watched out for that the traffic conditions "green" and "red" must be set accordingly.

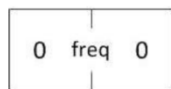
3.4.11.2 Bitcode

The bitcode is defined in OCIT-O and is encoded using hexadecimal coding.

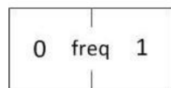


freq	freq
grün	green
gelb	yellow
rot	red

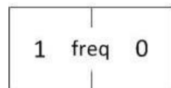
Frequency



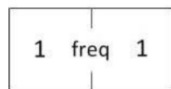
1 Hz



2 Hz

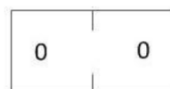


(reserviert)



(reserviert)

RED, YELLOW, GREEN



Dunkel



Blinken
(Anfang Dunkel)



Blinken
(Anfang Hell)



Hell

freq	freq
(reserviert)	(reserved)
Dunkel	Off
Blinken (Anfang Dunkel)	Flashing (begins off)
Blinken (Anfang Hell)	Flashing (begins on)
Hell	on

Complete table of signal images:

Name	Description	Value
off	off	0
roT1Hz	red_flashing_start_dark 1Hz	1
ROt1Hz	red_flashing_start_bright 1Hz	2
red	red	3
geLB1Hz	yellow_flashing_start_dark 1Hz	4
roTgeLB1Hz	red_flashing_start_dark yellow_flashing_start_dark 1Hz	5

ROtgeLB1Hz	red_flashing_start_bright yellow_flashing_start_dark 1Hz	6
rotgeLB1Hz	red yellow_flashing_start_dark 1Hz	7
GEIb1Hz	yellow_flashing_start_bright 1Hz	8
roTGEIb1Hz	red_flashing_start_dark yellow_flashing_start_bright 1Hz	9
ROtGEIb1Hz	red_flashing_start_bright yellow_flashing_start_bright 1Hz	10
rotGEIb1Hz	red yellow_flashing_start_bright 1Hz	11
yellow	yellow	12
roTgelb1Hz	red_flashing_start_dark yellow 1Hz	13
ROtgelb1Hz	red_flashing_start_bright yellow 1Hz	14
redyellow	red yellow	15
grUEN1Hz	green_flashing_start_dark 1Hz	16
roTgrUEN1Hz	red_flashing_start_dark green_flashing_start_dark 1Hz	17
ROtgrUEN1Hz	red_flashing_start_bright green_flashing_start_dark 1Hz	18
rotgrUEN1Hz	red green_flashing_start_dark 1Hz	19
geLBgrUEN1Hz	yellow_flashing_start_dark green_flashing_start_dark 1Hz	20
roTgeLBgrUEN1Hz	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_dark 1Hz	21
ROtgeLBgrUEN1Hz	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_dark 1Hz	22
rotgeLBgrUEN1Hz	red yellow_flashing_start_dark green_flashing_start_dark 1Hz	23
GEIbgrUEN1Hz	yellow_flashing_start_bright green_flashing_start_dark 1Hz	24
roTGEIbgrUEN1Hz	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_dark 1Hz	25
ROtGEIbgrUEN1Hz	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_dark 1Hz	26
rotGEIbgrUEN1Hz	red yellow_flashing_start_bright green_flashing_start_dark 1Hz	27
gelbgrUEN1Hz	yellow green_flashing_start_dark 1Hz	28
roTgelbgrUEN1Hz	red_flashing_start_dark_yellow	29

	green_flashing_start_dark 1Hz	
ROtgelbgrUEN1Hz	red_flashing_start_bright yellow green_flashing_start_dark 1Hz	30
rotgelbgrUEN1Hz	red yellow green_flashing_start_dark 1Hz	31
GRuen1Hz	green_flashing_start_bright 1Hz	32
roTGRuen1Hz	red_flashing_start_dark green_flashing_start_bright 1Hz	33
ROtGRuen1Hz	red_flashing_start_bright green_flashing_start_bright 1Hz	34
rotGRuen1Hz	red green_flashing_start_bright 1Hz	35
geLBGRuen1Hz	yellow_flashing_start_dark green_flashing_start_bright 1Hz	36
roTgeLBGRuen1Hz	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_bright 1Hz	37
ROtgeLBGRuen1Hz	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_bright 1Hz	38
rotgeLBGRuen1Hz	red yellow_flashing_start_dark green_flashing_start_bright 1Hz	39
GEIbGRuen1Hz	yellow_flashing_start_bright green_flashing_start_bright 1Hz	40
roTGEIbGRuen1Hz	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_bright 1Hz	41
ROtGEIbGRuen1Hz	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_bright 1Hz	42
rotGEIbGRuen1Hz	red yellow_flashing_start_bright green_flashing_start_bright 1Hz	43
gelbGRuen1Hz	yellow green_flashing_start_bright 1Hz	44
roTgelbGRuen1Hz	red_flashing_start_dark yellow green_flashing_start_bright 1Hz	45
ROtgelbGRuen1Hz	red_flashing_start_bright yellow green_flashing_start_bright 1Hz	46
rotgelbGRuen1Hz	red yellow green_flashing_start_bright 1Hz	47
green	green	48
roTgruen1Hz	red_flashing_start_dark green 1Hz	49
ROtgruen1Hz	red_flashing_start_bright green 1Hz	50
rotgruen	red green	51

geLBgruen1Hz	yellow_flashing_start_dark green 1Hz	52
roTgeLBgruen1Hz	red flashing start dark yellow flashing start dark green 1 Hz	53
ROtgeLBgruen1Hz	red flashing start bright yellow flashing start dark green 1 Hz	54
rotgeLBgruen1Hz	red yellow_flashing_start_dark green 1Hz	55
GEIbgruen1Hz	yellow_flashing_start_bright green 1Hz	56
roTGEIbgruen1Hz	red_flashing_start_dark yellow_flashing_start_bright green 1Hz	57
ROtGEIbgruen1Hz	red_flashing_start_bright yellow_flashing_start_bright green 1Hz	58
rotGEIbgruen1Hz	red yellow_flashing_start_bright green 1Hz	59
gelbgruen	yellow green	60
roTgelbgruen1Hz	red_flashing_start_dark yellow green 1Hz	61
ROtgelbgruen1Hz	red_flashing_start_bright yellow green 1Hz	62
rotgelbgruen	red yellow green	63
dunkel2Hz	dark 2Hz	64
roT2Hz	red_flashing_start_dark 2Hz	65
ROt2Hz	red_flashing_start_bright 2Hz	66
rot2Hz	red 2Hz	67
geLB2Hz	yellow_flashing_start_dark 2Hz	68
roTgeLB2Hz	red_flashing_start_dark yellow_flashing_start_dark 2Hz	69
ROtgeLB2Hz	red_flashing_start_bright yellow_flashing_start_dark 2Hz	70
rotgeLB2Hz	red yellow_flashing_start_dark 2Hz	71
GEIb2Hz	yellow_flashing_start_bright 2Hz	72
roTGEIb2Hz	red_flashing_start_dark yellow_flashing_start_bright 2Hz	73
ROtGEIb2Hz	red_flashing_start_bright yellow_flashing_start_bright 2Hz	74
rotGEIb2Hz	red yellow_flashing_start_bright 2Hz	75
gelb2Hz	yellow 2 Hz	76
roTgelb2Hz	red_flashing_start_dark yellow 2Hz	77

ROtgelb2Hz	red_flashing_start_bright yellow 2Hz	78
rotgelb2Hz	red yellow 2Hz	79
grUEN2Hz	green_flashing_start_dark 2Hz	80
roTgrUEN2Hz	red_flashing_start_dark green_flashing_start_dark 2Hz	81
ROtgrUEN2Hz	red_flashing_start_bright green_flashing_start_dark 2Hz	82
rotgrUEN2Hz	red green_flashing_start_dark 2Hz	83
geLBgrUEN2Hz	yellow_flashing_start_dark green_flashing_start_dark 2Hz	84
roTgeLBgrUEN2Hz	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_dark 2Hz	85
ROtgeLBgrUEN2Hz	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_dark 2Hz	86
rotgeLBgrUEN2Hz	red yellow_flashing_start_dark green_flashing_start_dark 2Hz	87
GEIbgrUEN2Hz	yellow_flashing_start_bright green_flashing_start_dark 2Hz	88
roTGEIbgrUEN2Hz	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_dark 2Hz	89
ROtGEIbgrUEN2Hz	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_dark 2 Hz	90
rotGEIbgrUEN2Hz	red yellow_flashing_start_bright green_flashing_start_dark 2Hz	91
gelbgrUEN2Hz	yellow green_flashing_start_dark 2Hz	92
roTgelbgrUEN2Hz	red_flashing_start_dark yellow green_flashing_start_dark 2Hz	93
ROtgelbgrUEN2Hz	red_flashing_start_bright yellow green_flashing_start_dark 2Hz	94
rotgelbgrUEN2Hz	red yellow green_flashing_start_dark 2Hz	95
GRuen2Hz	green_flashing_start_bright 2Hz	96
roTGRuen2Hz	red_flashing_start_dark green_flashing_start_bright 2Hz	97
ROtGRuen2Hz	red_flashing_start_bright green_flashing_start_bright 2Hz	98
rotGRuen2Hz	red green_flashing_start_bright 2Hz	99
geLBGRuen2Hz	yellow_flashing_start_dark green_flashing_start_bright 2Hz	100

roTgeLBGRuen2Hz	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_bright 2Hz	101
ROtgeLBGRuen2Hz	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_bright 2Hz	102
rotgeLBGRuen2Hz	red yellow_flashing_start_dark green_flashing_start_bright 2Hz	103
GEIbGRuen2Hz	yellow_flashing_start_bright green_flashing_start_bright 2Hz	104
roTGEIbGRuen2Hz	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_bright 2Hz	105
ROtGEIbGRuen2Hz	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_bright 2Hz	106
rotGEIbGRuen2Hz	red yellow_flashing_start_bright green_flashing_start_bright 2Hz	107
gelbGRuen2Hz	yellow green_flashing_start_bright 2Hz	108
roTgelbGRuen2Hz	red_flashing_start_dark yellow green_flashing_start_bright 2Hz	109
ROtgelbGRuen2Hz	red_flashing_start_bright yellow green_flashing_start_bright 2Hz	110
rotgelbGRuen2Hz	red yellow green_flashing_start_bright 2Hz	111
gruen2Hz	green 2Hz	112
roTgruen2Hz	red_flashing_start_dark green 2Hz	113
ROtgruen2Hz	red_flashing_start_bright green 2Hz	114
rotgruen2Hz	red green 2Hz	115
geLBgruen2Hz	yellow_flashing_start_dark green 2Hz	116
roTgeLBgruen2Hz	red_flashing_start_dark yellow_flashing_start_dark green 2Hz	117
ROtgeLBgruen2Hz	red_flashing_start_bright yellow_flashing_start_dark green 2Hz	118
rotgeLBgruen2Hz	red yellow_flashing_start_dark green 2Hz	119
GEIbgruen2Hz	yellow_flashing_start_bright green 2Hz	120
roTGEIbgruen2Hz	red_flashing_start_dark yellow_flashing_start_bright green 2Hz	121
ROtGEIbgruen2Hz	red_flashing_start_bright yellow_flashing_start_bright green 2Hz	122
rotGEIbgruen2Hz	red yellow_flashing_start_bright green 2Hz	123

gelbgruen2Hz	yellow green 2Hz	124
roTgelbgruen2Hz	red_flashing_start_dark yellow green 2Hz	125
ROtgelbgruen2Hz	red_flashing_start_bright yellow green 2Hz	126
rotgelbgruen2Hz	red yellow green 2Hz	127
dunkel1R	dark reserved_1	128
roT1R	red_flashing_start_dark reserved_1	129
ROt1R	red_flashing_start_bright reserved_1	130
rot1 R	red reserved_1	131
geLB1R	yellow_flashing_start_dark reserved_1	132
roTgeLB1 R	red_flashing_start_dark green_flashing_start_dark reserved_1	133
ROtgeLB1R	red_flashing_start_bright yellow_flashing_start_dark reserved_1	134
rotgeLB1R	red yellow_flashing_start_dark reserved_1	135
GEIb1R	yellow_flashing_start_bright reserved_1	136
roTGEIb1R	red_flashing_start_dark yellow_flashing_start_bright reserved_1	137
ROtGEIb1R	red_flashing_start_bright yellow_flashing_start_bright reserved_1	138
rotGEIb1R	red yellow_flashing_start_bright reserved_1	139
gelb1R	yellow reserved_1	140
roTgelb1R	red_flashing_start_dark yellow reserved_1	141
ROtgelb1R	red_flashing_start_bright yellow reserved_1	142
rotgelb1R	red yellow reserved_1	143
grUEN1R	green_flashing_start_dark reserved_1	144
roTgrUEN1R	red_flashing_start_dark green_flashing_start_dark reserved_1	145
ROtgrUEN1R	red_flashing_start_bright green_flashing_start_dark reserved_1	146
rotgrUEN1R	red green_flashing_start_dark reserved_1	147
geLBgrUEN1R	yellow_flashing_start_dark green_flashing_start_dark reserved_1	148
roTgeLBgrUEN1R	red_flashing_start_dark yellow_flashing_start_dark	149

	green_flashing_start_dark reserved_1	
ROtgeLBgrUEN1R	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_dark reserved_1	150
rotgeLBgrUEN1R	red yellow_flashing_start_dark green_flashing_start_dark reserved_1	151
GEIbgrUEN1R	yellow_flashing_start_bright green_flashing_start_dark reserved_1	152
roTGEIbgrUEN1R	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_dark reserved_1	153
ROtGEIbgrUEN1R	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_dark reserved_1	154
rotGEIbgrUEN1R	red yellow_flashing_start_bright green_flashing_start_dark reserved_1	155
gelbgrUEN1R	yellow green_flashing_start_dark reserved_1	156
roTgelbgrUEN1R	red_flashing_start_dark yellow green_flashing_start_dark reserved_1	157
ROtgelbgrUEN1R	red_flashing_start_bright yellow green_flashing_start_dark reserved_1	158
rotgelbgrUEN1R	red yellow green_flashing_start_dark reserved_1	159
GRuen1R	green_flashing_start_bright reserved_1	160
roTGRuen1R	red_flashing_start_dark green_flashing_start_bright reserved_1	161
ROtGRuen1R	red_flashing_start_bright green_flashing_start_bright reserved_1	162
rotGRuen1R	red green_flashing_start_bright reserved_1	163
geLBGRuen1R	yellow_flashing_start_dark green_flashing_start_bright reserved_1	164
roTgeLBGRuen1R	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_bright reserved_1	165
ROtgeLBGRuen1R	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_bright reserved_1	166
rotgeLBGRuen1R	red yellow_flashing_start_dark green_flashing_start_bright reserved_1	167
GEIbGRuen1R	yellow_flashing_start_bright green_flashing_start_bright reserved_1	168
roTGEIbGRuen1R	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_bright reserved_1	169

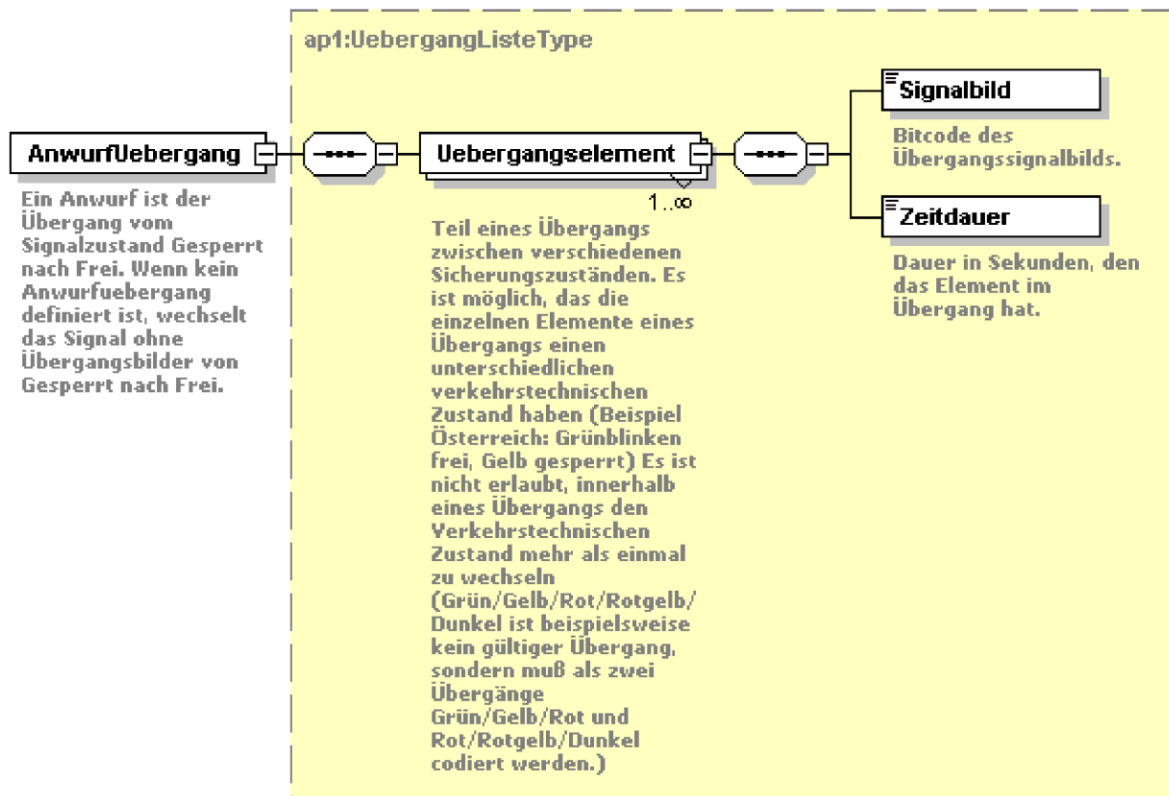
ROtGEIbGRuen1R	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_bright reserved_1	170
rotGEIbGRuen1R	red yellow_flashing_start_bright green_flashing_start_bright reserved_1	171
gelbGRuen1R	yellow green_flashing_start_bright reserved_1	172
roTgelbGRuen1R	red_flashing_start_dark yellow green_flashing_start_bright reserved_1	173
ROtgelbGRuen1R	red_flashing_start_bright yellow green_flashing_start_bright reserved_1	174
rotgelbGRuen1R	red yellow green_flashing_start_bright reserved_1	175
gruen1R	green reserved_1	176
roTgruen1R	red_flashing_start_dark green reserved_1	177
ROtgruen1R	red_flashing_start_bright green reserved_1	178
rotgruen1R	red green reserved_1	179
geLBgruen1R	yellow_flashing_start_dark green reserved_1	180
roTgeLBgruen1R	red_flashing_start_dark yellow_flashing_start_dark green reserved_1	181
ROtgeLBgruen1R	red_flashing_start_bright green_flashing_start_dark reserved_1	182
rotgeLBgruen1R	red yellow_flashing_start_dark green reserved_1	183
GEIbgruen1R	yellow_flashing_start_bright green reserved_1	184
roTGEIbgruen1R	red_flashing_start_dark yellow_flashing_start_bright green reserved_1	185
ROtGEIbgruen1R	red_flashing_start_bright yellow_flashing_start_bright green reserved_1	186
rotGEIbgruen1R	red yellow_flashing_start_bright green reserved_1	187
gelbgruen1R	yellow green reserved_1	188
roTgelbgruen1R	red_flashing_start_dark yellow green reserved_1	189
ROtgelbgruen1R	red_flashing_start_bright yellow green reserved_1	190
rotgelbgruen1R	red yellow green reserved_1	191
dunkel2R	dark reserved_2	192
roT2R	red_flashing_start_dark reserved_2	193
ROt2R	red_flashing_start_bright reserved_2	194

