OCIT®

Open Communication Interface for Road Traffic Control Systems
Offene Schnittstellen für die Straßenverkehrstechnik

OCIT Outstations

OCIT-O Version 3.0
for traffic signal controllers

Glossary

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ODG – OCIT-Developer Group

OCIT Outstations Version 3.0 for Traffic Signal Controllers Glossary

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Specifications

The **OCIT Outstations configuration document OCIT-O KD V3.0** contains an overview of all the specifications whose copyrights are managed by the ODG and arranges versions and revision levels according to:

- associated specifications of the interface "OCIT outstations for traffic signal controllers" with reference to the corresponding OCIT-C specifications,

- gives information on the use of the transmission profiles and

- provides an overview of packages of specifications for interfaces for the use of which a nominal fee is required by ODG

The current issue of the document is published on www.ocit.org.

1   Introduction

The OCIT glossary should help planners and operators define the language of terms and explain which ones are used in context with the OCIT documentation. The glossary is based on OCIT documentation version 3 and includes the preceding versions.

Sources of the glossary are: OCIT-O and OCIT-C documents, Guidelines for Traffic Signal Systems, Langenscheidt dictionaries, Wikipedia.

2   Glossary

A	
Actuator	Actuators are an integral part of a system with which traffic / road users should be directly influenced in the sense of traffic control and traffic information. Examples are traffic signal systems, variable direction signs, blocking equipment, parking guidance signs, variable message signs or other individual end devices. In traffic signal controllers, the switching equipment which switches the signal head of a TSS is labeled as an actuator.
AP values	User program values Umbrella term in OCIT-O for selected internal variables of the traffic signal controllers that are dynamically calculated by user programs or (if settable) can be dynamically modified by upper-level central applications for controlling programs.
Archives	Selected data of the traffic controller that serve the documentation of operating conditions or storage of dynamic values are collected in archives. The storage format (sharing format) may be different from the format of the individual data in order to compress data.
Artifact	An Artifact is an information-carrying physical product of the OCIT process. The physical variant can either be paper or a file.

B	
BASt	German Federal Highway Research Institute (Bundesanstalt für Straßenwesen)
Road Authorities	The Road Authorities are the institution (generally the public authorities) who are responsible for the planning, construction, operation and maintenance of a road and the associated traffic facilities and system, i.e. also the traffic signal control systems. The various topic areas may be divided between different road authorities.
Command	The term Command is used in the context of traffic management systems as a synonym and generic term for the demand of switchings, program changes and comparable actions from actuators. Typical examples are the demands for traffic management to switch a TSS (via the traffic signal control center). If a command cannot be carried out because it is not implemented in the device, or due to another reason, a corresponding message (return code) is issued to the control center.

Command sources	Command sources are different origins of the commands for selecting the signal program or the operating mode.
Operating mode	A designation for a certain kind of controller (e.g. local or central controller of a traffic signal controller). The operating mode can only be preselected on the traffic signal controller.
Operating state	A designation for a state such as On, Off, Malfunction.
bps	bits per second = bit/s
BTPPL	Basis Transport Packet Protocol Layer of the OCIT-O interface

C	
C-ITS	Cooperative Intelligence Transport Systems
CAM	Cooperative Awareness Message
Car2X	Communication between vehicles as well as vehicles with their surroundings.
CHAP	Challenge Handshake Authentication Protocol (RFC1334, 1994)
Client	The Client (computer and program) is responsible for making contact with the server during a data transmission and determines the time. A network connection is not required until the time that contact is made.
CLIP	Calling Line Identity Presentation (ITU-T)

D

Data specification	Precise specification of the data transferred over the interface. The data specification is composed in XML. It is readable as text and machine readable.
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
DENM	Dencentralized Environmental Notification Message
DKE	Deutsche Kommission Elektrotechnik Elektronik Informationstechnik [German Commission on Electrical Systems, Electronics and Computerized Systems] in DIN and VDE
Documentation	Documentation comprises documents and data specifications (XML). It contains all the definitions required for reproducing the interface.
Documents	The documents describe the individual parts of the interface as well as their function and handling.
DTD	Document type definition A set of rules that is used to represent documents of a certain type. DTD is a part of the XML Specifications.
Dynamic values	Umbrella term for selected internal variables of the traffic signal controller that are usually affected by network control processes.

