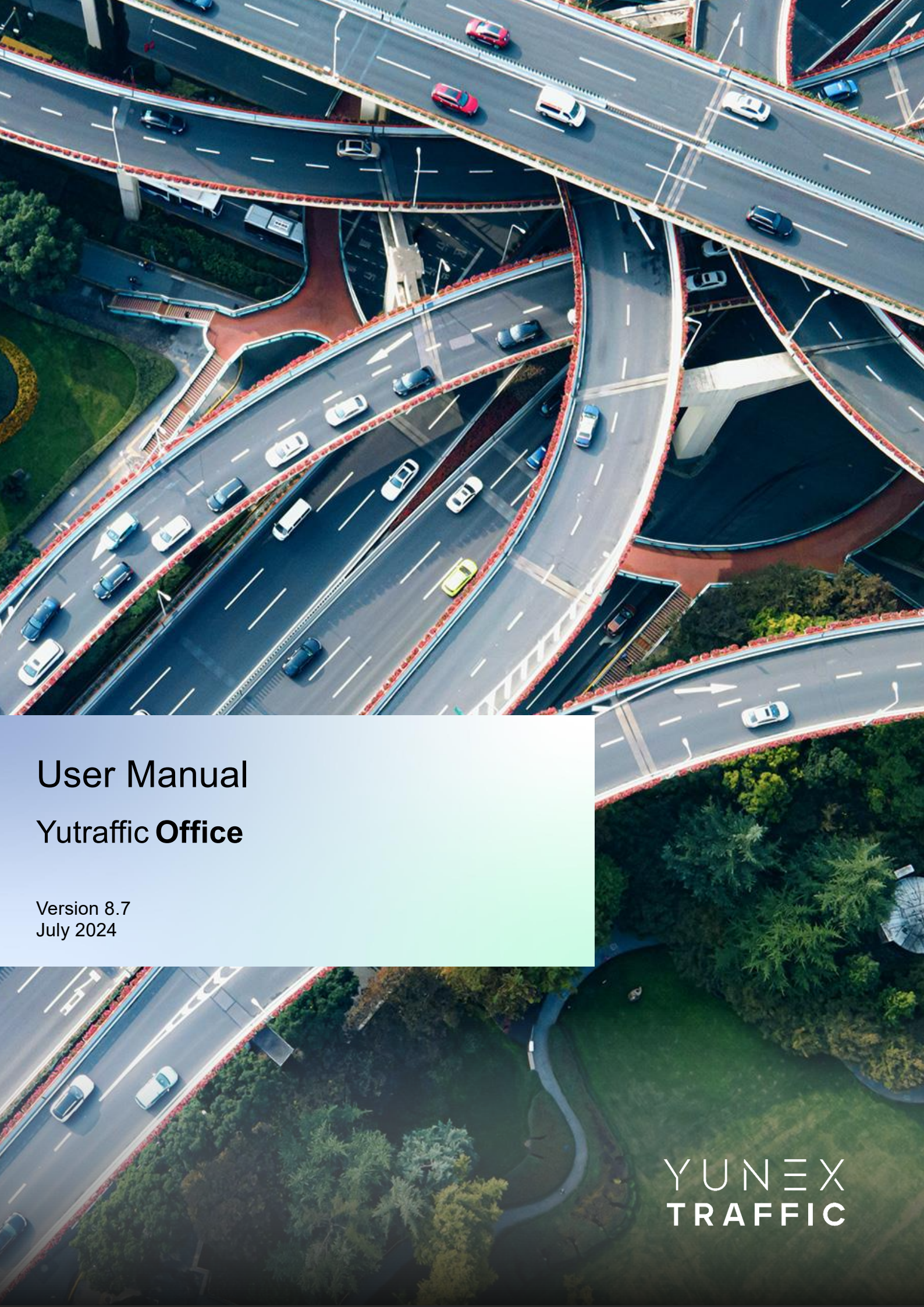

User Manual

Yutraffic **Office**

Version 8.7
July 2024

YUNEX TRAFFIC

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1. Preface

This manual and the online help were created for users with experience from engineering consultancies, civil engineering planning offices and the traffic engineering group of Yunex Traffic Engineering. It is assumed that users have a basic knowledge of planning and parameterization of traffic signal-controlled intersections. traffic engineering routes and networks as well as of the standard techniques used with MS Windows® programs. General program functions such as the integration of external programs are explained briefly.

The structure of the manual corresponds to the workflow for traffic engineering planning and implementation of intersections, routes, networks or fields of Yutraffic Motion.

The most important workflows for creating signal programs. editing the basic data for traffic actuated control and time-distance diagrams are illustrated in scenarios.

The documentation also includes special notes on the calculation algorithms used and on the input data for the controllers and traffic control computers.

See Version history.

2. Introduction

Yutraffic Office is an object-oriented tool for planning traffic signal-controlled intersections. traffic engineering routes and networks in fixed-time and traffic-actuated control systems. It is also used for planning and supplying the network control method Yutraffic Motion. It covers the creation of signal programs (taking any evaluation of signal plans into account). time-distance diagrams and basic data for traffic actuated control. This data can be transferred to VISSIM resp. exported to Aimsun and used for simulations.

The objects are shown in a tree structure of similar functionality to MS Explorer® and are supplied with data using the layout plan and/or editors (tables. matrices. graphics. etc.).

Planning is supported by automatic transfer of layout plan data into the editors. data checks. as well as by various calculation algorithms.

The data created is used as a basis for data supply to controllers (e.g. sX) and to traffic control computers (Yutraffic Scala). It is adopted by current controllers or by Yutraffic Control. if older components are used. This controller data forms the basis for parameterization of the network control methods in Yutraffic Motion.

Numerous imports and exports serve as interfaces for older tools (Sitraffic P2, Sitraffic Control etc.) and for third party systems (OCIT VD-DM-TSS).

2.1. Program installation

Please note that there is a separate installation guide.

The installation guide is integrated within the setup and can be shown after starting it. You will need a PDF reader to open it (e.g. Adobe Acrobat).

Hierzu gibt es eine eigene Installationsanleitung, die unbedingt zu beachten ist.

2.1.1. Installation option „Serverless“

You can install Office in a „Serverless“ option without any server parts. The data management is exclusively file persistent. Only one user is allowed. The start is via a simplified login. Only reduced menu options are available. All elements are always reserved. There is no“control center” perspective. Details of the differences you can find in the respective topics.

The „Serverless“ profile is provided automatically for initial installation or update in all installation options (client/server and Serverless).

In an initial installation of the Serverless option no server part is installed → with this no alternative profiles (and consequently no TE server access) are available!

2.2. Open-Source software

This product uses free open-source software (OSS) components and software licensed from third parties. For further information on this topic (e.g. components. licenses used. copyrights). please refer to the OSS Read Me file. This document is either on the installation media and /or has been saved to the target system during installation. Depending on the component. it might be necessary to provide the user with the corresponding source code on the installation media (DVD).

2.3. User/Programm settings

After installing the program, you should check or adapt the following settings.

User profiles

A user profile is automatically created per default on your local drive. However. you can define own profiles. using central data storage locations and licences.

Workflow settings

Here you define the workflow statuses (DRAFT. INVENTORY. etc.) and the changeovers from one status to the next (see chapter 4.6.2.1).

Please note that you should only change these settings if you have detailed background knowledge on the effects. Wrong configuration settings might damage the data.

Settings

Here you specify automatic data saving routines, screen display parameters and data paths (see chapter 4.5.1).

User account management

Here you create user accounts and group accounts and assign rights for them (see chapter 4.2).

Favourites tree view of intersections

For each project you can specify a self-defined structure for intersections (see chapter 4.5.2.3).

Defaults for several configurations

Defaults are data required for traffic engineering configuration and that recur in different configurations. Check these defaults and adapt them where necessary. or create alternative defaults (see chapter 4.8).

Create and configure projects

Create at least one project (see chapter 4.9.1) and if the OCIT or Yutraffic Scala are available. configure your project data accordingly (see chapter 5.1).

Views

You can choose between the views intersection planning and intersection supply and the workflow status (DRAFT. INVENTORY....) (see chapter 5.2).

Print templates

You can change the templates according to your requirements (see chapter 4.14).

3. Basics

3.1. Elements

An Element is the smallest unit that can either be requested or released. deleted irretrievably or restored. Elements are exchanged as a whole between client and server.

This is also the smallest unit that can be versioned.

Example:

Project

Intersection

Network

Network version

Motion

Request and release

Request and release are used to request and release exclusive write access. To edit an object. you first need to reserve it (for yourself). During the "reservation period" other users can see and read the object. but cannot edit it. This is how concurrent access and inconsistencies are avoided.

Requested elements can be changed and are disabled for other users. Reservation can be undone again with "Release".

Elements can contain systems. Systems are files which the system requires internally or any files which can be added to an element additionally by the user. e.g. to describe them in more detail.

3.2. Element version

Elements are assigned with versions. The version is continued with every element change and so allows changes to be more transparent.

An element version always has:

a superior logical element (e.g. an intersection version always has an intersection)

a version number (1..)

different checksums (for several buyers: OTEC. controllers. central computer. etc.)

a workflow status.

Example:

Intersection version

Motion version

3.3. Supply objects

Supply objects are logical and coherent data. e.g. signal group. signal program.

Differences to the element (elements consist of supply objects):

deleting cannot be undone

objects cannot be "requested" / "released" individually. but only in connection with their elements

objects cannot be versioned.

3.3.1. General attributes of supply objects

Different identifiers exist for each object which are pre-set by the system. but which can be assigned freely:

Short name

1 to 32 characters

Using the special characters \ / : * ? " < > is not permitted and is prevented by the Office editors.

The following characters are allowed in OTEC and Motion supply objects: 0…9. a…z. A…Z. . - + _ = ( ) ! | ~ # (including space characters). This must be ensured by the user.

These short names are transferred to the controllers. If the permissible number of characters transferred to the controller is exceeded. plausibility messages are output, and the default identifier is used. When you download data from controllers. these default identifiers are adopted into the intersection version after data synchronization.

Name

1-250 characters; see short name for characters allowed.

If two identifiers exist the short name is automatically included in the name in Office editors. This is only the case if no name is specified or the name used to be the short name.

In addition an object is defined by the following numbers which must be unique:

Number

Assignable number (1…n).

This is a planned or logical number for the object. independent of the controller number areas.

Example: intersection numbers

Technical numbers. channel numbers. outstation numbers

Explicit numbers for the identification within controlling processes (such as controller)

Example: device number.

You can enter a description for each object.

3.3.2. Identifying objects

Objects are clearly identified by the number in the system. per default. The signal group with the number 1 can only occur once per intersection version. Identification is amongst other things important for data transfer. so that the assignment of objects from other intersection versions is ensured.

The following objects are not identified per number:

Object	Identified by means of
Reference line	Crossing (if available); otherwise, the number
Minimum time entry Switching time entry Stage element (SDM frame plan section Signal group extension for Motion	Signal group

Object	Identified by means of
Signal sequence element	Signal pattern and fixed pattern information
Intergreen matrix	BD/TA identifier. if available; otherwise, the number
Offset time matrix	Type
Matrix entry	Row and column (signal groups)
Program switching time	Time
Stage Stage transition Stage change matrix	BD/TA identifier. if available; otherwise, the number
Stage change matrix entry	Start and destination stage
Basic stage sequence PI	Technical PI no.
Stage area Frame area SL detector problem entry MX frame entry MX priority entry	Stage
Pdm demand entry Pdm calculation entry	Type. signal group. detector
Generic controller components	Type and CtrMType
Partial route, lanes	Start and destination information (intersection version and leg. if available; otherwise, the number.

Tab. 1:Identifying objects

3.4. Data management

Version management is integrated into Yutraffic Office. This is directly connected to the necessary steps

in a „serverless configuration“ for a local data management or

for a multi-client system. All data are in a database on a Server.

Request and release are used to request and release exclusive write access. A user can only edit an object if he has requested it (for himself). Another user. however. can see and read the object. but cannot edit it. Concurrent access and inconsistencies are therefore avoided.

If an element (e.g. an intersection) is created completely new. this takes place locally on a client and the database object is added and only becomes visible for other users after being saved. As of this moment you can also find it under version management and it also must be requested for reediting.

4. General program functions

4.1. Login

4.1.1. Serverless (without server)

With the first start of Office with this profile you can store your login data (login name. department designation. address etc.). With further starts the login runs automatically without any login screen. User data can be changed later via an Office menu item.

4.1.2. Client/server

Starting from Yutraffic Office 8.6 Update 01, there are now two user managements supported: one for Scala 8.3+ / TE server and one for older Scala 8.1.1. The older user management was added to support deployment of Yutraffic Office 8.6 Update 01 on a Scala 8.1.1 systems. You can switch between these two in the Yutraffic Office Profiles tool by invoking it's context menu and selecting the "User management" entry there. This will open the Yutraffic Office Profiles tool window, where it is possible to switch between the user managements via corresponding toggle button. By default the Scala 8.3+ / TE server user management is selected.

When deploying Yutraffic Office 8.6 Update 01 (and later versions) on a Scala 8.1.1, please always make sure to update all Yutraffic Office clients (including the Yutraffic Office installation on Config server) as mixing client versions within a system is not supported and could severely harm the entire environment.

To start Yutraffic Office you must enter a login name and password. When entering a login name you are given the user rights you have been assigned.

After calling Yutraffic Office the login mask appears.

Please enter your login name and password.

4.2. Manage user

4.2.1. Scala 8.3+ / TE Server

The users of the central computer can be summarized and managed in groups. You assign these groups specific user rights.

The users can be managed within web user administration (called Administration console), which can be accessed on specific URL, depending on environment:

for Scala environment, the user administration location may vary, please ask your system administrator for specific user administration url

for TE server environment, the user administration can be reached directly from Core server machine at: https://<FQDN>:3030/auth/.
(where <FQDN> is Fully Qualified Domain Name of Application server)

For the detailed instruction regarding managing groups, permissions and user details, please refer to official ITS Installation guide, TE server user management chapter (also applicable for Scala environment). For external users or for further questions contact the SOC.

In the Serverless profile you can exclusively edit on the computer the user data of the only local user.

4.2.2. Scala 8.1.1

4.2.2.1. Managing user groups

Clicking **Delete** repeatedly deletes the rows in the table from the cursor position upwards.

- Close the window using the "Close" symbol in the window frame.

4.2.2.2. Manage users

4.2.2.2.1. Create user

Proceed as follows:

- In the **User account management** folder. click **User**.

The **Users** window opens with a table of user information and a list of the user groups specified (or the assignment of users to groups).

- Click **New** to create a new user.

A dialog **Detail view groups** appears.

- Enter all information through the user. Assign a **password** for the user. Confirm your entries with **OK**.

The data is saved in the user overview.

- Assign the user to a group by clicking the desired group column in the overview.

The group is marked for this user.

The groups are displayed as columns in the table. You only must select them.

- Create more users in the same way and assign them to a group.

It is necessary that each user is assigned a group because rights can only be assigned via a group.

- Click **Save** to save a new user.
- Close the window using the "Close" symbol in the window frame.

4.2.2.2.2. Delete user

Proceed as follows:

- In the **User account management** folder. click **User**.

The **User** window appears. There is a table in this window containing user information and a list of already created groups.

- In the table. select the user you want to delete.
- Click the **Delete** button.

The row with the selected group is deleted.

Clicking Delete repeatedly deletes the rows in the table from the cursor position upwards.

- Close the window **User** using the "Close" symbol in the window frame.

4.2.2.2.3. Importing/exporting user data

- In order to import or export user data in the system. click the corresponding button in the user overview.

The **Import/Export** dialog appears.

- Select the data and confirm.

The user data is imported/exported. After the import. the user data is available in the overview.

4.2.2.2.4. Change password

Proceed as follows:

- In the **User account management** folder. click **User**.

The **User detail view** window appears.

- Enter a new **password**.
- Confirm the new password by repeatedly entering it.
- Confirm your entries with **OK**.

The new password is assigned to the selected user.

- Close the window **User** using the "Close" symbol in the window frame.

4.2.2.3. Assigning user rights

Proceed as follows:

- In the **User** folder click **Assigning rights**.
- The **Assigning rights** window appears.
- Click in the **Group column** check box which you want to assign the listed access right.

The group is selected, and the users of this group were assigned rights.

- Proceed in the same way with all rights you want to assign.

A list of permissions with explanations can be found in the appendix.

- In order to create a right or look at it in detail. click **New** or **Detail view**.

The **Detail view user rights** dialog appears.

- Give the new access right a **name**. assign it a new **area** and **lower range** and enter a **description**.
- Confirm with **OK**.

The new right is displayed in a list.

4.3. License management

Yutraffic Office is copy protected. A dongle or a file license must be available for correct operation.

File license can be configured within the Yutraffic Office profile tool in the Licenses tab. In order to use file license, the license source toggle must be set to License file. Then a license file (*.licx) can be specified, together with a user name and password, which can be retrieved from a licenseInfo.txt file, which is distributed together with the license file. Subsequently, the file license can be added by pressing the “Add license” button. There is also a possibility to switch between multiple added file licenses via the "Activate”

In the **Serverless profile** there are no volume licenses available because there is only communication with the local dongle or file license.

All Yutraffic Office clients get their licenses from the Server. but might also require an extra USB dongle (standard for stand-alone systems) or a file license. Yutraffic Office licenses are generally floating licenses if a client-server operation has been configured.

There are three types of licenses:

A **Volume license** or a Floating license is a license which is available n times per system. The volume license **Planning intersections** for instance is limited to a certain number of clients that can be used simultaneously to plan intersections.

A Feature license is limited to the use of a certain feature. e.g. **OCIT-I VD Export**.

A Volume license allows use of a maximum number of objects. It e.g. specifies a specific **number of intersections**. i.e. the number of intersections that can be saved on the Server.

To view the licenses available, choose **Settings – License management**

Volume licenses are reserved upon selection of the perspectives. To specify the licenses, you want to reserve. From the **Settings menu, choose License Management.** Then click the **Settings** tab. For the Supply intersection perspective, you can specify to supply all data to controllers or to the simulation (previously Control S). Here you can also assign the Planning perspective to the planning licenses Compact. Standard. Extended and TA.

However. you cannot differentiate in detail between the perspectives Planning Motion. Planning network or Supply control center.

4.3.1. License updates and modifications

If you want to change program functions which are subject to license (bought), an update of the dongle – information is required.

To avoid sending the dongle back and forth, a *.c2v file (customer to vendor) must be created on the server PC to which the dongle is attached using the tool *hasprus4ITSCustomer.exe* which was provided at delivery. This file contains individual customer dongle data and is required to generate a license update.

This must be sent to customer services per email.

As an answer you will receive a *.v2c file with the changed / extended license information.

With the tool *hasprus4ITSCustomer.exe*, which was supplied with the product, you can execute the update.

The tool *hasprus4ITSCustomer.exe* is supplied with a brief instruction on how to update the license.

In an exclusive Serverless installation the update tools are not available.

4.4. User interface

This document does not describe the user interface in detail.

The user interface follows the Windows standard convention and the program can be controlled using the mouse and/or the keyboard. Most of the programs can be controlled using the keyboard. except for some complex editors. The Appendix contains an overview of the keyboard shortcuts.

4.4.1. Functions and tables

The individual functions on tables are:

Sorting: By clicking on the column header you can sort in ascending or descending order (column no. short name. name and description).

Filter: To select the filter criteria and activate the filter, click the right half of the column head.

Searching: Press <Ctrl> + <F> to show a search panel. You can enter a text there. The system will highlight this text in the values (if available).

Setting the optimum column width: Use the context menu (click column header) to set the optimum column width for each column. You can do so for individual columns or for all columns at once.

Changing the column sequence: To move a column to a different position, hold the left mouse button down and drag the column to the position of your choice.

Grouping: A group can be selected according to its contents via the context menu of the relevant column header. Detectors can be grouped according to their layout for example.

Keyboard operation: as known in Excel

Copying/inserting via the clipboard:

copying/inserting complete rows:

To select entire rows. highlight the marking column (left from the first data column). then copy with Ctrl C / insert with Ctrl V or via context menu **copy/paste**.

The highlighted row is copied with all subordinate objects.

Copying/inserting cells

Select cells with the mouse. copy with Ctrl C / insert with Ctrl V or context menu Copy/paste.

Copying and inserting complete rows is not activated in each editor. In editors, where no new objects can be created, copying/inserting complete rows is not possible.

The content is not inserted in read-only fields.

4.5. Main window

4.5.1. Menu bar

The menu bar is split into a left and a right part, where the left part represents the active program settings and the right part represent the overall program settings.

New

Here you can add an element, e.g. a new intersection.

Project

Here you can select or create the project. When clicked, the dialog for the project selection and project management is shown.

Save all

When any change was made by the user the save button becomes active and gives the user the possibility to save his work.

Perspective

The active user perspective is shown. When clicked, the user can select a different available user perspective.

Data

The data menu contains functionalities to import and export data. The dialog for the system library imports and update is located here too, as well as the overview dialogs for reserved elements, deleted elements and to unlock data. The dialog for the management of the system t can be started here as well as the statistic views.

View

Under this menu you have the option of resetting the window settings. This is especially helpful if for example, you have reorganized or even closed windows in different editors and you want to undo this state.

Settings

The language can be set via the menu “Settings”. The newly selected language is displayed after Yutraffic Office has been restarted.

Via the menu “**Options**” you can change different settings of Yutraffic Office, including settings for “Auto Save”, the “Object tree”, the “Segment” and some Yutraffic Motion parameters.

In addition, you can adjust the “Default layout” for direct printing (within the editors) and the paths to the components, WTT files and compilers.

The settings under "Migration" controls the basic behavior for data synchronization between the planning data and the configuration data.

Under "TA logic" you can adapt the colors and fonts of the “Structogram”.

Under "Feature Toggles" you can find different options to customize Yutraffic Office. For details see chapter 4.5.8 Feature Toggles. The menu “**Licenses management**” under “**Settings”** allows you to display all available feature licenses.

Further points of the “Settings” menu are the “Communication” settings and the “Workflow configuration”.

4.5.2. Object tree

The object tree is the central control element for Yutraffic Office. The structure is like the tree in the Windows file explorer.

The element displayed at the top is the project currently opened. Underneath. you will find folders for the object groups **General**, **Intersections**, **Network** and **Motion**. In some perspectives user libraries are displayed next to the project.

4.5.2.1. Object tree views

The structure of the tree or that what is visible to you in the tree, is dependent on the selected view. There are object tree views available for several tasks. e.g. intersection design. network design. intersection supply. etc. These views are also available in certain editors. The **Network** folder is not visible in the **Intersection planning** view. for example. Please note that if you change the view, the tree will be recreated and some of the opened folders might be closed!

You can open a folder and get to the next detailed level by double clicking on the folder in the object tree.

The object tree also displays if an object is requested and you can see if they are requested by you or another user and can therefore not be edited. The status bar below the tree shows who reserved the element.

Via the tabs **Data – Reserved elements** you can show all elements you have reserved. You can release individual elements or all elements at once.

The object tree contains a context menu with many important functions. Almost all these functions are necessary for working in the object tree and the context menu is adapted to the selected object tree.

4.5.2.2. Object tree restrictions

The context menu in the object tree offers the possibility of displaying the object tree by not starting with the project but starting with a subordinate object and therefore restricting the view and creating the currently required area more clearly.

By clicking **Display change** via the object tree you can move back and forth between the two displays.

4.5.2.3. Favorites tree view

For each project you can specify a self-defined structure for intersections. This allows you to organize as many folders and subfolders and save as many intersections as you wish.

To edit the tree structure on the toolbar click the **Edit favorite tree view** button.

Then the context menu is extended by the following entries:

Create **New folder**: You can enter a name of your choice.

Delete folder: The Favourites folder is deleted.

To quit the Edit mode click the **Edit favorite tree** again.

Use the **Switch intersection list** button to switch the "flat" intersections list (default setting) on and off.

The intersections saved to favorite folders are merely links to the original intersections in the "flat" list. You can save links to the same intersection in several favorite folders. Favorite folders can therefore be used for temporary projects and deleted again without data loss after the project has been completed.

4.5.3. Intersection overview

In case that the controller type is set to sX or the corresponding feature toggle is set, the tree is visualized without sub nodes for intersection versions. Instead of child nodes, which represent each configuration editor, a special view can be started to get an overview of the planning/configuration data of the intersection version and edit the data via editors. This overview can be started by double clicking the intersection version node or selecting the plus sign in front of the node.

All other data like control center relevant data, may be edited as usual.

For each intersection version of sX or other controllers having the corresponding feature toggle set you get a separate overview page in the main window.

You can select the main methods in this toolbar, like:

- **Reserve** and **Release** this intersection version
- **Export** the data to a file. You can choose between the *.SOP-file format, for a data exchange between Office applications, or the *.sxa-file format as configuration file for the sX controller.
- **Transfer** the configuration to the sX controller. Yutraffic Office exports a *.sxa-file implicitly and you can transfer it then to the sX controller. The function is only available in perspective Intersection supply.
- **Print** the data of the intersection version.
- Further functions are **Duplicate** and **Delete** the intersection version.

It depends on the selected user perspective and the component configuration how many pages of configuration objects can be seen.

In the planning perspective you can only see the “Planning data”. In the configuration perspective you can see pages for each controller component.

On each data page you can see groups of tiles on the left side. A group can be expanded or closed by clicking on the group heading. The tiles represent the configuration objects. You can see the name and the amount of object instances of this type. If you select any tile the detail view on the right side will show the details of the object. If you double click on a tile the editor for this object (or the first object instance) is opened immediately.

In case of perspective “Intersection supply” the page for the “sX advanced” component is visible. On this page there are two special tool buttons.

- **System data precalculation…** opens a dialog to pre-assign following system data:
  - System data which depend on the signal monitoring controller type. The required type can be chosen in a combo box.
  - Channel assignment data with an option to reset the existing assignment.
  - Overlap list.

Print terminal overview creates a preview for the terminal overview of each existing lamp switch. The preview can be printed.

4.5.4. Detail view

Just like in the Windows Explorer, the detail view shows the content of the selected folder or selected tile within the intersection overview. If you are on the object level, use the context menu/toolbar to select the main object functions such as create, delete, edit or copy.

You can open the respective editor by double clicking in the tree or detail view. provided the appropriate object is available. If no objects are available (e.g. no signal groups or detectors have yet been created) a new object can be created via the context menu/toolbar. The relevant editor then opens.

In the detailed view you can also search or apply filters. To do so press the corresponding buttons. Please note that a filter may continue to apply upon selection of a new object and, therefore, not all entities will be displayed.

4.5.5. Message window

In the main window of Yutraffic Office there is a message window at the bottom edge which displays system messages.

Here you can also view information on importing files or the like.

This window can be moved to another position by the user at any time.

The status bar shows you how many messages there currently are. Click the respective symbol to open the Message window.

4.5.6. Data verification

In the **Data verification** window. you can check the data for inconsistencies. To start a plausibility check, click the **Check…** button. However, you first need to choose the use case and to which extent you want the data checked.

In the first list box. click the use case. i.e. the context within which you want the data check performed.

All: Check data for all use cases.

Local software

Intersection (otec): Check on OCIT-I Schema (version 109)

OCIT-C (2.0): Check on OCIT-C 2.0 Schema

Intersection (xml): Consistent check for Yutraffic Control

sX Controller: Consistent check for an advanced sX controller

Motion: Check on Motion Engine Schema

Network

Network optimization.

In the second list box. you specify the extent of the data check. The check is either performed for the version of an element (highlighted in the tree). an individual element or for the entire project.