rot2R	red reserved_2	195
geLB2R	yellow_flashing_start_dark reserved_2	196
roTgeLB2R	red_flashing_start_bright green_flashing_start_dark reserved_2	197
ROtgeLB2R	red_flashing_start_bright yellow_flashing_start_dark reserved_2	198
rotgeLB2R	red yellow_flashing_start_dark reserved_2	199
GEIb2R	yellow_flashing_start_bright reserved_2	200
roTGEIb2R	red_flashing_start_dark yellow_flashing_start_bright reserved_2	201
ROtGEIb2R	red_flashing_start_bright yellow_flashing_start_bright reserved_2	202
rotGEIb2R	red yellow_flashing_start_bright reserved_2	203
gelb2R	yellow reserved_2	204
roTgelb2R	red_flashing_start_dark yellow reserved_2	205
ROtgelb2R	red_flashing_start_bright yellow reserved_2	206
rotgelb2R	red yellow reserved_2	207
grUEN2R	green_flashing_start_dark reserved_2	208
roTgrUEN2R	red_flashing_start_dark green_flashing_start_dark reserved_2	209
ROtgrUEN2R	red_flashing_start_bright green_flashing_start_dark reserved_2	210
rotgrUEN2R	red green_flashing_start_dark reserved_2	211
geLBgrUEN2R	yellow_flashing_start_dark green_flashing_start_dark reserved_2	212
roTgeLBgrUEN2R	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_dark reserved_2	213
ROtgeLBgrUEN2R	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_dark reserved_2	214
rotgeLBgrUEN2R	red yellow_flashing_start_dark green_flashing_start_dark reserved_2	215
GEIbgrUEN2R	yellow_flashing_start_bright green_flashing_start_dark reserved_2	216
roTGEIbgrUEN2R	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_dark reserved_2	217

ROtGEIbgrUEN2R	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_dark reserved_2	218
rotGEIbgrUEN2R	red yellow_flashing_start_bright green_flashing_start_dark reserved_2	219
gelbgrUEN2R	yellow green_flashing_start_dark reserved_2	220
roTgelbgrUEN2R	red_flashing_start_dark yellow green_flashing_start_dark reserved_2	221
ROtgelbgrUEN2R	red_flashing_start_bright yellow green_flashing_start_dark reserved_2	222
rotgelbgrUEN2R	red yellow green_flashing_start_dark reserved_2	223
GRuen2R	green_flashing_start_bright reserved_2	224
roTGRuen2R	red_flashing_start_dark green_flashing_start_bright reserved_2	225
ROtGRuen2R	red_flashing_start_bright green_flashing_start_bright reserved_2	226
rotGRuen2R	red green_flashing_start_bright reserved_2	227
geLBGRuen2R	yellow_flashing_start_dark green_flashing_start_bright reserved_2	228
roTgeLBGRuen2R	red_flashing_start_dark yellow_flashing_start_dark green_flashing_start_bright reserved_2	229
ROtgeLBGRuen2R	red_flashing_start_bright yellow_flashing_start_dark green_flashing_start_bright reserved_2	230
rotgeLBGRuen2R	red yellow_flashing_start_dark green_flashing_start_bright reserved_2	231
GEIbGRuen2R	yellow_flashing_start_bright green_flashing_start_bright reserved_2	232
roTGEIbGRuen2R	red_flashing_start_dark yellow_flashing_start_bright green_flashing_start_bright reserved_2	233
ROtGEIbGRuen2R	red_flashing_start_bright yellow_flashing_start_bright green_flashing_start_bright reserved_2	234
rotGEIbGRuen2R	red yellow_flashing_start_bright green_flashing_start_bright reserved_2	235
gelbGRuen2R	yellow green_flashing_start_bright reserved_2	236
roTgelbGRuen2R	red_flashing_start_dark yellow green_flashing_start_bright reserved_2	237
ROtgelbGRuen2R	red_flashing_start_bright yellow green_flashing_start_bright reserved_2	238

rotgelbGRuen2R	red yellow green_flashing_start_bright reserved_2	239
gruen2R	green reserved_2	240
roTgruen2R	red_flashing_start_dark green reserved_2	241
ROtgruen2R	red_flashing_start_bright green reserved_2	242
rotgruen2R	red green reserved_2	243
geLBgruen2R	yellow_flashing_start_dark green reserved_2	244
roTgeLBgruen2R	red_flashing_start_dark yellow_flashing_start_dark green reserved_2	245
ROtgeLBgruen2R	red_flashing_start_bright green_flashing_start_dark reserved_2	246
rotgeLBgruen2R	red yellow_flashing_start_dark green reserved_2	247
GEIbgruen2R	yellow_flashing_start_bright green reserved_2	248
roTGEIbgruen2R	red_flashing_start_dark yellow_flashing_start_bright green reserved_2	249
ROtGEIbgruen2R	red_flashing_start_bright yellow_flashing_start_bright green reserved_2	250
rotGEIbgruen2R	red yellow_flashing_start_bright green reserved_2	251
gelbgruen2R	yellow green reserved_2	252
roTgelbgruen2R	red_flashing_start_dark yellow green reserved_2	253
ROtgelbgruen2R	red_flashing_start_bright yellow green reserved_2	254
rotgelbgruen2R	red yellow green reserved_2	255

3.4.11.3 An- und Abwurfübergang



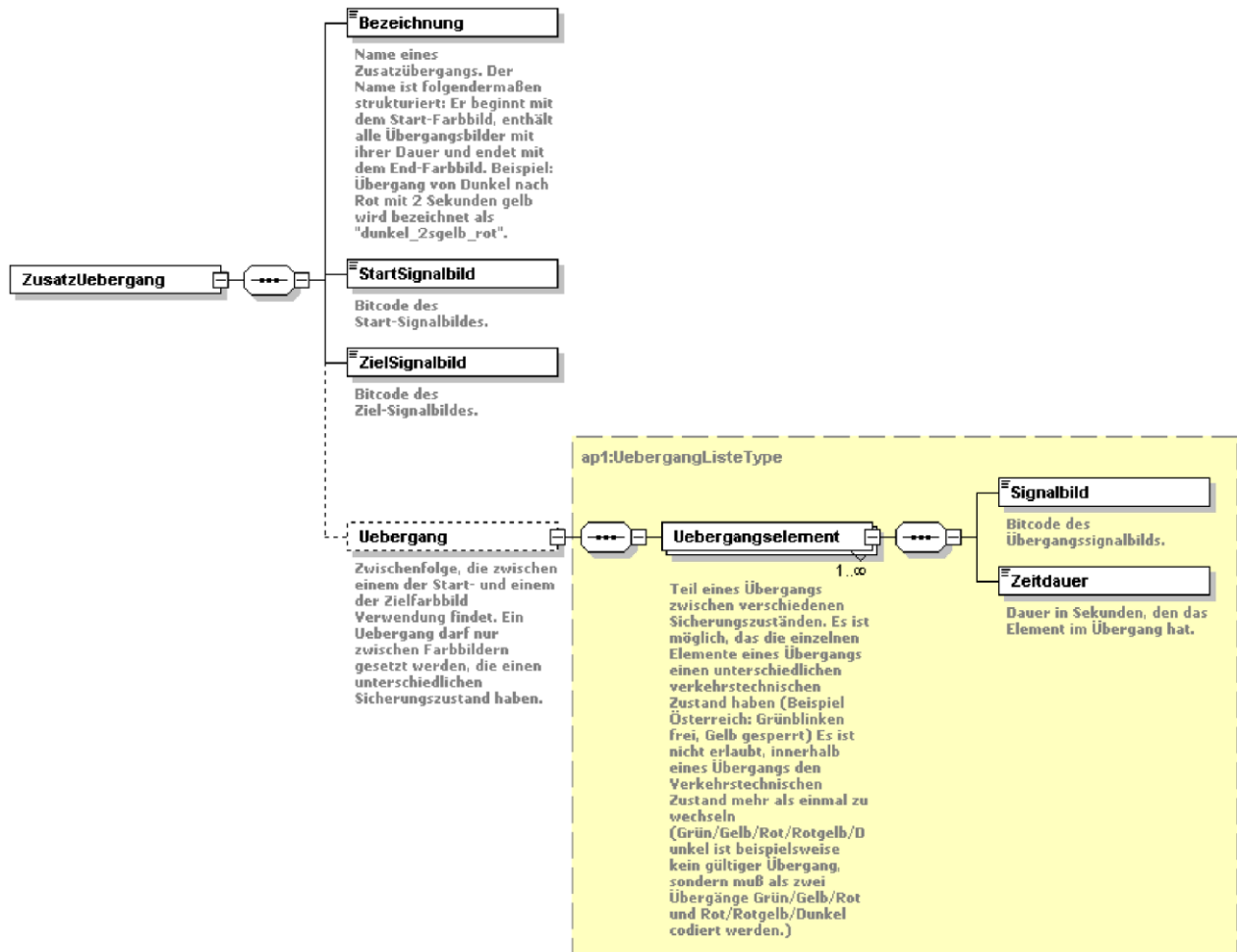
AnwurfUebergang	AnwurfUebergang
Ein Anwurf ist der Übergang vom Signalzustand Gesperrt nach Frei. Wenn kein Anwurfuebergang definiert ist, wechselt das Signal ohne Übergangsbilder von Gesperrt nach Frei.	An Anwurf is the signal status transition from red to green. If no AnwurfUebergang is defined, the signal changes from red to green without a transition pattern.
ap1:UebergangListeType	ap1:TransitionListType
Uebergangselement	Transition element
Teil eines Übergangs zwischen verschiedenen Sicherungszuständen. Es ist möglich, das die einzelnen Elemente eines Übergangs einen unterschiedlichen verkehrstechnischen Zustand haben (Beispiel Österreich: Grünblinken Frei, Gelb gesperrt) Es ist nicht erlaubt, innerhalb eines Übergangs den Verkehrstechnischen Zustand mehr als einmal zu wechseln (Grün/Gelb/Rot/Rotgelb/Dunkel ist beispielsweise kein gültiger Übergang, sondern muß als zwei Übergänge Grün/Gelb/Rot und Rot/Rotgelb/Dunkel codiert werden.)	Part of a transition between different safety conditions. It is possible that the individual elements of a transition may have different traffic conditions (i.e. Austria: green flashing go, yellow stop) It is not permissible to change the traffic condition more than once within a transition (green/yellow/red/redyellow/dark for example is not a valid transition, rather it must be encoded as two transitions green/yellow/red and red/redyellow/dark).
Signalbild	Signal aspect
Bitcode des Übergangssignalbilds.	Bitcode of the transition signal aspect.
Zeitdauer	Duration
Dauer in Sekunden, den das Element im Übergang hat.	Duration that the element has in the transition in seconds.

The An- and Abwurfübergang have the same structure. It comprises a list of signal aspects which are switched for a certain time. The sequence of the signal aspects in the transition element list corresponds to the time sequence of the switching of the signal aspects. It is

possible that individual elements of the transition have a different safety condition than others. In the **Abwurfübergang**, the first signal aspect with the safety condition "green" may only be followed by signal aspects with the safety condition "green". In the **Abwurfübergang** instead, after the first signal aspect with the safety condition "red", it may only be followed by signal aspects with the safety condition "red". All signal aspects must also be entered as permissible signal aspects.

The time duration is specified in the transition. A transition with the same signal aspects but other time durations must be entered separately as an additional transition.

3.4.11.4 AdditionalTransition



Zusatzuebergang	AdditionalTransition
Bezeichnung	Name
Name eines Zusatzuebergangs. Der Name ist folgendermaßen strukturiert: Er beginnt mit dem Start-Farbbild, enthält alle Übergangsbilder mit ihrer Dauer und endet mit dem End-Farbbild. Beispiel: Übergang von Dunkel nach Rot mit 2 Sekunden gelb wird bezeichnet als "dunkel_2sgelb_rot".	Name of the additional transition. The name is structured as follows: It starts with the start colour pattern, contains all transition patterns with their duration and ends with the end colour pattern. Example: Transition from dark to red with 2 seconds yellow is labelled as "dunkel_2sgelb_rot".
StartSignalbild	StartSignalAspect
Bitcode des Start-Signalbildes.	Bitcode of the start signal aspect.
ZielSignalbild	TargetSignalAspect
Bitcode des Ziel-Signalbildes.	Bitcode of the target signal aspect
uebergang	Transition
Zwischenfolge, die zwischen einem der Start- und einem der Zielfarbbild Verwendung findet. Ein uebergang darf nur zwischen Farbbildern gesetzt werden, die einen unterschiedlichen Sicherungszustand haben.	Intergreen sequence, which is used between a start and a target colour pattern. A transition may only be placed between colour patterns which have different safety conditions.
ap1:uebergangListeType	ap1:TransitionListType
uebergangselement	Transition element
Teil eines uebergangs zwischen verschiedenen Sicherungszuständen. Es ist möglich, das die einzelnen Elemente eines	Part of a transition between different safety conditions. It is possible that the individual elements of a transition may have different

Übergangs einen unterschiedlichen verkehrstechnischen Zustand haben (Beispiel Österreich: Grünblinken Frei, Gelb gesperrt) Es ist nicht erlaubt, innerhalb eines Übergangs den Verkehrstechnischen Zustand mehr als einmal zu wechseln (Grün/Gelb/Rot/Rotgelb/Dunkel ist beispielsweise kein gültiger Übergang, sondern muß als zwei Übergänge Grün/Gelb/Rot und Rot/Rotgelb/Dunkel codiert werden.)	traffic conditions (i.e. Austria: green flashing go, yellow stop) It is not permissible to change the traffic condition more than once within a transition (green/yellow/red/redyellow/dark for example is not a valid transition, rather it must be encoded as two transitions green/yellow/red and red/redyellow/dark).
Signalbild	Signal aspect
Bitcode des Übergangssignalbilds.	Bitcode of the transition signal aspect.
Zeitdauer	Duration
Dauer in Sekunden, den das Element im Übergang hat.	Duration that the element has in the transition in seconds.

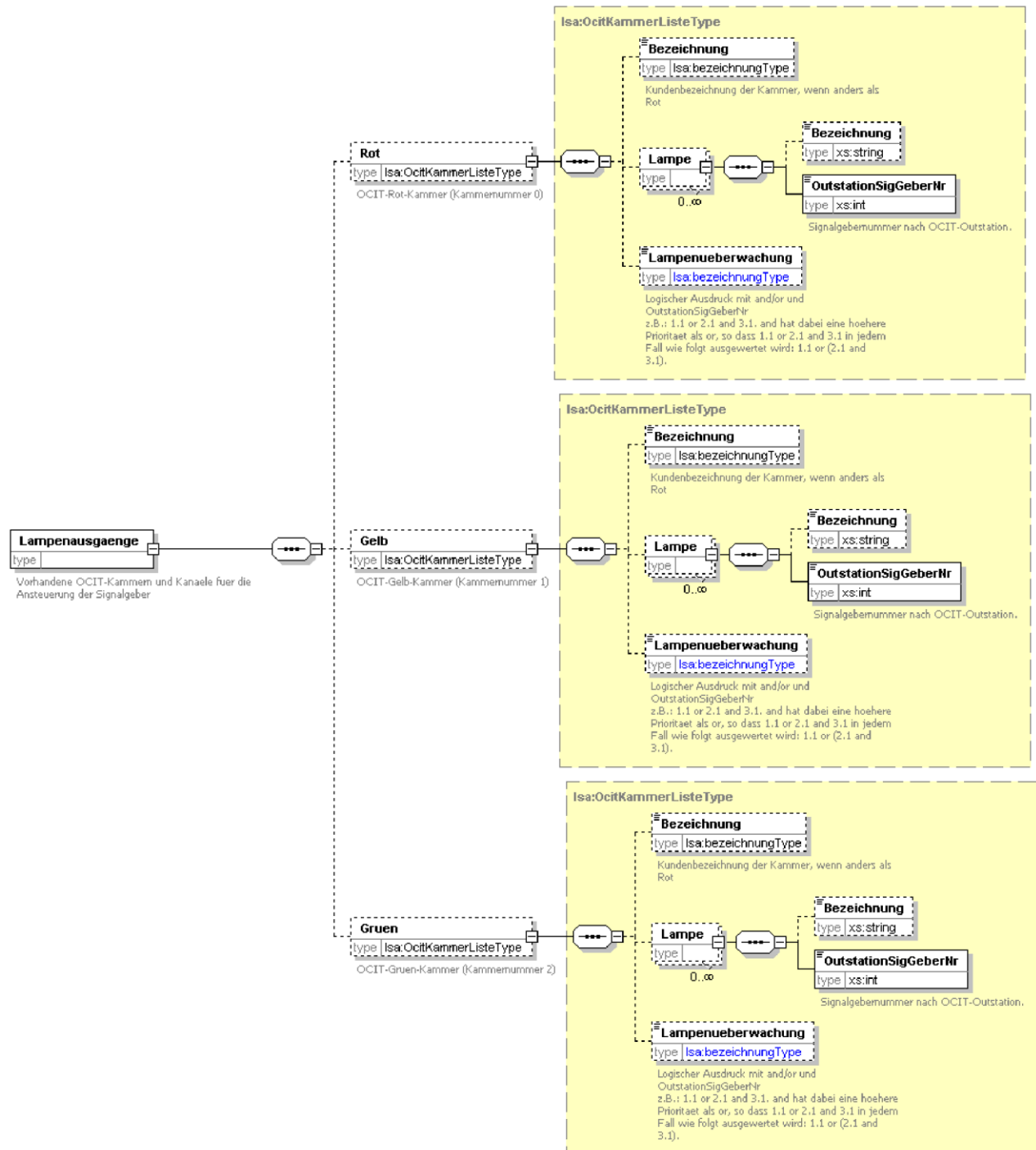
An additional transition is always defined between two exact signal aspects. The transition itself is structured like the Anwurf and the Abwurfübergang.