E

On / off patterns	A sequence of signaling states via which a device is switched from off to on into the desired signal program or from on to off.
Entity	In the ISO / OSI model, Entities represent the functions of a layer. These functions relate to tasks for realizing data communication services. These include the setup, communication and the termination of connections for the data exchange.
Ethernet	Ethernet is a wired data network system for local data networks (LANs). It enables the exchange of data in the form of data frames between all of the devices (computer, printer and similar) connected in a local area network (LAN). Ethernet includes definitions for cable types and plugs, describes the signaling for the bit transmission layer and specifies package formats and protocols. From the perspective of the OSI model, the Ethernet specifies both the physical layer (OSI layer 1) as well as the data link layer (OSI layer 2).

ETSI	European Telecommunications Standards Institute
Event	Certain occurrences in the traffic signal controller trigger a notification to the control center. This notification is designated as an event. Events are triggered, for example, when archives are full or messages should be requested by the control center.

F	

Error	In contrast to faults, errors are not caused by a technical defect, rather they are unexpected reactions from system components triggered through user or supply operations.
Error message	In contrast to faults (fault messages) errors are not caused by a technical defect but rather faults in the supply (e.g. in the intergreen time) or in the use (e.g. non-executable command) of the traffic signal controller.
Field device	Also: Field-level device; A field device is a device which is installed on the road, such as a traffic signal system, a traffic detection device or a display system control unit. This is generalized in the OCIT process and designated as a field device.
Function	Task or the purpose which an element performs in a system.
Functionality	This is the way to describe the capacity of a product or a component to solve a given problem.

G	

Gateway	A Gateway connects network partial systems and enables an exchange of data between components with various communication forms and services.

H	

HDLC	High level Data Link Protocol (ISO)

Mixed manufacturer system landscape	System landscape which is made up of part systems from various manufacturers. The ability to use parts from different manufacturers together is the stated goal of the OCIT standardization. Various manufacturers and providers should retain the possibility of developing partial systems and components for traffic planning, traffic control and traffic management systems and integrated these into systems from other manufacturers.
Manufacturer-specific	The relevant manufacturer determines the exact classification scheme or functionality. Generally, no project-specific definitions are possible or useful here because they would pose a risk to the pervasiveness and resiliency of the manufacturer-specific solution.

I

Internet technology	Constructive and standardized communications technology on the basis of the open TCP, IP and UDP internet protocols.
IP	Internet Protocol (Version 4, if not otherwise noted)
ISO / OSI	ISO/OSI – Basic – Reference Model (DIN-ISO 7498 v.1982, X.200 v. 1994) ISO: International Organization for Standardization OSI: Open Systems Interconnection
I2V	Interface to Vehicle Communication interface of the vehicle

K

Intersection	Also: Crossing, point of intersection. Collective term for the various forms of street intersections, i.e. also traffic circles. A traffic signal controller can control multiple points of intersection depending on its design. It is on the other hand possible that multiple traffic signal controllers control one point of intersection. In OCIT outstations it is defined that every intersection can also contain partial intersections.
Communication	The exchange of data between communication partners. The ISO / OSI reference model is tailored to open data communication.
Component	The term component is fundamentally associated with a realization. Components encapsulate and realize a specified functionality. Access to the functionality takes place via the provided interfaces. Required interfaces specify the services required rendering the performance.

Coupling (close, loose)	The term coupling is used here in a software architecture sense and describes how close systems/components are connected with one another. The term software granularity describes something similar. In contrast to close coupling, loosely coupled components can be parted from each other relatively easily and combine with other components flexibly. The advantage of the flexible switching is countered by the disadvantage of having a somewhat lower level of efficiency.
L	
Traffic signal system	Also: Traffic light system (RiLSA), installation, signal system, TSS: In accordance with the StVO (Germany Highway Code), traffic signal systems belong to the class of traffic installations and have the task of governing traffic by means of traffic lights at intersections. Your traffic lights operate in accordance with the general traffic rules. A traffic signal system includes all of the parts installed in the intersection area, i.e. traffic signal controllers, masts, signal heads, traffic detection units as well as the entire electrical installation.
Traffic signal controller	Field device for controlling traffic signal systems.
Traffic signal control system	System for handling road traffic on intersections through the use of traffic lights. From the perspective of the OCIT process it includes at least one traffic signal control center and the traffic signal systems attached to it with their traffic signal controllers. The subsystems such as traffic engineer's workstation, supply data server, system for quality assurance, adaptive network control and others, if applicable, are extensions.
TSC	Traffic signal controller
M	
MAP	Topology Info for Intersection and Road Segments
Messages	Messages designate events and name origins, time of occurrence, etc. Messages are saved in archives (standard message archive). The control center does not receive the messages directly, rather only a notification that the messages are available (Event), in response to which the control center requests and receives the messages from the traffic signal controller.