The results are displayed in a table. There are three types of messages:

Error: A schema conform data storage is not guaranteed. Errors must be corrected prior to further editing. especially prior to an export.

Warning: Data is logical inconsistent. Checking the marked data is recommended.

Information: Useful notes. the data is inconsistent.

Double-click the plausibility message to go directly to the respective editor.

In case of an advanced sX controller a fourth message type is possible. Critical error: A non-schema conform data export is possible but not accepted by the sX controller. A correction of the data is absolutely required.

4.5.7. Consistent test

The Consistent test service window informs you of any data integrity violations that might occur during editing. This test can only be performed within one intersection version. If an object is deleted. created or edited. this window displays how it affects any dependent data. You can click the **Check…** button to later show the data whose integrity has been violated.

The results of the Consistent check are displayed in a table. There are two types of messages:

Error: An object was changed or deleted. Data integrity cannot be guaranteed for the object pointing towards the changed or deleted object. Please check.

Info: A new object was created. Check object that must point to the new object.

If a message is displayed while you are editing an object. you can show further information on the action and its effect that led to the inconsistency.

Double-click the message to go directly to the editor where you can edit the "inconsistent" object. The editor outputs a message. stating the "inconsistent" object and the Save option is automatically activated. Select Save to confirm data integrity of the object and undo the "inconsistent" status.

Alternatively use the context menu in the table to confirm data integrity

4.5.8. Feature Toggles

With the “Feature Toggles” you can adapt Yutraffic Office in general. The settings are client specific. You must restart Yutraffic Office to apply the modified settings!

Feature toggle „100ms visibility“

If this feature toggle is set, time values in 100ms cycles can be entered in various places (e.g. signal program), which are then of course also documented accordingly.

A corresponding supply to a controller is only possible if the controller and its firmware (version) support this as well.

Please use this option only if the country-specific guidelines allow it. In many European countries such as Germany, Austria and Switzerland this is NOT allowed!

Feature toggle “Automatic Ocit export”

This feature toggle enables the function to automatically create an OCIT-I export to a selectable location after an intersection version was switched to inventory state. The export procedure is silent and will only show feedback to users if the process failed. The created file receives the name according to its Intersection number and version number.

Within this feature toggle the selection can also be made to delete existing files at the selected path with the same version number of an intersection version that changes from an inventory state.

The automatic export functionality can be used without the deletion mechanism.

Feature toggle „Fill conflict matrix and validation”

If this feature toggle is activated, the conflict matrix can be preassigned or checked according to the topology.

Feature toggle „Editors Process Separation“

This switch is set by default and should not be disabled. However, it can be deactivated if necessary if imminent problems arise in connection with the multi-process environment.

If this feature toggle is set, each plugin editor runs in its own 64-bit process, which, among other things, provides them with more RAM and in addition improves performance.

Feature toggle „New Topology/Layout editor“

If this feature toggle is set, the new editor will be opened and used exclusively. In addition to the functionalities of the old editors for layout plan and topology, the new topology/layout editor also includes the functions of the map, pedestrian crossings and stops editors.

Working in parallel in the old and new editor is not supported and therefore not offered.

It is strongly recommended not to switch back to the old editors, as this might cause unwanted problems.

For the outdated Mdocu, the old P2 editor is used in any case, regardless of the feature toggle setting.

Feature toggle “Intersection Overview”

This feature toggle can be used to activate the well-known sX advanced intersection overview for all other types of intersections. The detailed object tree beneath the intersection will be removed in that case. All functionality provided by the context menu will in this case be available from the toolbar above the detail view.

Feature toggle “Reactivate old Signal program editors”

This feature toggle is disabled by default. Yutraffic Office version 8.7 is the last version that supports this switching option!

If this feature toggle is set, the old signal program editors are used.

Working in parallel in the old and new editor is not supported and therefore not offered.

For the outdated Mdocu, the old P2 editor is used in any case, regardless of the feature toggle setting.

Funktionsschalter „Reaktiviere MDocu für Planungsdaten“

This feature toggle is disabled by default, i.e. planning data can no longer be documented within the outdated MDocu. Please use the new print function!

Feature toggle „Multiple tree nodes“

If this feature toggle is set, for particular plugin editors, like e.g. signalprograms, multiple tree nodes for individual types (signal programs, on/off programs, etc.) will be displayed

This has the advantage that the existing instances for the different types are listed again and the desired instance can be opened directly by double-clicking.

The editor itself is unchanged and still contains all instances of all types.

Function switch “Second 0 / 1”

This switch will affect the time base used for display / documentation of time points. Time durations will not be affected!

You have the choice between "second 0" and "1 second”.

Second 0: This time base used within OCIT. In this case the t_X within a signal program is between 0 and T_u -1

Second 1: This time base was originally used by Yunex Traffic together with the M(S) controller. In this case the t_X within a signal program is between 1 and T_u.

Remarks

By changing the time base the data isn’t changed in any way, the conversion is done exclusively in the editor or documentation.

Since the introduction of the C controller and Yutraffic Office the second 0 was used internally, only the visualization and documentation has been converted to the second 1.

Affected editors are:

- Signal program
- Stage frame plan
- SDM frame plan
- Time to distance diagram (TDD)

- All other editors incl. the user parameters where time-points are used.

The used time base is documented within the following editors:

- General data
- Signal program
- Stage frame plan

Time-points of the sX controllers within the Sitraffic smartCore are ALWAYS on time base "second 0". Please note that especially if a sX device is a part of a Time to distance diagram (TDD).

Within the signal programs and frame plans the offset by one second is not displayed in the timeline but in the times point values.

Feature toggle “Configuration data .docx printing”

This feature toggle enables the overall printing of the configuration data also in the .docx format (with the feature toggle switched-off, only the planning part of Office is printed in .docx format).

If this feature toggle is set, the .docx format is used for print preview instead of the mDoku.

4.6. Versioning and workflow status

Yutraffic Office contains workflow states and a version management system known from the Yutraffic project management. It further includes some fundamental document management functionalities.

4.6.1. Version management

Versions can be created for intersections. network and Motion. Versioning is used to ensure consistent data and to provide transparency within planning and further development.

Each version is displayed below each corresponding object in the object tree (the corresponding intersection. a specific network or Motion). In addition to the versions. the respective valid workflow status is also output there.

Versioning generally consists of two parts: implicit versioning within the project and explicit versioning including the controller.

Implicit versioning within the project is part of the system process. i.e. of Yutraffic Office. and cannot be deactivated. All management functions are based on implicit versioning.

Controller versioning can be activated or deactivated within the project when creating the project. Once deactivated in the project controller versioning cannot be activated again. Controller versioning: If this has been activated. transfer to the controllers. e.g. via Yutraffic Control. is versioned (provided supported by the controller and its firmware). In this case Delta supplies are possible, and the workflow states are automatically set.

If you deactivate Controller versioning under **Project General** or if it is not licensed. the system cannot automatically support and optimize remote supply. Without the **Versioning** license. the workflow statuses are restricted, and you cannot "configure workflows".

Using Versioning management. you can manage versions and workflow statuses.

To open it. in the object tree. open the context menu of the respective object (intersection. network or Motion).

A new version can be added or created by copying an existing version.

Version management provides the following functions:

Add version: A new version is created with the defaults of your choice. The version number is automatically incremented. Choose a name that makes sense and includes details. e.g. "Main street - side street – revised traffic actuation plan 2008".

Copy version: The version selected is copied and becomes a new version with the status DRAFT (independent of the status the copied version). For information on version numbers and names. see "Adding versions".

Rename version: You can enter a new version name.

Delete version: The version is deleted. but not finally deleted. The version stays in the recycle bin until it is finally deleted.

Show details: Details. as e.g. the controller version. are shown. Double-click the respective entry in the list to show the details of a version.

Example: A new version with the status DRAFT can be created from the version in the INVENTORY. This allows the planner to make and simulate small changes.

The workflow status for each version can also be changed in the version management. Whether you can change workflow statuses depends on their configuration (see chapter 4.6.2.1) and your user rights.

However. only one version per intersection can have the workflow INVENTORY.

Changes made to the version and the respective files are logged in the version history. The history allows you to trace back when a version was changed to a certain status. etc.

4.6.1.1. Dokument management

Document management is integrated in version management. It allows you to edit. manage and add files to individual versions and the unversioned higher-ranking element (intersections. networks. Motion). These can be for example. layout plans or described documents. Document management allows you to store all documents centrally. i.e. to a project. intersection. etc.

It provides the following functions:

Files can be organized in structured levels/folders (only one level possible)

Specification of a validity period for documents

Automatic saving of modified documents when you close version management

Configuration options (e.g. path to storage location)/various other options

Saving files locally

Adding/deleting files.

Document management in a versioned element also undergoes version management. This means that files are assigned to a version. When this version is copied. deleted or exported. the files are also processed and subject to the workflow statuses of this version.

In this way. no changes can be made to these data in the inventory or archive and none of these files can be deleted.

However. documents can be added. This is always possible. irrespective of the workflow status. This means that files can even be added to an inventory or archive version. If need be. you can mark older files by giving them a validity date.

All document management functions are available via the corresponding menu of the menu bar on the left side of the dialog.

Configuration settings and options as well as other general functions can be found in the menu.

4.6.1.2. Show checksums

You also have the option of displaying the checksum and the OCIT-/OTEC checksums for the selected intersection version in the version management.

To do so select the corresponding menu in the menu bar.

The corresponding checksum is displayed in a dialog. depending on the configuration and data.

Controller (C8xx and C9xx, not for sX)

OCIT/OTEC.

4.6.2. Workflow status

A workflow is the status of a project and serves project organization.

A workflow status is an attribute assigned to each versioned element. It describes the current status of the version. In User management you can limit the workflows available to certain users by giving them different access rights.

Overview of possible workflow statuses

Status name	Meaning	Editing right
DRAFT	A draft will be created of one or possibly more than one version	All changes possible. Changing to the status test position or simulation takes place when loading in a controller (or test position) or manually.
SIMULATION	Project is simulated	
TEST	Project loaded in controller (or test position). only the current supplied state and its predecessor in the controller (test position) are backed up.	All changes possible. The pattern number is automatically increased, and the status is reset to DRAFT. A change in status INVENTORY = green is performed by user intervention.
CHECKED	Project run in controller (or test position). determined to be OK and waiting for green through authorized person. Can be more than one version.	Except for green no more changes are possible.
INVENTORY	Project is running in the controller and was released by user.	No changes possible. A new draft version containing the same data, but updated data version can be created.
ARCHIVE	The versions will be archived for future reproduction.	No changes possible. A new draft version containing the same data, but updated data version can be created.

Tab. 2: Workflowstatus

A version normally undergoes several specific workflow statuses in a particular sequence. The workflows and their sequence can be changed by users with the required user rights.

4.6.2.1. Workflow configuration

A customer specific adjustment of the workflow state can be made in Yutraffic Office.

From the Settings menu choose → Configuration workflow status to open the configuration dialog.

Editing in this dialog is protected by the Workflow management license and the user rights Editing user and Editing user rights.

Furthermore. editing should only be executed by professionally trained users because important program functions are thus controlled or overridden.

The settings are saved throughout the system and can be exchanged between different systems via an export/import file.

Select the desired box.

Workflow settings can be changed for the versioned elements intersections and networks. The statuses are specified for the element’s central intersection data and Motion.

On the left of the window you can specify:

which states exist in the system ,

how often versions can exist in this state (e.g. an “existing version” may only exist once) and

whether the version can be edited in the specified state.

In the right half of the window you can specify which status changes are possible.

By default, the transition from DRAFT or SIMULATION to TEST for an intersection is not set via version management. These transitions are automatically set by the Office system (or Yutraffic Control) with the supply of the controller

4.6.3. Versioning limitations

Versioning is based on a check of the supply checksums. Therefore, versioning is limited by the control centers. controller types and communication facilities (possibly by their version) used. Here are some examples of the limitations:

Control centers

SICOMP serial

Sitraffic C800V: No transfer possible with version check

SICOMP LAN

Sitraffic C800V from level 4.0: Transfer with version check possible. but not recommended. as very time-consuming

Sitraffic Central up to version 3.3

Sitraffic C800V from level 4.0: Transfer possible with version check.

Controllers

M32 and MS controllers

As the supply checksums (based on dynamic data sections) are often formed with only few defined data sections. a definite statement on changes is only possible to a limited extent.

Sitraffic C800 up to version 3.x

The checksums of these controllers cannot be read out via BEFA 15. Therefore, versioning is not possible when it comes to central supply actions.

Sitraffic C800 Version 4.0 & C900

Methods required for transfer of version information to control centers are not implemented. Therefore, versions are not displayed in the log or in the View. Default storage to the flash is possible for data transfer via BEFA. from Sitraffic C800V level 4.1.

Sitraffic sX

Sitraffic sX has an integrated version management. This way. the build number is managed by the device itself and is automatically increased after each new supply. Yutraffic Office shows this number. The planning and supply version numbers can be freely supplied by the user. As with the Desktop documents. the editor and the save date of the last change are used to identify the supply status.

4.7. Open project

Several projects can be saved to data storage.

If no project has been saved to data storage yet, e.g. after installation) please note chapter 4.9.1

When you start Yutraffic Office the project you last worked on is opened.

From the **File menu choose > Open** to open the Selection window and select the project you want to edit.

Double-click the project to open it in the main window. Projects that are currently opened are not displayed in this list.

In the Yutraffic Scala system you must make sure. that only one project is being created and used. otherwise no clear allocation is possible. The connection to Sitraffic S4.x is also only possible with one project.

4.8. System templates

You should create default files before you start planning intersections.

Defaults are data required for traffic engineering configuration and that recur in different configurations.

There are defaults for

Intersection version(s)

Automatic twelve-month switching routine (calendar)

Automatic twelve-month switching routine (master control clock)

System data

Intersections

Network version(s)

User data

Templates (defaults) are copied to the concrete element data and can later be changed then independently from the primary default.

The Yutraffic Office System allows you to use any number of templates across all projects. These can be viewed via the **Data – System template** menu and if applicable edited.

The **template** dialog appears.

Here., we differentiate between system templates and user templates.

System templates are managed and updated by the manufacturer. which is why they cannot be edited and cannot be deleted. System templates with errors are corrected when the automatic update runs.

Application templates are those template that the user can manage in any way. i.e. new ones can be created, or templates can be deleted. A system template can also be copied and used as the basis for a user template. and it can then be edited in any fashion.

An import and export option are also available in the main tool bar that allows data to be transferred. rejected and reviewed.

With it. the following default setting categories can be exchanged:

Intersection version(s)

Automatic twelve-month switching routine (calendar)

Automatic twelve-month switching routine (master control clock)

System data

Importing default settings:

If the import dialog opens. first the template file in "*.sot" format must be selected. In the dialog that follows. the content of the template file is listed, and the user can select. which content to import. Also shown here is whether the selected content is compatible with the sX control unit. After confirming the dialog by clicking on OK. the selected templates are imported.

Exporting default settings:

After the export dialog opens, the user can select whether the template should be used for an sX control unit, then select the default settings and contents that should be exported as well as indicate the path, the description and name of the export file. After confirming the dialog with OK. the template file is written in ".*sot" format.

For all default setting types. a random number of default settings can be created.

The following functions are available in the symbol bar per tab:

New default

Delete default

Editing the name of the default

Copy default setting

Transfer defaults for templates

The following function is also available in the tab Intersection Version:

Import default setting for intersections (Import an *.svb file)

Data **transfer** from another default.

The following function is also available in the tab Automatic twelve-month switching routine (calendar)

Import JVL from Control

The data is initialized when you create an intersection or network (i.e. it is copied to its data). In some cases. it can be changed later. e.g. in the Signal group editor. However. changes made to default data in the editors are only effective there. not in the default data.

Defaults of each element (e.g. of the intersection version) are automatically passed on during import and export. If an element contains a new default. the default can be extracted as a new additional global default after importing this element. Direct import or export of default data is not an option.

4.8.1. Default settings intersection version

The default settings for an intersection version consist of:

General data

Colors

Signaling type

Plausible ranges

Flow types

Conversion factors

HBS 2001 / HBS 2015

Vehicle types

4.8.1.1. General data

Guideline: Selecting the guideline

Left-hand traffic: Determination of whether the traffic is right-hand or left-hand side

Rounding type as per RiLSA: When rounding as per RiLSA. the intergreen times calculation is always rounded up to full seconds.

If the rounding type is not used, the Rounding limit [1/100s]' can be defined by the user in 100ths of a second.

The following applies to the **Reference Border Line:** If the current value is greater than the defined value. the real route is taken into consideration. All values lower than the defined values are set to 0 m.

Display border / calculation intersection map:

Border width display for reference lines: "None", "covered" or "transparent"

With border width: "Glancing intersections", "crossing intersections" and/or "pedestrians"

Border width [m] of lanes

Border width display for crossings: "None", "covered" or "transparent"

With safety system: Decision on whether to display/calculate with or without safety system.

Lanes of safety system [m]: Safety system measurements in meters

Filter / options intergreen times display: Boolean options for

Consider lane information

Consider right-right combinations

Consider entering cyclists on vehicle lanes

Consider clearing cyclists on vehicle lanes

Cyclists on mixed lanes in conflict to cyclists

Cyclists on mixed lanes in conflict to pedestrians

Intergreen time calculation with updated layout plan roads

Consider maximum transition times

4.8.1.2. Colors

Available colors for signal groups in this supply.

Call up the dialog from the menu option **Data - Default** settings.

The dialog **Default settings** appears.

Switch to the **Intersection version** tab.

These can be supplied:

No.: Color number

Name: The user-definable color name

Top, center, bottom section: States of each chamber of a signal head. Possible are:

- On: Light on (not flashing)
- Off: Lamp off
- 1Hz Da: Light flashing with 1Hz, at the start of a second the light is dark (off)
- 1Hz Br: Light flashing with 1Hz, at the start of a second the light is bright (on)
- 2Hz Da: Light flashing with 2Hz, at the start of a second the light is dark (off)
- 2Hz Br: Light flashing with 2Hz, at the start of a second the light is bright (on)

4.8.1.3. Signaling types

Signaling types define the default behavior of a signal group. When creating or assigning the signaling type these properties are saved as a copy and changed specifically for this signal group without changing the default.

This table is nested; the levels define:

- Signaling type

- Permitted colors
- Signal sequences
- Signal heads.

4.8.1.3.1. Signaling type

A signaling type defines:

Designation and description of the signaling type

A prefix for default assignment of signal group names

A signal group type according to RiLSA

A signal group detail type

Permitted signal group colors (chamber states)

- Standard stop and go color
- Additional permitted end states
- Transition colors

Signal sequences where a selected default signal sequence is marked with "*" in the event of multiple sequences.

Monitoring type for signal monitoring

- Minimum monitoring: For this monitoring type only if the last red lamp fails is an alarm issued. The system is not switched off as a result of lamp failures.
- Single monitoring: For this monitoring type the system is switched off if the last red lamp fails. An alarm is issued if a lamp fails for any other color.
- Single red lamp(s) [1,2]: For this monitoring type the system switched off if the first of two red lamps fails (switch-off logic: Failure signal 1 or 2). An alarm is issued if a lamp fails for any other color.
- Single red lamp(s) and channels [3,4]: For this monitoring type the system is switched off if the last red lamp of a red lamp channel fails (switch-off logic: Failure of signal 1 and 3 or 2 and—if applicable—4). For any other color an alarm is issued if a lamp fails.

Signaling out for primary and secondary direction (PD/SD)

- AR: All red pattern
- AGE: All yellow pattern
- ADU: Continuous off pattern
- GEB: Flashing off pattern
- Spec. ABLI: Special off flashing pattern

4.8.1.3.2. Permitted colors

The display of the go and stop colors means the following:

[Standard color]; permitted end state; (transition colors)

For example:

[Color 1]; Color 2, Color 3; (Color 4, Color 5)

Color 1 is the standard color

Color 2 + color 3 are other permitted end states

Color 4 + color 5 are transition colors.

All colors not listed here are not permitted for this signal group. They may be identified by the signal monitor as an incorrect color which leads to a switch off.

4.8.1.3.3. Signal sequences

Create the signal sequences in the **Default data** dialog in the tab **Intersection version** in the subtab **Signaling types** by double-clicking on the signal sequences in the desired row.

A signal sequence is defined by:

No.: Signal sequence serial number: automatically issued internally.

Name: Name of signal sequence.

ID **of the default signal sequence**

The signal group patterns are defined by:

No.: Serial number of the signal sequence element

O no.: Entity number for the control unit structure

Signal pattern: Reference to a **color**

Duration of the pattern

Fixed duration/Fixed pattern: End state or transition pattern**.**

Signal sequence elements can be **copied**, **added**, **moved** or **deleted** via the pop-up menu. It is also possible to **undo** or **redo** changes from the popup menu:

4.8.1.3.4. Signal heads

The signal heads that belong to the selected signaling type are shown and supplied in a separate table below the signaling types.

You can **create** or **delete** signal heads with the corresponding buttons.

A signal head is defined by:

No.: Serial number of the signal head

Short name: Short name of the **signal head**

Name: Name of the **signal head**

Position: Selection between "pole", **"extension"** or "signal bridge".

Pole name: Name of the **pole**

Sections: Sections of the signal head with the specifications

- Diameter: Diameter in millimeters
- Symbol: Symbol for the signal head section

The number of signal heads is also used as a default for the configuration of an sX controller within the sCore.

Signaling type ↔ Signal group

The properties of the signaling type can be applied to the entity of the respective signal group by selecting a signaling type (standard or user-defined) in the signal group list. This means that the signaling of the signal group can be customized at any time without the template type changing. On the other hand, changes to the template will not change any signaling in the signal groups.

Individual changes to the signaling type of the signal group can be copied to the template using the **Copy ... to template** function.

4.8.1.4. Validity ranges

Validity ranges define the monitoring type for a detector. These characteristics are transferred as a copy into the detector when the monitoring type for a detector is selected.

The default settings for a validity range are defined by:

No.: Serial number for the validity range template

Name: Name of the validity range template

Description: Description of the validity range template

Prefix: Prefix that was used when entering detectors of a selected type as default setting for a detector name.

Detector type: Selection of a detector type

Flutter threshold [ms]: Flutter threshold in milliseconds

Detector validity range 1/2/3/4

- **Gap [min]**: Gap in minutes
- **Assignment [min]**: Assignment in minutes

A name and a description can be edited for the four columns of the detector validity ranges in a separate table under the one for the validity ranges. This information is shown in the automatic twelve-month switching routine when selecting a detector validity range.

4.8.1.5. Flow types

The vehicle types that can travel on a certain section define the flow types. The parameters define their speed, acceleration and braking behavior.

The default of the flow types is relevant for intersection versions and network versions.

The following road user groups can be selected:

Car

Motorcycle

Truck

Tractor trailer

Bus

Tram

Bicycle

4.8.1.6. Conversion factors

The conversion factors are needed for current loads, for example.

The default settings for the conversion factors are relevant for intersections and intersection versions.

In addition to the factors used to convert vehicle types into the dimension variable of car units pursuant to RiLSA 1992, two user-definable vehicle types are also available, in which you can name the vehicle types specifically for the project as they should appear in the current load object.

Furthermore, you can define which of these vehicle types are to be applied as HGV for extension according to the German HBS. Because according to HBS signal time plans are no longer calculated based on car units but rather vehicles/interval, the conversion factors for individual vehicle types are pre-set here at 1.00.

To determine the capacity of non-signal-controlled intersections car units are still used, which can be edited in another column using factors.

The required time value for the respective traffic flow specifies the time required by a vehicle to pass over the stop line.

The saturation traffic volume is calculated from the required time according to this equation:

$q_S = 3600 / t_B$ [Veh / h]

Additional time requirement to include response time from road users, for example, is no longer included at the green start according to RiLSA '92.

4.8.1.7. HBS 2001 and HBS 2015

The parameters listed in these tabs serve as initial defaults pre-set for extension according to the German HBS 2001 and HBS 2015.

The register “General” under “HBS 2001” contains the following values:

Statistical probability of non-overloading	S (%)
Saturation flow under standard conditions	qS,St (Veh/h)
Time gap in oncoming traffic	Required critical time gap in oncoming traffic for semi-compatible left turning movements tg (s)
Follow-up time gap	Required follow-up time gap in oncoming traffic for semi-compatible left turning movements tf (s)
Minimum time gap in single-lane oncoming traffic	Required minimum time gap in single-lane oncoming traffic for semi-compatible left turning movements tC (s)
Degree of saturation of the traffic flows to be coordinated	gk (-)
Degree of saturation of other traffic flows	gR (-)
Vehicle length for traffic jam space calculation	lVeh (m)

Tab. 3: HBS 2001

The saturation traffic flow volume under standard conditions qS,St can be set regarding green time as per the table in HBS 2001.

Specific values for single lanes can be set accordingly in the lane load object.

The degrees of saturation gK and gR should be selected according to Table 6-9 of the HBS 2001. The values can be adjusted according to situation in the lane load object.

The Register "**HBS 2015**" contains almost the same parameter, but in addition the defined conversion factors between the volume loads and the HBS 2015 capacity analysis.

Also the values for velocity of pedestrians and cyclist is defined here as well as the acceleration and deceleration of busses and trams.

Please note that without these values no evaluation according to HBS2015 is possible.

4.8.1.7.1. HBS 2001 – Alignment factors

The parameters of this tab serve as default values for alignment factors used for saturation flow calculation according to HBS 2001.

In accordance with Table 6-5 of the HBS 2001 this tab contains the following values:

Name	Table name – user-editable
Description	Table name – user-editable
f_b Lane width <= 2.60 m	Alignment factor for lane width <= 2.60 m
f_b Lane width <= 2.75 m	Alignment factor for lane width <= 2.75 m
f_b Lane width >= 3.00 m	Alignment factor for lane width >= 3.00 m
f_R Turning radius <= 10 m	Alignment factor for turning radius <= 10 m
f_R Turning radius <= 15 m	Alignment factor for turning radius <= 15 m
f_R Turning radius > 15 m	Alignment factor for turning radius > 15 m
f_S – Lane longitudinal gradient with climb + 5%	Alignment factor for lane longitudinal gradient with climb + 5 %
f_S – Lane longitudinal gradient with climb + 3%	Alignment factor for lane longitudinal gradient with climb + 3 %
f_S – Lane longitudinal gradient on plane 0 %	Alignment factor for lane longitudinal gradient on the plane with 0 %
f_S – lane longitudinal gradient with slope – 3 %	Alignment factor for lane longitudinal gradient with slope - 3 %
f_S – lane longitudinal gradient with slope – 5 %	Alignment factor for lane longitudinal gradient with slope - 5 %
f_F - High influence of pedestrians	Alignment factor for heavy impact by pedestrians

f_F - Moderate influence of pedestrians	Alignment factor for moderate impact by pedestrians
f_F - Low influence of pedestrians	Alignment factor for low impact by pedestrians

Tab. 4: HBS 2001 - Alignment factors

4.8.1.7.2. HBS 2001 – Critical time gaps for unsignaled intersections

For the calculation of the basic capacity of unsignaled intersections average critical time gaps are required.

These HBS critical time gaps are pre-set in the Critical time gaps tab according to Table 7-5. HBS 2001.

4.8.1.7.3. HBS 2001 – Follow-up time gaps for unsignaled intersections

In addition to average critical time gaps, average follow-up time gaps are also required for the calculation of the basic capacity of unsignaled intersections.

These HBS follow-up time gaps are pre-set in the "Follow up time gaps" tab according to Table 7-6. HBS 2001.