By specifying the start and target signal aspect, it is ensured that the transition is uniquely assigned to precisely this pair. Should there be a transition in particular which contains the same transition elements, but is generated with a differing start or target aspect, a new transition must be defined.

The naming of the additional transition is also standardised, to make the format easier to read. The name is composed of the bit code of the start-signal patten, the names of all the transition-signal patterns including duration and the end-signal pattern.

A 3 sec "yellow" in a transition from "green" to "red" can for example be given the name "gmen_3sgelb_rot". Alternatively, the bitcode can be used in place of the symbolic name, however the symbolic name is preferred.

3.4.11.5 Lamp outputs



Lampenausgaenge	Lamp outputs
type	type
Vorhandene OCIT-Kammern und Kanäle fuer die Ansteuerung der Signalgeber	Available OCIT chamber and channels for controlling the signal head
Rot	Red
Isa:OcitKammerListeType	tss:OcitChamberListType
OCIT-Rot-Kammer (Kammernummer 0)	OCIT red chamber (chamber number 0)
Gelb	Yellow
OCIT-Gelb-Kammer (Kammernummer 1)	OCIT yellow chamber (chamber number 1)
Gruen	Green

OCIT-Gruen-Kammer (Kammernummer 2)	OCIT green chamber (chamber number 2)
Isa:OcCitKammerListeType	tss:OcCitChamberListType
Bezeichnung	Name
Isa:bezeichnungType	tss:nameType
Kundenbezeichnung der Kammer, wenn andere als Rot	Client's name for the chamber if other than red
Lampe	Lamp
Lampenueberwachung	Lamp monitoring
Logischer Ausdruck mit and/or und OutstationSigGeberNr	Logical expression with and/or and OutstationSigHeadNo e.g. 1.1 or 2.1 and 3.1. and had a higher priority than or; so that 1.1 or 2.1 and 3.1 in any case can be evaluated as follows: 1.1 or (2.1 and 3.1).
z.B.: 1.1 or 2.1 and 3.1. and hat dabei eine hoehere Prioritaet als or, so dass 1.1 or 2.1 and 3.1 in jedem Fall wie Folgt ausgewertet wird: 1.1 or (2.1 and 3.1).	Name
Bezeichnung	xs:string
xs:string	OutstationSigHeadNo
OutstationSigGeberNr	xs:int
xs:int	Signal head number going by OCIT Outstation.

All signal heads can be described for the lamp outputs. As OCIT only supports signal heads with a max. 3 chambers, these are entered here as "red" (chamber number 0), "yellow" (chamber number 1) and "green" (chamber number 2). One name can be supplied per chamber, if the signal group doesn't have the standard names "red", "yellow", or "green". Additionally, the corresponding chambers of the signal head are entered under "lamp". A signal group for example with the chambers "red" and "green", as well as five signal heads has five "lamp" entries each under red and green. The OCIT Outstations parameter signal head no. is entered for each entry.

The lamp monitoring only allows chambers of the same type to be jointly monitored. These are saved as a formula in the lamp monitoring. Each chamber is specified by the combination of signal head no. / chamber no., separated by a point and can be combined using "and" and "or". In this case, "and" takes priority over "or".

Example:

Logical expression: 1.1 or 2.1 and 3.1 is evaluated as 1.1 or (2.1 and 3.1).

If the chamber 1.1 or both chambers 2.1 and 3.1 fail, the lamp monitoring responds.

"2.1" in this case means: OCIT signal head number + 2, OCIT chamber no. = 1.

3.4.11.6 Special cases

The following special cases are generated as follows in the data model:

The PT 4 point signal is implemented using three signal groups with the colour codes red, green, yellow.

The hop light (or "jump light" as well) is implemented like an indicator with the colour code wbl_rotgruen.

3.4.12 Signal program

The signal program includes all signal programs used (not only the fixed time programs). The switch on and switch off programs are modelled separately and described further below. For traffic-actuated programs, the headers must be filled out in any case.

If the signal program does not relate to the standard intergreen and/or offset time matrix, another matrix can be entered here.

If the signal program relates to the standard intergreen time matrix, the entry must be left empty.

This also applies to traffic-actuated minimum times. A reference to a minimum times list for traffic can be specified for greens and reds. These minimum times however must be equal to or greater than the minimum safety time. It is also possible to specify a stage sequence plan which relates to the signal program.

Important references and the essential times are entered into the header row. The OCIT Outstations number entered in the signal program is the program number. There is no further mapping here.

Only a synchronisation time is possible. Further (manufacturer-specific) times such as the advance points, Sumi and stretch areas available in Siemens are defined as Nocit objects.

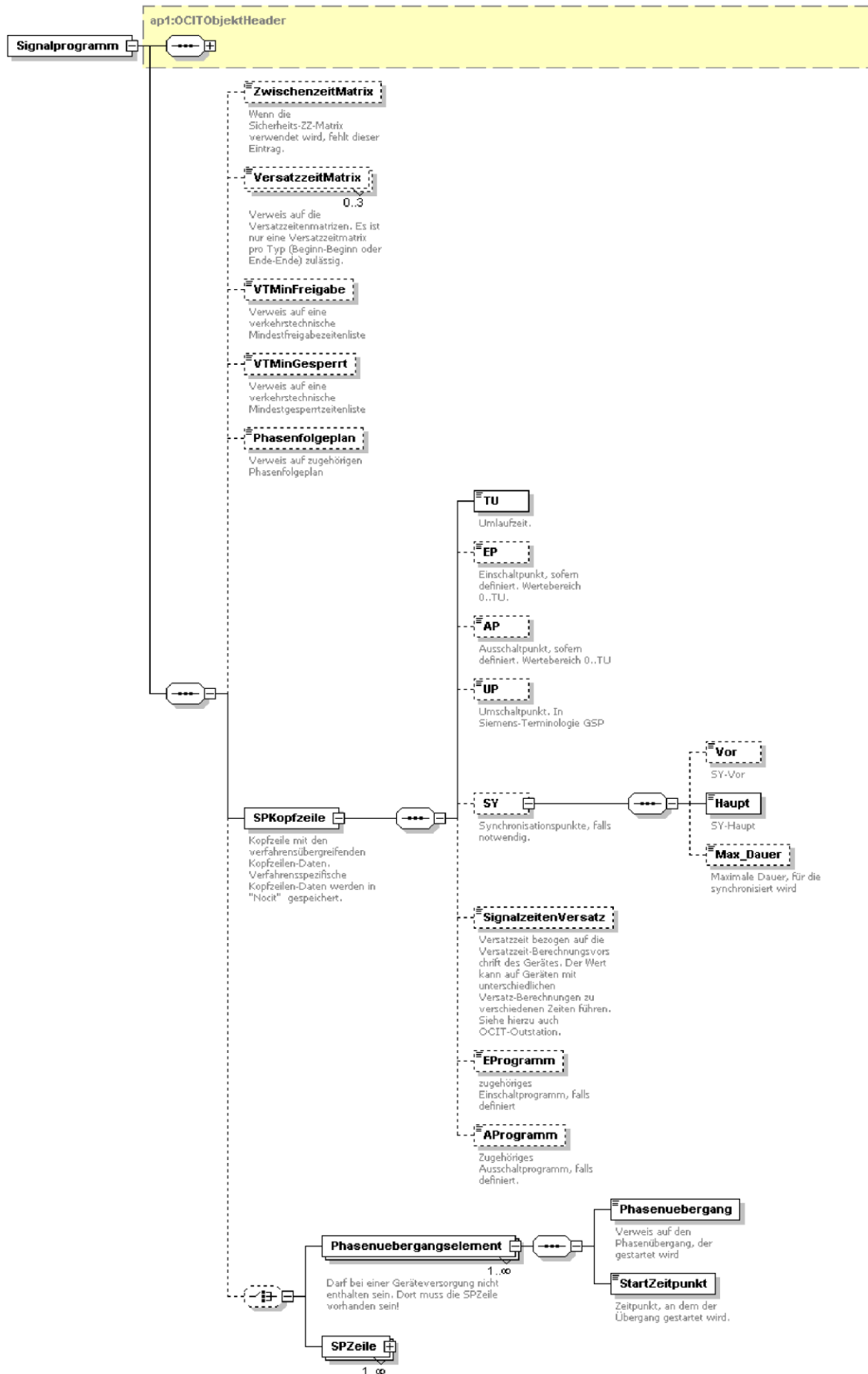
It is possible to specify switch on and switch off programs, through which the device should switch this plan on or off. These programs use the name.

The times within the signal plan are notated from 0 to T_U-1 , like in the planning tools. In these, the time T_U corresponds to the OCIT Outstation time 0, since 0 and T_U coincide. The count always starts at 0 (e.g. a new year starts at 0 seconds).

Times in the sub-second range, which cannot be activated by a device, are rounded up.

The content of the signal program can alternatively be specified as a consequence of stage transitions at certain points in time or as the switching operation itself. The name of the stage transition is also specified as the stage transition. Warning: The data with the stage transitions start with the time 0, not 1. For a controller supply, a signal program must not contain any stage transition elements, rather it must include SP rows.

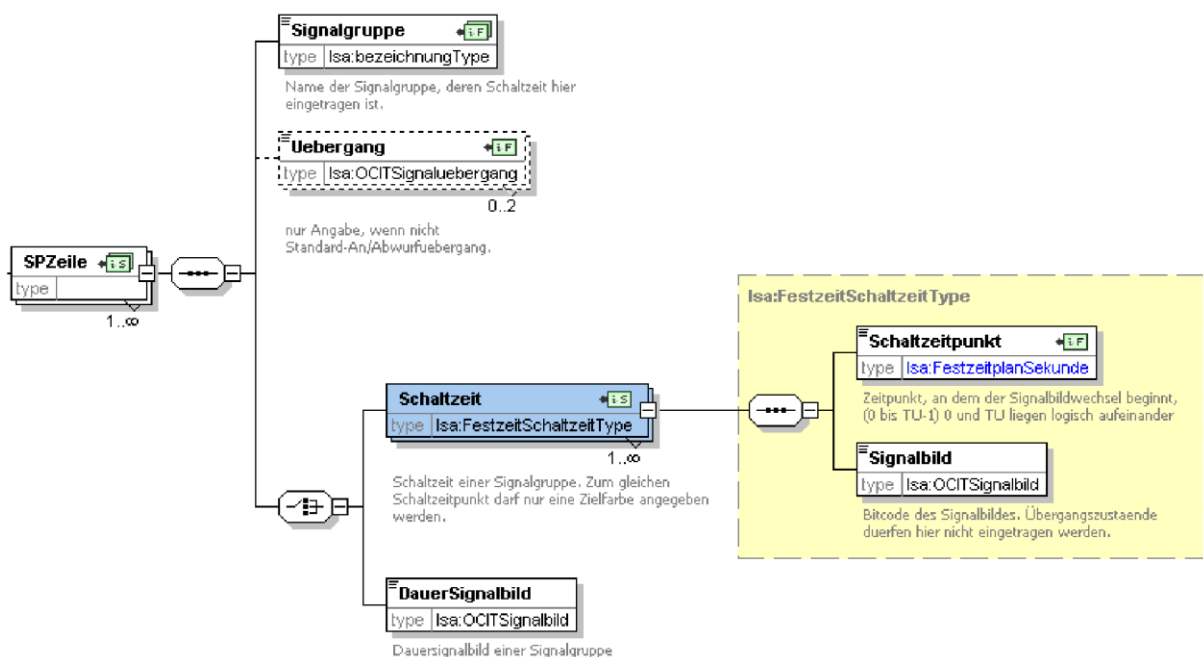
In the case of a controller supply, the signal program list must contain at least one element. It doesn't matter if it is a switch on, switch off, or a signal program.



Signalprogramm	Signal program
ap1:OCITObjektHeader	ap1:OCITObjectHeader
ZwischenzeitMatrix	Intergreen time matrix
Wenn die Sicherheits-ZZ-Matrix verwendet wird, fehlt dieser Eintrag.	If the safety IGT matrix is used, this entry is omitted.
VersatzzeitMatrix	Offset time matrix
Verweis auf die Versatzzeitenmatrizen. Es ist nur eine Versatzzeitmatrix pro Typ (Beginn-Beginn oder Ende-Ende) zulässig.	Reference to the offset time matrices. Only one offset time matrix is permitted per type (start-start or end-end).
VTMinFreigabe	VTMinGreen
Verweis auf eine verkehrstechnische Mindestfreigabezeitenliste	Reference to a traffic-related minimum green times list
VTMinGesperrt	VTMinRed
Verweis auf eine verkehrstechnische Mindestgesperrtzeitenliste	Reference to a traffic-related minimum red times list
Phasenfolgeplan	Stage sequence plan
Verweis auf zugehörigen Phasenfolgeplan	Reference to associated stage sequence plan
SPKopfzeile	SPHeader
Kopfzeile mit den verfahrensübergreifenden Kopfzeilen-Daten. Verfahrensspezifische Kopfzeilen-Daten werden in "Nocit" gespeichert.	Header with the overarching-procedure header data. Traffic-specific header data are saved under "Nocit".
Phasenubergangselement	Stage transition element
Darf bei einer Geräteversorgung nicht enthalten sein. Dort muss die SPZeile vorhanden sein!	May not be included in a device supply. The SPLines must be present there!
SPZeile	SPLine:
Phasenubergang	Stage transition
Verweis auf den Phasenübergang, der	Reference to the stage transition, which
StartZeitpunkt	StartTime
Zeitpunkt, an dem der Übergang gestartet wird.	Time at which the transition starts.
TU	TU
Umlaufzeit.	Cycle time.
EP	EP
Einschaltpunkt, sofern definiert. Wertebereich 0..TU.	Switch-on point, if defined. Value range 0 - TU.
AP	AP
Ausschaltpunkt, sofern definiert. Wertebereich 0..TU	Switch-off point, if defined. Value range 0 - TU.
UP	UP
Umschaltpunkt. In Siemens-Terminologie GSP	Transition point. In Siemens terminology BPS
SY	SY
Synchronisationspunkte, falls notwendig.	Synchronisation points, if necessary.
SignalzeitenVersatz	SignalTimesOffset
Versatzzeit bezogen auf die Versatzzeit-Berechnungsvorschrift des Gerätes. Der Wert kann auf Geräten mit unterschiedlichen Versatz-Berechnungen zu verschiedenen Zeiten Führen. Siehe hierzu auch OCIT-Outstation.	Offset time in relation to the offset time calculation provision of the controller. The value can lead to different times on controllers with different offset calculations. See also OCIT Outstation.
EProgramm	EProgram

zugehöriges Einschaltprogramm, falls definiert	associated switch-on program, if defined
AProgramm	AProgram
Zugehöriges Ausschaltprogramm, falls definiert.	Associated switch-on program, if defined.
Vor	Pre-
SY-Vor	SY-pre
Haupt	Main
SY-Haupt	SY-main
Max_Dauer	Max_duration
Maximale Dauer, Für die synchronisiert wird	Maximum duration for which is synchronised

3.4.12.1 Signal program line



SPZeile	SPLine:
i S	i S
type	type
Signalgruppe	Signal group
i F	i F
Isa:bezeichnungType	tss:nameType
Name der Signalgruppe, deren Schaltzeit hier eingetragen ist.	Name of the signal group, whose switching time is entered here.
Uebergang	Transition
Isa:OCITSignaluebergang	Tss:OCITSignalTransition
nur Angabe, wenn nicht Standard-An/Abwurfuebergang.	only an indication, if not a standard An/Abwurfuebergang.
Schaltzeit	SwitchTime
Isa:FestzeitSchaltzeitType	Tss:FixedTimeSwitchedTimeType
Schaltzeit einer Signalgruppe. Zum gleichen Schaltzeitpunkt darf nur eine Zielfarbe angegeben werden.	Switch time of a signal group. Only one target colour can be specified at the same switch time.
DauerSignalbild	ContinuousSignalAspect
Isa:OCITSignalbild	tss:OCITSignalAspect

Dauersignalbild einer Signalgruppe	Continuous signal aspect of a signal group
Schaltzeitpunkt	SwitchTime
Isa:FestzeitplanSekunde	Tss:FixedTimePlanSecond
Zeitpunkt, an dem der Signalbildwechsel beginnt, (0 bis TU-1) 0 und TU liegen logisch aufeinander	Time at which the signal aspect change starts (0 to TU-1) 0 and TU are located next to each other logically.
Signalbild	Signal aspect
Bitcode des Signalbildes. Übergangszustände dürfen hier nicht eingetragen werden.	Bitcode of the signal aspect. Transition statuses may not be entered here.

The actual switching operations are specified for each signal group. A maximum of one line per each signal group may be specified. The behaviour of the traffic signal controller is not determined in the standard, if it doesn't contain a signal group.