Member numbers	In the OCIT system, it is possible to differentiate between standard OCIT objects and the manufacturer's own determinations by using the member numbers. The member number identifies an object's owner, e.g. a company, working group or a project. Member 0 and 1 identify the OCIT outstations objects defined by the ODG and thus the OCIT-O standard. The current list of member numbers managed by the ODG is published on the homepage www.ocit.org.
Measured values	Measurement values are measurement results of the sensor system and other data detected by the controller that provide information about the traffic occurrences in the form of an original value or pre-processed.
Migration process	A migration process describes the (step by step) process from one system or generation of technology to the next. An example of this is the piece by piece replacement of a traffic signal control system under provisional maintenance, old field devices.
O	
OCA	Open Traffic City Association (OCA) Also see www.OCA-eV.org; The OCA is an association of German, Austrian and Swiss cities which would like to make a constructive contribution on the topic of OCIT. The goal is the harmonization and specialized safeguarding of the requirements for interfaces in the city road traffic control systems of cities and the direct influence on the industry developments regrading the development and provision of standardized, openly laid out communication interfaces for traffic planning, traffic control, and traffic management systems.
OCIT	Open Communication Interface for Road Traffic Control Systems / Offene Schnittstellen für die Straßenverkehrstechnik. It relates to interfaces between devices, components and systems. Communications profiles, functions and data which are operated via OCIT interfaces are standardized. "Internal" properties, which do not relate to the communications interfaces such as setup, applications, databases, user interfaces etc, are not processed in OCIT.
OCIT Center to Cente	Components with OCIT interfaces at the central level which provide services at the central level of a road traffic control system by using OCIT interfaces.

OCIT Developer Group (ODG)	The ODG (also see www.ocit.org) is a working group of signaling manufacturers which manufacture traffic control systems and their components. In the OCIT group, it plays a part in the development of requirements, highlights technical solution approaches and implements the results into technical specifications for its systems and components. The successful founding of the ODG in 1999 which came about as an initiative from the member companies was the trigger of the OCIT standardization which has spread widely in the meantime. Members are the signalling manufacturers AVT-STOYE, Siemens, Stührenberg and SWARCO.
OCIT Group	Diverse groupings with differing interests and tasks from the road traffic control system sector have organized themselves into a sort of "round table" since 1999 to collaborate for the standardization of OCIT interfaces. OCIT interfaces are designed to make it possible to use parts from different manufacturers together in road traffic control systems.
OCIT-Instations	Components with OCIT interfaces at the central level which provide services at the central level of a road traffic control system by using OCIT interfaces. (Note: replaced by *OCIT-C*)
OCIT-LED	OCIT-LED is an electrical interface for traffic signal heads using LED technology.
OCIT-Outstations	Components with OCIT interfaces on the field level that provide services on the field level of a system of the road traffic control system with the use of OCIT interfaces.
OCIT-I Process	Work and cooperation process which is connected with the standardization work of the OCIT group.
OCIT Process data	OCIT terms for data which accrue dynamically in the operation, this includes traffic data, status data, operating messages and commands. Such data can arise regularly or be event-driven. Such data can arise regularly or be event-driven.
OCIT interfaces specification	A specification for the interfaces which were developed and released as part of the OCIT process and is used for communication within road traffic control systems.
ODG	OCIT Developer Group
PT archive	The PT telegrams are archived into the PT archive, supplemented with values from the RSU device. The PT archive is a special type of archive.

PT telegram	Also: PT telegram, R09 telegram.
	The standard telegram of the R09-xx type consists of the following data sets: Date, time, message number, line number, run number, route number, priority, vehicle length, direction, schedule deviation. The PT telegram extended with several data sets can optionally be used in OCIT.
Data communication	Open data communication based on standardized, open protocols, based on the ISO / OSI reference model.
Open interfaces	Open interfaces are based on standardization and specifications which are laid out openly, available to everyone, also under license and pursue the goals of interoperability and portability.
OTEC	Open Communication for Traffic Engineering Components (OTEC)
	Consortium for standardizing communication between traffic control system components.

P	
Stages	A stage is a part of a signal timing plan in which a certain signaling status remains unchanged (during the beginning of a stage, stage transitions may still be taking place). In the controller data supply, stages are an assignment of switching states to signal groups. Switching times are assigned to the stage transitions.
PPP	Point to Point Protocol
Project-specific	The relevant specifications generally allows project-specific classification schemes or functions within the limits established by the system present.
Proprietary	Hardware or software which is developed specifically for a manufacturer and can only be used on one system is described as proprietary. Proprietary software is often not compatible with hardware or software from other manufacturers.
Protocol	Set of rules / determinations with which two instances of the same ISO/OSI layer communicate with one another.
Point-to-point	Point-to-Point Connection
	A direct, exclusive connection between two communication partners.