4.8.1.7.4. HBS 2001 – Thresholds for delay for unsignaled intersections HBS 2001 – Thresholds for delay for unsignaled intersections

For level of service calculation of unsignaled intersections, average delay thresholds are required, which are pre-set according to Table 7-1 HBS 2001.

Value 99999 for traffic flow level of service E indicates average delay thresholds > 45 s.

Level F is not based on average delay thresholds but rather is reached when the degree of saturation

$g_i = q_i / C_i$

is greater than 1.

qi = Volume of minor flow i (CarUnits/h)
Ci = Capacity of minor flow i (CarUnits/h)

(cf. equation 7-3 in HBS 2001).

4.8.1.8. Vehicle types

The parameters of separate vehicle types are assigned in the lane editor. Their speed and acceleration values determine the times that are set for the clearance and entrance distances and that in addition are needed for the intergreen time calculation.

The different vehicle types each have different characteristics. Where the RiLSA data set is concerned they are assigned with default values according to RiLSA 1992.

The setting as to whether these parameters should be used when calculating the intergreen time is made in the general intersection data / guidelines. The following overview of vehicle types serves as a reference tool for original values after changes.

Parameters from RiLSA 1981 are no longer considered according to RiLSA 1992 and are no longer relevant for intergreen time calculation.

The parameters for pedestrians are used for Progressive Pedestrians.

In accordance with the 2003 partial update of RiLSA [the German guidelines for traffic installations] the time allowance suggested for the blind can be entered in the **Transition time/time allowance** parameter. The vehicle length column regarding clearing is only relevant for the Polish guidelines. A separate vehicle length can be supplied for each clearing scenario.

The parameters of the tab "Vehicle types - Switzerland" are used as default settings for the intergreen time parameters for vehicle types in accordance with the Swiss standard SN 640838.

4.8.2. Default settings automatic twelve-month switching routine (calendar)

The default settings for a calendar consist of:

Special days

Fixed holidays

Floating holidays

Relative holidays

Reference days

Time zones

Daylight savings time rule

Calendar overview

4.8.2.1. Special days

In the **Special days** area, you have the option to manage one-time special days for the calendar template. Relevant functions are available via the pop-up menu.

A special day is defined by:

No.: Serial number of the special day

Date: Specific date with day, month and year

Name: Name of the special day

Day plan: Day plan that should be activated on the special day.

Weighting: Weighting for the special day

4.8.2.2. Fixed public holidays

The **Fixed public holidays** area allows you to manage public holidays that occur on the same date each year in the calendar template. Relevant functions are available via the pop-up menu.

A fixed public holiday is defined by:

No.: Serial number of the fixed public holiday

Day: Day of the annually reoccurring date

Month: Month of the annually reoccurring date

Name: Name of the fixed public holiday

Day plan: Day plan that should be activated on the fixed public holiday.

Weighting: Weighting for the fixed public holiday

4.8.2.3. Floating public holidays

The **Floating public holidays** area allows you to manage public holidays for the calendar template that occur every year and depend on the date of Easter Sunday or another reference day. Relevant functions are available via the pop-up menu.

A floating public holiday is defined by:

No.: Serial number of the floating public holiday

Offset: Offset to the reference day

Name: Name of the floating public holiday

Day plan: Day plan that should be activated on the floating public holiday.

Weighting: Weighting for the floating public holiday

4.8.2.4. Relative holidays

The **Relative holidays** area allows you to manage public holidays for the calendar template that occur every year and depend on a fixed given date (e.g. Day of Prayer and Repentance). Enter the date that the week day being supplied depends on. Relevant functions are available via the pop-up menu. This option is only active for control units that support this option, e.g. C900, GV 3.1.

A relative holiday is defined by:

No.: Serial number of the relative holiday

Day: Day of the earliest possible date

Month: Month of the earliest possible date

Weekday: Weekday of the relative holiday

Name: Name of the relative holiday

Day plan: Day plan that should be activated on the relative holiday.

Weighting: Weighting for the relative holiday

4.8.2.5. Reference days

The **Reference days** area allows you the option to edit the calculation principle for the floating public holidays.

As the calculation method (for example, Easter Sunday as the reference day), select either the calculation based on the Gregorian Calendar (Gauss algorithm, e.g. for Germany) or the calculation based on the Julian calendar, such as the one used by the Orthodox (e.g. in Greece). The third option lets you manually enter the dates for each of the years as you like. The default time range for the list of Easter Sundays is: 1990-2089

4.8.2.6. Time intervals

In the **Time intervals** area, you have the option to manage time ranges (e.g. school vacation periods) for the calendar template. Enter the start and end date for each period. Relevant functions are available via the pop-up menu.

A time interval is defined by:

No.: Serial number of the time interval

Start: Date for the first day in the time interval

End: Date for the last day in the time interval

Name: Name of the time interval

Day plan: Day plan that should be activated during the time interval.

Weighting: Weighting for the relative holiday

4.8.2.7. Daylight savings time rule

The **daylight savings time rule** area allows you the option to enter the start and end date for daylight savings time. Enter on which day and month daylight savings time begins and ends, respectively. Clicking the button **Standard** sets the time interval to "Last Sunday in March" – "Last Sunday in October".

4.8.2.8. Calendar overview

In the **Calendar** tab you will find a graphic illustration of the calendar dates to be supplied, such as special days, public holidays, etc. You navigate between each of the days in the calendar element as you typically might in Microsoft Windows. **Right clicking on the** Calendar page shows a popup menu from where you can change the way the calendar is shown. You can choose between, day view, week view, month view and others. In addition, the **Settings** tab allows you to change the display color for each of the day types and objects according to your needs. You can also deactivate/activate how the switching times are displayed (displaying switching times for many days/weeks in the calendar might affect system performance).

On the **Calendar** page double-clicking an element selects the respective object in the editor and brings it to the front (e.g. double-clicking a special day switches to the **Special days** tab and selects the respective entry).

4.8.3. Default settings automatic twelve-month switching routine (master control clock)

The default settings for a master control clock consist of:

Day plans

Day plan assignment

4.8.3.1. Day plans

You can add **Day plans** for the master control clock template. To edit the switching times, expand the relevant day plan entry in the list. By double clicking (or selecting the menu item "Edit" in the popup menu), you can open the dialog in which to edit the switching time. The possible parameters and settings are offered in this dialog.

4.8.3.2. Day plan assignment

You have the option to set up weekly plans for the master control clock template from the **Day plan assignment** tab. In a week plan, a day plan is assigned to each week day You must also specify the week plan type.

4.8.4. Default settings system data

The default settings for system data includes parameters for controlling and for signal monitoring

You can define the following default settings for the control unit and the signal monitoring in the system data:

Line voltage category: Selection options "117 V", "117 V + UPS", "230 V" or "230 V + UPS"

Line voltage: Default setting for the line voltage

Frequency: Selection options "50 Hz" or "60 Hz"

Fault current circuit breaker (FI): Option to select between "not active" or "active"

Type of "Outdoor system": LED with line voltage, 24V LED, etc.

For each of these types of outdoor systems:

- **Dimming voltage**: Default setting for the dimming voltage
- **Dimming Output Threshold [mW]:** Default setting for the dimming output threshold in milliwatts
- **Min Output Threshold [mW]:** Default setting for the minimum output threshold in milliwatts

Acknowledgment type: Selection options "Please wait" or "Please print"

Key type: Selection options "Electronic" (up to 24 V)", "Low voltage (40 V)" or "High voltage (> 50V)"

Back calculation method: Selection of back calculation methods

Factor for cycle time reset: The cycle time check is activated according to the cycle time x factor.

Switchover method: Selection options "GSP" or "STRETCH"

Synchronization method: Selection options "GSP Siemens", "STRETCH" or "GSP RILSA"

Cycles until synchronous: Number of cycles for synchronization

Signaling parameters: Selection of a signal monitor template

4.8.5. Default intersection version

Default intersections are required for volume flow.

The following functions are available in the toolbar:

Data transfer from the editor to the main program

Editing the name of the default

Data **transfer** from the general defaults.

4.8.6. Default network version

The network version consists of:

Flow types (see chapter 4.8.1.5).

4.8.7. User data

The rtf documents containing user data can be divided into RTF classes. These RTF classes can be defined globally here.

You can then create or edit rtf documents in the class of your choice in the editors.

4.9. Create new element

New elements are always created using the same wizard. Use the context menu of the respective tree object or from the menu option **Start - New** to open the dialog.

If Wizard is called up from the main menu, on the first page using the options button, you can select the new element type. After you have selected the element type, you can go to the next page by clicking on **Next** .

If the Wizard is called up from the context menu of a tree object, the selection of the element type has already been made implicitly and the Wizard begins with the second page immediately.

The short name, name, a description and the number of the new element are entered on this page.

Only after saving the newly created element is it added to the data management in the server and therefore visible for other users!

4.9.1. Create project

A project is usually a city and contains all elements such as intersections and networks of this city.

On the next page in the Wizard, you can enter the city and domains for the project accordingly and specify whether version management should be active.

After confirming the Wizard entries by clicking on **Finish** on the last page, the new project is set up and opens in the object tree directly.

Yutraffic Office data management also supports several projects, whereas only one project can be opened and edited at a time.

In the Yutraffic Scala system you must make sure, that **only one project is being created and used**, otherwise no clear allocation is possible. The connection to Sitraffic S4.x is also only possible with one project.

For system independent operation, e.g. in traffic engineering, service centers or engineering offices, the use of several projects is recommended for a clear separation.

4.9.2. Create controller

On the first page of the Wizard you select is as element type. Details about the new intersection and its first version are entered on the following pages.

After confirming the element selection by clicking on **Next**, the following input fields are available on the second page:

Short name: Short name **for the new intersection**

Name: Name for the new intersection

Description: Optional additional information

No: Number of the new intersection

After confirming by click on **Next** the following information is entered:

City

District

You can define the following characteristics for the intersection version on the next page:

Use case: Here, please select your application case: Plan & simulate, Supply or Motion planning. The purpose of the information is to classify the data and to also support the transition later between planning dates and configuration dates.

The sX smart controller is only available for the use case "Supply".

The new sX advanced controller is available for any use case.

Signaled: For the Use case Plan & simulate, please select whether the intersection should be signaled or non-signaled.

Control unit: Selection of the control unit family (only if signaled)

Control method: Selection of the TA traffic method (only if signaled)

Planning, version and build number: The build number is always initialized with 1, planning and version numbers can be specified freely.

Reason for change: Optional additional information

After confirming by clicking on **Next**, you can select the default setting(s) for the intersection version (see Section 4.8 System templates) and define the following numbers on the next pages:

Cno.: Central device number

FNo.: Field device number as per OCIT-O specifications

Traffic center/VSRNo.: Territory number

After confirming by clicking on **Next** and **Finish**, a new intersection and its first version are set up. If the control unit type and the control method were specified, the corresponding components are set up automatically.

If the controller was managed in earlier applications, it is easier to accept the data via the import function in Yutraffic Office (see chapter 4.10 Data import).

The controller is added to the data storage of the Server and becomes visible for other users after you have created and saved it.

4.9.3. Create network

A network defines connections between several intersections.

A route (known as Sitraffic P2, Q2) is also a network.

4.9.4. Create Motion

The element **Motion** contains parameters for a Motion supply.

Please note that from Sitraffic Office 4.6 several Motion elements are allowed.

4.9.5. Delete / restore elements

Elements can be deleted via the context menu in the tree. Compared to objects (e.g. signal groups, detectors, etc.) these elements are not deleted irretrievably. They are simply no longer displayed in the object tree.

In order to delete elements, they must not be requested by another user.

Under **Deleted elements**, you can delete elements irretrievably or restore them.

The dialog **Deleted objects** appears after calling up.

In the window, choose the **elements** you want to delete or restore.

4.9.6. Deleting controllers

When deleting a controller, you should use the function **Delete / restore elements** (see chapter 4.9.5)

If the controller points to other objects that are still active during deletion, a message is displayed, saying deletion is not possible as the controller is still required.

4.10. Data import

With Yutraffic Office supply statuses can be imported from different formats, such as Yutraffic Control or Sitraffic Supply.

4.10.1. Overview of functions

Supported file formats:

The Office exchange format is a *.SOP6 file.

Office is always optimized to support the current file format in an efficient manner. *.SOP6 files of older Office versions or no office files need additional processing steps such as Migration or conversions to be performed. These steps may take longer.

The supported file formats are amongst others *.sxs, *.sxa, * c10, *sop6, *.scx, *.xml (Supply, Otec).

When a *.SOP6 file of an older Office version is selected for import, the file must be migrated first. Therefore, an external migration tool is necessary.

This tool can be downloaded on the homepage https://traffic-tools.mocca.yunextraffic.cloud/. After downloading the *.zip file must be unpacked. When a migration is requested, a dialog is informing about that. After clicking “**Yes**” the migration application file (Sitraffic.Tools.Sop6Migration.exe) must be chosen. In the following migration dialog, the original *.SOP6 file is already selected as source file for the migration.

Now the migration itself can be started with “**Migrate file(s) to selected sop6 format**”. The process should be done with state [OK]; this info is displayed on the second tab named “**Result/Output**”.

After finishing the migration with “Close” the import wizard is shown again. There the newly migrated *.SOP6 file is automatically selected as input file. Now the import can be finished as usual. Entry points

Use cases

Import of a file (an intersection, a route, etc.)

Importing several files (migration, network exchange).

4.10.2. General instructions

Optional password: The sop source format can be protected by a user dependent password. Data import is only possible when you enter the correct password.

Identify intersection: This function only applies for imported intersections. It is therefore only active for the formats intersections, network and Motion after import, like the status. If this function is selected, newly created intersection versions are identified during import via the field device, central, TCC and intersection numbers and if necessary inserted below an already existing intersection.

If no project is available before the import, a new project is created and a reference dialog indicating this is displayed.

Inconsistencies in the source data, adaptations to the new data format and similar actions are saved in the import log. It is recommended to keep the default setting (display import log).

Workflow status of the imported intersections

This selection refers to the workflow status of the imported intersections. Selection is thus active when importing intersection, network and Motion.

Make sure that the desired workflow status for the imported intersection version has been selected correctly.

If the destination status cannot be determined restrictedly and it is necessary to adjust the data (in the area C no.) in Yutraffic Office, execute the import in DRAFT status. After the change (**General Intersections / Base attributes**), the intersection version in version management of the higher-ranking intersections can be set manually to the INVENTORY status.

Importing P2 data

The importation/exportation of P2 files is no longer supported. For migrating this data please use the “Sip-Converter”. This tool can be downloaded on the homepage https://traffic-tools.mocca.yunextraffic.cloud/. After downloading the *.zip file must be unpacked.

Dummy objects

During data import placeholder ("Dummy") objects can be created for the following object instances:

Signal group

Detection point

Detector

Stage

Stage transition.

These objects are referenced by number without the respective object instance existing. Especially in Yutraffic Control these unsupplied objects are often used to signalize a "Placeholder reference". In order not to lose this information, the placeholder ("Dummy") objects are created during import. As soon as you edit these, the dummy status expires, and they are regarded as supplied.

Importing Yutraffic Control **data**

Note the following when importing Yutraffic Control (*.scx/) intersection:

For Yutraffic Control to apply the duration frames in the stage frame plans, these must start = 1 and end = a default value.

If you import a scx file, which contains a TA procedure with standard code (SL, VS-PLUS) you should afterwards delete a standard code which was also imported, if necessary. Please note chapter 9.2.5.1.1.

If the scx file was created with a Yutraffic Control version lower than 4.0, you need to update it manually with a Yutraffic Control version higher than 4.0 before data import. This might be the case for control supplies with C800 level 3 controllers or below.

4.10.3. Individual import

4.10.3.1. Data import into an intersection version

The supported file formats are

*.sxs, *.sxa, *.c10, *.sop6, *.scx, Supply *.xml, OCIT-I *.xml, OCIT-C *.xml.

Variants

Menu **File – Import**

Select the option **Identifying intersections** to search the intersection in the opened project according to the following criteria: no. and C no. or VsrNo and GuiNo. This option is not supported for the *.c10 format.

- If an intersection with these identifiers is available, the data is imported to a new version.
- If the intersection is not available yet, a new intersection is created, and the data is imported to its first version.

Without the option Identifying intersections a new intersection is created and its first version is filled with import data.

Exceptions are sX files (*.sxs, *.sxa, *.c10). If the sX unit is connected to a Scala, and if it has information about the FNo./CNo. from the relevant system configuration, the file is supplemented under the already existing intersection as a draft.

Context menu **Intersection**

The data is imported to a new version of the selected intersection.

Context menu **Intersection version**

After data import, a data transfer dialog is displayed that looks like the dialog for data transfer from one version to another in Yutraffic Office (preselection: new and change are adopted).

Import as INVENTORY. This intersection already has a version with the status INVENTORY:

- The versions differ:

  In the import dialog, check which version is the current one. The import will be cancelled with the following message **"Please specify in the import dialogue the steps to be taken if both the import data and the existing intersection data have the status INVENTORY!"** After you have specified how to proceed in the Import dialog:

  If the import version is predominant, the status of the current inventory version is set to ARCHIVE and the import version is imported as inventory.

  If the existing version is predominant, the import process is cancelled, and the following message is displayed: **"Import process cancelled as according to import settings existing inventory data shall not be overwritten."**

- If the two versions do not differ:

  "Import process cancelled as the inventory data you want to import, and existing inventory data do not differ."

Selection of other files as intersection files at import in existing version: Import is cancelled with a reference dialog.

Starting the import from another context menu (e.g. network): Import is carried out as in menu **File – Import** plus reference: **Import not carried out in selected element.**

Import of M controller supplies with control principle SF/SF: In special cases, the signal program structure may contain framework plan information for Yutraffic Control supplies, for M controllers with control principle SF/SF. This special case cannot be identified when you import data into Yutraffic Office. If, at the same time, there are still transition sequences in Yutraffic Control supply, this will produce transition patterns in the signal sequences imported into Office. The supply in Office is then either edited after the import, or all transition sequences are deleted in the control supply before the import in Office.

The automatic OTEC import of LISA+ data (file format OCIT installation VI / OTEC converter V.1) in Yutraffic Office - is not supported. In order to import these data, you first must convert these manually.

Importation/exportation of *.C10 files of the version-1 sX control unit is not possible in Office 4.6.8. Please migrate the data prior to importation with the appropriate tool.

4.10.3.2. Data import into a network version

The supported file format is *.sop“X

Importation/exportation of P2 files is no longer supported. That is, it is indeed still available, but assistance is no longer offered in the event of problems or faults.

Variants

Menu **File – Import**

Data is always imported to the first version of a newly created network, because there are no clear identifying characteristics in a network.

If desired, intersections are identified and receive a new version (if available), otherwise new intersections are created.

Context menu **Network:** Data is imported into a new version of the network selected.

For *.sop import, inconsistencies, i.e. references to intersections or intersection objects in the recycle bin or in other projects, are documented in the import log.

Starting the import from another context menu (e.g. intersection): Import is carried out as in menu **File – Import** plus reference: **Import not carried out in selected element.**

4.10.3.3. Data import into a central intersection version

The supported file format is *.sop6.

Variants

Context menu **Central intersection**: Import as a new version in this central intersection.

Menu **File – Import**: Not possible.

Starting the import from another context menu (e.g. network): Not possible.

Central intersection already has more than one version: Import not possible.

Import into intersection as "inventory". Intersection already has a version with the status INVENTORY: Import is cancelled, and an error message is displayed.

4.10.3.4. Data import into Motion version

The supported data format is *.sop6.

Variants

Menu **File – Import**

Data was imported as a new version into newly created Motion.

Context menu **Motion**

Data is imported into a new version of the Motion selected.

Inconsistencies (references to intersections, networks, intersection objects in recycle bin or other projects) are logged in the import log.

Starting the import from another context menu (e.g. network): Import is carried out as in menu **File – Import** plus reference: **Import not carried out in selected element.**

4.10.3.5. Data import into a segment

The supported data format is *.sop6.

Variants

Menu **File – Import**

Data is imported into the first segment of a newly created network, as there are no clear, identifying characteristics of a network.

Context menu **Network**

Data is imported into a new segment of the network selected.

For *.sop import, inconsistencies, i.e. references to intersections or intersection objects in the recycle bin or in other projects, are documented in the import log.

Starting the import from another context menu (e.g. network): Import is carried out as in menu **File – Import** plus reference: **Import not carried out in selected element.**

4.10.3.6. Project import

Supported data format

*.sop6.

Variants

Menu **File – Import**:

A new project is always created, and imported files are always saved due to the large amount of data.

4.10.3.7. Importing a user library version

The supported data format is the *.soa.format.

Variants

Context menu **User library**

If the version is already available in this user library, an update is carried out

If the version is not available in this user library,

- and the imported version is not yet contained in the database, a new version is attached 1:1.
- and the imported version already exists in the database (e.g. in another user library), a new version is created.

File – Import menu is not available.

Import via another context menu is not possible.

4.10.3.8. Import of supply data

See migration document.

4.10.4. Multiple import (import of multiple files)

It is possible to import several files at the same time for the following use cases, using multiple selection:

4.10.4.1. Import of multiple intersection files in order to migrate old data records.

The supported file formats are *.xml, *.scx.

Variants

As for the data import in an intersection version (see chapter 4.10.3.1).

Xml files of Sitraffic Supply and of intersections cannot be imported at the same time.

4.10.4.2. Import of several sop files in order to import an entire network or Motion

The supported data format is *.sop6.

Variants

Menu **File – Import**: All import files result in new intersection, network or Motion versions in the opened project.

Context menu of intersection, network or Motion

- Sop files, which are versions of the tree entry selected, can be found below the respective entry. Example: New network version in network.

- Other sop files are treated as when called via the File– Import menu. Example: Intersection version is imported into new or identified intersection.

4.11. Data export

Yutraffic Office offers the possibility of exporting supply statuses into different formats.

According to the definition the last two product versions are available as a standard feature regarding exporting. Therefore for *.sop6 the old versions 8.0.1+ and 4.6.8+ are available; export into older versions is not available. Please ensure that data is not lost during exportation into old versions due to such data not having been available in old versions.

4.11.1. Overview of functions

The supported file formats are *.sop“X“, *.xml, *.scx plus hardware documentation Hermes and simulation files.

Entry points

Context menu open in tree:

Intersection version

Central intersection version

Network version

Motion version

Project

Use cases

Exporting a file (of an intersection, a Motion supply, etc.)

Exporting several files (migration, network exchange).

General notes on how to use the export function:

Make sure that the elements you want to export have been released.

For the safety of passing on data, you have the possibility of encoding the target file with a password during the sop export.

In some cases, an internal plausibility check is initiated on the data, before the data export. This checks the data to be exported for conformance of each target format, if this is defined. A notice appears if applicable. To guarantee correct data export, a check and supply are recommended.

In the field **Information**, inconsistencies in the data and similar error sources are saved, if an unexpected error occurs during the export.

4.11.2. Exporting an intersection version

Export into a Yutraffic Office file (*.sop6)

Exporting an sX file (*.c10, *.sxs, *.sxa)

Export into an OCIT-I file (*.xml)

Export into an OCIT-C file (*.xml)

Vap: Export editor is started

HERMES export (HW documentation): Control is started

Export of controller and simulation data (*.vag, *.vsg, *.vgg)

Export into a Yutraffic Control project (*.scx).

Before an OCIT export, the result of the plausibility check is displayed. Cancelling the display still leads the file to be exported.

When you export controller and simulation files, the data is added to the respective intersection version as a file attachment.

This data is then available for selection of supply data in the simulation parameters, see chapter 6.6.2.

4.11.3. Export of network version

Exporting a sop6 file

- Only network version: a file is created
- Including dependent data (intersection versions and segments allocated): a file is created.

4.11.4. Export of Motion version

Exporting a sop6 file

- Only network version: a file is created
- Including dependent data (intersection versions and segments allocated): a file is created.

4.11.5. Project export

Exporting a sop6 file

4.11.6. Export of central intersection version

Exporting a sop6 file.

4.11.7. Exporting segments

Exporting a sop6 file.

4.11.8. Export of user library version

Exporting a soa file

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4.12. Data comparison and data transfer

It is not possible to compare and transfer data for an sX smart Intersection Version.

The dialog for the data comparison or data transfer can be started from two locations.

Comparison of two intersection versions in the Yutraffic Office tree

Return direction and data transfer of Yutraffic Control.

4.12.1. Calling comparison function and transferring data into tree view

To call the comparison function and transfer data into the tree view, from the context menu, choose **Compare version with / Transfer data to …**.

In the following dialog, select the target version. The source version is the version for which the context menu was called.

Click **Comparison > Transfer** to open the dialog for data transfer which lists all differences in data and thus allows a comparison.

4.12.2. Data transfer dialog

The data transfer dialog appears in the following places in the system:

after the comparison dialog (transfer from one version to another),

when "switching back" to Yutraffic Control,

when reading out data via OCIT and

when importing data into an existing intersection version.

You can adjust the settings of the data transfer dialog for the respective use cases. In the case of version comparison and import, first the dialog default view is shown that you can change to Preselection Yutraffic Control or Preselection OCIT. When you "switch back" to Yutraffic Control and read out data via OCIT, the preselection is set by default. Confirm the dialog with OK to transfer the selected data.

Per default, objects are compared and identified via their number in the source and target version.

Some of them have special identifiers (see chapter 3.3.2).

If the object does not have an identifier, it is assigned a substitute identifier. In this case no object correspondent can be found, and the object is listed in the data transfer dialog under "new" or "delete".

Options

The options **New**, **Delete** and **Change** can be cumulated. The default settings are **New** and **Changes** to avoid that data is deleted by mistake. Before you accept these settings, check whether they apply to your workflow.

You can select data for transfer on the attribute level. Make sure you reduce data transfer to the data changed, checked and that you want to transfer!

Optional parameters

Data attachments are updated by default. However, you can deselect this option. The data attachments are updated as follows:

Control file attachments are identified via their file extension. To avoid mixing different versions of control data, Control data attachments are always processed in a block. Therefore if there are Control file attachments in both versions, all Control attachment files will be deleted from the target version and saved to temporary folder. You can specify this folder in the **Settings – Options – Data transfer** menu. Per default, it is the system-wide temporary folder. Then all Control file attachments of the source version are transferred to the target version.

Other file attachments are identified via their name. If a file attachment already exists in the target version, it is updated. Otherwise, it is simply added. None of the file attachments are deleted.

The system files *ConfigIDReplacement.xml* and *ImportLog.txt* are excluded from data transfer since they are import-specific files that must remain with their respective intersection version.

The **Data filter** option is only available if you have specified a pre-selection with the filter. This is possible in Yutraffic Control and for OCIT transfer.

4.12.2.1. Yutraffic Control option

The Yutraffic Control option allows you to set an automatic transfer of supply data to planning data - in exactly this data transfer direction. Objects and attributes that cannot be supplied by Yutraffic Control are hidden by default in the list of differences. To show them, select the respective check box under "Data filter".

Use cases for this option are:

Data transfer after data editing in Yutraffic Control (back transfer for controller components not integrated in Yutraffic Office)

Merging of two intersection versions in Yutraffic Office, e.g. after importing a cpr and sip file.

To enable automatic data transfer, we had to establish some basic assumptions. E.g. objects and their attributes are divided into **Planning data and Supply data** (Office and Control data) and they have a specific transfer behavior.

This is illustrated in the following two examples:

A leg is a planning object that is not included in the supply data. Consequently, after changing a leg object and selecting **Supply data** you will not select it for data transfer.

Depending on its number, a signal plan is considered a planning or a supply instance and contains planning and supply data. A supply object instance is selected after it has been changed, its pure planning attributes (e.g. stage sequence reference) are deselected.