No transition signal aspects are entered as signal aspects, rather only the end status, which it should switch to. Example: A signal group has a yellow time of 3s and a redyellow time of 1s. When entered as a switch time:

- Switch time: 10 / signal aspect: green (hexadecimal code:30)
- Switch time: 40 / signal aspect: red (hexadecimal code:03)

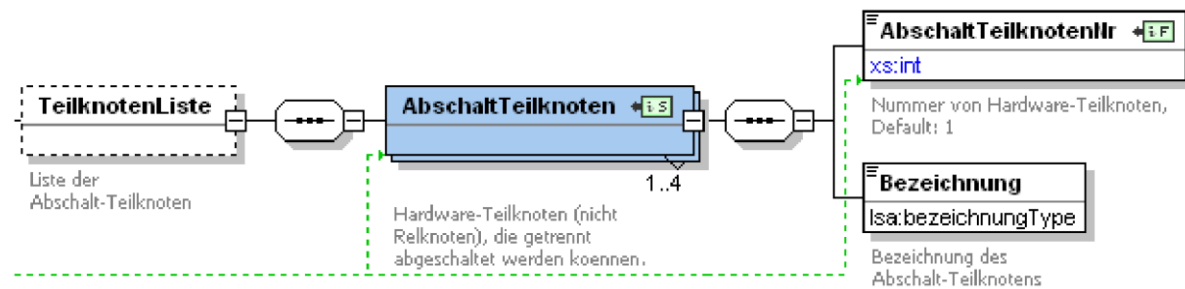
the signal group ($T_U = 90$) responds as follows:

- Time: 10s → Switch from red to red-yellow
- Time: 11s → Switch from red-yellow to green
- Time: 40s → Switch from green to yellow
- Time: 43s → Switch from yellow to red.

If the standard Anwurf and Abwurfübergang is not to be used here, it is necessary to enter which "transition" elements should be used. Only one "transition" element may be specified between two signal aspects. No "transition" element is permitted between two signal aspects of the same safety condition.

Continuous aspects should be entered as a ContinuousSignalAspect. There is the option of only specifying one switch time per signal group, if for example another switching operation should be carried out via a logic (which is not defined in the standard).

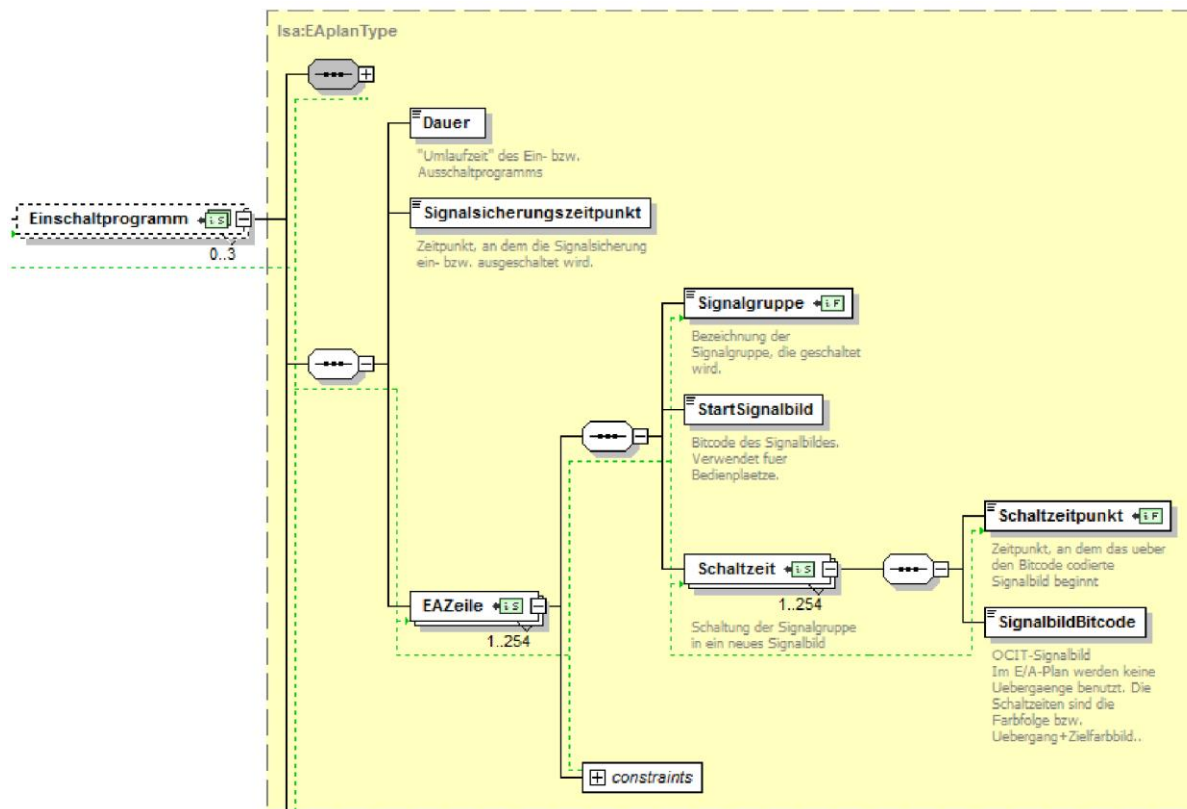
3.4.13 Partial intersections



TeilknotenListe	PartialIntersectionList
Liste der Abschalt-Teilnoten	List of the switch off partial intersections
AbschaltTeilnoten	SwitchOffPartialIntersection
i S	i S
Hardware-Teilnoten (nicht Relknoten), die getrennt abgeschaltet werden koennen.	Hardware partial intersections (not RelIntersections), which can be switched off separately.
AbschaltTeilnotenNr	SwitchOffPartialIntersectionNo
i F	i F
xs:int	xs:int
Nummer von Hardware-Teilnoten, Default: 1	Number of hardware partial intersections, default: 1
Bezeichnung	Name
Isa:bezeichnungType	tss:nameType
Bezeichnung des Abschalt-Teilknotens	Name of the switch off partial intersection

The partial intersection list lists partial intersections which can be switched off separately from one another. In the signal group list, this list is referenced via the partial intersection number.

3.4.14 Switch on and off program



Einschaltprogramm	Switch on plan
i S	i S
Isa:EAplanType	tss:EAplanType
Dauer	Duration
"Umlaufzeit" des Ein- bzw. Ausschaltprogramms	"Cycle time" of the switch on or off program
Signalsicherungszeitpunkt	SignalMonitoringTime
Zeitpunkt, an dem die Signalsicherung ein- bzw. ausgeschaltet wird.	The time at which signal monitoring is switched on or off.
EAzeile	EALine
constraints	constraints
Signalgruppe	Signal groups
i F	i F
Bezeichnung der Signalgruppe, die geschaltet wird.	Name of the signal group which is activated.
StartSignalbild	StartSignalAspect
Bitcode des Signalbildes, Verwendet fuer Bedienplaetze.	Bitcode of the signal aspect used for workstations.
Schaltzeit	SwitchTime
Schaltzeitpunkt	SwitchTime
Zeitpunkt, an dem das ueber den Bitcode codierte Signalbild beginnt	Time at which the signal aspect coded using Bitcode starts
SignalbildBitcode	SignalAspectBitcode
OCIT-Signalbild Im E/A-Plan werden keine Uebergaenge benutzt. Die Schaltzeiten sind die Farbfolge bzw. Uebergang+Zielfarbbild..	The OCIT signal aspect in the E/A plan does not use any transitions. The switching times are the colour sequence or transition + target colour pattern.

Switch on and off programs are structured differently than signal programs. They have a signal safety time, at which the signal safety is switched on or off (for the switch on program,

the signal safety is switched on at this point and for the switch off program, switched off). The time code starts with the stage transition at second 0.

Furthermore, the switch on and off programs do not use transitions, rather contain all transition patterns directly. When switching a signal group for example from dark via yellow flashing (time point 5s) and yellow (time point 15s) to red (time point 18s), all three times are entered:

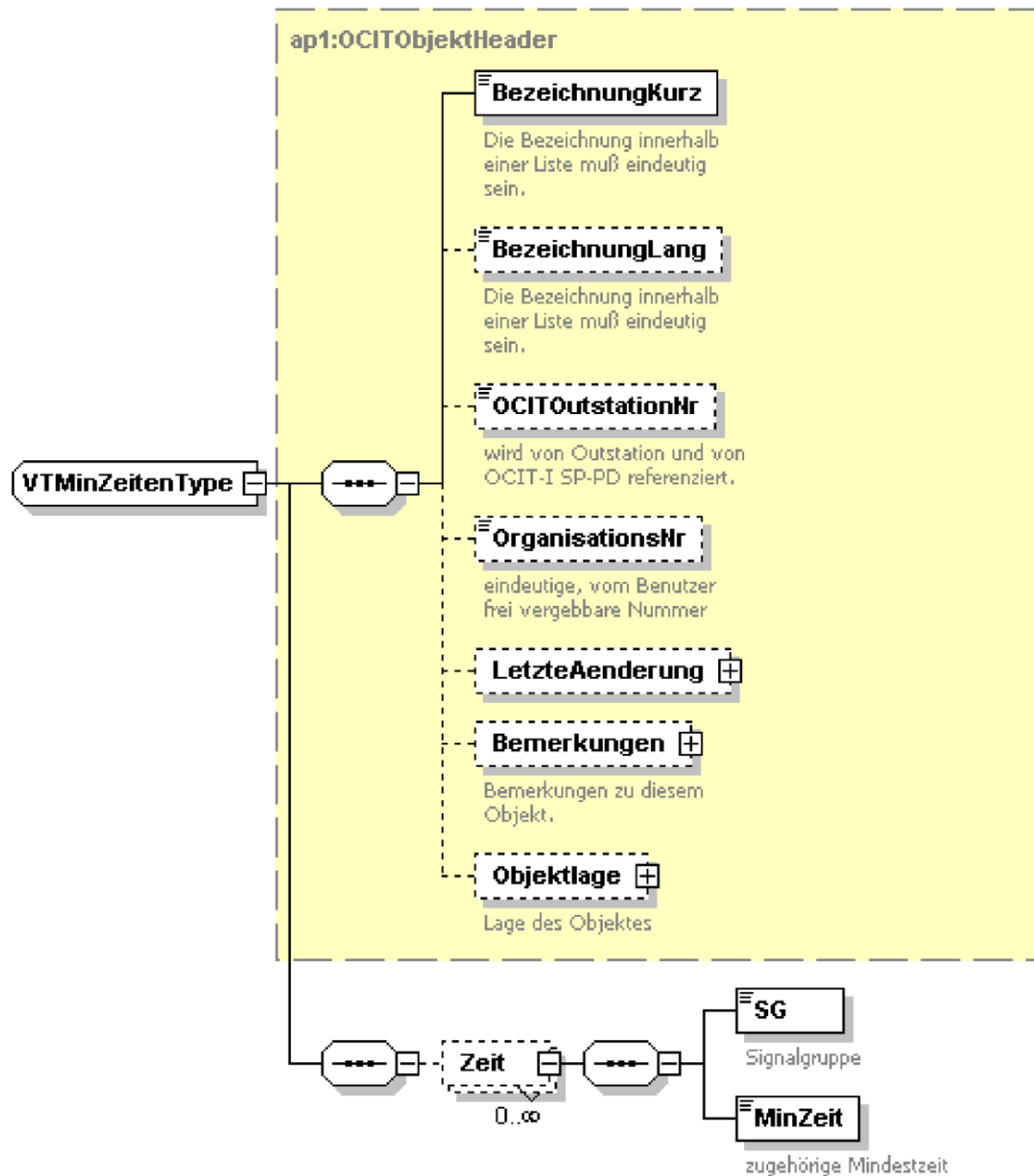
- Switch time point 5/yellow flashing (SignalAspectBitcode:03)
- Switch time point 15/yellow (SignalAspectBitcode:0C)
- Switch time point 18/red (SignalAspectBitcode:03)

A StartSignalAspect is also entered, which is only used for display purposes in workstations. This aspect provides a note on the signal aspect which should be displayed before the first switching operation takes place. The value is necessary, since this aspect is not known in every case. This value does not have any further technical significance.

A switch time is to be specified, but not necessarily at the zero second. Optionally however, the zero second can be specified.

3.4.15 Traffic minimum times

3.4.15.1 VTMinGreenList



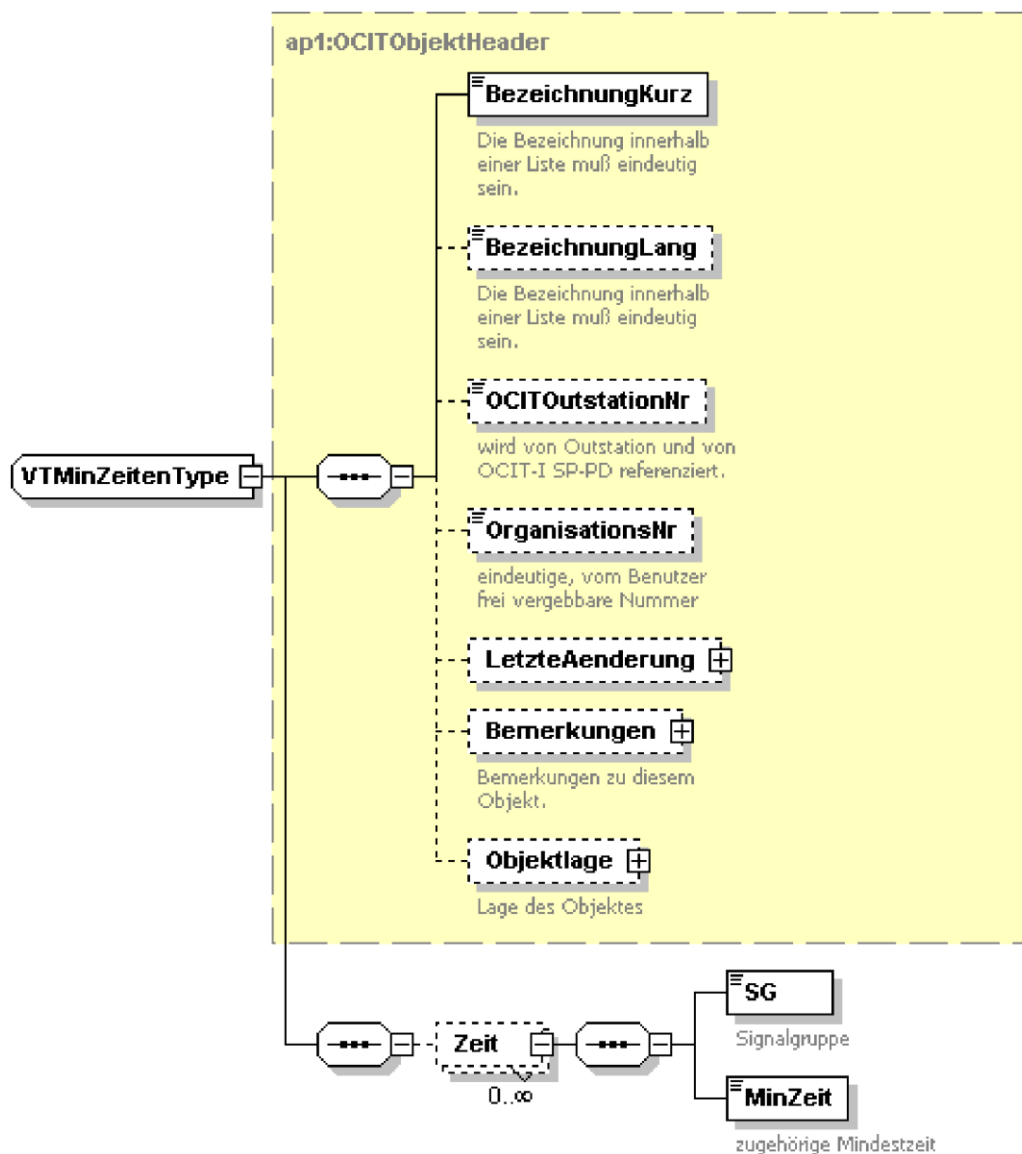
VTMinZeitenType	VTMinTimesType
ap1:OCITObjektHeader	ap1:OCITObjectHeader
BezeichnungKurz	Short name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.
BezeichnungLang	Long name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.
OCITOutstationNr	OCITOutstationNo
wird von Outstation und vor OCIT-I SP-PD referenziert.	is referenced by the Outstation and by OCIT-I SP-PD.
OrganisationsNr	OrganisationsNo
eindeutige, vom Benutzer frei vergebbare Nummer	unique, number freely definable by the user
LetzteAenderung	LastChange

Bemerkungen	Comments
Bemerkungen zu diesem Objekt.	Comments on this object.
Objektlage	Object position
Lage des Objektes	Position of the object
Zeit	Time
SG	TCU
Signalgruppe	Signal group
MinZeit	MinTime
zugehörige Mindestzeit	associated minimum time

In addition to the minimum time which must be specified for each signal group and which is also relevant to safety, up to 3 traffic minimum time lists can be created. These however must contain minimum times, which are equal to or greater than the minimum safety time. How many matrices can actually be managed in the device depends on the controller.

The use of such a minimum times list is carried out through referencing from the desired list from the signal plan.

3.4.15.2 VTMinRedList



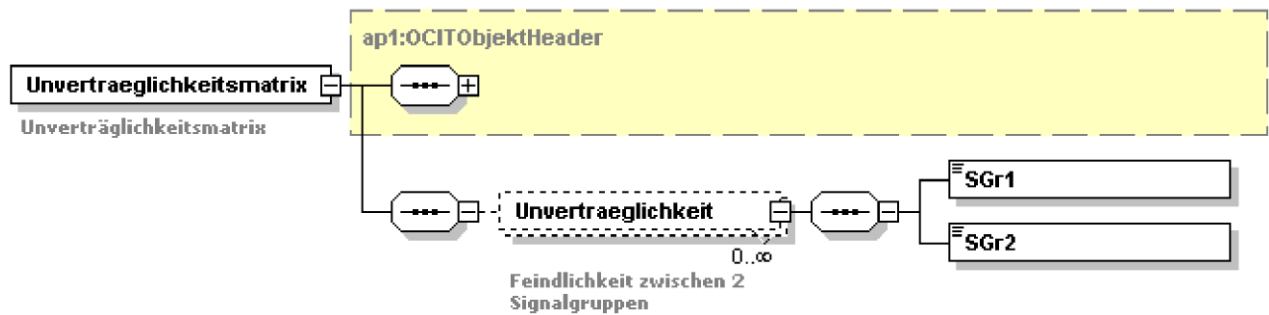
VTMinZeitenType	VTMinTimesType
ap1:OCITObjektHeader	ap1:OCITObjectHeader
BezeichnungKurz	Short name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.
BezeichnungLang	Long name
Die Bezeichnung innerhalb einer Liste muß eindeutig sein.	The name must be unique within the list.
OCITOutstationNr	OCITOutstationNo
wird von Outstation und vor OCIT-I SP-PD referenziert.	is referenced by the Outstation and by OCIT-I SP-PD.
OrganisationsNr	OrganisationsNo
eindeutige, vom Benutzer frei vergebare Nummer	unique, number freely definable by the user
LetzteAenderung	LastChange
Bemerkungen	Comments
Bemerkungen zu diesem Objekt.	Comments on this object.
Objektlage	Object position

Lage des Objektes	Position of the object
Zeit	Time
SG	TCU
Signalgruppe	Signal group
MinZeit	MinTime
zugehörige Mindestzeit	associated minimum time

In addition to the minimum time which must be specified for each signal group and which is also relevant to safety, up to 3 traffic minimum time lists can be created. These however must contain minimum times, which are equal to or greater than the minimum safety time. How many matrices can actually be managed in the device depends on the controller.