R	

Relative intersections	The addressing scheme of OCIT outstations provides for the possibility to put in place multiple points of intersection logically unconnected to each other (relative intersections). Not all manufacturers can offer such (sophisticated) devices.
Returncode	If a feature that is not available in the traffic signal controller is called up by the control center, a return code that the control center can evaluate is generated and transmitted.
RFC	Request for Comment (= work papers, protocol specifications or comments on network subjects)
RiLSA	Guidelines for traffic signals - Traffic signs for road traffic (Federal Republic of Germany). The RiLSA was established in agreement with the Road Traffic Regulation and the Traffic Police of the highest competent State Authority. In Germany, the guidelines are binding for the entire road network.
RSAP	Roadside Access Point A roadside access point is a WLAN 802.11p communication component without a "cooperative" function
RSU	Roadside Unit A roadside unit is an independent component without a TSS for communication with cooperative applications (CoApps) in vehicles via WLAN 802.11p.
S	
Schema	A visual (diagrammatic) representation of a concept.
Sensor	A sensor is generally a component which is able to detect the physical properties (e.g. temperature, pressure, noise, brightness, magnetism, acceleration, force) of its environment qualitatively or quantitively as measurement variables. Examples in the traffic control system: Induction loops, infrared sensors, video sensors for road traffic, pushbutton on a TSS etc.
Server	A functional unit which provides a service. It requires the resources of a computer. A server possesses communication abilities to make the offered services available to a user or a customer (client). For this reason, the server is ready to be able to react at any time to contact being made to a client program installed on the customers computer. The rules which determine the format as well as the level of importance of the messages exchanged between the server and the client are called the protocol.
SHA-1	Secure Hash Algorithm

Signal group	A signal group includes all the traffic signals at an intersection whose signaling status is always the same.
Signal group data supply	Signal group data supply is a part of the supply data. This is a data supply of the signal group types. Color combinations, on/off patterns among other safety-relevant data such as the intergreen times generally cannot be changed from the control center during normal operation.
Signaling status	Also: Signaling, signal status, signal pattern. The traffic signals connected at the signal heads of an intersection that yield a certain status on the signal groups, e.g. green, yellow, red, off, flashing, etc.
Signal plan	It contains the duration of signal times and the assignment to certain signal groups (signaling statuses). Data for synchronization and signal program switch are also included here. Signal plans are a part of the supply data for fixed-time and/or traffic-actuated control processes. Special signal plans such as fire department plans, for example, are also signal plans.
Signal programs	Signal programs are instructions for the control procedure. They determine the time-based sequence of the signaling statuses based on signal plans and/or the logic type (fixed-time, stages, traffic-actuated). On/off patterns are assigned to each signal program. The operating status "Off" is not a signal program.
Signal timing plan	The signal timing plan is the graphical representation of a signal program on a time scale.
Special intervention	Selection of a signal program that is only temporarily in effect, e.g. a fire department plan. After the special intervention is over, the device returns to its original status / signal program.
SPaT	Signal Phase and Timing
Road traffic control system	A system for controlling and monitoring road traffic consisting of central equipment and field devices (devices on the road) that communicate with each other using data transmission equipment.
Fault	Faults, in contrast to errors, are caused by a technical defect of a system component.
Fault messages	Fault messages report the occurrence of a fault in a system component caused by a technical defect. They contain the origin with as detailed as possible a localization of the malfunction location and the type of fault (different from: error messages).

Synchronization	Synchronization in green waves is based on synchronized clocks. The back calculation process needed for this is to be determined on a project-specific basis because the back calculation method in the system (existing + OCIT) must be the same.
System	An existing functional unit made up of a number of individual parts (also hardware and software) which is used for carrying out a certain task or a series of tasks A logical structure to plan
System architecture	System architecture is the abstract representation of certain structural properties of a system to which certain principles are usually connected.

T	
TCP	Transmission Control Protocol One of the internet protocols. Connection-oriented transport protocol in layer 4 of the ISO/OSI reference model.
Partial intersection	Partial intersections are signal groups of one complete intersection aggregated into individual signal areas that do not oppose one another. All partial intersections work with the same signal program at a particular time. Partial intersections can be switched on and off from the control center.
Subsystem	A subsystem is an aggregation of autonomous and non autonomous components.
TLS	Technical delivery terms for roadway stations.