The following rules have been defined for transfer behavior:

The changes to a supply object instance are transferred.

The changes to a planning object instance are not transferred.

The changes to a planning attribute within a supply object instance are not transferred.

The deletion of a supply attribute is transferred.

The deletion of a supply object instance within a valid instance range (e.g. SP 32) is transferred.

The deletion of a planning object instance outside a valid instance range (e.g. SP 99) is not transferred.

New supply object instances are transferred.

New planning object instances are not transferred.

If data transfer is called from the object tree, the column headings for the two versions selected are **Source** (left) and **Target** (right).

If you select the **Supply data** Yutraffic Control check box, the column headings are changed from **Source** to **Supply** and from **Target** to **Planning**. This automatism, however, is no guarantee that the selected source/target really is supply/planning data.

For details and frequently asked questions about data transfer from Yutraffic Control, see chapter 4.12.2

4.12.2.2. OCIT transfer option

The **OCIT transfer** option is like the Yutraffic Control option. It allows the automatic transfer of supply data to planning data. Objects and attributes that cannot be supplied by the VD server are hidden per default in the list of differences.

Concerning transfer behavior, the following rule was added for Yutraffic Control selection:

The deletion of a supply attribute is not transferred. Example: Reference to a security-relevant intergreen time matrix cannot be supplied by OCIT-O. Even so, references to it must not be deleted.

Since the maximum number of instances for OCIT-O is device-dependent and cannot be specified for third-party manufacturers, the maximum instance number according to OCIT I schema (version 102) shall apply for back transfer.

4.13. Connection to external applications

4.13.1. Yutraffic Control connection

To configure controllers containing components that have not been integrated in Yutraffic Office, data transfer to the controller is performed via Yutraffic Control.

The following components are integrated into Yutraffic Office:

Component	C800	C900
Basic data supply (GV resp. Sim)	4.02 and higher	2.00 and higher
Kern(e)	5.02 and higher	2.00 and higher
PDM(e)	6.02 and higher	1.02 and higher *)
S-L(e)	1.02 and higher	1.00 and higher *)
M-X(e)	6.06 and higher	1.00 and higher *)
SDM(e)	---	3.00 and higher *)
VSP(e)	---	1.00 and higher *)
OML(e)	---	3.02 and higher *)
Norra(e)	---	2.00 and higher *)
Stride(e)	---	1.00 and higher *)
Fesa(e)	---	2.00 and higher *)

Tab. 5: Integrated components in Yutraffic Control

*) are all available versions

For simulation configuration, you must use Yutraffic Office for integrated components and Yutraffic Control-S for components which are not integrated, regarding that there is no connection from Yutraffic Control-S to Yutraffic Office.

Further information is therefore not relevant for simulation configuration.

To start Yutraffic Control, in the object tree view of an intersection version, open the context menu and choose the respective entry. It must be the object tree view of an intersection version, otherwise it would be ambiguous. Yutraffic Control then starts in the version selected and shows the intersection via which it was started.

Please note: Only edit data in Yutraffic Control that you cannot edit in Yutraffic Office. Otherwise, inconsistencies may occur.

There is no reverse data transfer, i.e. the guideline and default data, such as signal color combinations or information on signalization types, are not transferred back to Yutraffic Office.

4.13.1.1. Data transfer from Yutraffic Office to Yutraffic Control

When you start Yutraffic Control, the Yutraffic Control project file (*.cpr) is created from the controller data saved in Yutraffic Office. In addition, Yutraffic Control receives all controller data editable in Office as an *.xml file.

Directly after the start of Yutraffic Control, it opens the project file transferred and imports all *.xml data. If data irregularities within the basic supply or traffic actuation are determined, these are displayed in the import dialog (except for object instance levels).

All listed changes (except for those with action **delete)** are preselected for transfer. After confirming with **Import**, the selected Office data is applied to the Control project.

The names of Yutraffic Office are assigned as short names for the object instances in Yutraffic Control. If these names are longer than allowed according to the controller structure, they are shortened when being assigned to Yutraffic Control.

When deleting instances, please note the following:

If unsupplied instances of user parameters (e.g. PT storage instances) are marked as supplied in Control and no data is supplied for these objects in Office, these object instances are displayed with the remark **Delete** in the import dialog, although they have not been preselected for deletion. Do not delete these instances manually, since the existing supplied identifiers are required for controller supply.

Please note the following when you start Yutraffic Control with Office (from version 4.5) for the first time:

As of Office 4.5, the following data can be exchanged additionally between Yutraffic Office and Yutraffic Control:

General: controller

Detector data: Distance SL, connection information and Mexwa interval

Annual automatic

TA assignments

M-X data: Basic stage sequences

S-L: Stage parameters.

If this data is not yet supplied in Yutraffic Office as it is in the controller data, we recommend that you cancel data transfer in Yutraffic Control, when starting Yutraffic Control with Office 4.5 for the first time. Control supply thus remains unchanged.

After (pseudo) change, saving and closing the control, back transfer is carried out in Yutraffic Office. The control data can be transferred here and thus supplemented in the Office supply.

4.13.1.1.1. General instructions

If the intersection version, for which the Yutraffic Control should be started, is read only, e.g. because it is released or has the status **INVENTORY** or **ARCHIVE** the intersection project in Yutraffic Control is opened in Read only mode. This means that after you change data and then wish to save it, the **"Save as"** dialog in Yutraffic Control is opened, but the intersection project can only be saved locally. Data transfer back to Yutraffic Office is not possible in this case.

Generally, it should be noted, that the Yutraffic Office editors are partially not restricted to the supplied controller configuration.

When a value is supplied for a supply field (e.g. detector layout), which does not exist in the controller structure (e.g. detector layout **infrared, contact**, **laser** or **radio**), this supply value cannot be transferred to the Yutraffic Control. The controller structure is then supplied with a default value (e.g. detector type **Not used**). Through reverse data transfer of the controller supply, the controller default value is also transferred to Yutraffic Office.

4.13.1.1.2. Data transfer with data selection in Yutraffic Control

For all objects the following general assumptions apply:

Attributes you can edit in Yutraffic Office, but that are device- or version-dependent in Yutraffic Control are not transferred.

- For instance, a special operation in a switch on/switch off program or references to offset time matrices (BB and EE) in BUESTRA and fire department programs can only be supplied in C900 in Yutraffic Control. To make sure you do not overwrite this information in Yutraffic Control for C800 controllers through a back transfer from Yutraffic Office, it is never selected.
- This decision further serves the purpose of not changing values in Yutraffic Control that you can edit in Yutraffic Office.

Specifying the validity range of object instances: Currently, this is the total maximum for all controller instances (so not device-specific or version-dependent).

- Signal group instances: Maximum throughout all versions (48)
- Stage instances: Maximum over BD and TA (31)
- Stage transition instances: Maximum over BD and TA (224)
- Offset time matrix instances: Sum of EE and BB (6)
- Intergreen matrix instances: Sum of BD and VA (4)

For default data transfer, not the name but the **short name** of supply objects is transferred. During data export to Yutraffic Control, the Office short name is transferred as name and short name. This means that Yutraffic Control only contains the short name. It can thus only transfer the short name back to Yutraffic Office. IMPORTANT: If the names in the controller or in an older Control supply, e.g. for intergreen times or minimum times have been deleted, these are replaced by default names. Versioned delta supply is therefore no longer possible. The controller then must be fully supplied at the location.

When choosing the default selection, the system does not check whether object references have been transferred or not.

- For example, stage 255 is not deleted through data transfer because it lies outside the valid instance range. However, if in Yutraffic Office the stage changes matrix references to stage 255, the reference will be deleted through data transfer. This is because it is a field that can be supplied in Yutraffic Control, but the reference target (stage 255) cannot be referenced in Control.

Exceptions for special objects:

Object	Feature
Signal groups	The attribute GuiNo is applied in the object **SigruLI** by Yutraffic Control, (because of consistency to number and name). Office initially does not create the **SigruLi**. During the first data transfer from Yutraffic Control to Yutraffic Office a SigruLi is created.
Signal sequences	**Name** and **short name** of the signal sequences are not adopted by Yutraffic Control. In Yutraffic Control these fields cannot be edited and are therefore generated by systems with the switch request in the signal program and the manual stage transitions. The signal sequence always starts with the standard green pattern or the respective signal group and the name is generated with the sequence of patterns, for example **Green-Red**. If sequences in Yutraffic Office have the same content but were created in another color sequence by the planner, their names will be overwritten by Yutraffic Control during data transfer.
Detectors	Missing **detector properties** (e.g. maintenance from C900 3.0) are currently not exchanged between Yutraffic Control and Yutraffic Office.

Object	Feature
	The attributes **curve length** and **curve distance** are not transferred, because they are only supplied in the central components in Yutraffic Control. The **References to a signal group** on queue length calculation as of a C900 level 2 are also accepted.
Detection points	For detector points assigned to PT directions, the **debounce time** is transferred from Yutraffic Office to Yutraffic Control. This is not the case vice-versa. The debounce time is not transferred from Control to Office. Depending on the supply of Office and Control, not all Office detector points and their debounce times can be supplied. There is no data exchange between the Control **message points of the PT data** in the basic supply.
Switch-off programs	Only C900: If the **SISI and intergreen time monitoring** in Yutraffic Control are as an exception not supplied, these are changed by the data exchange with Yutraffic Office to 1.
Signal programs	If in Yutraffic Control signal programs are edited, the following special case occurs when switching times are changed: If the signal programs in Yutraffic Office were **stage oriented**, these are set to signal group oriented when being applied.
BÜSTRA signal programs	Are currently not exchanged between Yutraffic Control and Yutraffic Office:
Fire department signal programs	Are currently not exchanged between Yutraffic Control and Yutraffic Office:
Manual stages	Implausible data supply for manual stages (comes from wrong default values for C800 V5 of previous versions) is best "fixed" in Yutraffic Control. To do so, switch from Yutraffic Office to Yutraffic Control without transferring data. Change the data in Control. Check the data you changed in the merge dialog and transfer it to Yutraffic Office.
Stage transitions	This may cause **numbering** to be shifted: Only manual stage transitions, which are used by a stage change matrix , are transferred to Yutraffic Control. Since the BD identifier cannot be supplied in the Yutraffic Office editor but is given when you use a manual stage change matrix, a consecutive number is assigned during the export process. If there are "gaps", this might change the numbering. However, if the data is supplied through import into Yutraffic Office, the numbering can be kept, since the BD identifier is only lost when it is edited. In Yutraffic Control there are no references to transition assignments and minimum times for TA stage transitions. They are deleted during the data transfer process.
M-X parameters	If M-X parameters are supplied in Yutraffic Office, the M-X allocations and M-X parameters are transferred from Yutraffic Office to Yutraffic Control. During reverse data transfer, however, they are excluded from data transfer. Yutraffic Control only saves non-default allocation and stage parameter values, since otherwise the default data in Office would be deleted. If Yutraffic Office does not contain any M-X parameters, then no M-X allocations are transferred to Yutraffic Control.
Annual automatic	The annual automatic **basic data** for M controller can momentarily not be exchanged between Yutraffic Control and Yutraffic Office.

Tab. 6: Exceptions for special objects in Yutraffic Control

4.13.1.2. Data transfer from Yutraffic Control to Yutraffic Office

When editing data in Yutraffic Control, saving the complete project and closing Yutraffic Control the Control data are saved in Yutraffic Office; **however, there is no data transfer or synchronization with model data or planning data**. If you reopen Yutraffic Control the data from the last change are reused in Yutraffic Control.

4.13.1.3. Changing the controller configuration

To change a controller configuration, proceed as follows:

Make your changes to the controller configuration in the General editor of the intersection version.

Delete components which are no longer used and add current components

For integrated components of the new configuration the synchronisation check should be activated!

In saving the new configuration a data synchronisation with the old configuration takes place.

4.13.1.4. Changing the controller family

Example "C800 > C900" describes how the controller family is changed.

Requirements

The existing Office intersection version is aligned with the Yutraffic Control i.e. that there have been no changes since the last control alignment in Office.

Procedure

Change controller family and type and in the intersection version‘s **General** editor -> all old components are deleted.

For integrated components of the new configuration the synchronization check should be activated!

In saving the new configuration a data synchronization with the old configuration takes place.

Perspective „ **Supply intersection** “ – modify manually C900 objects in the system data (e.g. hardware inputs and outputs, detectors, door contacts, archives etc.).

Testing. Due to different data structure this test is mandatory.

4.13.1.5. Supply of two-term right turns

Please note the following for the supply of two-term right turns, which depending on the stage sequence have **Green-dark** or **Green-amber-dark** as the signal sequence within the same signal plan.

The transition "amber" can only be added not suppressed. In the signal plan documentation, the amber transition should be documented at lag signalization of the amber transition.

There are two possible solutions:

- Defining the amber duration as a second red state in the signal plan, i.e. in Yutraffic Office there is a second signal sequence with amber as another red. This sequence is then referenced in the signal program.
- Define a signal plan outside of the controller signal plans for the documentation. This is maintained for back transfer.

For stage transitions, the instances of the transitions can only be assigned during planning. The controller always runs the transition that has been referenced by the signal program (so without amber is mandatory). Because of a missing reference in the controller, this is lost when reimporting the data from Control to Office.

The references from the planning are not allowed to be changed.

- Because TA stage transitions in the Control have no references to minimum times and transition assignments, TA stage transitions are no longer considered for generating signal sequences.

- If planning information should be deleted by a back transfer of Control, the respective **Delete** entries must be deselected manually in the back-transfer dialog.

The signal group transitions with amber are deleted because of a missing reference.

- **Delete** must be deselected for the signal sequence to be deleted, when transferring Control back.

For the definition of the amber signal in the signal plan (variable signal) minimum red time must be defined for this signal. Definition as special red with corresponding duration. This definition is lost during the transition Control-Office.

If a signal sequence with another red (possibly with differing duration compared to the default red) exists in Office, it should be transferred to the minimum red instance of the controller structure as **Color specific** with corresponding **Duration specific**.

Color specific and **Duration specific** are not exchanged between Office and Control. Information is lost, if the transfer dialogs are confirmed without manual changes in both directions. This means you need to enter the data correctly in Office and Control and deselect the corresponding objects (minimum red list in Control and signal sequence in Office) in the data transfer dialogs.

4.14. Documentation/Print

The print function generates a documentation as docx format of all relevant areas of the chosen perspective, based on the selected template. The document can then be customized with the appropriate program (for example Microsoft Word).

Please also note the additional documentation on printing, which is available parallel to this manual, and if necessary, watch the corresponding video, which is linked in the print dialog.

During the wizard, you can specify the required template and the file name for the target file, you can adjust or specify various parameters such as the name of the city and at the end you decide whether the created document to be opened directly.

The "System parameters" are filled by attributes of the intersection version and can be adapted. These parameters are provided as fields. (In Microsoft Word 2010 see Insert – Quickparts – Field).

You have to accept the parameters within the document. in Microsoft Word you have to do it with the function "Update fields".

To update all please select all first (Strg -A). Header / footer must be selected and updated separately, see also the official Microsoft Word Help

The template can be adapted to customer needs. A template for the Documentation is a Word document which can contain the cover page, overview, headers and footers and the definition and predefined sections. This requires Microsoft Word 2010 or later.

The individual planning objects are inserted by Yutraffic Office at the defined placeholder / keywords. The parameters are provided as fields.

These are the currently supported keywords:

Keyword	Description	Restrictions
{SitrafficOffice: Description}	General information	
{SitrafficOffice: ConflictingPlan}	Conflict layout plan	from V8.7 new editor
{SitrafficOffice: VolumeFlowInstances}	Volume flows	New for V8.5
{SitrafficOffice: SignalgroupInstances}	Signal groups	
{SitrafficOffice: SignalgroupHeadInstances}	Signal heads	
{SitrafficOffice: DemandInstances}	Detectors	
{SitrafficOffice: RequestInstances}	Demands	
{SitrafficOffice: ExtensionInstances}	Extensions	

Keyword	Description	Restrictions
{SitrafficOffice: PublicTransportInstances}	PT directions	
~~{SitrafficOffice: ConflictmatrixInstances}~~	~~Conflict matrix~~	from V8.3 integrated in Matrices
{SitrafficOffice: IntergreentimeCalculationInstances}	Intergreen time calculation	not supported for Polish & Swiss Guideline
{SitrafficOffice: Matrices}	Matrices	new for V8.3
~~{SitrafficOffice: IntergreentimeMatrixInstances}~~	~~Intergreen time matrix~~	from V8.3 integrated in Matrices
~~{SitrafficOffice: OffsetmatrixInstances}~~	~~Offset time matrix~~	from V8.3 integrated in Matrices
~~{SitrafficOffice: SwitchOnInstances}~~	~~Switch-on programs~~	from V8.6 integrated in signal programs
~~{SitrafficOffice: SwitchOffInstances}~~	~~Switch-off programs~~	from V8.6 integrated in signal programs
~~{SitrafficOffice: SignalprogramOverview}~~	~~Signal programs overview~~	from V8.6 integrated in signal programs
{SitrafficOffice: SignalprogramInstances}	Signal program instances	
~~{SitrafficOffice: FireBrigadeProgramInstances}~~	~~Signal program for fire brigade~~	from V8.6 integrated in signal programs
~~{SitrafficOffice: BuestraProgramInstances}~~	~~Signal program for Büstra~~	from V8.6 integrated in signal programs
{SitrafficOffice: HBS2015CapacityAnalysis}	HBS 2015 Capacity analysis	
{SitrafficOffice: AnnualAutomaticInstances}	Annual automatic	
{SitrafficOffice: StageDefinition}	Stage	
~~{SitrafficOffice: StageSequence}~~	~~Stage sequence~~	from V8.2 integrated in stages
{SitrafficOffice: SlStageData}	S-L stage data	
{SitrafficOffice: StageTransitionInstances}	Stage transitions	
{SitrafficOffice: FramePlanOverview}	Stage frame plans overview	

Keyword	Description	Restrictions
{SitrafficOffice: FramePlanInstances}	Stage frame plans instances	
{SitrafficOffice: PDMParameter}	TA user parameter	
{SitrafficOffice: Assignments}	Assignments (TA)	new in V8.5
{SitrafficOffice: PDMLogicInstances}	TA user logic	
{SitrafficOffice: ComponentData}	Component data	new in V8.6

Tab. 7: Currently supported keywords

The selectable objects depend on the template. It means that if an object with its corresponding “keyword” is not included in the template it can´t be selected for printing.

Within the default template under the “General” section, there are three subsections (intersection data, controller data and versioning), each with a table, the content of which must be updated using the “Update fields” function in MS Word.

The purpose of the planning documentation is to create a document that can be refined with a suitable Tool like e.g. Microsoft Word. Despite this for many objects already an opportunity is provided to select the favored instances.

Attention should be given to the following points:

Generally, the order of the instances corresponds to the order saved in Office. It means the shown order when you remove the sorting from GUI list.

The sorting of the stage transitions is grouped additionally by the software partial intersections.

Disregarding the selection all instances of the separately listed diagrams, like e.g. for signal programs, are always included.

As of Yutraffic Office Version 8.6, the formats of the tables, fonts and headings within the planning documentation are no longer strictly specified but must be defined by the selected template. For this reason, the supplied templates have also been adjusted. Possibly existing own templates may also have to be adjusted if they do not (or no longer) lead to the desired format.

The following formats are used in the documentation and can be adjusted in the template. If these formats are not yet available in the desired template, then the format templates must be created in the template with exactly the following names:

Name	Used for
Standard	Normal text
Sitraffic-Heading1	Headline 1. Level
Sitraffic-Heading2	Headline 2. Level
Sitraffic-Heading3	Headline 3. Level
Sitraffic-Heading4	Headline 4. Level
Sitraffic-VerticalTable	HBS 2015

Sitraffic-Matrix	All matrices of signal group references
Sitraffic-Table	All other tables e.g. signal groups
Sitraffic-Legend	Legends

Tab. 8: Currently supported formats

In addition to the font, font size and color, the lines of tables (color, thickness, …) can then be adjusted in the respective format. The "Sitraffic-Matrix" has a special position in which the formatting for the "first column" is used as a distinction between the signal group names (2nd column) and the actual matrix. Possibly just take a look at the delivered template in this regard, then hopefully it will be understandable.

4.15. User data

You can save user data for each element or versioned element. You are now able to edit rtf documents in Yutraffic Office. Any texts can be written or formatted or read in an rtf file.

RTF documents can optionally be divided into rtf classes.

Contrary to the other files managed in Data management, these rtf files can be integrated into the documentation.

The integrated rtf editor is a Microsoft® component. Its properties can thus not be influenced. Please note that the rtf format does not allow for optimized data storage and that the files can quickly become very large!

4.16. Statistics

Information on current summarized projects are displayed in the **statistics** window.

You can get information on the state of the intersection, the intersection versions as well as all detection points of the inventory intersections, in the controller and in the central computer.

Because creating the statistics takes some time, data entry in the toolbar must be started via the **Start** button.

The data is then registered in the background. A status bar shows the current progress. You can cancel the statistics acquisition any time.

In the first **Inventory** tab, all intersections in the INVENTORY state (only those) are displayed.

In the columns **Central** you can see if the controller inventory coincides with the central inventory or if further supplies or exports are required.

A double click on the table entry selects the intersection version in the inventory in the object tree of the main window.

Further information can be set and displayed in the table status bar. A right mouse click on each column thus opens a menu. The sum, the minimum, the maximum, the number or the mean can be displayed for each column.

The **Intersection versions** tab shows all intersections and their versions (grouped according to intersections). It thus includes various information, e.g. the status of the intersection version, the version content, number of objects, traffic actuation methods, controller type, etc.

The **Detection points** tab displays all detection points for public transport in the projects. Please note that you can only show detection points that are listed in a controller inventory version.

The **Versions** tab shows an overview of versions per intersection. The number of attachments and their size are displayed in byte.

4.17. Components

Components are software components and parameters which each correspond to components in the controllers, for example. These are for example, C900 basic supply parameters or PDM parameter in a defined version.

In order to work with these components (e.g. to create TA logics), the system needs to know them (see chapter 4.18 User libraries).

4.17.1. Importing components

After the first Office start the import dialog runs automatically and must be started by the user. For an update, it can be necessary to import the libraries again – this would be communicated to the user in the Office message window.

In the **Data tab, start the Wizard.**

The Wizard first compares all components provided in the system (database) with the information known in the Yutraffic Office installation.

It then shows you the components it knows and/or the components already saved to the project (only up to version 4.5 and Scala 1.5 systems) and/or database.

After having clicked **Next** it is displayed whether the components and / or the project must be updated. The selection can be customized manually.

Please note, that it is guaranteed that the components and the project / General are read-only. Another user is not allowed to lock these elements.

The respective elements are updated in the next steps.

4.18. User libraries

The import is done together with the above-mentioned components.

User libraries are special TA logic libraries which can be created and changed by the user.

Details see chapter 9.2.2 User libraries.

Right-click the User library to open the Properties menu. Then define the TA values for the library.

The library can then be assigned to an intersection version (also for controllers of other manufacturers) and opened in Yutraffic Scala visualization.

5. Project

5.1. Project configuration

Using this editor, you can e.g. change the name of a project later.

The following text fields are available:

Name, **short name**: project name, e.g. of the city

Domain: OCIT – Outstation name of the OCIT network (for IP routing).

It is necessary to enter a domain for an OCIT system. Ask your Administrator for the name of the domain. This domain name is either specified when creating a new project or via this editor. A project is therefore limited because only intersections belonging to the same domain can be stored usefully in a project and later supplied.

Description: optional additional information.

Controllers versioning: If this has been selected the transfer to the controllers (e.g. via Yutraffic Control) versioning takes place, provided this is supported by the controller and its firmware. In this case Delta supplies are possible, and the workflow states are automatically set. If the selection is not active, automatic support and optimization for the remote supply cannot be executed by the system. Versioning within Yutraffic Office is active. This function is linked to the feature license **office.management.workflow**. Despite activated versioning the transfer can be executed unversioned in the supply assistant.

5.2. Project – General

Via the General folder, directly below the project, you can get to the settings and data which are described by the following titles and are available for the entire project:

Maintenance teams

Manufacturer

Controller components

5.3. User data

Detailed project information also see chapter 0.

5.4. Maintenance team

This is used to create and save valid maintenance teams (known from previous Sitraffic S4) for the entire project, with their address and phone number. The Config element **Project General** must be requested for editing.

To open this dialog, in the tree structure, click **Maintenance team**.

On the right-hand side of the window, a list of the teams created is displayed.

Using the context menu on the right, you can create new teams and edit or delete the existing teams selected.

Note that the maintenance team names must correspond to an existing Yutraffic Scala/Supply supply. Otherwise, intersections cannot be correctly supplied to the control computer.

5.5. Manufacturer

For each intersection, in the versioned general intersection data, you can enter the manufacturer of the intersection system. In this editor, you can globally create the manufacturers for this project, stating their address and telephone number. They can then be selected for the intersection.

To open this dialog, in the tree structure, click **Manufacturer**.

On the right-hand side of the window, a list of manufacturers already created is displayed.

Using the context menu on the right, you can create new manufacturers and edit or delete existing manufacturers.

Note that the manufacturer names must correspond to an existing Scala/Supply supply. Otherwise, intersections cannot be correctly supplied to the control computer.

5.6. Controller components

The controller components are only required up to Scala 1.5. From Office 4.6, the components are managed by Office and are superordinate to the project.

An overview shows all controllers and their procedures (**Components** tab), including individual versions, wtt files assigned and AP value names defined.

This data cannot be edited manually.

Update or add AP value files via Office

Save AP value files to the right storage location

When you install Yutraffic Office, a WTT folder is created parallel to the Office folder (under Sitraffic). This folder contains the AP value files. If an update of such a file or a new file is supplied, it must be saved to this folder. Then you can perform an import.

Start import process

You can perform an import under "Controllers and Components". To do so, the Project / General must be checked out by the corresponding user.

Click the **Components** tab. Then from the **Edit – Import** to start the import process. You do not have to select any files, since all new or changed files in the WTT folder are updated or replaced.

Update the component version for an intersection

A corrected AP value file will only become effective if an intersection version has been assigned to a method version after the correction was set to INVENTORY.

If e.g. an intersection version in the DRAFT status is assigned a controller component that was updated, you first need to delete the controller component and then add it again for the update to become effective in the intersection version.

An intersection version that is in the Inventory status before a correction update, will not be updated during the import!

For pure planning or investigation tasks, there are device and version independent components (version 0.00-00, e.g. PDMe 0.00-00) available.

6. Intersections

6.1. Introduction

You also use versioning when editing intersections. Intersection versions show the supply states of an intersection. An intersection version consists of the complete data for an intersection. This data can be read out and supplied.

All intersection versions are grouped into an intersection element (unversioned). The intersection versions may contain signalized and non-signalized intersections.

An intersection element (unversioned) consists of:

General (unversioned intersection data),

Version management,

User data,

Defaults,

Simulation parameter,

Traffic data,

of one or several intersection versions and

central intersection versions.

An intersection contains all intersection data, i.e. planning data, basic configuration data, traffic-dependent data, data relevant for the control center and intersection-specific motion data. You can change the views in the main window to show one or several sections.