The use of such a minimum times list is carried out through referencing from the desired list from the signal plan.

3.4.16 Incompatibility matrix

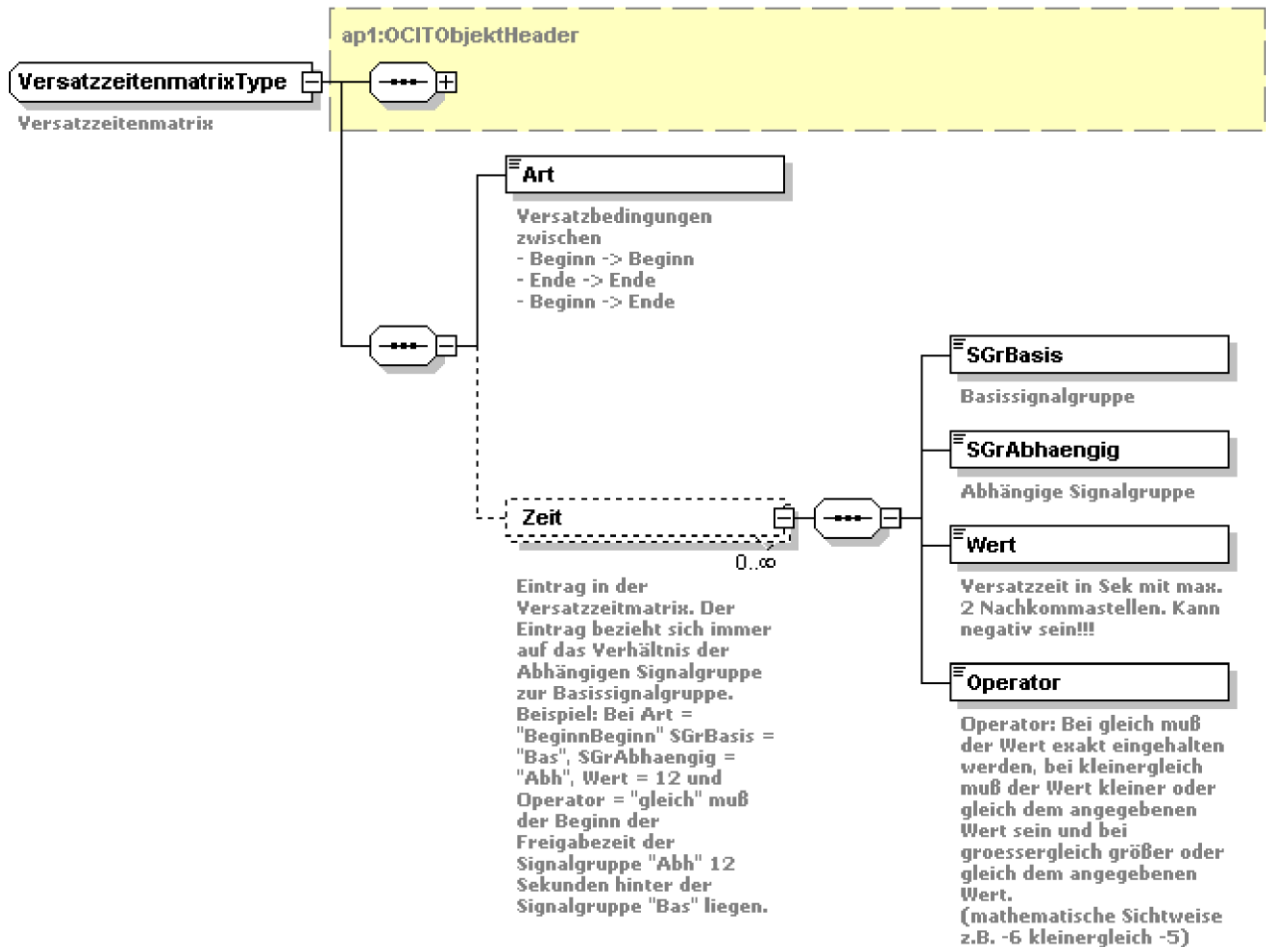


Unverträglichkeitsmatrix	Incompatibility matrix
Unverträglichkeitsmatrix	Incompatibility matrix
ap1:OCITObjektHeader	ap1:OCITObjectHeader
Unverträglichkeit	Incompatibility
Feindlichkeit zwischen 2 Signalgruppen	Conflict between 2 signal groups
SGr1	SGr1
SGr1	SGr1

The signal groups which are incompatible with one another are saved in the incompatibility matrix. The matrix is sometimes also called the conflict matrix.

The incompatibility statement is in any case commutative. If signal group SGr1 is incompatible with SGr2, SGr2 is also incompatible with SGr1. It is possible that the same combination has been entered twice. Sgr1 / Sgr2 and Sgr2 / Sgr1. This double representation doesn't have any special meaning. It is also not necessary.

3.4.17 Offset time matrix



VersatzzeitenmatrixType	OffsetTimeMatrixType
Versatzzeitenmatrix	OffsetTimeMatrix
ap1:OCITObjektHeader	ap1:OCITObjectHeader
Art	Sort
Versatzbedingungen	Offset conditions between Start -> start End -> end Start -> end
zwischen	Time
Beginn -> Beginn	Entry into the offset time matrix. The entry always refers to the relationship of the slave signal group to the basic signal group. Example: If Type = "BeginBegin", SGrBasis = "Bas", SGrSlave = "Sla", Value = 12 and Operator = "equal", the beginning of green time of the signal group "Sla" must be 12 seconds behind signal group "Bas".
Ende -> Ende	SGrBase
Beginn -> Ende	Base signal group
Zeit	SgrDependent
Eintrag in der Versatzzeitmatrix. Der Eintrag bezieht sich immer auf das Verhältnis der Abhängigen Signalgruppe zur Basissignalgruppe. Beispiel: Bei Art = "BeginnBeginn" SGrBasis = "Bas",	Dependent signal group

SGrAbhaengig = "Abh", Viert = 12 und Operator = "gleich" muß der Beginn der Freigabezeit der Signalgruppe "Abh" 12 Sekunden hinter der Signalgruppe "Bas" liegen.	
SGrBasis	Value
Basissignalgruppe	Offset time in seconds with a max. 2 decimal places. It can be negative!
SGrAbhaengig	Operator
Abhängige Signalgruppe	Operator: If equal, the value must be retained exactly, if less than or equal to, the value must be less than or equal to the specified value and if more than or equal to, more than or equal to the specified value. (mathematical perspective, e.g. -6 less than or equal to -5)

The offset time matrix includes both known offset time matrices for start-start and end-end, as well as the seldom used offset time start-end. (The offset time matrix end-start is the intergreen time matrix).

Depending on the type, a maximum of three matrices can be defined. How many matrices can actually be managed in the device depends on the controller.

The numbering of the offset time matrix is free and may have gaps.

SGrBasis and SGrDependency is the pair of signal groups between which a dependency is entered. It is not possible to enter the same pair of signal groups in the same matrix with reversed roles. I.e. if signal group B is entered as the basis and signal group A as the dependency in the matrix, then it is not possible to enter signal group A as the basis and signal group B as the dependency in this matrix.

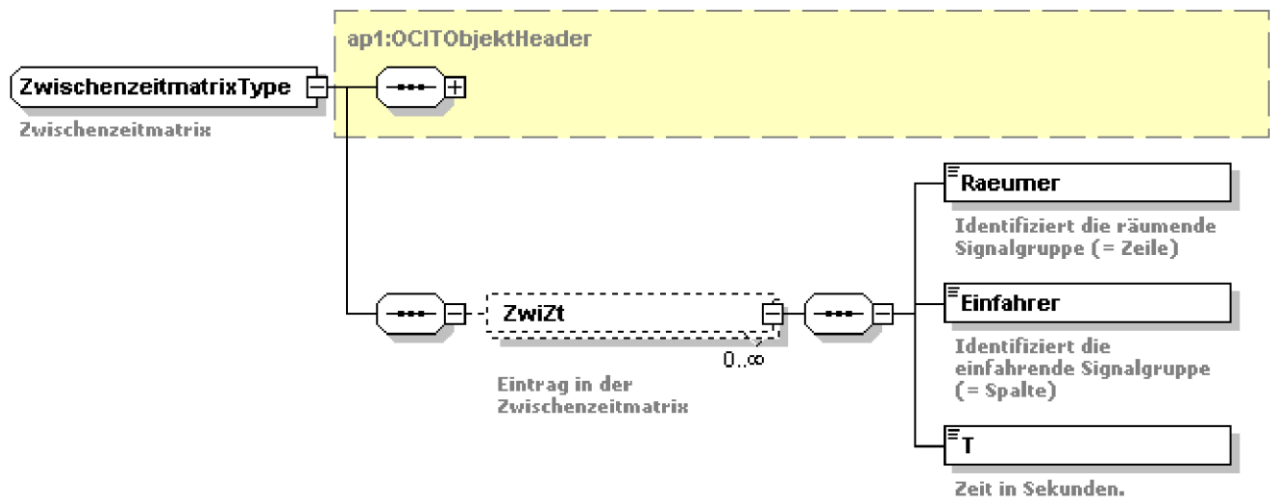
The time is given in seconds, negative times are permitted.

The possible operators are "greater than or equal to", "less than or equal to", "equals", depending on whether the offset time has to be greater than or equal to, less than or equal to or equal to the specified value.

"greater than or equal to" 5 for example means that the offset time between the signal groups must be greater than or equal to 5 seconds.

Note: The description of the possible offset time variants is given in the document OCIT-O_TSC_V3.0.

3.4.18 Intergreen time matrix



ZwischenzeitmatrixType	IntergreenTimeMatrixType
Zwischenzeitmatrix	intergreen time matrix
ap1:OCITObjektHeader	ap1:OCITObjectHeader
ZwiZt	IntGrTime
Eintrag in der Zwischenzeitmatrix	Entry into the intergreen time matrix
Raeumer	Outgoing
Identifiziert die räumende Signalgruppe (= Zeile)	Identifies the outgoing signal group (= line)
Einfahrer	Incoming
Identifiziert die einfahrende Signalgruppe (= Spalte)	Identifies the incoming signal group (= column)
Zeit in Sekunden.	Time in seconds.

The intergreen time matrix contains the intergreen times between signal groups. It is possible here that a pair of signal groups may appear in a mixed-up combination, since the intergreen times may be different for both combinations.

Negative times are not permitted in this matrix.

There are two different types of intergreen matrices. The safety intergreen matrix is constantly checked by the traffic signal controller, breaching of this matrix leads to an immediate switch off.

Note: The safety intergreen matrix always has the number 0 in OCIT-O. In OCIT-C, no number shall be entered.

The remaining intergreen matrices are intended for bad weather for example. They must contain all entries from the safety intergreen times matrix and additionally, all times must be greater than or equal to those of the safety intergreen times matrix. How many matrices can actually be managed in the device depends on the controller.

3.4.19 NocitList

The NocitList saves data which are relevant for individual planning tools and also for traffic signal controllers, but which cannot be standardised. For example, these are the expansions to the basic data supply.

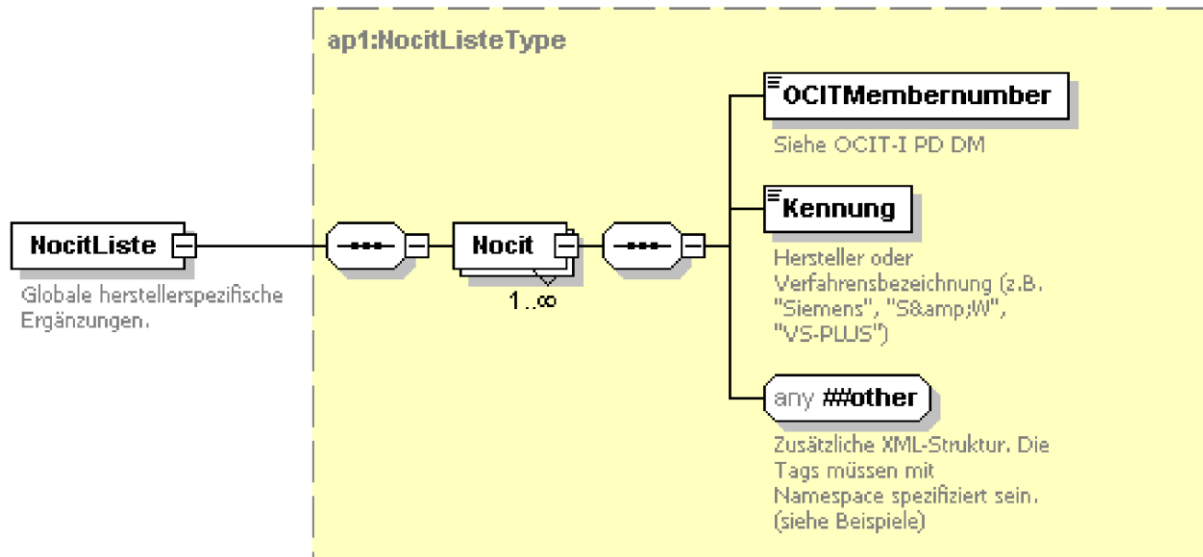
Objects in the NocitList are dealt with by the gateway in a standardised manner: All Nocit parts are transferred with it.

The substructure of the Nocit objects must be displayed in a schema supplied by the manufacturer of the planning tool. If the structure should not be disclosed, the data can be

saved in Base64 binary encoding. The planning-tool specific Nocit structures are not subject to standardisation of any kind and may be changed by the manufacturer of the planning tool without giving any reasons.

3.4.19.1 Project-specific Nocit structures

In addition to the planning-tool specific Nocit structures, there is the technical possibility to establish Nocit structures on a project-specific basis and save project-specific data within them. This removes the need of having to move project-specific expansions into auxiliary files. A project-specific shall then be determined as its ID.



NocitListe	NocitList
Globale herstellerspezifische Ergänzungen.	Global manufacturer-specific add-ons.
ap1:NocitListeType	ap1:NocitListType
Nocit	Nocit
Siehe OCIT-I PD DM	See OCIT-I PD DM
Kennung	Identifier
Hersteller oder Verfahrensbezeichnung (z .B. "Siemens", "S&W", "VS-PLUS")	Manufacturer or procedure name (e.g. "Siemens", "S&W", "VS-PLUS")
any ##other	any ##other
Zusätzliche XML-Struktur, Die Tags müssen mit Namespace spezifiziert sein. (siehe Beispiele)	Additional XML structure, the days must be specified using a name space (see examples)

4 Versions and data security

4.1 Introduction

4.1.1 Versions

The supply data versions for a unit are carried out either as a whole (complete version) or partially (partial version). The distribution of blocks follows the distribution of the planning and supply data (see **(Error! Reference source not found.)**). Whether the block versioning is used functionally must be specified on a project-specific basis. Otherwise, the version number of all blocks will always be increased "at the same pace" by the planning tool.

The block distribution for the standard part of the supply data is given in the standard. A block always comprises a "class" (e.g. fixed time control) and never "instances" of a class (e.g. individual signal programs).²

Each change of a partial version inevitably leads to a change of the complete version.

4.1.2 Procedure

The OCIT-C TSS data model for the TSS supply data can be filled out from multiple sources. Multiple sources for example are two traffic supply tools or planning tools, from which a tool is responsible for the supply of fixed time signal programs, while the other is required for the other program for the TA logic.

Since the dependent supplies are only valid if the basic data also remain unchanged, it is not only necessary to know the data source, but also to be able to detect the validity of data from other tools.

The mechanisms described below are intended for this:

4.1.2.1 Planning process

The following information are stored in the file intersection_config_data.xsd:

- The checksum and the checksum info regarding the data structured into different blocks (see section 4.5).
- The version name to be assigned by the planner (field <Planning version>)

4.1.2.2 Supply to the controller

The controller provides at least the following information:

- Formation of a checksum in the controller
- Formation of a build detection in the controller
- Return of following information from the device:
 - Device checksums
 - Device build detection
 - Transmission time
 - Fully Qualified Domain Name (FQDN) or IP address (if FQDN cannot be resolved)

² Otherwise this would also severely complicate the version number and data retention in the supply tools.

- Activation time
- All specific data of the transfer protocol are described in chapter 5.

4.2 Frames and header

There are three different types of files for the supply data and the information about the block assignment of the supply data:

- Supply data schema
("XSD supply", file name: intersection_config_data.xsd)
- Block assignment schema
("XSD Block assignment") file name: intersection_config_data_block_assignment.xsd):
The schema file determines the form in which block assignments are described.
- Block assignment specification
(XML block assignment, file name: intersection_config_data_block_assignment.xml):
The XML file determines how the elements of the XSD supply are assigned to the blocks.

The Distribution is necessary, so that it is possible to change the block assignment regardless of the supply data model.

4.2.1 Supply data

The XML file for the supply data comprises at least two parts: An XML header, which in particular contains the coding of the file, as well as an XML element in which the overall data are saved. For the OCIT-I standard, the header also specifies the standard name spaces which are used to assemble the OCIT-I VD supply file.