U	
UDP	User Datagram Protocol One of the internet protocols. Connectionless protocol in layer 4 of the ISO/OSI reference model.
UML	Unified Modeling Language UML is a semiformal graphic modeling language leaning towards object oriented thinking. The version is currently UML 2.0.

V	
V.xx	ITU-T standards (International Telecommunications Union), formerly CCITT
VDV	Verband Deutscher Verkehrsunternehmer (Association of German Transportation Companies)
Behavior	This is the way that the dynamic aspects of a modeled system are described in UML (Unified Modeling Language). In systems theory, system behavior is the term used when a system transfers from one state into another.
Traffic engineer	Traffic engineering describes the engineering competency for the field of traffic planning and traffic technology. It is the special field of construction engineering. A priority area can be the planning of a traffic signal system for example.
Traffic engineer work-station (TEWS)	Tool for planning, simulating and testing the supply of traffic data from traffic signal systems.
Traffic management	Traffic management is understood as integrating concepts and measures for all means of transport by using the existing network and system infrastructure, and new advances in information technology. Central goals are the avoidance of traffic, the improvement of the traffic flow, as well as comprehensive information about all road users if possible. Using a traffic management system, the conceptually performed aggregation is connected with a number of subsystems installed in relation with one another which cooperate with the goal of rendering a specified traffic management service.
Traffic planning	Traffic planning is a discipline of traffic science. It is used to optimally design the traffic infrastructure and the traffic flow, taking into account the qualitative and quantitative requirements for cost effectiveness, performance and safety.

Traffic control	Traffic control is understood as being traffic regulations through technical measures (traffic signal systems), through constructive measures (roundabouts), through operating measures (parking space management) as well as mobility and traffic management measures. Traffic control is an integral part and instrument of traffic management.
Traffic control system	The term traffic control system indicates the science which is able to describe the traffic flow. The control of traffic signal systems takes place using traffic control system methods. The term also describes in general the technical spheres in the traffic sector as well as branches located within this industry sector.
Traffic-related processes	Also: traffic-actuated logic, TA logic, TA, TA process Software in the traffic signal controller that modifies signaling based on specified algorithms and traffic measurement values in accordance with the current traffic situation. The algorithms of the logic can be changed through parameters (part of the supply data). Calculated results (variables) can be read or set as AP values at OCIT outstations.
Supply data	Supply data are all the static and quasistatic data that the data model forming the basis of a subsystem of a traffic signal control system needs to perform its range of functions. Examples of supply data of a subsystem of the traffic signal control system scope of application: Signal groups, signal sequences, minimum green times, maximum green times, fixed-time signal programs, parameters for traffic-actuated signal programs. Supply data originate primarily at the traffic engineer's workstation and are needed in the subsystems of a traffic signal control system for implementing planning-related specifications of traffic signal control. The OCIT process defines a data model for supply data which is distinguished according to data for user configuration and data for manufacturer data supply that is documented in the document OCIT-C.
Contracting partner	The party acquiring the rights of use from the ODG with this contract.
Distributed system	These are primarily networked subsystems which are installed in geographically different locations.
TEWS	Traffic engineer workstation Tool for planning, simulating supplies and testing the supply of traffic data from traffic signal systems.
Visualization data	Data that serve to indicate the second-by-second processes at the TSS on the display in the control center. This data can be used for analysis purposes as well.
VIV	German Institute of Traffic Engineering Offices e.V.

V2I2V	Vehicle-to-Infrastructure-to-Vehicle
	Communication between vehicles via the infrastructure
V2V	Vehicle to Vehicle
	Communication between the vehicles

X	
XML	Extensible Markup Language Metalanguage for defining document types. XML supplies the rules that are applied when defining document types.
XSD	XML Schema Definition A complex schema language for describing an XML type system. In contrast to DTD, when using XSD the name of the XML type and the XML tag name used in the entity can be distinguished.

Z	
Control center	The term control center is used in the OCIT-O documents as an **abbreviation** for a traffic signal control center to which traffic signal controllers are connected. The traffic signal control center can be a part of a device for controlling and monitoring road traffic composed of multiple components. The components of this central level can be found at different locations (distributed system).
Central level	A device for controlling and monitoring road traffic composed of one or more components. The components of the central level can be found at different locations (distributed system). From the perspective of the OCIT process the central level includes at least one traffic signal control center and the traffic signal systems connected to it with their traffic signal controllers. The subsystems such as traffic engineer's workstation, supply data server, system for quality assurance, adaptive network control and others, if applicable, are extensions.
Central and local system access	OCIT outstations interface of the central level or on the traffic signal controller to which tools for supply or service are connected.

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