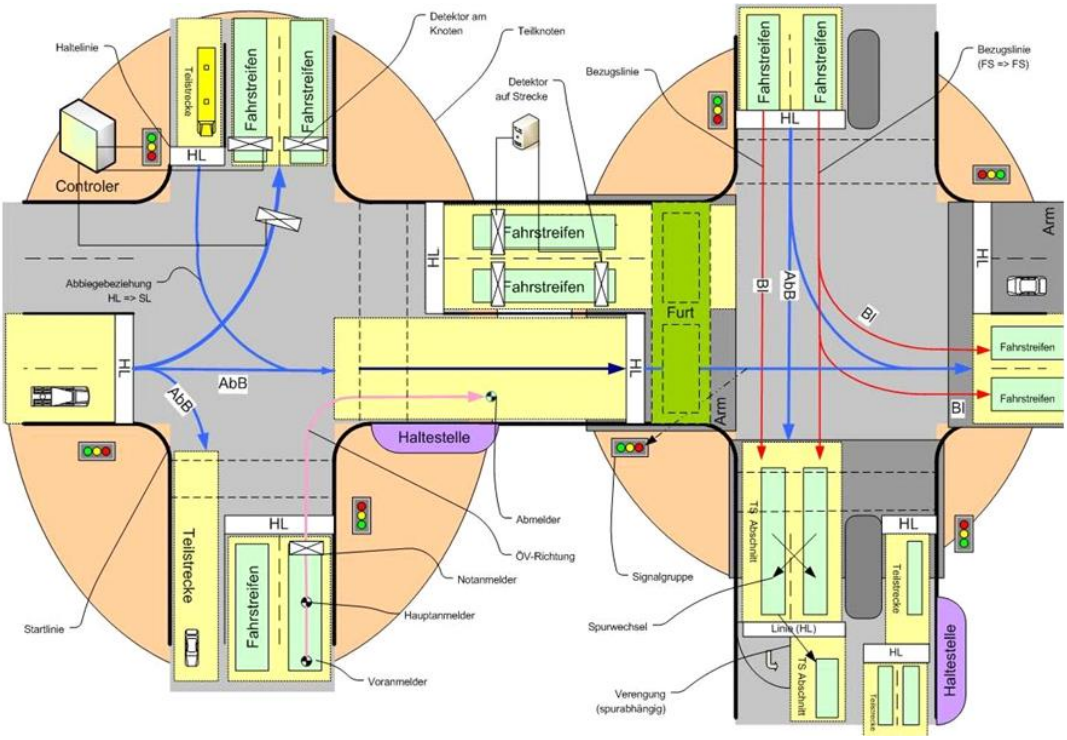
Just as for the other elements, there are several functions here for better managing of intersection data. Version management and user data management are described in the respective chapters.

When you create a new intersection or intersection version, default data is used. You can, however, later change these values in an editor.

An intersection version always requires an intersection. This means when you import an intersection version (OCIT, *sip, *cpr, etc.), an intersection is automatically created, if it does not already exist. The same applies for when you create a new intersection. Then an intersection version is then automatically created with your intersection.

6.2. Traffic model

The following figure depicts the traffic model (object definitions) in Yutraffic Office.



Img. 1: Object definition in Yutraffic Office

6.3. General (unversioned intersection data)

The general unversioned intersection data is the non-version dependent information of an intersection.

This data is saved to the **General** folder in the object tree, directly underneath the intersection.

The objects intersection number and controller number are automatically adopted by this version, if the intersection version is in the INVENTORY status when you open the editor. You cannot change them manually in the editor!

To set up communication between Yutraffic Office and a controller, the respective parameters for the local and central communication must be entered.

6.4. Default intersections

When you create a new intersection, you can copy one of the global default intersections that you can later change any time. You can also copy global defaults from a newly created or changed template (see chapter 4.8).

6.5. Volume flows

Traffic count data serves as raw data for creating volume flows. Traffic count data can be entered or imported per route relation. This allows you to show car units or vehicles according to HBS in a table or graph. Volume flows are also used to calculate and evaluate signal programs.

Volume flows are either created independently of an intersection version or they are assigned to an intersection version. Volume flows can be used by one or several intersection versions, i.e. they are version independent.

This e.g. allows you to compare a signalized and a non-signalized intersection (both draft versions of an intersection), using the same volume flow.

If you do not choose an intersection version in the header of a volume flow, you can define legs and route relations in it (independently of the topology of an intersection version). In this case, the legs are evenly positioned across 360°.

If you select an intersection version, its topology is adopted. After you have selected the respective intersection version, these two tables are generated automatically from the route relations, entries/exits and crossings specified in the intersection geometry. You cannot change or add any data here.

If you select or change an intersection version for a volume flow without reference, you can adopt the count data once you assign a leg.

If in an intersection version, you choose a volume flow for which no or another intersection version has been selected, perform a leg-to-leg assignment in order to assign the count values correctly.

In addition to the general data (Name, Number and Description), specify in the header a time interval that applies to the values entered. The interval is required for calculating the car units per hour.

You can enter the exact time in the **From** and **To** columns. After double-clicking in the field, a flashing black triangle marking the focus appears at the bottom edge. The time specifications for hour and minute can be edited using the arrow buttons to the right of the field.

The upper section contains vehicle streams and their volumes. Separated by a horizontal bar, the lower section contains the volumes per pedestrian or cyclist crossings for calculations according to the German HBS.

Into the table, you can enter values per route relation and vehicle type or import values from a measuring point. These values are then multiplied by a time demand value, grouped and extrapolated to an hour value. The time demand values used for the vehicle types are default values.

New default types (max. 2) defined by the user additionally to the standard vehicle types are listed in the table, if applicable. The vehicle type names you changed are displayed in new columns.

In the case of **manual input**, you must enter the count values into the **Bicycle**, **Motorcycle**, **Car**, **Truck** and **Truck trailer** columns.

Cyclists can only be input, if stream type Bike has been supplied on at least one lane of the relation in the lane list.

Even in case of a separate bike lane, bicyclists cannot be entered, since this would change the basis for powered traffic calculations.

Cyclists on separate cycle lanes must be edited in object lane load.

Car/h or Veh/h values, respectively, are calculated automatically, and so is the total (per leg).

When assigning a **measuring point**, in the **partitioning** column, specify the proportion (0 ... 1) the measuring point covers for the respective route relation. If the measuring point is used only for this route relation, partitioning should = 1. If a measuring point is used for several route relations, for example for **straight-ahead** and for **right-turning traffic**, and if right-turning traffic accounts for 10%, then the measuring point should be specified in both rows and the proportion set to 0.9 and 0.1 respectively.

In the lower section of the table, pedestrian or bicyclist loads can be entered per interval. Cyclists can only be supplied if bicycle traffic has been selected for the crossing (see **Cycl**. column in **crossing list**). Likewise, pedestrians cannot be entered in crossings purely for cyclists.

Entered traffic loads are used for capacity analysis according to the German HBS. Additionally, pedestrian loads serve for red-time calculation in case of semi-compatible right-turning flows.

6.5.1. Calculating the number of vehicles

According to the German HBS, the number of vehicles is calculated per route relation.

Besides automatic calculation of vehicle sums per stream and approach, the HGV share is also calculated automatically, if the respective vehicle type has been defined. Then default identification for the vehicle type HGV is considered. Values may be edited manually. Those entries are highlighted in red.

For reduction factor pedestrians calculation, which is regarded during saturation load calculation, a vehicle category (pedestrians) can be selected for the streams. This selection is only provided for streams with priority pedestrian signal groups assigned in the lane object. The pedestrian category is initialized with *low* when opened the first time. This default value for initialization may be edited in the file *SIP_SBP.INI* by adjusting the entry *DefaultPedCategory*.

The following values are intended:

DefaultPedCategory	Pedestrians category
0	No pedestrian volume
1	Low pedestrian volume
2	Mean pedestrian volume
3	Heavy pedestrian volume

Tab. 9: Pedestrians category

6.5.2. Calculating car units

The calculation must then be repeated. To do so, choose Edit – Calculate car units or on the toolbar, click Calculate car units.

6.5.3. Displaying vehicles and car units in a graph

The results calculated are displayed graphically as volume flow diagrams in [Car-Units] or [Veh] in separate intersection tabs.

You can change the display options under **Options – Display**. After clicking the menu, a window opens where you can change the appearance of the volume flow plans via three registers.

Display tab

By selecting the visualization for the respective leg, you can determine if this leg is contained in the graphical display.

It is recommended to uncheck this option for irrelevant legs in case of several partial intersections for separate and successive volume flow display by partial intersection.

Tab Options

Via **Assign colors according to entries** the streams of one entry are displayed by a single color.

Via **Display volume flow fill out** the stream indicating arrows are filled.

Via **Show leg information** flow volumes are displayed as access and entry labels.

Option **Black-white-display** is only valid for output to monochrome printers.

Scale factor for graphical display controls the stream scaling.

A value >30 is recommended.

This value can be edited via EDIT - RAISING LOAD FACTOR or – EDIT REDUCING LOAD FACTOR .

Graphical display is then adapted accordingly.

Tab Colors

Here you can change the stream colors for each leg.

6.5.4. Import count values

Formats supported

DPA archive

Count value statistics C900

Configurable count value statistics C900.

First select a volume flow as a template.

The volume flow contains the following data required:

- Detector reference
- Intersection version reference
- Aggregation interval
- Substitute values.

Then select a count file.

The file content is displayed in a table. The program then tries to assign the recording points to detectors and route relations (volume flow elements). You can also add data to the table.

Select the **Create new volume flow...** check box

Click **OK** to create volume flows with an aggregation interval for the time period specified in the dialog.

Check box **Create new volume flow...** is not checked

All count data for the period specified is processed using the aggregation interval. To import this data into the existing volume flow, click **OK**.

6.6. Simulation parameters

6.6.1. Introduction

To call simulation, open the Edit dialog for the simulation parameters of your choice. Then, from the **File** menu, choose **Simulate…** or **Export…**.

When you start simulation, first the files required for simulation are saved to the Simulation folder (this is normally the *%TEMP%* folder of the user, set in the **File** menu). Then VISSIM is started - if not already done - via COM commands and the files required are imported.

The **Simulate…** function only works, if there already is a VISSIM file, either as a file attachment of the intersection or network or available on the hard disk that it can access. With the **Export…** function, you always create a new export file of the type *.anm (Abstract Network Model). However, if there is a VISSIM file, it is read in first. Then the anm file is imported adaptively, so that - to a certain extent - manual changes made to the VISSIM file remain unchanged. For details, please refer to the VISSIM manual.

For adaptive data import, the VISSIM file you want to import needs to be created through an anm import. To create such a file, after the first data export, change to VISSIM and save the data there. Then both a VISSIM file (*.inp) and its anm backup copy (*.panm) are created. If during the first export, the name of the VISSIM file has already been supplied, the data is automatically saved in VISSIM after the anm import. The VISSIM file is also automatically saved after every adaptive anm import.

In the **Options** menu, you can specify if you want to save the simulation files to the file attachment of the intersection or network and how you want to save them, after the Edit dialog is closed. If Save is activated, you should only close the Edit dialog after exiting VISSIM. We recommend that you activate the function Save VISSIM data files automatically. Please note that changes made in VISSIM are only saved to the file attachment after you close the Edit dialog. Changes are lost if you start another export before closing the Edit dialog. In this case, the data you changed and saved in VISSIM is not saved to the file attachment. It is overwritten with the "old" data in the file attachment during the export process.

VISSIM data files are files with the extensions *.inp, *.sig and *.panm in the Simulation folder.

VISSIM configuration files are files with the extensions *.fzi, *.fzk, *.ini, *.kfg, *.knk, *.npc, *.pdk, *.qmk, *.sak, *.szp and *.m_i in the Simulation folder.

VISSIM result files are files with the extensions *.fzp, *.kan, *.ldp, *.lsa, *.mes, *.npe, *.pp, *.rsz, *.str and *.vlz in the Simulation folder.

The started VISSIM instance is fully functional within the respective license so that the exported network can be modified and saved in VISSIM. Furthermore, an import log can be displayed in VISSIM by pressing Ctrl+Shift+F10. The VISSIM instance is automatically closed (at the latest when Office is closed).

Errors or events which may occur during the export are displayed in a message window. If no messages were logged, this window is automatically closed after the export has been completed.

The message window is modal, i.e. if this window is open (also hidden) you cannot work with Office.

6.6.2. Exporting intersections

The simulation parameter edit dialog consists of four sections: **export settings**, **intersection geometry settings**, **load line** and **signalization**.

In the first section export settings are made:

The intersection version determines, which data set should be exported.

Parameter set name

The **minimum leg length** defines the length of the route which form the connection to the non-exported part of the network. The input flows are positioned at the end of this route.

Into the **VISSIM file** field, enter the name of an existing VISSIM file (either in file attachment of intersection or network, or available on hard disk) or the name under which you want to save the data. If you choose the **Export…** function for an existing VISSIM file, data import is always adaptive.

If a scaled layout plan is supplied, it is suggested to activate **Use geometry** to create a possibly identical intersection in VISSIM. If the switch is not set, a standard intersection is created from the defined legs, lanes, pedestrian crossings and traffic island in VISSIM.

A use case of adaptive import would be the simulation of several signal controls in a manually refined intersection model. The VISSIM file contains the current, manually refined network model and the anm file contains the current signal control.

In the second section intersection geometry settings are made:

Using the switches arranged here, the generation of the intersection geometry can be influenced. If a scaled layout plan is supplied, it is suggested to deactivate the switches **Ignore bus/tram**, **ignore cycle paths**, **treat bus/tram as IV** and **Treat cycle paths as IV**. If possible, this setting creates separate routes for bus/tram or cycle paths and due to the specifications, is positioned in the scaled layout plan. If no scaled layout plan is supplied, separate routes for bus/tram or cycle paths may cause problems when creating the intersection in VISSIM. In this case it may be useful not to create the problematic routes (**…ignore** activated) or to create them as additional lanes on the routes of IV (**…treat as IV** activated). In the last case, the appropriate track blockings in VISSIM must prevent that the IV lanes are used.

In the third section load lines are defined. A list of volume flows with time of validity is specified. The time of validity is pre-set with the interval time but may differ from these. Simulation period is the sum of the time of validity. The volume flows determine the volume and mixture of the input flows (at the borders of the network) of the created stream.

In the last section the settings for the signal control is made. It is first differentiated between signalized and signalized intersections. The following control methods are currently supported with signalized intersections:

Fixed-time control: Signal program selection from the intersection version selected above. In VISSIM, a file (*.sig) is created for each intersection that contains signal control data. When you copy the VISSIM file, you need to copy these files as well.

vap: Input of program number, cycle time and offset. Selection of stage (*.pua) and logic file (*.vap)

Siemens VA: Selection of a signal program from the intersection version selected above. Selection of the control program (*.exe), supply data (*.vsg, *.vag) and setting files (*.wtt)

Siemens-VA(DLL): In addition to the components with an intersection specific control program (* .exe) that you need to select for Siemens VA, you also must select a common control library (*.dll). Whether the procedure is employed with dll or not depends on the controller version.

The data required for the traffic actuated control methods can either be saved in the file system (button opens file selection dialog) or in the appendix of the intersection version (selection list contains the appropriate entries).

When you select Siemens VA or Siemens VA(DLL), a record of configuration files (*.kfg and *.szp) required for simulation of traffic-dependent control is automatically generated. Assignment of these configuration files to the corresponding signalized intersections is not performed automatically. If desired, the assignment must be made manually in VISSIM. To save the assignment, save the VISSIM file. If you change data or configuration files in VISUM that have been saved to the file attachment, close the Edit dialog to save these changes to the file attachment to avoid loss of changes (see 6.6.1).

When you select Siemens VA or Siemens VA(DLL), pedestrian crossings with normal signal groups and with signal groups for blind persons are displayed in VISSIM as two separate pedestrian crossings.

Before you select the "Export" function, save the changes made to the parameters so that they become effective before the export!

7. Intersection versions

Intersection versions show supply states of an intersection that are changed due to external circumstances. An intersection version has a certain "life cycle" and might undergo several workflow statuses (including the **INVENTORY** status).

An intersection version in the **DRAFT** status might only serve as a variant for examining, simulating or comparing situations and thus might never reach the **INVENTORY** status.

There are signalized and non-signalized intersection versions. A non-signalized intersection version can be used for a capacity analysis (according to German HBS 2001) or for network planning, e.g. for simulation purposes.

A non-signalized intersection version consists of:

General (versioned intersection data)

User data

Defaults

Intersection topology

Capacity analysis

A signalized intersection version consists of:

General (versioned intersection data)

User data

Defaults

Basic supply

Traffic actuation

When you create a new intersection version, select a variant. You can copy a signalized intersection version to create a non-signalized version and the other way around. You can thus use some of the topology data if required. Changing the version later (from signalized to non-signalized or the other way around) is not possible if you have not used the Copy function.

Just as for the other elements, there is user data available here

The data record of a signalized intersection version is enough to supply a controller with all the data it needs or to operate it within the Yutraffic Scala control center.

7.1. General intersection data versioned

General intersection data assigned to an intersection version (e.g. the intersection number) can be changed from one version to the other, even if it is for the same intersection. They are therefore not suitable as globally identifying features for the intersection and are saved with the respective version.

The data can be viewed in the folder **General** below the intersection version in the object tree.

The editor consists of several registers:

Intersection (general data)

Partial intersection (topological intersection and hardware)

Components (of controller)

Motion parameter sets

If you open the **General** (unversioned) editor and the intersection version is in the **INVENTORY** status, its objects intersection no. and controller no. are automatically adopted.

This editor can have different views. These depend on the licenses purchased, the view selected and the intersection type (e.g., if the intersection version is non-signalized, only the Intersection tab is enabled).

You do not have to specify device details for planning or analysis purposes. In this case, choose version-neutral components (e.g. PDMe 0.00-00). For simulation purposes or supply of the controller, however, you must first select a version.

7.1.1. Intersection tab

The data of a signalized intersection version can be divided into the following sections:

General

Name and identifying attributes of an intersection version.

C no./Device no.: must be supplied correct and clear for OCIT systems.

The information required for communication with the controller (C no., Device no. and rel. Int. no.) can change from version to version and is edited in and saved to the corresponding version data.

Planning

Parameters which are relevant for this intersection during intersection planning.

Motion

Parameters which are relevant for this intersection during MOTION planning.

Intersection type (Motion)

- Motion intersection
- Intersection is controlled by Motion
- No Motion intersection
- Intersection is not controlled by Motion
- Attached intersection
- Motion optimization is not carried out for this intersection, but the control is carried out by Motion (is not being evaluated).

Signal program calculation

- Calculation
- Motion calculates new signal programs for the intersection
- Selection with offset time optimization
- Motion selects the existing signal programs and adjusts the offset times (is not being evaluated)
- Selection without offset time optimization
- Motion selects existing signal programs.

Important

- The important identification may be activated or not.
- Important intersection determines the behavior of Motion in case of a failure.
- If important intersections are faulty, the Motion controller core is released for all intersections of the entire area. It then controls the supplied fall-back level.

- If unimportant intersections are faulty, Motion continues to control the entire area. The unimportant intersections are then controlled by the fall-back level.

Device settings

Parameters that specify the controller and its (possible) connection to a traffic control computer.

Controller family/type: must be set correctly for a complete and correct supply of the components.

Language 1/2: Option of country-specific language settings. The language 1 set is used for the first supply and is activated every time the system is started.

Teams

Information on maintenance team for controller, the lights and detectors. These values are pre-set from the project settings.

Signal monitoring

Parameters which are relevant for signal monitoring of the controller.

Name: Signal monitor name that is checked by signal monitoring and the actual intersection when you restart the controller. The earlier definition from TCC/intersection number is no longer necessary in Yutraffic Office.

Country code and supply type are only visible if the controller supports this.

The intersection name entered here usually corresponds with the intersection names and intersection – **General unversioned**. However, you can change the name (e.g. by adding "first construction section").

Apart from the guideline, which is relevant for defaults of planning data, all additional data is optional.

For a non-signalized intersection version, the editor only shows the data required:

In this case, **Non-signalized** is activated and you must choose an **Intersection type** whose capacity can be evaluated according to the German HBS 2001:

Junctions

Intersection

Roundabouts.

7.1.2. Partial intersection tab

Definition of partial intersections

The **number**, **name** and **position** of the partial intersections must be parameterized. These are "topological partial" intersections. They are listed separately in the layout plans.

Hardware partial intersections require a topological partial intersection that can be separately switched off via signal monitoring. However, not every topological partial intersection requires a hardware partial intersection.

7.1.3. Components tab

Definition of components in the controller.

7.1.3.1. Changing components

Click the Change … button to supply the controller configuration or change an existing configuration.

You do not have to specify device details for planning or analysis purposes. In this case, choose version-neutral components (e.g. PDMe 0.00-00). For simulation purposes or supply of the controller, however, you must first select a version.

In the left overview select the components which you want to move with the buttons between lists in the right overview.

Controller components marked with a green flag have been integrated in Yutraffic Office (i.e. the controller data of these components can be edited and supplied in Yutraffic Office).

Attention: This selection depends on the controller. If there is no possibility of selecting, check the parameters Controller family, Controller type in the Intersection tab.

For AWP components the sub version can be selected in right selection. The subversion supplements the version by a third and fourth position for the TA logic share of the component. It is pre-set to the highest available version. For further information, please refer to chapter 9.5.

During data transfer, default values, if available, are set for the controller data of each component. For instance, there are no default values for the M controller.

7.1.3.2. Reading components from the controller

The components can be read in directly from the controller. To do so, click the **Read from controller …** button to open the Wizard.

To enable this function, you first need to set a connection for the controller (see chapter 8.2).

7.1.3.3. Editing/supplying AP values

If there are VA components, you can edit and supply the AP values there.

In "Customer name" column, you can enter a name for each AP value.

Click the button if you want to delete all customer names entered.

Click the En button to copy the English names (if available) to the "Customer name" column.

Click the button to supply the TA values to the controller. The Wizard is opened. Then select the connection for supply.

7.1.3.4. Data synchronization

If all controller components configured are integrated in Yutraffic Office, the Synchronize components automatically option is selected per default.

This means that when you change Office data, the controller data (system data) is automatically synchronized with it.

If the option is deselected, the Editor and Date are automatically saved. The controller data (system data) is then visible and can be edited. The data is not automatically synchronized.

If a controller component of the configuration is not fully integrated in Yutraffic Office, the option for synchronization cannot be changed. Data synchronization is then performed when you start Yutraffic Control.

Also see chapter 7.9.

7.1.4. Motion parameter sets tab

Here you can define capacity factors in several parameter sets (Ps) for the Motion network control method.

Please note that to use this tab you require the corresponding license and must activate the Motion view.

Using the **capacity factors**, the traffic capacity or the traffic efficiency are influenced at the intersection. A capacity factor of 1.1 means, that all capacity values are increased within the Motion optimization by 10 per cent. The result is, that the cycle time range becomes less at this intersection, which influences the network cycle time (Capacity factors are currently not considered).

7.2. Default intersection version

When you create an intersection version, you can copy global default values into it. You can always adjust these default values to the individual intersection. However, you cannot copy global defaults into the intersection version after you have created it (e.g. from a newly created or changed template).

Here you can e.g. specify the colors or signal sequence for the intersection version. The changes made here will only affect the intersection version.

7.3. Non-signalized intersection

In Yutraffic Office, you can create the following non-signalized intersection types and evaluate their capacity according to German HBS 2001:

Junctions

Intersection

Roundabouts

Use the intersection topology for editing purposes. For the evaluation, click the **Capacity analysis** tab.

7.3.1. Intersection topology

The intersection topology of a non-signalized intersection is in many ways like the intersection topology of a signalized intersection. It is also described in chapter Intersection topology. When copying an intersection version, you can change the intersection type (signalized, non-signalized). The data that is identical in both types remains unchanged.

7.3.2. Capacity analysis

According to chapter 7 of HBS 2001, a capacity analysis can be performed for non-signalized intersections. A capacity analysis acc. to HBS 2015 is not possible now.

The following tasks should be completed before commencing work in this area:

Supply of general intersection data

Intersection topology with lanes and crossings

Changes to defaults (if required)

Volume flow.

To perform a capacity analysis, you must choose an intersection type under General and/or define right of way types/signage in the intersection topology.

Tables for capacity analysis must be created within the right-hand section of the Sitraffic P2 main window; access is provided in context menu **New** via **Capacity analysis** tab.

In Chapter 7 of the German manual HBS 2001 (equivalent to HCM), the calculation methods used are described in detail.

The tables provided via the capacity analysis tags have been designed according to the Forms 1-4 published in HBS 2001.

After starting the editor, first edit the Header:

Capacity analysis	Name of the object - freely editable
No.	Number of the object – read only
Description	Description of the object – freely editable
Volume flow	Selected volume flow to be used for the LoS determination
Interval (min.)	Duration of the evaluation interval in minutes. Is applied from the volume flow – read only

From day	Counting date, Start. From volume flow – read only
From time	Counting time, Start. From volume flow – read only
To day	Counting date, End. From volume flow – read only
To time	Counting time, End. From volume flow – read only
DM (s/veh)	Calculated mean delay of vehicles of the decisive stream at intersection – read only
LOS	Level of service of the intersection - read only
Delay limit(s/Veh)	Limit of delay; editable by the user as quality default. This value is compared to the calculated delays listed in the table. Values exceeding the limit are red-shaded, values smaller than the limit are green-shaded.
Position	Intersection position including variants: rural, outside of metropolitan areas rural, within metropolitan areas urban Read only. Value derived from general intersection data. From this data, critical time gaps and follow-up time gaps are calculated for calculation of the base capacity of streams.
Minor directions	Headline describes the minor flow leg. Output of the Right of way sign for the leg supplied in the Legs table of the Diagrammatic Junction Editor.

Tab. 10: Capacity analysis - Header

By selecting the **volume flow** table in the table header, other header data is entered automatically from the volume flow table and the results derived from this data are listed in the table.

The structure of the table depends on the intersection type. It contains:

Stream	Number of the traffic flow due to HBS 2001 – read only
From leg	Source leg, origin of stream – read only
To leg	Destination leg, destination of stream – read only
Category	Category level of the traffic flow due to HBS 2001– read only
v (veh)	Load of the traffic stream in vehicles/hour, from stream volume - read only
v (carUnits)	Load of traffic flow in vehicle-units/hour, from stream volume – read only

qH (veh/h)	Load of the superior stream (major flow), calculated from stream volume – read only
C base (carU)	Base capacity of volume flow. Calculated according to equation (7-1), HBS 2001 – read only
fPed (-)	(Optional) reduction factor for pedestrian crossings at roundabouts. Calculated according to equations on page (7-80), HBS2001 – read only
C (carU)	Capacity of traffic flow. Calculated according to chapter 7.5.2, HBS 2001 – read only
Cres. (vehUnits/h)	Capacity reserve. Calculated from C – q ; read only
s (-)	Degree of saturation Calculated from q / C ; read only
P0 (-)	Probability of non-congested state (no blocking-back). Calculated according to chapter 7.5.3, HBS2001 – read only
N95 (carU)	Queue length not exceeded in 95 % of observed time interval. Calculated according to equation on page (7-81), HBS2001 – read only
N99 (carU)	Queue length not exceeded in 99 % of observed time interval. Calculated according to equation on page (7-81), HBS2001 – read only
d (s/veh)	Mean delay of vehicles in stream. Calculated according to equation on page (7-81), HBS – read only Values smaller than d are green-shaded, values exceeding d are red-shaded.
LOS	Level of Service of traffic flow by stream, determined from the mean delay. Value derived from mean delay according to table (7-1), HBS 2001 - read only Level E and F are highlighted by a red background.

Tab. 11: Volume flow

The capacity and delay data for shared entry lanes are listed at the end of the table.