The frame of an OCIT-I VD supply file in this case looks as follows (the colours and line breaks are to provide a clearer overview):

```
<?xml version="1.0" encoding="UTF-8"?>
<OIVD xsi:schemaLocation="http://odg_und_partner/intersection_config_data
intersection_config_data.xsd" xmlns="http://odg_und_partner/intersection_config_data"
xmlns:n1="http://www.altova.com/samplexml/other-namespace"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<Basic supply dataTSS>
  - The standardised supply data are listed here -
<NocitList>
  - The manufacturer-specific expansions for the supply data are listed here -
</NocitList>
</ Basic supply dataTSS>
<TrafficSignalControllerSupplyTAProcedure>
  - The data for traffic procedures are listed here -
</TrafficSignalControllerSupplyTAProcedure>
<Checksums>
  - The data for checksums are listed here -
</Checksums>
```

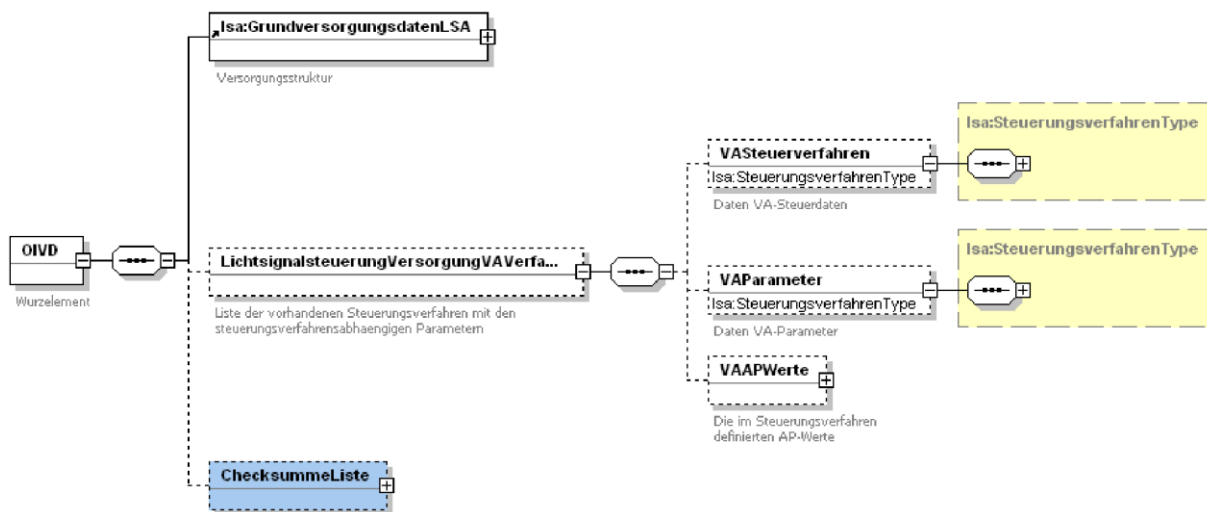

</OIVD>

The blocks marked in colour are also XML-structured data, which are entered at this position and have already been explained in the first part, as well as explained in further detail in this part.

The part marked in blue is optional and contains the necessary information for the automated data check. The content consists of pairs of lines, in which the first line gives the name space and the second line the file, in which the name space is specified. The example assumes that the schema files are saved in the same directory as the XML file. Each tool is free to enter this "xsi:schemaLocation" entry as it needs.

4.2.2 Basic supply data

The basic supply data from part 1 are entered into the first block of the file.

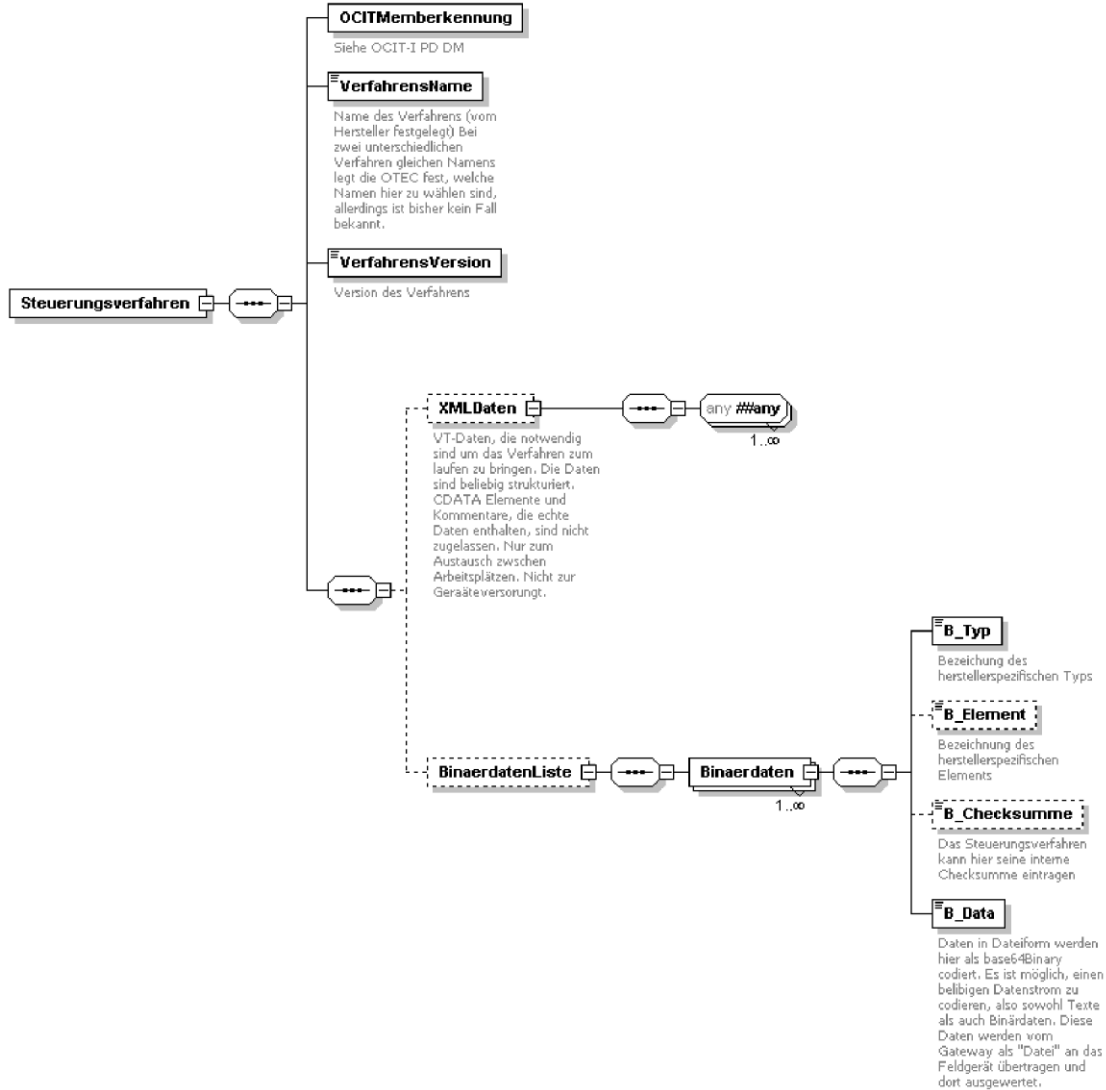


OIVD	OIVD
Wurzelement	Root element
Isa:GrundversorgungsdatenLSA	Tss:BasicSupplyDataTSS
Versorgungsstruktur	Supply structure
LichtsignalsteuerungVersorgungVAVerfa...	TrafficSignalControllerSupplyTAProce...
Liste der vorhandenen Steuerungsverfahren mit den steuerungsverfahrensabhaengigen Parametern	List of the available control processes with the control-process-dependent parameters.
ChecksummeListe	ChecksumList
VASTeuerverfahren	TAControlMethod
Isa:SteuerungsverfahrenType	Tss:ControlProcessType
Daten VA-Steuerdaten	Data TA control data
VAParameter	TAParameter
Daten VA-Parameter	Data TA parameters
VAAPWerte	TAAPValues
Die im Steuerungsverfahren definierten AP-Werte	The AP values defined in the control process
Isa:SteuerungsverfahrenType	Tss:ControlProcesType

4.2.3 Control process

The TA procedures used by the traffic signal controller are entered into the file divided into TAControlProcess and TAParameter. Currently only a process with a parameter block is permitted.

The data supply for each TA_Control process or TA parameters looks as follows:



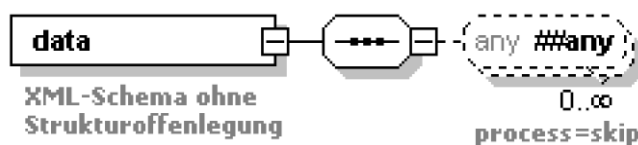
Steuerungsverfahren	Control process
OCITMemberkennung	OCITMemberIdentifier
Siehe OCIT-I PD DM	See OCIT-I PD DM
VerfahrensName	ProcessName
Name des Verfahrens (vom Hersteller festgelegt) Bei zwei unterschiedlichen Verfahren gleichen Namens legt die OTEC fest, welche Namen hier zu wählen sind, allerdings ist bisher kein Fall bekannt.	Name of the process (determined by the manufacturer) In the event of two different processes with the same name, OCIT determines which names are selected here, however there is no known case of this.
VerfahrensVersion	ProcessVersion
Version des Verfahrens	Version of the process
XMLDaten	XMLData
VT-Daten, die notwendig sind um das Verfahren zum laufen zu bringen. Die Daten sind beliebig strukturiert.	Traffic data that are required to get the process up and running. The data can be structured as you wish.
CDATA Elemente und Kommentare, die echte Daten enthalten, sind nicht zugelassen. Nur	CDATA element and comments, which contain actual data, are not permitted. Only for exchanging between workplaces. Not for device supply.
	any ##any

zum Austausch zwischen Arbeitsplätzen. Nicht zur Geräteversorgung.	
any ##any	BinaryDataList
BinaerdatenListe	BinaryData
Binaerdaten	B_Type
B_Typ	Designation of the manufacturer-specific type.
Bezeichnung des herstellerspezifischen Typs	B_Element
B_Element	Name of the manufacturer-specific element
Bezeichnung des herstellerspezifischen Elements	B_Checksums
B_Checksumme	The control process can enter its internal checksums here.
Das Steuerungsverfahren kann hier seine interne Checksumme eintragen	B_Data
B_Data	Data in file form are encoded here as a base64Binary. It is possible to encode any data stream, as both text and binary data. These data are transferred from the gateway to the field device as a "file" and are evaluated there.

The name and the version name specified by the manufacturer must be given for each control process. Furthermore, it is possible to configure the parameters of the control process. The format of the parameters in this case is stipulated by the manufacturer of the control process and must be disclosed.

The manufacturer of the control process is able to stipulate how the parameters should be structured here. There are two basic ways to do this:

- Processes that are given parameters for XML can save the data as XML data. This data set is not for the traffic signal controller, rather it is defined for exchanging between planning stations. The XML structure is as desired, however it must contain the frame guidelines (no comments with data, no CDATA elements, no macros with the exception of standard macros). Additionally, the manufacturer is required to supply an XML schema for the XML structure.



data	data
XML-Schema ohne Strukturoffenlegung	XML schema without structure disclosure
any ##any	any ##any
process=skip	process=skip

- For processes for which the parameters are configured using files (not XML text files or binary data), the process manufacturer is able to save the parameter supply data as "binary data". In this format, any given data flow is encoded in base64 and embedded and saved in the XML structure. As the base64 format doesn't use a control character from the XML structure, it is possible to embed any data within it. It is also permissible to distribute the data into multiple binary files and attach these.

Furthermore, there is also the optional possibility to use the data from a TA process with a checksum and save these. This checksum is intended in the TA data area under the user supply.

4.2.4 Restrictions

The following restrictions are not a problem for the export, however they facilitate the creation of overarching data which will be able to be read by more than one tool.

- The elements of the frame not marked in colour are not mandatory. The sequence of the attributes - such is mandatory in XML - is irrelevant. Like in the example, it is permitted to indent the elements, however it is not necessary.
- XML comments can indeed be written, however they shall not contain any relevant data and it must be possible to delete them at any time from any supply tool.
- The only approved macros are the five standard macros:

&	for the ampersand symbol	
<	for the symbol	<
>	for the symbol	>
"	for the symbol	''
'	for the symbol	'
- CDATA sections are not permissible (note: CDATA are elements which are in and surrounded by `<![CDATA[` and in `]]>` and may have any format.

4.3 Metadata of the AP values

4.3.1 Data catalogue of the AP values of a control process

4.3.1.1 Identification

An identification string is used to identify the AP values in the data model and in the **protocol** of the process data. The string is defined by the supplier of the control process. The string must be the OITD number and is to be written in IP notation e.g. 57.1. The member number is defined on the website <http://www.ocit.org/OCIT-O Member.htm>.

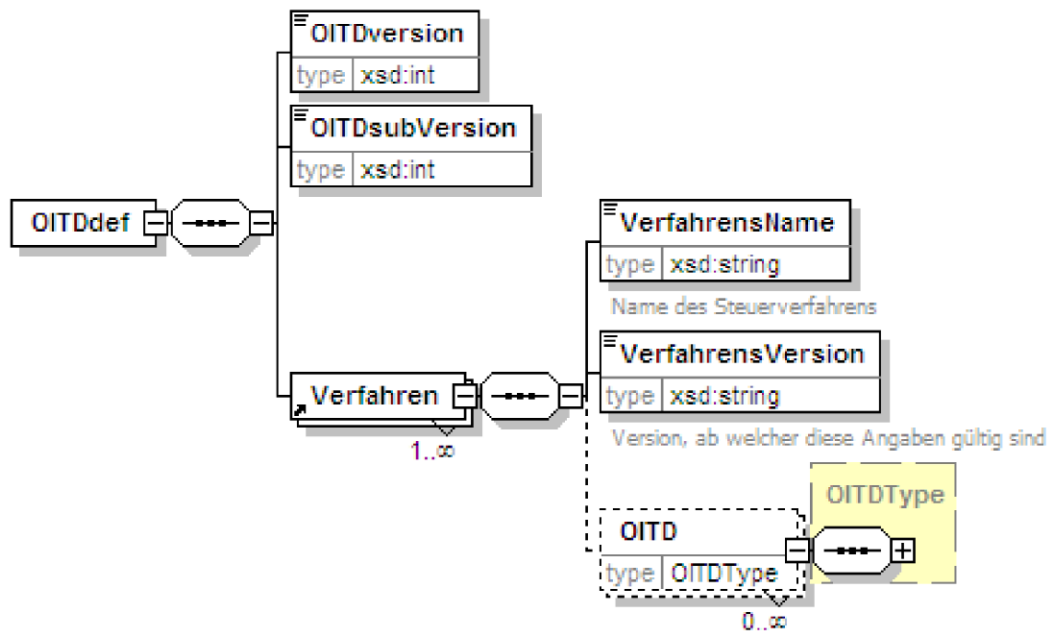
4.3.1.2 Schema of the AP value definition

The AP values are defined in accordance with the schema file `intersection_config_data_ap_values.xsd`.

The schema is required,

- to define new AP values
- in order to be able to validate files of automatically read AP values in an application

The structure of this schema is explained below.



OITDdef	OITDdef
OITDversion	OITDversion
type	type
xsd:int	xsd:int
OITDsubVersion	OITDsubVersion
Verfahren	Procedure
VerfahrensName	ProcessName
xsd:string	xsd:string
Name des Steuerverfahrens	Name of the control process
VerfahrensVersion	ProcessVersion
Version, ab welcher diese Angaben gültig sind	Version, as of which this information is valid
OITD	OITD
OITDType	OITDType

The root is the tag **<OITDdef>**, directly below this is the version information **<OITDVersion>** and subversion information **<OITDSubVersion>**, the definitions in the respective XML file (starting with the values 1 and 0 for Version 1.0).

Following is the list of processes **<processes>**, for which definitions are made. Each process is identified by its name **<ProcessName>**, furthermore the version number of the process **<ProcessVersion>** is specified, as of which the definitions are valid. Processes are able to distinguish between definitions for various control processes, companies or organisations.

For each process, the list of AP value definitions **<OITD>** follows.

Each **<OITD>** entry describes a data type. This is identified via **<ShortName>** and has a plain text name **<Name>**.

For display in user interfaces or documentations, the identifiers **<ShortName>** or **<LongName>** can be specified under the tag **<Identifier>**. The short name is used as the identification string for data requests. The ShortName must be the OITD number and is to be written in IP notation.

Under the **<Description>** tag, you can specify a short plain text description of the data type, which should be used for a precise explanation or definition of the desired value.

Under the **<ODGref>** tag, you can specify a reference on an existing ODG data type (OCIT Outstations), which is identified via **<Member>** and **<OType>**; the specification of the **<BasetypeName>** is optional. Under the **<LimitValue>** tag, the minimum **<Min>**, maximum

<Max> and a zero value **<NULL>** can be specified for the data type. The highest possible displayable number is normally used as the zero value, the maximum value is then one value lower.

Under the **<LimitIndex>** tag, the **<IndexMin>** and **<IndexMax>** limits are specified, which limit the value range of the object number for the data type.

The **<Interpretation>** tag is used to determine the interpretation of the data type content. Here under **<Resolution>**, the unit **<ResNo.>** and the scaling **<ResUnit>** can be specified.

Under **<Enum>**, it is possible, if the data type is a counting type, to receive the list of possible values **<Value>** (this should always be by whole numbers; the number 0 should not be used) and its textual representation **<Text>**.

Under **<Display>** **[obsolete]**³, details regarding the visual display of a data type (e.g. in a user interface) corresponding to the WTT agreement can be found⁴.