In case of Roundabouts, the header includes:

Capacity analysis	Name of the object - freely editable
No.	Number of object – read only
Description	Description of the object – freely editable
Volume flow	Selected volume flow to be used for the LoS determination
Interval (min.)	Duration of the evaluation interval in minutes. Is applied from the volume flow – read only

From day	Counting date, Start. From volume flow – read only
From time	Counting time, Start. From volume flow – read only
To day	Counting date, End. From volume flow – read only
To time	Counting time, End. From volume flow – read only
DM (s/veh)	Calculated mean delay of vehicles of the decisive stream at intersection – read only
LOS	Level of service of the intersection - read only
Delay limit(s/Veh)	Limit of delay; editable by the user as quality default. This value is compared to the calculated delays listed in the table. Values exceeding the limit are red-shaded, values smaller than the limit are green-shaded.

Tab. 12: Roundabouts - Header

Also, for Roundabouts, level of service calculations are based on the **volume flow table**:

Leg	Entry leg, origin of traffic flow – read only
vL (veh)	Entering stream in vehicles per hour, from stream volume – read only
vL (carU)	Entering stream in vehicle-units/hour, from stream volume – read only
vR (veh/h)	Roundabout volume flow in vehicles per hour, calculated from stream volume – read only
vR (vehUnits/h)	Roundabout volume flow in vehicle-units/hour, calculated from stream volume – read only
qFG (Ped/h)	Number of pedestrians in entry leg, calculated from stream volume – read only
C base (carU)	Base capacity of volume flow. Calculated according to equation (7-1), HBS 2001 – read only
fPed (-)	(Optional) reduction factor for pedestrian crossings at roundabouts. Calculated according to equations on page (7-80), HBS2001 – read only
C (carU)	Capacity of traffic flow. Calculated according to chapter 7.5.2, HBS 2001 – read only
Cres. (vehUnits/h)	Capacity reserve. Calculated from C – q ; read only
s (-)	Degree of saturation Calculated from q / C ; read only
d (s/veh)	Mean delay of vehicles in stream. Calculated according to equation on page (7-81), HBS – read only

	Values smaller than d are green-shaded, values exceeding d are red-shaded.
LOS	Level of Service of traffic flow by stream, determined from the mean delay. Value derived from mean delay according to table (7-1), HBS 2001 - read only Level E and F are highlighted with a background in red.

Tab. 13: Roundabouts – Volume flow

7.4. Basic supply (signalized intersection)

The basic configuration of an intersection allows the basic supply of a signalized intersection version. Basic configuration of an intersection is divided into the following areas:

Topology / Layout

Topology objects

Signal group relations

Traffic data

Signal programs

Stages

These groups in turn consist of several different objects.

The **stages** group belongs to basic configuration since it is partly standardized in OCIT-I VD and because of its manual use (another criterion for these objects).

7.4.1. Topology / Layout

In the Topology /Layout editor the functionality of the Intersection topology and Layout plan editor were combined as well as the Map, Pedestrian crossings and the Stops editors integrated. The aim of the editor layout was to provide the maximum possible space for the graphic area as it is the most important element of this editor. Therefore, there is just a panel on the right side with properties for the categories General, Object Pool and Selected Objects.

You can switch to the old editors using the corresponding feature toggle.

However, this should only be done in outmost need, as 100% backwards compatibility cannot be guaranteed due to new functions.

In the editor all partial intersections are displayed and edited together. However, it is possible to filter by hardware partial intersections, in this case only objects of the selected partial intersection are displayed n the graphical part of the editor. Please note that Detectors, Reporting points and Stops are not assigned to any partial intersection and are therefore always displayed regardless of the partial intersection filter selected.

Using the corresponding zoom button in the toolbar, you can enlarge or reduce the graphical part or set the optimal zoom factor so that all objects are visible. The optimal zoom factor is also set automatically every time the editor is opened. In addition, the zoom factor can be changed quick and easy using the mouse wheel as long as the mouse is over the graphical part of the editor.

Usually all positions in the graphical part are editable as long as the intersection version is not read-only. In order to avoid unwanted changes, which may even affect the intergreen time calculation, the “positions” can be locked using the corresponding button in the toolbar.

Additional settings can be made in the menu under “Visualization”. An online map (Open Street Map) can also be displayed as a background, a background image can be loaded and its opacity can be set. Options for the display of various objects can be set as well. Finally, the size of the labels (signal groups, detectors, etc.) can also be adjusted here.

The options for displaying the various objects are independent of the options when calculating the conflict points.

For example, you can switch on a realistic display of the lanes or the border widths for the turning relations or crossings and still calculate the conflict points without the border widths.

The graphic formats supported are Bmp, Jpg, Png, Tga, Tif, Pdf, Emf, Wmf, Lpg and Svg. These graphic formats can then be displayed as a background in the full-scale layout plan, but cannot be further processed.

Please note that in order to display an online map, at least the first reference point must be set and an internet connection to the corresponding map server is required.

AutoCad background files are no longer supported. Please convert this into a supported format, including PDF, which is now also supported. In multi-page PDFs, the first page is displayed as the background.

You can use the “Measuring” button to determine the length of a route. Each click sets a corner point, and a double click starts a new measurement. To exit this mode, please click on the button again.

You can recalculate all conflict points using “Recalculation...” in the toolbar.

Please note that no conflict points between arms, lanes and pedestrian crossings of different partial intersections are calculated.

If two reference lines intersect more than twice, only the intersection with the smallest and the intersection with the largest clearing path are calculated!

You can set the following options when recalculating:

- Border widths (only) for tangential lines (necessary for the Austrian RVS directive)
- Border widths for crossing lines (necessary for the Austrian RVS directive)
- Border widths for pedestrian crossing (only possible in combination with ”Border widths for crossing lines”, necessary for the Austrian RVS directive)
- Special clearence safety for pedestrians (only possible in combination with ”Border widths for crossing lines”, reasonable for the Austrian RVS directive) from a defined pedestrian crossing width (6m according to current RVS)

Please note that special clearance safety for pedestrians with a width of more than 4 meters is always covered if guideline „RiLSA 2010/2015“ is selected and „Border widths for pedestrian crossings“ is NOT selected

This special rule has been adhered to by Yutraffic Office since the introduction of RiLSA2015!

What is new is that the “corrected” position of the conflict point is shown now. A corresponding note is displayed at the respective conflict point.

If you cannot find an object that is already positioned in the graphical part, you can use the search function in the toolbar.

7.4.1.1. Properties Panel

The panel is deliberately kept small in order to give the graphic part as much space as possible, but it can be folded in and out as usual and its width can be adjusted.

In the general part, in addition to the usual data such as name etc., the dialog for editing the partial route between partial intersections can also be opened. This is important for motion but also for green waves, among other things. After selecting the source and destination arms, the lanes are initialized and can then be adjusted.

Please note that you cannot cancel this partial route dialog. Every entry is accepted immediately, just like in the actual editor. While editing in the dialog, undo and redo are not available (as usual), but you can undo the entire change using an undo action after closing the dialog.

All objects that have not yet been positioned are displayed in the object pool and their visibility is set. In addition to the well-known objects such as the north arrow and scale, the “general elements” also include the reference points, of which there are now two.

Additionally there are the following types:

- **Partial intersection (Hardware)**
  These are actually created under Intersection Version/General and are available here until they are positioned. Additional partial intersections with basic data can also be created and positioned directly using the “+” button. Existing partial intersections cannot be edited or deleted, with the exception of their position.
- **Arms**
  The arms are the primary object of the topography and, in addition to the approach and exit lanes, also contain the pedestrian crossings. Existing unpositioned arms can be positioned or new arms can be added using the “+” button.
- **Signal groups**
  These are actually created in the signal group editor and are available here until they are positioned. Additional signal groups with basic data can also be created and positioned directly using the “+” button. Existing signal groups cannot be edited or deleted with the exception of their position
- **Detectors**
  These are actually created in the detector editor and are available here until they are positioned. Additional detectors with basic data can also be created and positioned directly using the “+” button. Existing detectors cannot be edited or deleted except for their position.
- **Reporting Points**
  These are actually created in the reporting point editor and are available here until they are positioned. Additional reporting points with basic data can also be created and positioned directly using the “+” button. Existing reporting points cannot be edited or deleted, with the exception of their position.
- **Public transport stops**
  The stops are also primary objects of topography. Existing unpositioned stops can be positioned or new stops can be created and positioned using the “+” button.

In general, the visibility of the individual types in the object pool can be switched on or off using the small buttons at the top right. The following elements can also be switched on or off for the arms:

- Conflict points
- Name of arm or lane, shown in the middle of the object
- Assigned signal group, shown behind the stop line of the approach lane
- Assigned vehicle type, shown at the end of the approach lane

The properties of all objects selected in the graphical part are displayed under “Selected Objects”. If different types are selected, they will be displayed in the corresponding tab. Within a type/tab, the properties are summarized as common in the plugin editors. As usual, when multiselecting multiple instances of a type, the properties of all selected instances can be adjusted in one step. (For example, the width of all approach lanes on an arm can be adjusted in one step.)

7.4.1.2. General information on operation

As soon as the mouse is in the graphical part, the zoom factor can be adjusted using the mouse wheel.

The visible section can be moved by holding down the left, middle (mouse wheel button) or right mouse button, provided the click was carried out in a free area, i.e. not on an object.

Every object in the graphical part can be selected with a mouse click (left). The entire object or just one point of an object can be selected, depending on whether the mouse click occurred near a point or in between. In both cases, the properties of the object are displayed in the properties panel and can also be adjusted if necessary.

The Delete key can be used to delete the entire object or a single point if there are more than two points (including the start and end points). When deleting an entire object, depending on the object type, it is either deleted directly or, as is the case with secondary objects such as signal groups, it goes back into the object pool. If secondary objects were completely newly created in the editor, they will be completely deleted again when deleted.

An additional support point can be inserted by double-clicking on the center line of a lane or arm.

Reference lines can be created as a circle segment or as a polygon line (curve). Circle segments only have one support point in the middle and polygon lines have several support points.

To convert a circle segment into a polygon line, simply double-click to insert an additional support point at the desired location and when you delete the second to last support point of a polygon line, it will be converted into a circle segment, if this is possible.

Not all connections (e.g. straight relationships) can be represented with a circle segment; in this case a polygon line is automatically generated.

A multi-selection of several objects is also possible, regardless of whether they are of the same type (e.g. several signal groups) or different types (e.g. a signal group and a detector). To select multiple objects, please press the Ctrl key while clicking.

The group of selected objects is provided with a frame. A selected group can be moved using drag and drop (left mouse button pressed), resized at the corners and support points or with Ctrl+mouse wheel, or rotated in the frame area or with Alt-mouse wheel.

If an arm is selected while holding down the Ctrl key, all lanes and crossings of this arm are also selected.

With Ctrl-A all objects including the north arrow and the scale are selected.

The selection with Ctrl-A can be used, among other things, to fit the objects to a background image. In this case, after changing the size, no dialog for entering and confirming the scale is opened.

Please note that for security reasons, the north arrow and the scale cannot be part of the multiselect in any other combination, i.e. also that the north arrow and scale are automatically deselected as soon as you remove the first object from the multiselect after a Ctrl-A.

Within the intergreen time calculation there is the option to highlight a selection of conflict cases. In this case, the corresponding conflict points are displayed slightly enlarged and a dialog appears in which you can also end this function. In addition, a filter can be activated in this dialog, which temporarily hides all other conflict points. If the conflict points to be highlighted are not visible, they will be temporarily visible using this filter.

With the right mouse button you can open a selection menu to specifically select an object near the mouse. This is useful, among other things, when there are several objects in one area.

The Esc key ends the respective mode, including measuring or positioning objects.

7.4.1.3. General elements

Common elements are the north arrow, the scale and the reference points.

If a non-scale representation of the topology is sufficient, you can also work without general elements. However, if the topology is to be used as a basis for the intergreen time calculation, then of course at least the scale must also be defined.

To create the north arrow, click on the corresponding button in the properties panel under Object Pool/General Elements. The first left click in the graphical part defines the starting point, the second left click defines the end point of the north arrow.

Basically, the zoom factor can be adjusted while positioning with the mouse wheel or the visible section can be moved by holding down the middle mouse click (mouse wheel button).

The scale is defined analogously to the north arrow. After the scale has been drawn, a dialog for entering the actual length in meters is opened. Please enter the corresponding value between 1 and 1000m. A larger distance between the start and end points with a correspondingly larger actual length increases the accuracy. If the scale is positioned diagonally, any existing distortions between the X and Y axes will be compensated somewhat.

To define the reference point, click on the corresponding button. The (first) click in the graphical part defines the position on the background, then the dialog for entering the geographical position as UTM coordinates opens. Here you can either enter the coordinates manually, use the search function to find a location and find it precisely on the map, or insert them from Google Maps, for example.

In order to see the position on the map, a map section is displayed. This can be moved under the crosshairs by holding down the left mouse button and the zoom factor can be changed using the mouse wheel. Additionally, you can copy the current UTM coordinates or open Google Maps at the defined position.

A second reference point can also be defined. This must be in the same hemisphere and zone as the first reference point. It is initialized with the geographical position of the first reference point, but logically it must be at another nearby point.

If a second reference point is defined, the north arrow and scale are automatically calculated. In this case, the north arrow and scale can only be moved, but can no longer be adjusted in length and direction.

If the north arrow and scale are not yet positioned at the time the second reference point is defined, they are automatically positioned at the top left, as these continue to be the basis for all further calculations. You can move these if necessary.

If the distance or the resulting scale is too large, then the scale cannot be defined and remains in the object pool.

Please note that the second reference point and its functionality are not supported by the old layoutplan, i.e. the calculated north arrow and scale are normally shown in the old layoutplan, but any change in the old layoutplan breaks the consistency!

If the scale is changed in size (moving the start or end point) or the position of a reference point is moved, the corresponding dialogs are opened automatically to confirm the properties. If the dialog is canceled, the position change is also reversed.

Of course, the properties can also be adjusted after selection in the properties panel under selected objects.

7.4.1.4. Partial intersection (Hardware)

The partial intersections are secondary objects of the Topology/Layout editor, i.e. they are actually created and changed in their own editor outside of the Topology/Layout editor under intersection version/general. Existing partial intersections cannot be edited or deleted, with the exception of their position.

Existing partial intersections that have not yet been positioned are displayed in the object pool. To position, simply click on the desired partial intersection and position it in the graphical part. Additional partial intersection with basic data can also be

created and positioned directly using the “+” button. Once a partial intersection is positioned, the next one is automatically selected to position it. Pressing the Esc key ends this function.

The graphical position of the first partial intersection is the intersection center of the old layout plan. This is also important for coordination, among other things.

In addition, in the background, the geographical position of the first partial intersection is set to the geographical position of the first reference point, which replaces the old “Map” editor with geographical positioning. This geographical position is used, among other things, for the dimming function of the sX and for positioning the intersection in the GIS of the Yutraffic Scala or Symphony.

7.4.1.5. Arms

The arms are primary objects of the Topology/Layout editor. The arms also include the approach and exit lanes, which can be connected via turning relationships/reference lines, as well as the pedestrian crossings.

Existing arms that are not yet positioned are displayed in the object pool. To position it, simply click on the desired arm and position it in the graphic part. The first click defines the starting point in the approach direction, each additional click defines a base point and a double click defines the end point. For new arms, an approach and exit lane is automatically created and it is initially assigned to the closest positioned partial intersection.

Additional lanes or pedestrian crossings can be created using the respective “+” buttons next to or in front of the arrowhead of a selected arm. The direction of the approach lanes is automatically calculated from the sum of the turning relationships and cannot be edited.

If an approach and exit lane is selected, a possible connection is graphically displayed in the form of a reference line, which is created by pressing the corresponding “+” button.

Turning relationships and reference lines

In the Topology/Layout editor, only the reference lines are visible in the graphical part. However, reference lines are based on turning relationships or their lanes. When selecting a reference line, not only the properties of the actual reference line are displayed, but also the properties of the associated turning relationship including its lane.

The following definition must be noted:

Turning relationships (lanes) define which entry lane is connected to which exit lane. The signal groups and vehicle types are also assigned in the turning relationship.

Reference lines are even finer than turning relationships. They describe the exact driving line or driving surface of a driving relationship. There can also be several reference lines for a driving relationship (e.g. different radii for different vehicle types).

Conflict points are only calculated between reference lines of the same hardware partial intersection. If reference lines of different hardware nodes intersect, no conflict points are calculated, they cannot be created manually and are therefore not included in the intergreen time calculation!

To create a new reference line, select the desired approach and exit lane. Multiselect of multiple approach and exit lanes is also possible. Possible connections are graphically displayed in the form of a reference line, which can be created by pressing the corresponding “+” button.

If the turning relationship is already known (e.g. because there is already a right turn from this arm into the other arm and only an additional reference line or lane is added), it is created without further dialog.

In the other case, a dialog for selecting the signal group(s) is opened. The signal groups are filtered to the corresponding partial intersection, but the filter can be removed so that all signal groups can be selected. According to the signal group type and the detected direction, the direction, radius, vehicle type and case are preassigned. However, in any case this data should be checked and adjusted if necessary.

Extensions for, for example, cyclists or public transport must be made manually at this point, as well as, for example, changing to a narrow radius for calculating intermediate times, entering the turning relation storage or priority signal groups, etc.

In the Swiss directive, the vehicle types must also be selected in the reference line and turning relationship, but there are no cases and no fields for public transport

When you select a reference line, the properties of the actual reference line are shown in the upper part of the properties; in addition to the name, these are the vehicle type and the border width. The vehicle type can be selected for each reference line, as there can be a separate reference line for cyclists, for example. However, the selected vehicle type of the reference line must be defined in the associated turning relationship.

In the lower area of the properties of the reference line, the properties of the associated turning relationship are displayed.

The direction of the turning relationship is automatically calculated but can be changed manually.

However, this does not always make sense and should only be used in justified special cases.

If the direction of the relevant arm is changed (rotated), the direction is automatically recalculated

The radius (only relevant for turning traffic) is calculated automatically but can also be changed manually in the same way as the direction. In this case, the cases may be adjusted but this must be checked in any case!

The length of the turning relation is preset to 30m; by pressing the button next to the input field, the average of all reference lines can be adopted. Multiselect is also supported here.

The flow type is important for motion supply, but is not relevant for intersection-specific planning (e.g. for intergreen time calculating).

The flow type should not be confused with the vehicle type, which is important for the intergreen time calculation

All signal group details are displayed in a table, with the columns grouped per approach lane. There can be several signal group assignments per approach lane, each with one or more vehicle types. The desired case must be selected for each vehicle type. Additional signal groups and vehicle types can be added or deleted using the corresponding “+” and “x” buttons.

The vehicle types within the turning relationsand the reference line must fit together! So no vehicle type can be used in the reference line that is not also defined in the turning relation, and a vehicle type that is not used in any of the reference lines makes no sense in the turning relation.

If a vehicle type is deleted in a turning relation, it will also be removed from all relevant reference lines. If a vehicle type is added in a turning relation, it will NOT be automatically added to all reference lines.

Prioritized signal group(s) are relevant for dedicated left-turning lanes with a diagonal green arrow. The signal groups with which the priority traffic flows are signaled must be specified. The information is evaluated when calculating intergreen times. The entry route is set to 0 by the program when calculating intermediate times.

In addition, prioritized signal group(s) are relevant for pedestrian/cyclist signal groups that are partially compatible with the right- or left-turning flow of the main signal group (SG). The information is used in the current volume flow table and is used to determine the adjustment factors for pedestrian traffic or the blocking time for right-turners by pedestrians in accordance with HBS 2001 / 2015. If several pedestrian signal groups are specified for a conditioned conflicetd right turner, the first of them is used to determine the blocking time.

Finally, prioritized signal group(s) for determining the capacity for conditioned conflicted left turners are relevant for the quality verification according to HBS 2001/2015.

For the fictitious IT, the maximum of the fictitious intergreen time between prioritized signal groups and the main signal group must be specified.

The fields speed public transport, public transport stop, position and distance are only relevant for public transport vehicle types (bus, streetcar) and set the speed of the public transport vehicle (preset with the value from the selected case) and the position of an optional stop before or after the stop line firmly.

If a distance to the stop line (distance to SL) is specified, even with small distances in the intergreen time calculation, an approach speed Vcap is calculated from the distance and the acceleration, which is included in the calculation of the intergreen times. You should therefore ignore small distances and set the value to 0.

Pedestrian crossings

If a new pedestrian crossing is created using the “+” in front of the arrowhead of a selected arm, a dialog for selecting the signal group(s), the cases and the position is opened. The signal groups are filtered to the corresponding partial intersection, but the filter can be removed so that all signal groups can be selected. The case is preassigned depending on the signal group type, but must be checked and adjusted if necessary. In addition, it must be stated whether the crossing covers the entire arm or just the entrance or exit.

Within the properties, among other things, the length (usually synchronized with the length in the graphical part), the width and the adjacent signal group can be defined.

Pedestrian crossings have no direction, i.e. only one crossing in both directions is usually sufficient.

The width of a pedestrian crossing is also the border width, i.e. this is also used, among other things, to calculate the conflict points if you have activated the border width for pedestrian crossings.

Conflict points between pedestrian crossings and reference lines are only calculated for reference lines that start or end in lanes of the same arm as the pedestrian crossing. If reference lines intersect with pedestrian crossings of another arm, no conflict points are calculated, they cannot be created manually and are therefore not included in the intergreen time calculation!

7.4.1.6. Detectors and Reporting points

The detectors and reporting points are secondary objects of the topology/layout plan editor, i.e. they are actually created and changed in their own editor outside of the topology/layout plan editor. Existing detectors and reporting points cannot be edited or deleted, except for their position.

Existing detectors and reporting points that have not yet been positioned are displayed in the object pool. To position it, simply click on the desired detector or reporting point and position it in the graphical part. Additional detectors and reporting points with basic data can also be created and positioned directly using the “+” button. Once a detector or reporting point is positioned, the next one is automatically selected to position it. Pressing the Esc key ends this function.

If a detector or a reporting point is positioned on a lane, the lane is also assigned directly to this detector/reporting point. A detector or reporting point with lane assignment is shown in bold.

A repositioning does not change an existing assignment, but if the detector or reporting point is not yet assigned and is moved to a lane, a one-time assignment is also made in this case.

Only one lane can be assigned via the topology/layout plan editor. If several lanes are desired, these must be assigned in the detector or reporting point editor.

7.4.1.7. Public transport stops

The public transport stops are primary objects of the topology/layout plan editor. Existing stops that have not yet been positioned are displayed in the object pool. To position it, simply click on the desired stop and position it in the graphical part.

New stops can be created and positioned directly using the “+” button. Once a stop is positioned, the next stop is automatically selected to position it. Pressing the Esc key ends this function.

The public transport lines (line, course, route, stay time) for the stop can optionally be defined in a table.

If possible, the location of stops in the intersection area should be determined in such a way that additional lost time for public transport is avoided. Improved processing can also be achieved through measures such as setting up time islands, exit aids or announcement signals (e.g. door closing signal).

7.4.2. Signal groups

The following tasks should be completed before commencing work in this area:

Definition of general intersection data

With graphical editing: assignment of a layout plan with specification of scale

Data input for intersection geometry (legs, approaches/exits)

From the context menu **Open signal group editor**, choose **Intersection topology**.

The definition of signal groups, including the transition patterns, transition times, signal states for specific operating modes (All red, All amber, etc.), signal type and assignment to primary or minor direction must be made in a table.

To guarantee data consistency, it must be ensured when supplying the data that the signal groups are explicitly assigned to the respective partial intersection.

You can edit signal groups in the layout plan or in an editor.

7.4.2.1. Editing in the layout plan

After clicking the icon, you can create signal groups in design mode and position them precisely in selection mode. To edit existing signal groups, you must switch to selection mode and double-click to launch the editor.

In the signal group editor, you can assign default names and vehicle types as well as create new signal groups. In this case however, you will not receive a message indicating existing objects without layout plan assignment when you switch to the layout plan. You must therefore call up the respective list box manually.

7.4.2.2. Editing in the editor

You can insert one or more new signal groups by clicking. Another editor is opened that allows you to enter the number of newly created signal groups per type.

The number allowed depends on the controller selected in the **General** editor. Data verification checks the number of signal groups, also when they are later changed.

The newly created signal groups are appended to the end of the list. Gaps (after deleting signal groups) are not filled.

O no./ChanNo.	Channel numbers are assigned in ascending order (from 1) when signal groups are created. Any gaps in the numbering which arise when signal groups are deleted are not filled. The channel numbers can be freely edited, but they must remain unique. Duplicated numbers will be identified by the consistency check performed when you accept your inputs. Saving is then not possible.
Name	Freely editable.

Short name	Maximum 32 characters (specified by OTEC)
Description	Freely editable (max. 100 characters)
Type	You can enter the signal types in a list box (copy and paste, using Ctrl+C and Ctrl+V is possible). Standard signal sequences can be entered: • Vehicle • Traffic turning right • Left turners (incl. diagonal signal) • PT bus • PT tram • Cyclists • Pedestrians • Indicator • Signal for blind persons • Light triangle • Combined signal for cyclists/pedestrians • Combined signal for pedestrians/the blind • Unknown signal groups that do not fit into any of the known types. If you subsequently change the signal group type, the relevant entries in the signal sequences, additional signal sequences and the durations are adjusted accordingly. If signal heads were assigned, these are deleted and replaced by default signal heads.
Detail type	Specifies whether the signal has 1, 2 or 3 fields.
Colors	Definition of [standard] colors and transition colors
Signal sequence	Possible signal sequences in a signal group are listed here. Multiple sequences are possible for a signal group. The signal sequences of the signalization types template are used, but you can change them per signal group according to your requirements. For each signal sequence you can enter fixed (transition times) or variable times (minimum times), (see next columns). A signal sequence is marked as a standard sequence. It is then e.g. used in a signal program to create signalization with a double-click. The signal groups and sequences are conforming to the OCIT specification.
tMinF	Minimum free time in seconds (normally green) The correct duration according to the signal type is automatically entered from the system defaults (editable).
tFL	Transition time free to locked (normally amber) The free to locked red transition time list **contains** the types of durations. The duration cannot be directly entered with combined transition times, the individual patterns must be created separately. The values are automatically entered from the system defaults (editable).

tMinL	Minimum locked time in seconds (normally red) The correct duration according to the signal type is automatically entered from the system defaults (editable).
tLF	Transition time locked to free (normally red/amber) The locked to free transition time list contains the types associated with the durations. The duration cannot be directly edited with combined transition times, the individual patterns must be separately created. The values are automatically entered from the system defaults (editable).
PI SW	Allocation to software partial intersection number for e.g. the traffic actiation.
PI HW	Assignment to darware partial intersections (hardware-based), value range no. < 100
MD	Main direction This specification is required for the on-/off-patterns. For the MS controller, the state flashing amber for the secondary direction must be implicitly controlled via an entry in this field (flashing amber is a color sequence for the C800V controller).
Opt	Optimum transition
AllRd	All red pattern Static operating state that can be selected via a button on the controller.
AllAm	All amber All amber signalization state that is selected if the controller is switched off in response to a fault.
OffDa	Off dark Signalization state that is selected in response to the operating state Off-dark**.**
OffFL	Off flashing Signalization state that is selected in response to the operating state Off-flashing**.**
Special OffFL	Special Off flashing Signalization state that is selected in response to the operating state special Off-flashing**.**
Signal head	In general, a default signal head is created for each signal group. If the type is changed, the signal heads are also adjusted. You can add new signal heads or delete existing ones. You can switch off the display of the signal heads.

Tab. 14: Newly created signal groups

As the display, checking and calculation algorithms do not permit it, Yutraffic Office does not support the option available in the C800/C900 controller for providing two variable time ranges per signal group.

7.4.2.3. Fixed time supply of special signal heads

PT 4-point

Is realized using three signal groups with:

Type **Tram**

Signal type **PT 4 point**

Assignment to the same hardware partial intersection

Signal sequences:

- Standard color release: Green
- Standard color block: Red
- Additional color release: Amber flashing

Flasher traffic light

Is implemented like an indicator with the signal pattern **Alternate flashing Red-Green**.

7.4.2.4. Display options

Sorting

The rows in the signal group list can be sorted in any order by moving. Use the mouse to highlight the row(s).

Press the *"Ctrl"* key and use the Drag-and-Drop operation to move the row(s). The complete record is always moved as well.

To sort the list in ascending numerical order again, click the icon sort .

You can also **sort the list according to increasing rows** . This means that the rows remain where they are and only the channel numbers are renumbered.

Copying

You can copy individual rows. An asterisk * is added to the name of the copied signal group. The channel number is automatically added as the highest assigned number in the same way as a signal group is created.

7.4.3. Detectors

"Detectors" refer to parallel connected detectors. The parameters which must be specified for complete planning or supply are described below.

Construction: single / double curve etc.

Distance det: Distance of the detector curves (only with double curves)

Length: Extension of the curve in traffic direction

Position: Position of the detector (X,Y,Z coordinates)

Queue length: If the tailback length of the leg is to be estimated via the estimate of the traffic jam length, this option must be selected (technical requirements must be given).

> Default setting however is **no queue length estimate**. If you want to estimate the queue length, a lane allocation and with it a respective signal group must be specified.

Lane allocation

To assign the lane allocation, the detector row is extended via the "+" symbol.

Lanes can only be assigned if the detector has not been assigned a crossing.

If you use the scaled layout plan to create a detector and position it in a lane section, it will automatically be assigned to a lane. The distance to the stop line will also be entered automatically if you have set a scale. If you create a detector manually in this editor, you must assign it manually, even if you positioned the detector in the layout plan later.

A detector can be assigned to one or more lanes. When allocating lanes, the respective signal group (SG) is automatically defined.

LN assigned lane. All approaching lanes, turning relation lanes and exits are displayed.

SG which is assigned to the signal group (automatically results from the lanes)

Distance SL: Distance of detector from the stop line:

When positioning on an approach or turning relation lane, the distance is specified as the absolute difference to the stop line.

By positioning on an exit lane, the distance is the absolute difference to a fictitious „Start line“ after the intersection, thus the start of the intersection exit.

Crossing: optional. A crossing can only be assigned if no lane has been assigned.

Detector plausibility ranges are monitored thresholds in the controller. They are used for assignment and to fill in the gaps of a detector. The plausibility ranges are switched on or off via a time switch. Four plausible ranges are available for each detector.

The **Plausibility ranges** tab is only visible when the perspective **Supply intersection** has been selected.

In the **Plausibility ranges** tab, you can define parameters for ten possible plausibility ranges.

7.4.3.1. Demand

The **Demand** tab is only visible if the perspective (can be set via **View – Perspective**) **Supply intersection** or **Planning intersection** is selected and the function Planning traffic actuation is available.

Here you can supply the demand parameter for local control methods such as S-L and PDM.

Via the toolbar, new demand objects can be created or deleted. In the upper section of the editor page, names and numbers of the demand can be supplied. Only the first four object instances (see O no.) are supplied towards local control method.

The combination of detectors and signal groups are applied from the first index pages General and highlighte**d in the column** "Det/SD", **so that the** combination of detectors and signal groups are available from the topology. Other combinations can also be supplied manually by detectors and signal groups. These changes may cause the **Det/SG** column not to be set.

In the **Active** column you can select if the signal group is required with the detector. If a demand element is active, the number does not have to be equal to 0 as well as all numbers definite and without gaps.

In the **Function** column, set the function of the extension element. Note that for a ContTrafficJam function no signal groups must be supplied and no detector is required for the ContDem function.

7.4.3.2. Calculation

The **Calculation** tab is only visible if the perspective **Supply intersection** or **Planning intersection** have been selected (can be set via **View > Perspective**) and the feature **Planning traffic actuation** is available.

Here you can supply the extension parameter for local control methods such as S-L and PDM.

Via the toolbar, new extension objects can be created or deleted.

Only the first four object instances (see O no.) are supplied towards local control method.

The combination of detectors and signal groups are applied from the first index pages General and highlighted in the col**umn** Det/Sg**, s**o that the combination of detectors and signal groups are available from the topology. Other combinations can also be supplied manually by detectors and signal groups. These changes may cause the **Det/SG** column not to be set.

In the **Active** column you can select if the signal group is extended with the detector. If an extension element is active, the number must be unequal to 0 and all numbers must be unique and complete.

In the **Function** column the function of the extension element is set. Note that no detector is required for a ContRem function.

7.4.4. Reporting points

Radiogram position or sensor (detector) for capturing public transport.

Can be called via the tree entry **Intersection version / Basic supply / Topology objects / Detection points**.

Detection point number is a number within the PT telegram (in OCIT it is called AMLI).

The following reporting point types are available:

- Serial
- Pass on to traffic-actuation serial
- Parallel impulse
- Parallel gap

The **Detector** and **debounce time** columns are only necessary for parallel detectors.

7.4.4.1. Lane allocation

To assign the lane allocation, the detection point row is extended via the + symbol.

If you use the scaled layout plan to create a detection point and position it in a lane section, it is automatically assigned to a lane. The distance to the stop line is also automatically entered, if you have set a scale. If you create a detection point manually in this editor, you must assign it manually, even if you positioned the detection point in the layout plan later.

A reporting point can be assigned to one or more lanes.

LN assigned lane. All approaching lanes, turning relation lanes and exits are displayed.

Distance SL: Distance of detection point from the stop line:

When positioning on an approach or turning relation lane, the distance is specified as the absolute difference to the stop line.

By positioning on an exit lane, the distance is the absolute difference to a fictitious „Start line“ after the intersection, thus the start of the intersection exit.

In the P2 data storage, detection points are always assigned to approaching lanes. There is no specific information if the detection point lies in front or behind the stop line.

This means that after the import of P2 supplies, detection points are always assigned to approach lanes, i.e. positioned in traffic direction of the stop line. As **Distance SL** the absolute value of the distance to the stop line is applied according to P2 data.

Detection points are required in the PT directions (PT memory) (see chapter 7.8.3).

For the synchronisation with Yutraffic Control it should be noted:

For parallel detection points which reference detectors, the detector numbers must be applied to the (RP) number.

If you have a mixed supply of serial and parallel reporting points, you need to supply (RP) numbers outside the detector number area for all reporting points without a reference to a detector.

7.4.5. Signal group references

The following tasks should be completed before commencing work in this area:

Intersection objects (signal groups etc.)

Intersection topology

Optional: intergreen time calculation

The new editor combines the matrices for conflicts, intergreen times and the offset times. On the left side you can see all instances of each of the matrix types. Here you can create new instances or select, copy or delete existing ones.

On the right side at the bottom the relationship between the instances is displayed, here you can also select an instance.

The size of the middle part of the editor can be adjusted using the zoom setting in the toolbar.

You may filter the matrices based on partial hardware intersections. In that case, only the corresponding signal groups will be shown for the matrices. This filter only affects the display within the editor and is not part of the planning/configuration. When reopening the editor all partial intersections will be shown again (filtering is not set by default).

The matrices (no inputs permitted along center diagonal) show the created signal groups in the same order as they are displayed in the signal group editor (entering signal groups along the horizontals, clearing signal groups down the verticals).

A conceptional and traffic engineering-based consistency check regarding the intersection topology will be performed within the editor. In case, that any warning is found certain functionality might be deactivated. These warning then must be cleared within the intersection topology.

7.4.5.1. Conflict matrices

In the upper right you can edit the properties of the conflict matrix.

A matrix can be marked as **checked**. This can be done by another user (the last editing user must be different from the reviewing user) by clicking the button “Matrix checked”. Here the attribute “Checked by” will be set – it consists of the username of the reviewing user and the current date. The attribute is shown in the properties section of the matrix.

If a matrix having the checked mark set is about to be changed, the user has to confirm, if the change should be saved and the check mark then should be removed.

If the feature toggle “Fill conflict matrix and validation” is activated and there are no warnings and/or errors regarding the topography, the conflict matrix can be preassigned or checked according to the topography.

In any case the preassigned values must be checked manually!

To set or remove a conflict, click the corresponding entry (white background) in the upper right part of the matrix. The mirror-inverted entries will be set automatically.

7.4.5.2. Intergreen time matrices

In the upper right you can edit the properties of the intergreen time matrix. Here you can also reference a conflict matrix and an intergreen time calculation, which will be used for validation purposes and to provide given values.

Additionally, you can define if and where the selected instance should be used by selecting the appropriate option for “Used for BS/Sim/(SiMon)” and “Used for TA (SDM)”.

The option “SrIT (OCIT only)” is only relevant for marking the safety relevant matrix with respect to OCIT, but is not necessarily the SiMon relevant intersection matrix, because this one is defined via the option “Used for BS/Sim/(SiMon)” for Yunex Traffic controllers or is set via controller specific editors.

A matrix can be marked as **checked**. This can be done by another user (the last editing user must be different from the reviewing user) by clicking the button “Matrix checked”. Here the attribute “Checked by” will be set – it consists of the username of the reviewing user and the current date. The attribute is shown in the properties section of the matrix.

If a matrix having the checked mark set is about to be changed, the user must confirm, if the change should be saved and the check mark then should be removed.

If a reference to an intergreen time calculation is set, the intergreen time matrix can be filled with pre-calculated values by clicking “Fill matrix”. Here always the max. values for each conflict will be set. There is a choice of three variants to fill the matrix:

1. Fill with effective values

All intergreen times will be set to the calculated effective values, existing values will always be overwritten

2. Fill with theoretical values

All intergreen times will be set to the calculated theoretical values, existing values will always be overwritten

3. Fill with minimum of theoretical values

Only intergreen times, which are lower than the calculated, theoretical values or that are missing will be set or replaced with the calculated, theoretical values.

4. Fill with minimal compared values

This option is only available if tow matrices are compared! Only intergreen times which are lower than the compared values or that are missing will be set or replaced with the compared values unless these values are not lower than the calculated theoretical values.

Of course, intergreen time values can be entered or changed manually. In case a reference to an intergreen time calculation is set, values lower than the calculated, theoretical values are not accepted. Negative values are never accepted.

A symmetry check will always be performed. In case a reference to a conflict matrix is defined, the entries of the intergreen time matrix will be checked based on the entries of the conflict matrix. Entries without conflict will be marked in grey but can be anyway set to a (symmetric) intergreen time value. Via tab key navigation to the next conflict is available.

The selected intergreen time matrix can be compared to any other intergreen time matrix and to theoretical or effective values. Here you must select the relevant matrix to be compared in the center part of the editor.

In this mode two values per matrix field are displayed, on the left you can see the value of the selected matrix, on the right the value of the matrix, that it is compared to. The color of the entry shows, if the value for selected matrix is the same (grey), the value is larger (green) or the value is smaller (red). The left value (of the selected matrix) can be edited also in this comparison mode. In this case also the fourth type of “fill with value” is activated in the way it is described above.

In order to leave this mode simply select “None” for the matrix to compare.

7.4.5.3. Offset time matrices

In the upper right you can edit the properties of the offset time matrix. Here you can set the reference to a conflict matrix, which will then be used for validation purposes.

In addition, the type of the offset time matrix must be defined/selected.

Via the option “Used for BS/Sim/(SiMon)” you can define, if and where the specific instance should be used.

By specifying offset times, you can generate fixed or variable time dependencies between the green times of signal groups, for both their start and end.

The creation of signal group offsets is only relevant if the C800/C900 controller is selected.
With M and sX controllers they are used for planning only.

If a reference to a conflict matrix is defined, the entries of the offset time matrix will be checked against the entries of the conflict matrix. Conflicts are marked in grey.

A fixed offset can be defined by entering a symmetric entry having the same value but the opposite algebraic sign. Variable offsets are defined by entering a (non-symmetric) positive or negative value into the matrix.The following examples illustrate fixed and variable start and end offsets:

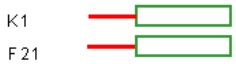
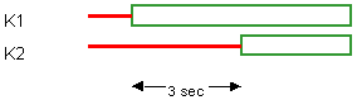
Fixed start offset

Here both signal groups are mutually dependent on each other, i.e. you cannot create an allocation between a main signal group and a dependent signal group.

You enter the same value for both, but with opposite algebraic signs.

	K1	F21
K1		0
F21	0	

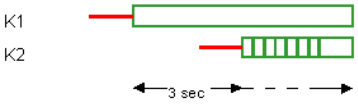
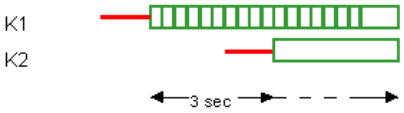
	K1	K2
K1		3
K2	-3	

 Both switch at the same time.	 K2 switches exactly 3 seconds after K1.

Img. 2: Fixed start offset

Variable start offset

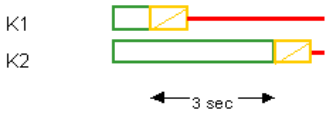
Here only a starting signal group depends on another one, the entry is done non-symmetric.

K1 K2 K1 3 K2  Here K1 is decisive and K2 is dependent. K2 switches 3 seconds or more after K1.	K1 K2 K1 K2 -3  Here K2 is decisive and K1 is dependent. K1 switches 3 seconds before K2 or later.

Img. 3: Variable start offset

Fixed end offset

Here both signal groups are also dependent on each other. This means you cannot create an allocation between a main signal group and a dependent signal group.

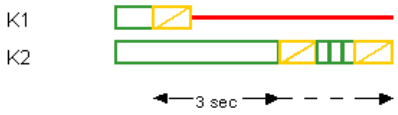
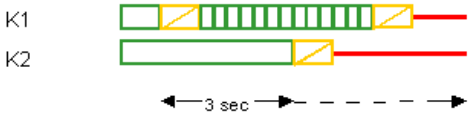
K1 K2 K1 3 K2 -3  K2 switches exactly 3 seconds after K1.	

Img. 4: Fixed end offset

Variable end offset

Here only one of the ending signal groups depends on another one, the entry is done non-symmetric.

K1 K2 K1 3 K2	K1 K2 K1 K2 -3

 Here K1 is decisive and K2 is dependent. K2 switches 3 or more seconds after K1.	 Here K2 is decisive and K1 is dependent. K1 switches 3 seconds before K2 or later.

Img. 5: Variable end offset

7.4.6. Intergreen time calculation

The following tasks should be completed before commencing work in this area:

Intersection objects (e.g. signal groups etc.)

Intersection topology & pedestrian crossings

Layout plan with specification of scale

Conflict matrix

Intergreen time calculation can be based on conflict matrices. Using the previously provided data, conflict areas and intergreen times can be calculated according to the selected guidelines. Moreover, the intergreen time calculation module provides various parameters that you can adjust according to the local requirements. You can change the parameters under Defaults. Select the guideline under Intersection General (versioned). You can choose between the following guidelines:

RiLSA '92 & 2010

RVS 5.32

SN Switzerland

Poland.

The creation of one or more conflict matrices is a mandatory precondition for calculating intergreen times only when conflicts are generated automatically. Manual editing is also possible without an assigned conflict matrix.

The intergreen times are calculated according to RiLSA '92 guidelines which were assigned in the **General** object.

Additionally, the look and feel of the editor is determined by the guidelines.

If the parameters change, a calculation will produce results that deviate from the guidelines.

First edit the header:

Name	Freely editable.
No.	Pre-set, freely editable
Description	Freely editable, max. 60 characters
CM	Selection from all conflict matrices created
Rule tz min	Rule for calculating the minimum intergreen time; **NO RULE** is set, i.e. no minimum intergreen time is calculated. See below for further options.
Countersignature	Not checked, option for manual addition on the printout. Replaced by Checked flag.

Constant	Reference to field Tz Min; specification of a constant in whole seconds (see below).
Transition SF	Transition time from red to green (is only displayed if more than one red-green transition list was created and is only possible with the C800V controller).
Transition LN	Transition time from green to red (is only displayed if more than one green-red transition list was created and is only possible with the C800V controller).
Checked by/on	Checked flag, contains user name and date of check.

Tab. 15: Intergreen – Header

By selecting the function **Intergreen time calculation checked** in the **Extras** menu, the name of the user and the current date are entered in the Checked flag and the calculation is saved.

If an intergreen time calculation is to be stored again which has already user and date entries in the Checked flag, then the user is queried for saving calculation and removing the old Checked flag from it. By subsequent execution of the CONFLICTS CHECKED functionality, a new Checked flag can be added to the header of the saved calculation. The Checked flag replaces the field **Countersignature** provided in previous versions, which only served as an internal comment storage. Data of the **Countersignature** field might be transferred to the Checked flag field without a date.

Clearing or entering distances bigger than 200m are not supported by the intergreen time calculation. If a clearing or entering distance that is derived from the layout plan or has been entered manually exceeds this limit a corresponding remark is added.

Calculation rules

RULE TZ MIN and **CONSTANT** fields

You can choose between various calculation rules for the minimum intergreen time. This constant can be assigned a value in the header field which is added to the calculation rule; e.g. the rule tZ Min = transGtoR + CONST. If you specify, e.g., 3 (seconds) as the constant and if transGtoR is 2 seconds, then

tZ Min = 2 s + 3 s = 5 s

If you want the minimum intergreen time not to be increased by exactly one constant, then set the constant to a value of 0.

The calculated intergreen time (theoretical intergreen times) can be negative. Make sure that via the calculation rule settings for the minimum green time, the effective intergreen times are larger or equal to zero.

Negative values are set to zero by the calculation algorithms and can also not be loaded in the controller.

No rule	Minimum intergreen time is not calculated
transGtoR + const	Value must not be less than transGtoR + constant
trans RtoG + transGtoR +const	Value must not be less than transRtoG + transGtoR + constant
const	Minimum intergreen time constant (in sec)

Tab. 16: Calculation rules

transGtoR + 1 second can be used as a guideline.

The minimum intergreen times should be selected in accordance with the **green-green** monitoring used in the controller.

Options

From the main menu, choose **Options** to change the following settings:

Print visible columns only

IC with current layout plan roads

Account for maximum transition time

Consideration only occurs, when general intersection data (version) guideline "RiLSA 92 BRD" was selected.

The amber time of the default signal sequence selected is normally used for tA+1. If you do not want to use the amber time, you can use the maximum transition time of all signal sequences of the signal group instead.

Take drag effect into account

Additional clearing must also be entered in the "With" column.

Intergreen times table

The parameters listed in the intergreen times table for the clearing signal groups are shown in fields with blue backgrounds, while those of the entering signal groups have yellow backgrounds.

No.	Row number
SG	Name of the clearing/entering signal group; assigned to each SG is a type (value according to RiLSA) which is identified.
LN	Clearing/entering lane; with pedestrian signals: crossing
Lane dir.	Clearing/entering direction Input via left, right or straight-ahead direction arrows; ► **Pedestrians and cyclists** if signalized on crossing: No direction ► **PT vehicles**: different input than for private cars ► **all others**: direction entered in the lane object as turning relation
Flow	Clearing/entering flow type
aC	Segment clearing/entering; clicking on the field opens an editor in which the distance and speed of up to 5 clearing/entering segments can be entered. Acceleration is automatically entered when the intergreen times are calculated. If the editor is open, the No **field** on the far right on the IC form is marked red for ease of reference (only possible for BUS or TRAM) (see chapter 7.4.6.2),
R<10	Road arc with < 10 m radius, takes account of slow turners; output field only. The check box is selected if the case **Turning vehicles narrow radius** is set in the lane.
vC ap, vEap	Clearing/entering speed in the approach (default values)

vC, vE	Clearing/entering speed according to RiLSA
aC	Clearing/entering acceleration, only relevant to PT vehicles
Length of vehicle	Vehicle length, default according to RiLSA; in the case of clearing signal groups, the vehicle length is added to the clearing distance
Cdist, Edist	Clearing */entering distance; from reference lines and conflict point plan
tPass	Transition time/time allowance
Drag Eff.	Drag effect with clearing in late release time; range 0-9 sec, activated via **Options**
tC+tPass	Clearing time + transition time/time allowance, required for ITcal
tA+1	Amber time + 1 second, depending on amber time setting of default sequence or maximum amber time.
tCd	Decisive clearing time

Tab. 17: Intergreen times

It is also possible to input negative clearing distances. For standard use this feature is deactivated. To activate, set the parameter NegativeClearingDistance=1 in the section [Settings] of the configuration file Sip_zb.ini located in (..*Documents and Settings\All Users\Application Data\Siemens Mobility GmbH\Sitraffic Office\x.x.x.x\System\xxx*).

Clearing distances < 0:

In accordance with the 2003 partial update of the German guidelines for traffic installations, the time allowance suggested for the blind can be entered in the Transition time/time allowance parameter of the system defaults.

Prior to generation, you can influence the result by means of several setting options:

Filters

Normally lanes must be supplied before the intergreen times can be calculated automatically. **If you deactivate the LANE INFORMATION** option on the **FILTER menu,** you might generate conflicts, even if no lane data is supplied.

To avoid overloading the intergreen time calculation with irrelevant cases, you can exclude other combinations from the calculation. The respective restrictions can be set via the **Filter** menu option (For instance, you can define whether vehicle signals should include co-travelling cyclists on entering cyclists or pedestrians. You can activate the option of considering right-right combinations). The setting is made in the respective flow type.

Conflict cases without distances are always considered, a filter is no longer provided.

When editing the layout plan, you might have to update clearing and entering distances (button or **Extras** context menu) before you start calculation. When one or more rows are selected, only these rows are updated. If no row is selected, the whole form is updated.

Highlight conflict point in layout plan

To check a conflict, select a row in the intergreen times table (when a layout plan is open), then click the **Mark conflict case in layout plan** button. The selected conflict point flashes in the layout plan.

Conflict points

After modifying, creating or removing a conflict point in the conflict point plan, click "Accept" to automatically change the clearing and entering distances in the intergreen times table. The intergreen times are then recalculated and the data updated.

Display of columns

To gain a better overview and adjust the table width for a preview, "hide" columns by running them together with the mouse. To restore the default column width, click or use the **Extras** menu.

Header

You can also configure the display of the buttons in the header. In the [Button] section of the SIP_ZB.INI file, you can set individual buttons to visible (=1) or not visible (=0) , depending on how frequently *y*ou use them.

Row functions

Selected rows can be "frozen", i.e. not included in calculations, via the context menu. This option can also be deselected again via the context menu. Frozen rows are marked blue.

You can use the tab key to jump to the clearing/entering distances in the table.

There are three ways of calculating intergreen times:

Automatic generation

Manual editing

Manual editing based on conflict matrix.

7.4.6.1. Automatic generation

For the automatic generation of conflict cases, you need a conflict matrix, all signal groups and reference lines as well as object data (default, lane flow type and direction data). In this mode, the table can automatically be filled with data and calculated.

Auto filling

To fill the form automatically, click the respective button or from the **Extras - Recreate IC according to CM**. All possible calculation cases for all combinations of signal groups are displayed that are possible according to the assigned conflict matrix.

Auto calculation

The following columns are automatically calculated/updated:

tC	Clearing time is calculated
tC+tPass	Clearing time + transition time/time allowance; value is updated
tCd	Decisive clearing time; value is updated
tE	Entering time is calculated
ITcal	Clearing time – entering time
ITth	Theoretical intergreen time according to the rule for rounded intergreen time (defined in the defaults) or according to RiLSA

ITmin	Minimum intergreen time based on the calculation rule defined in the header of the intergreen times table (see Intergreen times table section). If "no rule" was selected, the theoretical intergreen time is applied. Effective intergreen time > minimum intergreen time
ITeff	Either theoretical intergreen time or (if below the minimum time) minimum time

Tab. 18: Intergreen times automatic generation

Negative intergreen times can be entered (a message is output).

Each recalculation overwrites the existing values.

After calculations have been performed, on the far right of the IC form, check the **EXT** column. Extension about any unsuccessful or incorrect calculations are output here. Following correction, the calculation must be repeated.

As an additional information, changes of input parameter done by the calculation algorithm are displayed here.

This is the case for example, if a PT vehicle serves a stop which is in a short distance to the exit and the PT vehicle has to initiate a decelerate of clearing in the intersection. The program checks if the PT vehicle comes to a complete stop in the stop using the pre-set speed. If this is not the case, the approaching speed vC ap is reduced.

The display of clearing speed *vC* remains unchanged.

It is irrelevant because the PT vehicle clears the intersection using changed *vC* ap. Additionally, a message appears in the remarks field to inform the user about this change.

In the **Comment** column, in the respective row, you can enter comments on the calculation case.

Select the options **Relevant cases highlighted** and **at the beginning of table** to organize the display. These have the highest effective intergreen time for the same signal group combination.

You can edit the values later. However, if you enter a value that is less than the theoretical intergreen time, the input will be rejected, and a message is output.

Tips for supplying a diagonal green:

In the intersection topology, assign the right turn relation to both signal groups, i.e. to the main signal and to the right turns.

Input the values for the prioritized signal group in the lane for oncoming traffic against the diagonal green.

If necessary, take account of any drag effect. It is possible to set a corresponding flag for this [drag=1] in the *SIP_ZB.INI* file so that a message is generated.

7.4.6.2. Manual editing

If you enter the values manually, neither the assignment of a conflict matrix nor previous editing of the reference lines and conflict points are necessary.

Below the column headers, in the grey section, you can use the context menu to insert rows, add rows or delete selected rows.

Inserted rows are placed following the row in which the cursor is positioned (it is not necessary to select the entire row). The inserted row is duplicated from the selected row, i.e. it contains the same parameters.

Added rows are appended after the last conflict. The row contains no values.

For subsequent calculation of the intergreen times, at least the columns **SG**, **LN**, **DIR** and **Flow** must be filled for the clearing and entering signal group.

After the lane is entered on the form, the speed corresponding to the flow type is automatically entered.

The values for vC, vehicle length and tPass are likewise automatically filled after the flow type is selected. If the flow type is for a public transport vehicle, vC ap is also entered.

In fields such as **vC**, **vC ap**, **aC**, **Cdist**, **Length of vehicle**, **Drag Eff**, **vE**, **vEap**, **aE** and **Edist**, you can only certain value ranges.

To simplify manual editing, you can use **automatic input of calculation cases**.

To do so, enter the clearing and the entering signal groups in newly created rows and select these rows.

Click the **Insert calculation cases for SG combination** button to automatically calculate all possible combinations of directions and flows for these signal groups. The distances are calculated automatically from the reference lines (if present).

From the **Extras** menu, choose **Insert calculation cases for SG combination**. An entry dialog is opened. It allows you to select the signal groups for which you want to generate conflict cases (use the Ctrl key to select several signal groups).

All existing entries for those signal groups will be deleted prior to insertion. Intergreen times can then be recalculated.

This function allows you to extend existing intergreen time calculations if additional signal groups are added without manually adjusted intergreen calculation parameters getting lost.

A manually edited IC form is overwritten as soon as automatic generation is performed.

Segment entering/clearing

By clicking on the field in the **From** column you can define up to 5 segments for public transport, each with distance (segment length), acceleration and speed.

The total of the segment lengths is applied into the **Cdist** and **Edist** columns, respectively.