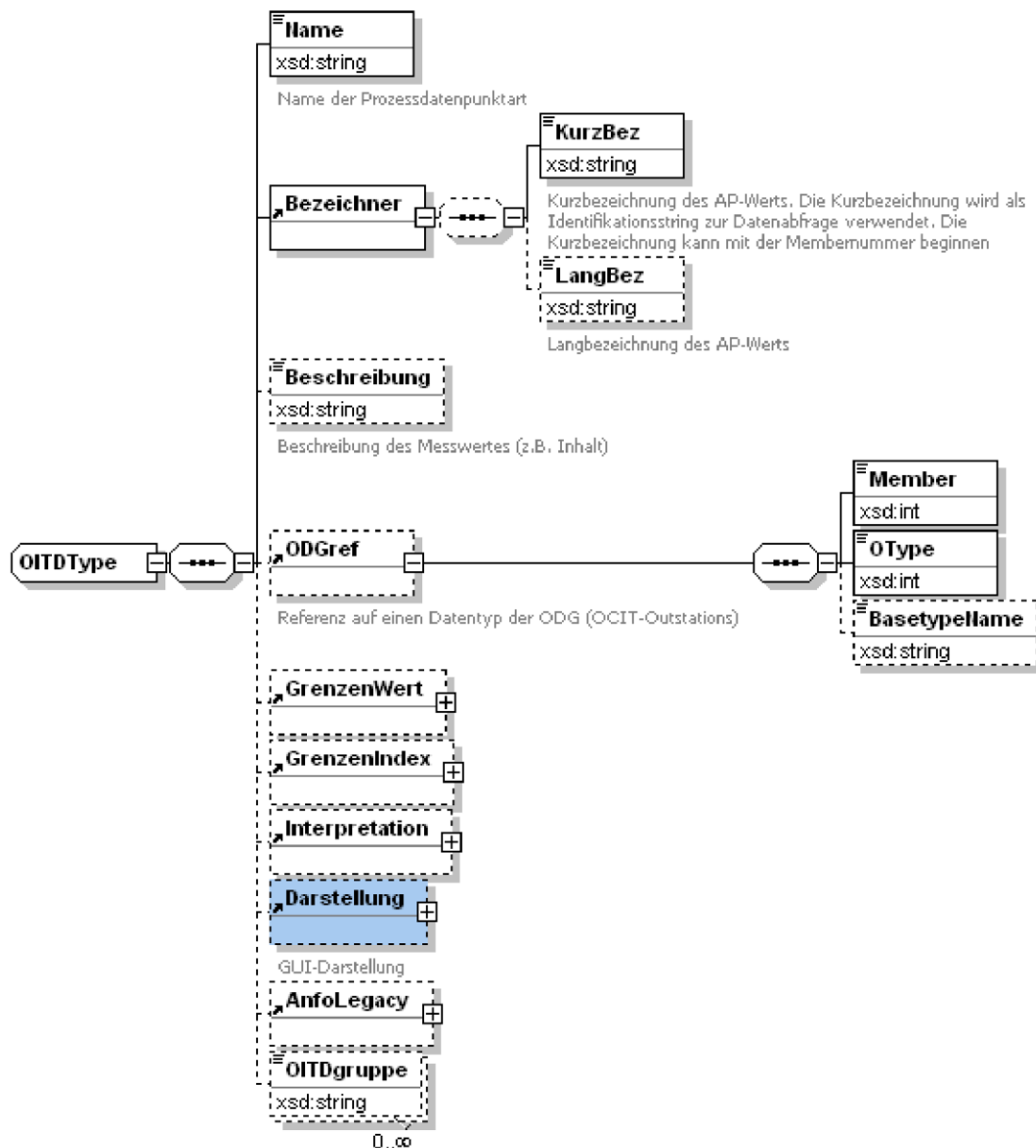
Under **<AnfoLegacy>** **[obsolete]**⁵, it can be specified once again with reference to the WTT code and module number for the localisation of a data value in the source system.

Finally, the assignment of the data type to any, freely definable groups **<OITDGroup>** can be supplied in order to automatically allow various visibilities to applications.

³ Can be omitted as it is obsolete.

⁴ TT is an old trilateral agreement between PTV, Siemens and Verkehrs-Systeme AG.

⁵ Can be omitted as it is obsolete.

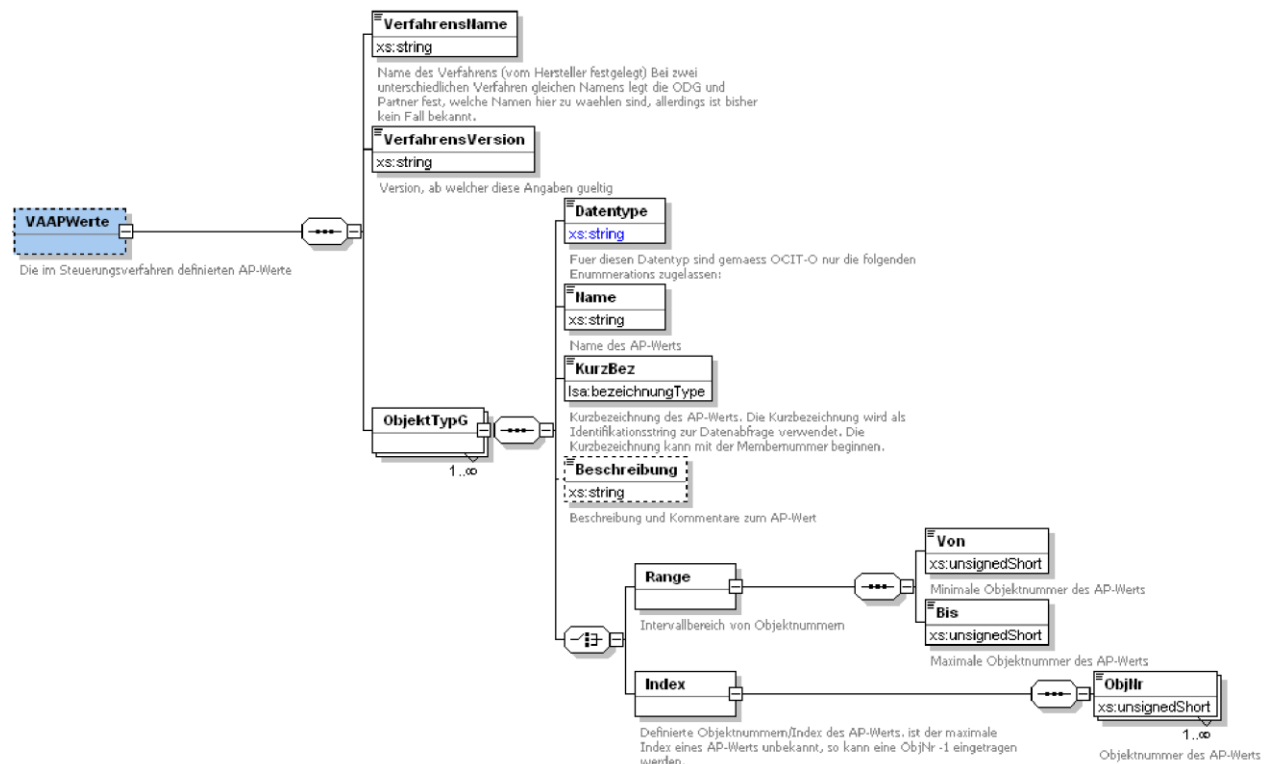


OITDType	OITDType
Name	Name
xsd:string	xsd:string
Name der Prozessdatenpunktart	Name of the process data point type
Bezeichner	Identifier
Beschreibung	Description
Beschreibung des Messwertes (z.B. Inhalt)	Description of the measurement (e.g. content)
ODGref	ODGref
Referenz auf Datentyp der ODG (OCIT-Outstations)	Reference to the ODG data type (OCIT Outstations)
GrenzenWert	LimitValue
Grenzenindex	Limit index
Interpretation	Interpretation
Darstellung	Depiction
GUI-Darstellung	GUI depiction
OITDgruppe	OITDgroup
KurzBez	ShortName
Kurebezeichnung des AP-Werts. Die	Short name of the AP value The short name is

Kurzbezeichnung wird als Identifikationsstring zur Datenabfrage verwendet. Die Kurebezeichnung kann mit der Membrnummer beginnen	used as the identification string for data requests. The short name can start with the member number.
LangBez	LongName
Langbezeichnung des AP-Werts	Long name of the AP value
Member	Member
xsd:int	xsd:int
OType	OType
BasetypeName	BasetypeName

4.3.2 Data catalogue of the AP values of an intersection

The AP values defined in the control process are executed under the datum <TAAPValues>. The definition is based on the data catalogue of the AP values of a control process. This should make it possible to address the relevant AP values without detailed knowledge of the control process and to order as process data.



VAAPWerte	TAAPValues
Die im Steuerungsverfahren definierten AP-Werte	The AP values defined in the control process
VerfahrensName	ProcessName
xs:string	xs:string
Name des Verfahrens (vom Hersteller Festgelegt) Bei zwei unterschiedlichen Verfahren gleichen Namens legt die ODG und Partner Fest, welche Namen hier zu waehlen sind, allerdings ist bisher kein Fall bekannt.	Name of the process (determined by the manufacturer) In the event of two different processes with the same name, ODG and Partners determine which names are selected here, however there is no known case of this.
VerfahrensVersion	ProcessVersion
Version, ab welcher diese Angaben gueltig	Version, as of which this information is valid
ObjektTypG	ObjectTypeG
Datentype	Data type

Fuer diesen Datentyp sind gemaess OCIT-O nur die Folgenden Enummerations zugelassen:	According to OCIT-O, only the following enumerations are permitted for this data type:
Name	Name
Name des AP-Werts	Name of the AP value
KurzBez	ShortName
Isa:bezeichnungType	tss:nameType
Kurzbezeichnung des AP-Werts. Die Kurzbezeichnung wird als Identifikationsstring zur Datenabfrage verwendet. Die Kurzbezeichnung kann mit der Membrnummer beginnen.	Short name of the AP value. The short name is used as the identification string for data requests. The short name can start with the member number.
Beschreibung	Description
Beschreibung und Kommentare zum AP-Wert	Description and comments on the AP value
Range	Range
Intervallbereich von Objektnummern	Interval range of object numbers
Index	Index
Definierte Objektnummern/Index des AP-Werts. ist der maximale Index eines AP-Werts unbekannt, so kann eine ObjNr -1 eingetragen werden.	Defined object numbers of the AP value, if the maximum index of an AP value is unknown, then an ObjNo 1 can be entered.
Von	From
xs:unsignedShort	xs:unsignedShort
Minimale Objektnummer des AP-Werts	Minimum object number of the AP value
Bis	To
Maximale Objektnummer des AP-Werts	Maximum object number of the AP value
ObjNr	ObjNo
Objektnummer des AP-Werts	Object number of the AP value

The short name is used as the identification string for data requests. The short name can start with the member number.

4.4 Block formation

4.4.1 Standard block formation

The following overview shows which data are summarised into which blocks by default, to the extent of the version numbering and checksum formation:

4.4.1.1 Part A: User supply:

Traffic control system

Block 1: Basic traffic engineering data / fixed time:

- Switch on programs (switch on program underneath the SignalProgramList)
- Switch off programs (switch off program underneath the SignalProgramList)
- Signal programs, data and green times (signal program under the SignalProgramList)
- List of partial intersections
- List of the traffic-related minimum green times (VTMinGreen)
- List of traffic-related minimum red times (VTMinRed)
- Traffic-related IG matrices (intergreen matrix underneath the IntergreenTimeMatrixList)
- Traffic-related offset time matrices (offset time matrix underneath the OffsetTimeMatrixList)
- Traffic-related minimum green times (VTMinGreen)
- Traffic-related minimum red times (VTMinRed)

Block 2: Data with network reference:

- Header data (header data)
- 12 month automatic routine (control clock)

Block 3: TA control process:

- Application-specific files block 4: TA parameters
- Application-specific files

4.4.1.2 Part B: Manufacturer supply:

Controller system

- Detectors or digital inputs (InputList)
- Signal groups or digital outputs (SignalGroupList, DigitalOutputList)
- Assignment to the partial intersection (PartialIntersectionSwitchOff underneath the signal group)
- Transition times (duration, attached under transition element)
- Definition of reporting points (reporting point attached under PT reporting section and RPValue under the PT memory instance)
- Behaviour in the event of a network failure (network failure)

Safety system:

- Incompatibility matrix (incompatibility matrix)

- Safety-related intergreen time matrix (SafetyIntergreenTimeMatrix)
- Minimum green times (minimum green under the signal group)
- Minimum red times (minimum red under the signal group)

4.4.1.3 Part C: Nocit data

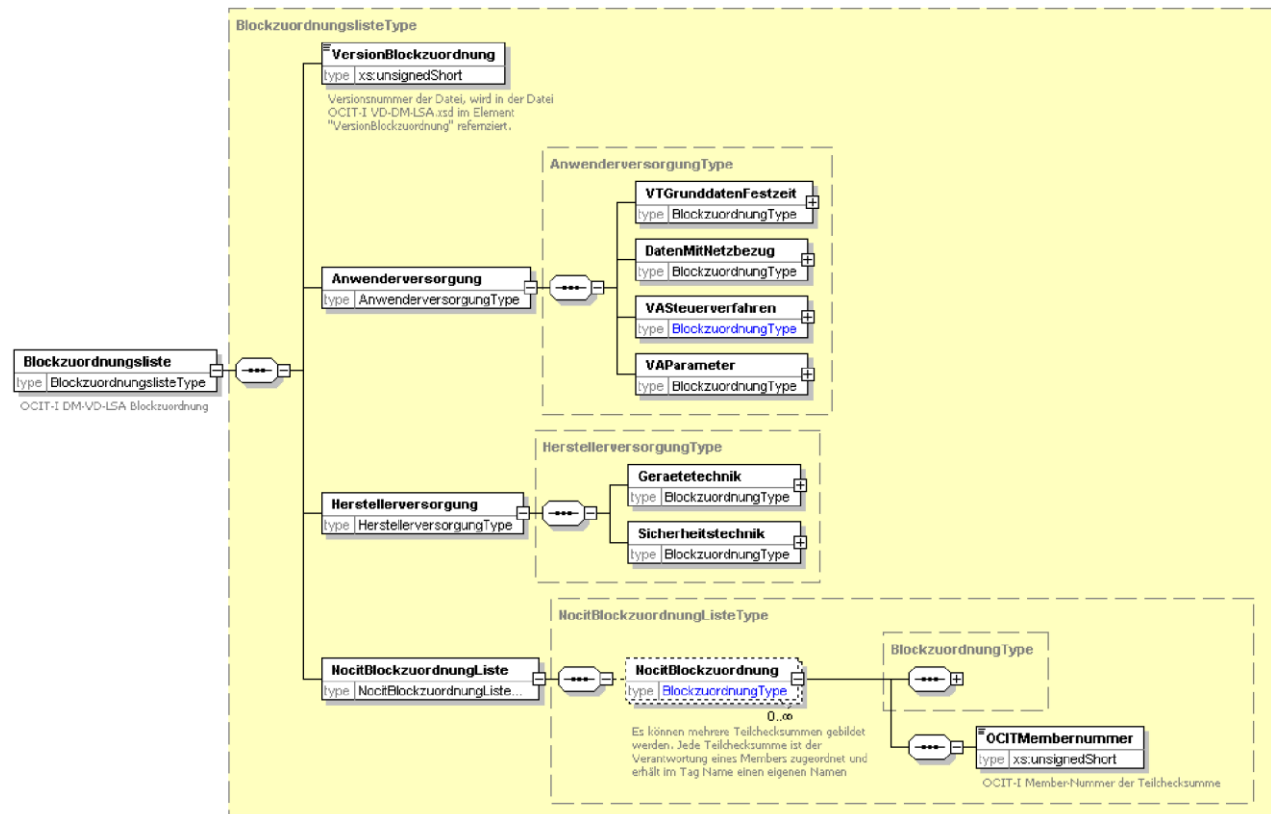
Nocit data:

- Non standardised planning data

The XML file intersection_config_data_block_assignment.xml allows you to deduce which data are assigned to which block and therefore through which of the checksums they are secured.

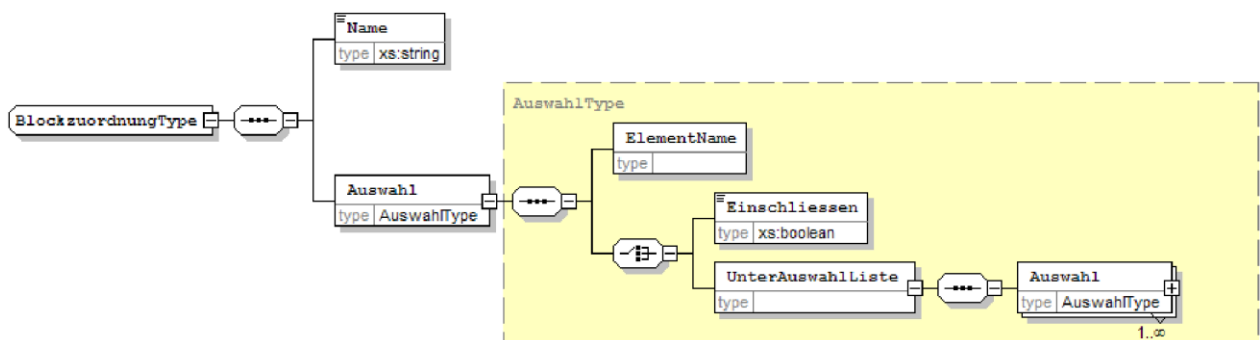
Changes to the block formation (as part of a new version of the interface) lead to changes in the already supplied devices.

The XML file is described by the intersection_config_data_block_assignment.xsd:



Blockzuordnungsliste	BlockAssignmentList
type	type
BlockzuordnungslisteType	BlockAssignmentListType
OCIT-I DM-VD-LSA Blockzuordnung	OCIT-I DM-VD-TSS Block assignment
VersionBlockzuordnung	VersionBlockAssignment
type xs:unsignedShort	type xs:unsignedShort
Versionsnummer der Datei, wird in der De OCIT-I VD-DM-LSA.xsd im Element "VersionBlockzuordnung" referenziert.	Version number of the file is referenced in the De OCIT-I VD-DM-TSS.xsd in the "VersionBlockAssignment" element.
Anwenderversorgung	User supply

AnwenderversorgungType	UserSupplyType
Herstellerversorgung	Manufacturer supply
HerstellerversorgungType	ManufacturerSupplyType
NocitBlockzuordnungListe	NocitBlockAssignmentList
NocitBlockzuordnungListe...	NocitBlockAssignmentList...
VTGrunddatenFestzeit	TRBasicDataFixedTime
BlockzuordnungType	BlockAssignmentType
DatenMitNetzbezug	DataWithNetworkReference
VASteuerverfahren	TAControlMethod
VAParameter	TAParameter
Geraetetechnik	Controller system
Sicherheitstechnik	Security technology
NocitBlockzuordnung	NocitBlockAssignment
Es können mehrere Teilchecksummen gebildet werden. Teilchecksummen ist der Verantwortung eines Members zugeordnet und erhält im Tag Name eigenen Namen	It is possible to model more than one partial checksum. Partial checksums is assigned the responsibility of a member and keeps its own name in the tag name
OCITMemberrnummer	OCITMemberNumber
OCIT-I Member-Nummer der Teilchecksumme	OCIT-I member number of the partial checksum



BlockzuordnungType	BlockAssignmentType
Name	Name
type	type
xs:string	xs:string
Auswahl	Selection
AuswahlType	SelectionType
ElementName	ElementName
Einschliessen	Involve
xs:boolean	xs:boolean
UnterAuswahlListe	SubSelectionList

The "SelectionType" type may contain itself repeated. The details can be taken from the XML schema file.

4.5 Checksums

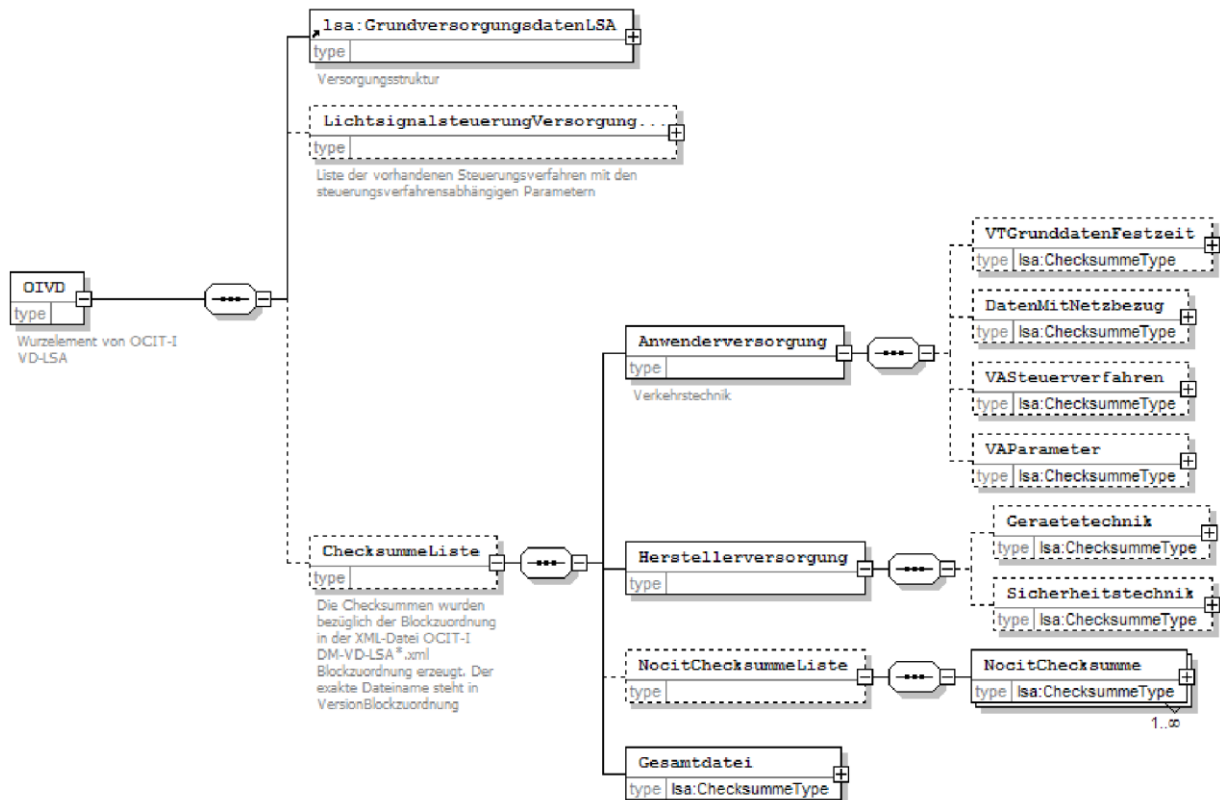
Using the CRC process for automatically forming a checksum, the planning tool automatically forms a unique checksum of all traffic-related data, for example without date, editor, tool manufacturer. Provided that the traffic-related supply data of the block doesn't change - regardless of the program to be executed - the same checksum is always generated. If for example version A in a supply file changes a green time (version B) and then changes it back

(version C), then version A and C have the same checksum.⁶

At least one checksum is created for each of the four established blocks, of the traffic technology area. Furthermore, a checksum is created via the complete file. This also saves the data from the "Device technology" and "Safety technology" areas which are not otherwise saved. Further checksums, for example including notes and comment fields, are possible. See the XML file block assignment.

The checksum from the NocitBlockassignment block is not assumed.

The checksums are executed under the <ChecksumList> datum. The datum is optional. The datum must be filled out at latest when supplying a ready file.



OIVD	OIVD
type	type
Wurzelement von OCIT-I VD-LSA	Root element of OCIT-I VD-TSS
Isa:GrundversorgungsdatenLSA	Tss:BasicDataSupplyTSS
Versorgungsstruktur	Supply structure
LichtsignalsteuerungVersorgung...	TrafficSignalControllerSupply...
Liste der vorhandenen Steuerungsverfahren mit den steuerungsverfahrenabhängigen Parametern	List of the available control processes with the control-process-dependent parameters
ChecksummeListe	ChecksumList
Die Checksumme werden bezüglich der Blockzuordnung in der XML-Datei OCIT-I DM-VD-LSA*.xml Blockzuordnung erzeugt. Der exakte Dateiname steht in VersionBlockzuordnung	The checksums are generated in terms of the block assignment in the XML file OCIT-I DM-VD-TSS*.xml block assignment. The exact file name is in the VersionBlockAssignment

⁶ This requires that the version number does not make its way into the checksum formation. For this reason, for the block assignment, you must ensure that checksums emerge which only include the content part of the supply.

Anwenderversorgung	User supply
Verkehrstechnik	Traffic control system
Herstellerversorgung	Manufacturer supply
NocitChecksummeListe	NocitChecksumList
Gesamtdatei	Complete file
Isa:ChecksummeType	Tss:ChecksumType
VTGrunddatenFestzeit	TRBasicDataFixedTime
DatenMitNetzbezug	DataWithNetworkReference
VASteuerverfahren	TAControlMethod
VAParameter	TAParameter
Geraetetechnik	Controller system
Sicherheitstechnik	Security technology
NocitChechsumme	NocitChecksum

4.5.1 Sequence in the controller

The checksum information of the planning tool is sent to the controller via the server and stored there. These data are not changed in the controller. The controller forms its own checksum and its own build identifier, which can be transferred via the communication protocol as per intersection_config_data_communication.xsd.

While the checksum information of the planning tools is sent from the server to the controller and from this can be exported again, in the event of a local change in the controller, the server is only able to read the build identifier, the checksum and the identifier of the local change of the controller. A change is then recognised as a local change, if the FQDN of the modifying tool is not the FQDN of the control center.

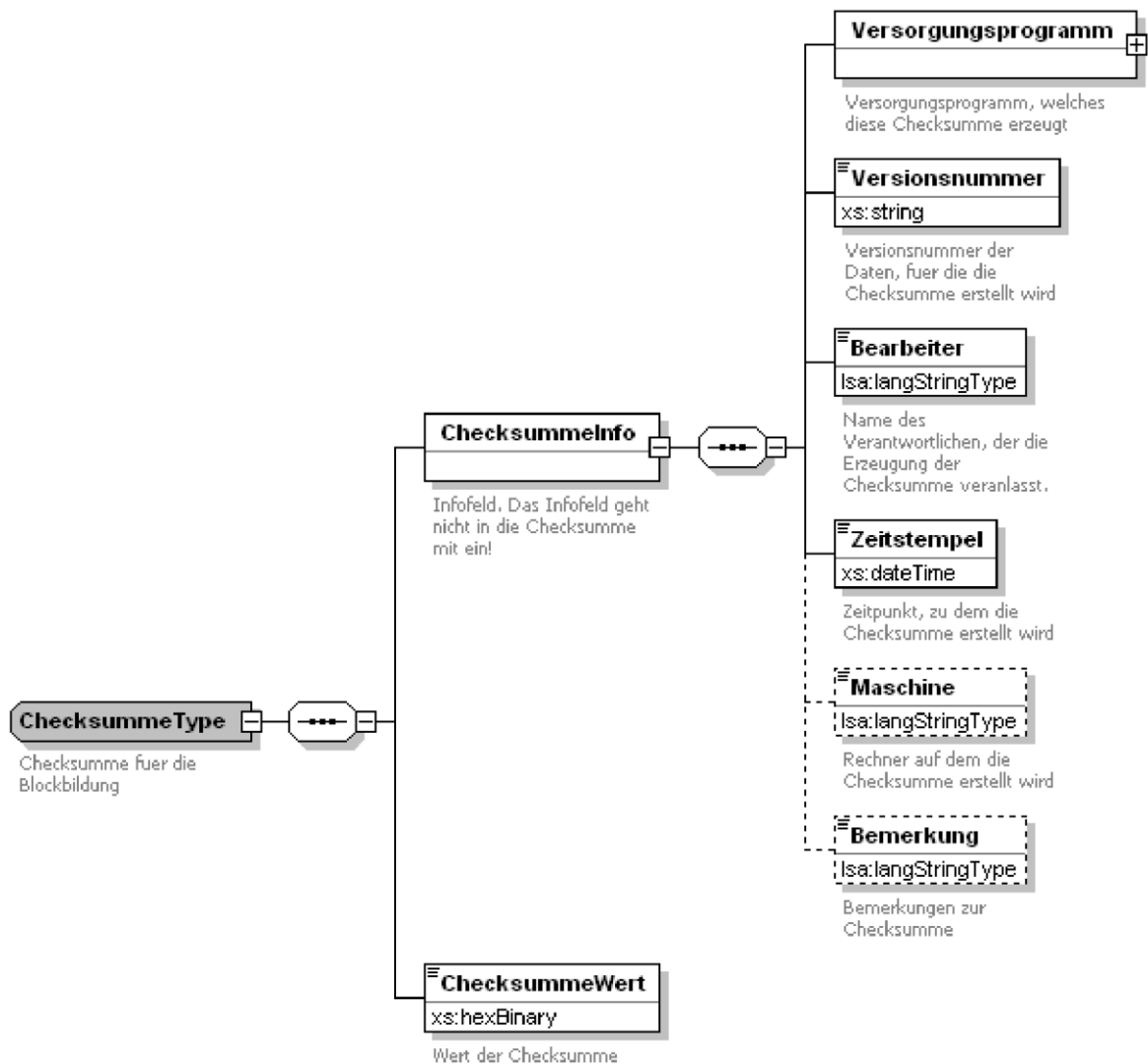
Using the methods displayed above, a management tool is given all possibilities to analyse both the changes as well as the content of the technical traffic data.

The build identifier is a simple counter in the traffic signal controller, which is increased by every supply intervention, regardless of whether carried out centrally or locally. Additionally, a checksum of the data is formed in the controller. From the pair formed from the build number and the checksum, it is clear to detect whether data have been changed or correspond with the known status. The build number and the checksum can be exported from the controller. If changed device build numbers or checksums are detected, it is certain that somebody has changed the parameters on site. In this case, the data could be uploaded or the local changes would also have to be made in the planning tool, provided that the planning data is mainly managed there.

4.5.2 Structure and depiction of the checksums

It is possible to have as many checksums as you wish per supply file, at least one per block and one additional for the complete file. These checksums can be created by each planning tool. A checksum only contains a subset of data within the file. All data, that are not covered by the checksum, can be modified without violating the checksum.

A checksum description is structured as follows:



ChecksummeType	ChecksumType
Checksumme fuer die Blockbildung	Checksum for the block formation
ChecksummeInfo	ChecksumInfo
Infofeld. Das Infofeld geht nicht in die Checksumme mit ein!	Info field. The info field is not included in the checksum.
ChecksummeWert	ChecksumValue
xs:hexBinary	xs:hexBinary
Wert der Checksumme	Value of the checksum
Versorgungsprogramm	Supply program
Versorgungsprogramm, welches diese Checksumme erzeugt	Supply program which generates this checksum
Versionsnummer	Version number
xs:string	xs:string
Versionsnummer der Daten, fuer die die Checksumme erstellt wird	Version number of the data for which the checksum is created
Bearbeiter	Editor
Isa:langStringType	Tss:longStringType
Name des Verantwortlichen, der die Erzeugung der Checksumme veranlasst.	Name of the person responsible who initiated the generation of the checksums.
Zeitstempel	Time stamp
xs:dateTime	xs:dateTime
Zeitpunkt, zu dem die Checksumme erstellt	Time at which the checksum is created

wird	
Maschine	Machine
Rechner auf dem die Checksumme erstellt wird	Computer on which the checksum is created
Bemerkung	Comment
Bemerkungen zur Checksumme	Comments on the checksum

The user-specific data, which (can) appear on the interface are saved in ChecksumInfo. These are:

- the supply program used to generate the checksum. The supply program is made up of the name and version.
- the version number of the dataset, for which the checksum was generated. The supply program is able to assign a version to a dataset. The version number corresponds to the <VersionNumberOCIT-I> datum in the communication protocol as per intersection_config_data_communication.xsd.
- the processor which initiated the generation of the checksums.
- the time stamp of when the checksum was created
- the machine used to generate the checksum. The entry is optional.
- a comment

The <ChecksumValue> datum is encoded as a hexadecimal string. It corresponds to the <ChecksumOCIT-I> datum in the communication protocol as per intersection_config_data_communication.xsd.

Note: For the sake of legibility, it should be shown in 10 groups of 2 bytes each, e.g. CAFE-1234-ABCD-5678-A1B2-C3D4-1A1B-1234-CAFE-ABBA.

4.5.3 Checksum algorithm

For the calculation of the checksum, the SHA-1-algorithm is used, like in the OCIT-O protocol. More detailed information can be found in the document OCIT-O protocol, chapter Transfer safety through the SHA-1 algorithm and in the document OCIT-O TSC V2.0, chapter Standard process for checksum formation. Code examples are also listed here.

To form a unique checksum, the data must be standardised. For this, the data type must be defined (see table) and the data sorted. The data are equipped with XML tags, however there shall not be any indents (tabs), spaces or lines between the tags. The tags are written in the sequence and using the <ElementName> from the block assignment intersection_config_data_block_assignment.xml.

For the sorting, all elements that have been derived from the OCIT ObjectHeader are sorted by the ShortName in ascending order and by length. Elements that have not been derived from the OCIT ObjectHeader are sorted by the first non-optional element. This way, signal program lines <SPLines> can be sorted by <Signal group> and their switching times <Switch time> by the <Switching time point>.

Definition of the data types:

Data type	Data for the checksums
longStringType ShortStringType DesignationType	String based on "xs:string" is used with UTF8 coding as in the XML

Second FixedTimePlanSecond VZSecond	Time specifications as decimal number based on "xs:decimal" It is always written to one decimal place, for example "0.0" (-)[0-9]+.[0-9]
OCITSignalAspect	The signal aspects are written as code. [0-9A-F][0-9A-F]
Integer (xs:int, xs:unsignedInt; xs:short...)	Integer, also negative. No leading zeros. Only negative signs. (-)[0-9]+
xs:datetime	Date and time as ISO date without time zone CCYY-MM-DDThh:mm:ss
xs:date	Date without time as ISO date CCYY-MM-DD
xs:gMonthDay	Date with month and day without year --MM-DD
xs:time	Time with leading zero hh:mm:ss

Shortened example of the data which are entered into the checksum algorithm (space added between the days for clarity):

```
<OIVD> <BasicSupplyDataTSS> <FileVersion> <VersionDocument>01.13.00</...>
</FileVersion> <SignalProgramList> <SignalProgram> <ShortName>SP1_22_OK</...>
<SPLine> <SignalGroup>SG 1</SignalGroup> <SwitchTime>
<SwitchTimePoint>1.0</SwitchTimePoint> <SignalAspect>30</SignalAspect>
</SwitchTime> </SPLine> </SignalProgram> <...> </SignalProgramList> <...>
</BasicSupplyDataTSS> </OIVD>
```

5 Communication log

The XML file of the TSS supply information as per the schema intersection_config_data.xsd can be replaced manually for example using the file system or automatically transferred using the communication protocol as per intersection_config_data_communication.xsd. The communication protocol is based on mechanisms in OCIT-C and is part of intersection_config_data_communication.xsd.

Methods, objects and transfer parameters used:

Method + object type	Request / Response
Get + SupplyDataInfo	<i>Request: GetType.data.SupplyDataInfoType</i>
	<i>Response: GetResponseType.DataList.Ds.data.SupplyDataInfoResponse</i>
Put + SupplyData_putSupplyData	<i>Request: PutType.PutType.PutList.Putds.data.putSupplyDataType</i>
	<i>Response: PutResponseType.data.putSupplyDataResponseType</i>
Put + SupplyData_activateSupplyData	<i>Request: PutType.PutType.PutList.Putds.data.activateSupplyDataType</i>
	<i>Response: PutResponseType.data.activateSupplyDataResponse</i>
Put + SupplyData_putandactivateSupplyData	<i>Request: PutType.PutType.PutList.Putds.data.putAndActivateSupplyDataType</i>
	<i>Response: PutResponseType.data.putAndActivateSupplyDataResponse</i>
Put + SupplyData_resetSupplyData	<i>Request: PutType.PutType.PutList.Putds.data.resetSupplyDataType</i>
	<i>Response: PutResponseType.data.resetSupplyDataResponse</i>
Get + SupplyData_getSupplyData	<i>Request: GetType.data.getSupplyDataType</i>
	<i>Response: GetResponseType.DataList.Ds.data.getSupplyDataResponse</i>
Get + SupplyDataInfoList	<i>Request: GetType.data.SupplyDataInfoListType</i>
	<i>Response: GetResponseType.DataList.Ds.data.SupplyDataInfoListResponse</i>
Get +	<i>Request: GetType.data.SupplyUnitListType</i>

SupplyUnitLis	<i>Response:</i> <i>GetResponseType.DataList.Ds.data.SupplyUnitListResponse</i>
---------------	--

To transfer the parameters required for the supply data, the optional "data" element (type any) of the protocol definition is used.

Recommended identification:

J<primary key>

The <primary key> is structured as follows:

<SystemNo>_<SubsystemNo>_<UnitNo>_<ObjectNo>

Optional: SystemNo, SubsystemNo, ObjectNo, (if complete object is addressed)

The identifiers SystemNo, SubsystemNo, UnitNo and ObjectNo have been taken from the OCIT-I standard.

Note: The assignment of the position number in the protocol doesn't play any role due to the missing history. The value should be assigned with 0.

OCIT-C_TSS_SupplyData_V 1.2_R1
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