Acceleration applies until the specified (final) speed is reached. If this cannot be reached with the acceleration value set, then the data is corrected automatically.

Specify the final speed of the respective segment and the start speed of the next segment. The speed indicated under vC ap is used as the start speed in the first segment.

7.4.6.3. Manual editing based on conflict matrix

Better described in chapter 7.4.6.2 the intergreen times table can be created based on conflict matrix.

According to this method conflicts are generated automatically based on a conflict matrix. Lane data and reference lines are therefore not necessary.

First select the conflict matrix in the header.

In the **Filter** menu, check the option **Account for lane data**.

If there is a check mark, please click to remove it.

Auto filling

To fill the form automatically, click the respective button or from the **Extras - Recreate IC according to CM**. All possible calculation cases for all combinations of signal groups are displayed that are possible according to the assigned conflict matrix.

Subsequently you must check the corresponding clearing and entering parameters of each conflict (mainly speeds), correct them if necessary and edit the clearing and entering distances. For easier editing you can use the TAB key to leave the respective distance column. The cursor is automatically positioned on the next distance column in the current or the following row.

Auto calculation

Selecting this button **or the Extras menu** – the intergreen times are calculated the values according to chapter 7.4.6.1.

7.4.7. Staggered pedestrians

The following tasks should be completed before commencing work in this area:

Definition of general intersection data

With graphical editing: assignment of a layout plan with specification of scale

Creation of signal groups

Creating pedestrian crossings.

Progressive pedestrian control is primarily concerned with the movement of pedestrians across a central traffic island. This is achieved by the shorter green time of the inner signals in comparison with the outer signals and by staggering the green times.

In addition, in the object, you specify basic input data for pedestrian delay determination (according to German HBS 2001) for more than one crossing per leg. For each pair of crossings per leg, you need to create a pedestrian reference object. More than 2 crossings per leg are not supported by the program.

The crossings are ordered by internal system object numbers.

Name	Automatically preset; can be freely edited, must be unique
Number	Automatically preset; can be changed
Description	Freely editable.
Wide crossing	The available pedestrian crossings are offered in a list box. Two different crossings should be selected for Wide crossing and Narrow crossing.
Length width crossing	The length is automatically applied from the selected pedestrian crossing object.
Narrow crossing	The available pedestrian crossings are offered in a list box.
Length narrow crossing	The length is automatically applied from the selected pedestrian crossing object.
Width of traffic island	If a traffic island is present, enter its width here.
Type	You can select if the pedestrian control should be executed progressively with 2, 3 or 4 signals or if the 2 signal groups should be defined for a direction-based pedestrian delay determination according to HBS 2001. Depending on this specification, various other specifications are required or calculated.
SG	Depending on the type, you can choose between outer SG (wide/narrow crossing) and inner SG (wide/narrow crossing). *)
Minimum green time	The minimum green time (in seconds) is displayed for each specified signal group (cannot be edited).
Offset time	If the **Extras > Calculate pedestrians** menu option is called, the calculated offset times for the various possible combinations (depending on type) are displayed here ((cannot be edited).

Tab. 19: Crossings interal system object numbers

*) Only the signal groups assigned in the respective crossing in the SIGNAL GROUP column are displayed in the list boxes for selecting the signal groups. If several signal groups are routed to a crossing, you must assign all signal groups involved here.

Once the required values have been entered, you can calculate the minimum green times and the offset times (according to RiLSA '92) by selecting the **Extras - Calculate progressive pedestrians** menu option.

Minimum green times may need to be added subsequently manually.

Abbreviations used below:

lW	Length of wide crossing
lN	Length of narrow crossing
lC	Width (length) of central island
lD	Dimensioning distance
vC	Clearing speed
vCs	Crossing speed green start
vCe	Crossing speed green end
iSG	Inner signal group
oSG	Outer signal group
(W)	Wide crossing
(N)	Narrow crossing
tmin	Minimum green time

Control with 2 signals according to RiLSA

tmin outer SG = (lW + lC + 0.5 * lW)/vC

tmin inner SG = 0.5 * lW/vC

Offset start:

Inner to outer signal = 0

Outer signal to inner signal = 0

Offset end:

Inner signal to outer signal = min. green outer signal group - min. green inner signal group

Outer signal to inner signal = - (value)

Control with 3 signals according to RiLSA

tmin outer SG wide cross. = (lN + lC + 0.5 * lW)/vC

tmin outer SG narr. cross. = (lW + lC + 0.5 * lW)/vC

tmin inner SG = 0.5 * lW/vC

Offset start:

All 0

Offset end:

iSG to oSG(W) = tmin oSG(W)-tmin iSG

iSG to oSG(N) = tmin oSG(N)-tmin iSG

oSG(W) to oSG(N) = tmin oSG(N)-tmin iSG(W)

oSG(W) to iSG = -(tmin oSG(W)-tmin iSG)

oSG(N) to iSG = -(tmin oSG(N)-tmin iSG)

oSG(N) to oSG(W) = -(tmin oSG(N)-tmin oSG(W))

Control with 4 signals according to RiLSA

tmin outer SG wide cross. = (lN + lC + 0.5 * lN)/vC

tmin outer SG narr. cross. = (lW + lC + 0.5 * lW)/vC

tmin inner SG wide cross. = 0.5 * lW/vC

tmin inner SG narr. cross. = 0.5 * lN/vC

Offset start:

All 0

Offset end:

iSG(W) to oSG(W) = tmin oSG(W)-tmin iSG(W)

iSG(N) to oSG(N) = tmin oSG(N)-tmin iSG(N)

iSG(W) to oSG(N) = tmin oSG(N)-tmin iSG(W)

iSG(N) to oSG(W) = tmin oSG(W)-tmin iSG(N)

iSG(N) to iSG(W) = tmin iSG(W)-tmin iSG(N)

oSG(W) to oSG(N) = tmin oSG(N)-tmin iSG(W)

oSG(W) to iSG(W) = -(tmin oSG(W)-tmin iSG(W))

oSG(N) to iSG(N) = -(tmin oSG(N)-tmin iSG(N))

oSG(N) to iSG(W) = -(tmin oSG(N)-tmin iSG(W))

oSG(W) to iSG(N) = -(tmin oSG(W)-tmin iSG(N))

iSG(W) to iSG(N) = -(tmin iSG(W)-tmin iSG(N))

oSG(N) to oSG(W) = -(tmin oSG(N)-tmin oSG(W))

7.5. Signal programs (signalized intersection)

Here you can edit the signal state sequences **Switch-on program** (switch on point pattern) and **Switch-off program** (switch-off pattern). Besides editing signal programs and the respective capacity analysis and quality you can also create fire department and bus/street programs.

All following sub-sections can be found in the tree under **Intersection version / Basic supply / Signal progams /** ...

7.5.1. Signal programs

The following tasks should be completed before commencing work in this area:

Intersection planning

Signal group definition

Intergreen matrix

Optional: Offset times. stages, stage sequences, stage transitions

The new editor combines the switch on and off signal programs, the “normal” signal programs and the fire brigade and Buestra signal programs. On the left part you get an overview of all instances of each signal program type. Here new instances can be created, and existing instances can be selected, duplicated or even deleted. The saved order can also be changed via the user sorting.

In the signal program editor, the display of the instances can also be switched between the standard view (only display of the short names) and a detail view (many other properties of the instances).

The order of the instances is usually identical in both views, but the order in the detail view can be adjusted by clicking in the header of the individual columns, and this order can then optionally be saved via the button "Apply current order…".

Individual instances can be temporarily detached as a separate window so that several programs can be viewed at the same time.

The size of the middle (graphic) part of the editor can be adjusted using the zoom setting in the bottom line.

The visualization of the different validations can be activated or deactivated in the menu under "Violations". The validations themselves always take place and messages are generated accordingly. The selected and visible validations are also displayed as information above the graphic representation of the signal program.

Intergreen time violations are shown with red lines, offset time violations with blue lines and reserved times with green lines. If the minimum time is violated, the name of the signal group is highlighted in red and if the signal sequence is violated, the signal group name itself is written in red. If the mouse pointer is on a line of a signal group within the graphics display, all violations that do NOT relate to this signal group are shown in a weakened color.

Additional settings can be made in the menu under "Visualization". So, for example, it is possible to switch between switching times and the beginning / end of green, and additional columns with information (e.g. markers) can also be displayed.

For normal signal programs and fire brigade / Buestra signal programs it is possible to filter by software partial intersections, i.e. in this case only the relevant signal groups of the selected partial intersection are displayed.

7.5.1.1. Switch on-/off programs

Using Yutraffic Office, you can plan switch on/-off programs and integrate them into overall project planning. For this, the basic conditions and controller type specified are considered. Switch-on programs define the signal state sequences from the off state to normal operation, Switch-off programs define the signal state sequences from normal operation to the off state.

As in other signal programs you can only use colors defined in the signal group within the switch on-/off programs. But you can use transition colors as normal end colors, so user must add and adapt the transition colors manually. As a result, a free definition of the color sequences is possible, which may allow other color sequences and transition color durations than in normal operation.

In the graphical representation, the off state (see “amber off flashing” within the signal group editor) is shown on the left side of the switch on and on the right side of the switch off program.

If you need more switching points (columns) as visible you can add additional columns (max 8) via the toolbar button.

Functions are:

Editing of switch on-/off program properties

Calculation of switch on-/off programs

Adjustment of individual signal times of the switch on-/off programs

Editing of switch on-/off program properties

The properties of the selected switch on-/off program are displayed and edited in the right part of the editor. If several instances are selected, the change is made for all selected instances. The most important properties are:

O no.

The O no. defines the instance in the basic supply of the controller.

Duration (tL)

It is necessary to specify the duration (tL) of the switch on-/off program in seconds.

Hardware partial intersection (PI HW)

Normally you have to define an own switch on-/off program for each hardware partial intersection to ensure a separated switch on/off

Matrices

The intergreen time matrix (IT) is necessary in order to be able to calculate switch on-/off programs, and of course validations regarding intergreen times and offset times can be displayed only if these have also been selected.

Markers

You must define the markers controller specific. The marker “IT monitoring” initializes the intergreen time monitoring as a part of the signal monitoring, and the marker “Signal protection” activates it.

The following principles must be observed:

- The initialization of the "IT monitoring" must take place in the switch-on program at the latest when the "Signal protection" is activated and must not be switched off in the switch-off program before the "Signal protection" has been deactivated.
- The "Signal protection" must be activated with the first color in the "free" state within the switch-on program, only the color "dark" in the "free" state is an exception. Of course, the "signal protection" must remain active until the last “free” state in the switch-off program.
- Markings can only be set at times when at least one switching point (color change) is available

Calculation of switch on-/off programs

The switch on/off program can be initialized in just a few steps. After the properties (at least the ZZ matrix) have been filled in, the switch-on/switch-off program can be calculated using the corresponding button in the toolbar in accordance with the RiLSA specifications. The signal group type, the information "main/secondary direction" and the definition of the colors per signal group are relevant.

The calculation options can be selected in the following dialog.

Only use main direction for tzmax

This option is usually sufficient, because normally only the main directions are released within the switch-on program or switched back to dark in the switch-off program.

Calculation with all-red signal sequence

All signal groups are first locked (usually red) and only then the main direction will be released

The following additional options are available for the switch-off program:

Two seconds of darkness

At the end of the switch-off program, all signal groups are dark for two seconds before they start flashing.

All free states end at the same time

All free states (of the main directions) in the switch-off program end at the same time, and not after the minimum duration.

The calculation also initializes the duration and the markers.

If several signal sequences are possible for a signal group type, the first one is always used.

Individual signal groups can also be initialized using the "Select switching-on/switching-off sequence" context menu. If necessary, you can choose between different sequences. Signal sequences with undefined colors cannot be selected and only the respective signal group is considered for initialization!

If there is no initialization for a signal group, the colors within the signal groups are usually not correctly defined. Please check whether all desired colors (including dark) are in the appropriate condition and are not "invalid". Also check the information "Main direction" and the signalization "Operation mode off flashing"!

Adjustment of individual signal times of the switch on/off program You can use several methods to optimize the calculated switch on/off program. Violations and request times are displayed for each entry.

Edit switching points

The switching points can be edited in the diagram or table.

Insert / delete individual switching point

New switching points can only be inserted via the pop-up menu of the graphic. An existing switching point can also be deleted via the context menu.

Select switching-on/switching-off sequence

Changing the switch on/off sequence reinitializes the corresponding signal group, see "Calculation of switch on-/off programs".

Changing the color of switching points

After selecting a switching point, its color can be adjusted via the context menu, only defined colors can be selected.

Copy and paste sequences

The sequence of a signal group can be copied and pasted into another signal group. The complete color sequence including the times or only the times can be pasted.

7.5.1.2. Signal programs

Signal programs can be created based on signal groups or stages, and the processing options change accordingly.

Two starts per signal group and cycle are supported and displayed. With stage-oriented signal programs, signal group starts can be in several stages and also in the stage transition. When you generate signal programs based on stages for a given stage sequence and more than 3 starts are generated for a signal group, a corresponding message is displayed.

The maximum number of signal groups created depends on the selected controller, as well as the number of cycle times and the maximum cycle time of each signal program. The number in Yutraffic Office can be exceeded for planning purposes. These signal plans can then however not be supplied in the controller!

The functions of the signal program are:

Editing the properties of the signal programs

Calculation of the signal programs

Adaptation of individual signal times of the signal program

Moving and editing stages

Moving the signal program

Creating of stages and stage transitions

Conversion of signal group-oriented signal programs into stage-oriented signal programs

Editing the properties of the signal programs

The properties of the selected signal program are displayed or edited in the right part of the editor. If several instances are selected, the change is made for all selected instances. The most important properties are:

O no.

The O no. defines the instance in the basic supply of the controller

Duration (tL)

It is necessary that the duration (tL) of the signal program is specified in seconds. If the cycle time is reduced, a message may be displayed that not all switching times can be accepted. You can then decide whether the switching points will be deleted, or the minimum cycle time is set.

Matrices

The intergreen time matrix (IT) is necessary to calculate a signal program. And validations regarding intergreen times and offset times can be displayed only if these have also been selected.

Switch on/off program

To switch on or off the signal program, a suitable switch on/off program must be selected.

Offset

The offset shifts the complete signal program for e.g. a green wave without having to adjust the individual signal times.

Compartment

Optional specification of the device compartment for the central control with various control methods.

Markers / Additional Markers

Some of the markers must be set device-specifically, the most important being the switching on point, the switching over point and the switching off point.

Calculation of the signal programs

The signal programs are calculated using the "Calculate signal program" button using the blocking signal group method. The blocking signal group procedure is based on dividing the signal groups into so-called blocking groups, which is aset of at least two signal groups, all of which are in conflict to each another).

The method determines the composition of the blocking groups based on intergreen times. The sequence of conflicting signal groups of each blocking group is defined according to the total of the minimum intergreen times. The main blocking group results from the main direction.

The blocking groups are supplemented by non-conflicted signal groups to generate the stages. The stage transitions are then calculated based on the signal program properties (intergreen time matrix and offset times) and put together to get a stage-oriented signal program.

Adjustment of individual signal times of the signal program

Stage-oriented signal programs cannot easily be processed in a signal-group-oriented manner, since this would invalidate the stage and stage transition structures

A double-click within the graphic part of the signal group line inserts a release with a minimum release time at the cursor position. Another double-click within the blocking time inserts another release as a double start.

The release start and/or end can be edited graphically and in tabular form, the release duration can only be adjusted in tabular form. In addition, a release can also be moved completely by grabbing the release in the middle.

Via the context menu in the graphic part of a signal group line, the entire line, or a single release (in the case of double starts) can be deleted, a permanent release or a permanent lock can be defined, or the signal sequence can be changed.

Regardless of the editing mode, the signal program can be stretched or compressed within the time scale above the graphic part of the signal program as soon as you see the double arrow as a cursor.

Drag to the right to expand or drag to the left to compress. When moving the cursor in the corresponding direction, the number of seconds of the stretching/compression amount is output via a tooltip.

If the target point is outside of the possible compression range when compressing, the input will not be accepted.

The cycle duration is corrected by the corresponding amount.

Moving and editing stages

The definition and supply of stage sequences and the calculation methods of signal programs from stages and stage sequences are to be edited in the "Stage definitions & -/sequences". Stage-oriented signal programs can also be generated from the calculation of the signal programs within the signal program editor based on the blocking signal groups.

In stage-oriented signal programs, the stage transitions are shown with a colored background. The position of the stage transitions and thus the duration of stages can be changed via graphic operation, considering the traffic conditions (intergreen times, offset times, minimum times). To do this, simply grab and move the stage transition below the graphic part.

Regardless of the editing mode, the signal program can be stretched or compressed within the time scale above the graphic part of the signal program as soon as you see the double arrow as a cursor. With stage-oriented signal programs, this is only possible within stages.

Additional stages can be inserted using the corresponding button in the toolbar above the graphic part. If this mode is active, you can open the desired time range for the new stage in any line by holding down the left mouse button and thus create the stage.

In the dialog that follows, you will see the details of the new stage and stage transition, where you can decide whether an existing stage / stage transition should be used or not. At the end, the new stage including stage transition is inserted into the signal program.

Moving the signal program

All the signal times and markers of the signal program are moved together by dragging them within the cycle time range.

In the case of stage-oriented signal programs, the signal program can also be packed and moved below the graphic part in a stage, independently of the editing mode.

Creating of stages and stage transitions

To define stages or stage transitions from already existing signal programs, you can take a section from a signal program. To do this, use the corresponding buttons above the graphic part of the signal program.

A stage can be accessed by double-clicking in the graphic part in the desired second. For a stage transition, the beginning of the stage transition is defined with the first click in the graphic part and the desired duration is specified with the left mouse button pressed.

In the dialog that follows, you will see the details of the new stage or the new stage transition.

The new stage or stage transitions are not used directly in the signal program. If this is desired, use the "Insert stage" function, which is described under "Moving and editing stages".

Conversion of signal group-oriented signal programs into stage-oriented signal programs

A signal group-oriented signal program can be converted into a stage-oriented signal program using the corresponding button above the graphic part of the signal program. In this case, any suitable and existing stages and stage transitions are reused.

7.5.1.3. Fire brigade and Buestra signal programs

In addition to the normal signal programs, you can define fire brigade and Buestra signal programs (signal programs that are switched in the event of an emergency response).

In the event of a fire brigade deployment or in the case of a Buestra, the signal program changes to the starting point of the fire brigade / Buestra signal program and continues to the stop point. The fire brigade / Buestra signal program remains there until the operation is over.

The fire brigade / Buestra signal program then continues to the end point and from there back to the originally running signal program. The number of the fire brigade / Buestra signal program defines its priority, i.e. fire brigade / Buestra signal program 2 ends e.g. fire brigade / Buestra signal program 1.

If there is an operation, the system immediately switches over to the start point pattern of the fire department signal program (maintaining the intergreen time and minimum time). Once the start point is reached, the system continues to run until the stop point. It remains at this point until this special operation is cancelled.

During partial interaction, the system then rotates accordingly. When PI (partial interaction) and **TP (train program)** are cancelled, the system switches back to the switch-over point of the current signal program via the exit point. In the special signal program, other signals required are controlled via signal groups.

If you want a rotating fire department signal plan, keep the stop point set to **Default** and instead supply **wCycleStart** and wCycleEnd. The system then rotates accordingly, and uncritical secondary stages can be run until the operation is cancelled. When a special operation is cancelled, the system still runs until it reaches the exit point. Via the intergreen time matrix, it then switches to the switch-over point pattern of the signal program currently valid.

Generally, you should set the stop point or end point, so that the minimum green times can be kept. Otherwise, your setting might result in a violation of the minimum green time. It is best, if the exit pattern is like the switch-over point pattern.

If no end point is supplied, the switch back to the normal signal program from the fire brigade/Buestra signal program takes place immediately without waiting for the end point. Waiting times can thus be reduced.

The switch-over is performed keeping the minimum time, offset time and intergreen time (independent of the current time switch position). Currently, you can activate up to three fire department signal plans via the control center or detector.

Further details are identical to the normal signal program and can be read in the corresponding chapter.

Offset time definition between signal groups in fire brigade / Buestra signal programs is different according to controller type. Offset time matrices are used for C-controller and for sX-controller definition in configuration editor needs to be done.

The maximum number of fire brigade / Buestra signal programs you can create depends on the controller type. In Yutraffic Office you can exceed the maximum number of signal programs for planning purposes, but the signal plans can then not be transferred to the controller!

7.5.1.4. Color combinations

The display of the individual colors can be adjusted using the "Color combinations" button within the signal program or stage transition editor. This representation is then used both in the editors and for the planning documentation.

There are two predefined templates (online, RiLSA) and based on these, each color in the graphic representation can be individually adjusted.

The color combinations are shown on the left; these are filtered to the colors used in the intersection. If a color combination is selected, the display on the right-hand side can be adjusted. Various geometric shapes are available for this, which can also be combined and changed in color. In addition, a text and optionally the duration can also be displayed.

At the end you must save the setting using the corresponding button to adapt the changed display in the editors and in the planning documentation.

This configuration is NOT part of the intersection-specific data, it is the client's settings. This means that the display on different PCs can also look different!

7.5.1.5. Toggle check

The toggle check is started using the corresponding button in the toolbar above the signal program. You then have to select the signal programs to be checked in the instance list in the left part of the editor.

The toolbar can be used to select what is to be checked, i.e. signal programs (among each other), switch-on programs and/or switch-off programs.

This is started via the "Check" button and fills the results directly into the table.

The "Calculate" button tries to calculate the switching on point, the switching over point and the switching off point. For each signal program, these results can be transferred to the respective signal program using the "Apply" button.

Pressing the "Toggle check" button again terminates the function.

7.5.2. Capacity analysis acc. HBS 2015

The following objects should be available before starting to work:

Template data HBS 2015

Signal groups

Lanes within the topology with optional

- prioritised signal group (SGPrior) and its fictitious intergreen time (IGTFict)
- turning relation storage (TRS)

Intergreen times

Signal programs

Optional: Crossings, Volume flow

Within the register “Programs” you can create a capacity analysis according to HBS 2015.

As a base for the calculation according to HBS 2015 you will need corresponding template data, which can be found in a separate register. In case such template data is empty, it has to be provided manually or can be taken from an existing template (e.g. “Default”).

The template data has been adapted for pedestrians, cyclists and public transport related calculations. During migration those values will be preset to default values according to HBS 2015.

The used calculations are described in detail in chapter S4 of the “Handbuch für die Bemessung von Straßenverkehrsanlagen” (Manual for the Design of Road Traffic Facilities), Edition 2015 Part S (City Roads).

The tables within the registers of the capacity analysis are based on the forms of the HBS 2015, i.e. showing all rows and columns. Non-relevant cells are empty or grayed out.

You can use the capacity analysis also without the volume flows. In this case you must enter the values in the table. Usually you select the volume flow within the capacity analysis, i.e. the well-known lane loads and the selected volume flow within the signal program is not used here!

First fill in the properties / parameters of the capacity analysis on the right side.

You must select the signal program to be evaluated. If an existing volume flow is selected, the conversion factors specified within the HBS 2015 are used to calculate the hourly-based results. If necessary, you can adjust these factors within the “Template data” of the intersection version.

Please note, that it is essential to provide a fully configured topology (e.g. lanes and directions) and types of signal groups (e.g. left turner) in order to get a valid calculation! Please doublecheck your input!

Such input will be validated. Any information, warning or error will be displayed to the user and depending on severity might prevent the calculation from running.

As soon as all necessary data has been provided and the data provided is valid, the calculation will start automatically.

Please note that the definition of the prioritized signal groups and the related fictitious intergreen times within the topology is mandatory in order to calculate the conditional compatible right and left turners!

The HBS 2015 doesn’t support u-turner, accordingly there are no statements regarding the calculation. In Yutraffic Office, the HBS 2015 calculation supports u-turners as left turner, so the prioritized signal groups are relevant as well. Form “S4-1d” is not calculated completely and from Form “S4-2b”, u-turners in the lane marker are no longer recognizable, but they are still considered together with the "normal" left turner.

Editable cells within the table are not grayed out. Every change leads to a recalculation. Values covering several columns will be displayed in groups.

Changing values from the volume flow on the first tab page automatically switches to "manual edited" mode. Accordingly changes in the volume flow will no longer automatically be reflected in the capacity analysis. In order to return to the original mode, select a volume flow again or press the button "Reload volume flow data".

If the volume flow geometry does not match the topology or one of the two has been changed a mapping dialog opens when the editor is started. There you can check and adjust the mapping between the legs. You can also open this dialog via the corresponding button.

The calculation for public transport on form 3f according to HBS 2015 is only done for pure public transport lanes. If the lane is also used by individual traffic, the part of the public transport will NOT be taken into account, only the individual traffic will then be relevant.

Please note, that for a public transport based lane row 151 will always be handled separately. This is due to an internal definition, as this is not part of the HBS 2015 definition.

For form 4a showing the pedestrian related values the pedestrian crossings are relevant. In addition, for form 4b showing the cyclist related values, those lanes with vehicle type “Bicycle” are included.

As well the type of signal group as the selected flow type will be evaluated. In case more than one crossing is found for a leg you may assign another crossing as the second one for the calculation. If there more than one signal group has been assigned the relevant one has to be selected. In addition to that the distance in meter between the start of the first crossing and the end of the second crossing need to be provided.

Multiple green states for pedestrian and bicycle signal groups are supported, in which in case of two crossings the green interval of the first crossing is the relevant one.

You can filter the columns of the table by a partial intersection if more than one is defined.

The size of the middle (graphic) part of the editor can be adjusted using the zoom setting in the toolbar.

All further details regarding the calculation can be found in the official HBS 2015 manuals, which are only available in German language.

Please note that the documentation is only possible with the so called “Planning documentation”.

7.6. Stages (signalized intersections)

For Yutraffic Office, manual stages and traffic actuated stages are described together. It is possible to use the same definitions for manual stages and traffic actuated stages. However, they can also be processed separately.

Processing them together saves planning and supply time. In addition, it leads to better data quality, since redundant data management is avoided when data is changed.

All following sub-sections can be found in the tree under **Intersection version / Basic supply / Stages /...**.

7.6.1. Stage definition and stage sequence

The following tasks should be completed before commencing work in this area:

Intersection objects (signal groups etc.)

Intergreen matrix.

Optional: intersection topology, offset times

The new editor combines the handling of stage definitions and sequences, by using the corresponding button you can switch between both views and you can even drag out one of the views temporarily.

The size of the middle tabular part of the editor can be adjusted using the zoom setting in the toolbar. The stage sequence has its own zoom setting with additional options.

There is an option to filter by software partial intersections, if the filter is active only stages and signal groups of the selected partial intersection will be displayed within the stage definition, the stage sequence graph will display stages, which are not assigned to the selected partial intersection, as greyed out.

Stage data for components S-L and M-X can now be edited in separate editors.

7.6.1.1. Stage definition

The stage definition aggregates signal groups into stages und shows them correctly positioned.

The signal groups within a stage can be marked as “free” (green) within a table. The fields of conflicting signal groups will be shown in grey, if an intergreen time matrix has been assigned in the properties section.

A validation process will recognize conflicting signal groups and mark fields and signal groups in the table/graphical part in red. A message pane at the bottom will show errors, warnings and information. The validation is based on the selected “IT matrix” in the toolbar.

This selection is NOT part of the data of an intersection version because it is not relevant for the planning and configuration and is ONLY used for the validation process. The selection is saved as a layout property however.

The graphical preview shows signal groups of the selected stage correctly positioned based on the intersection topology. If there is no defined topology, signal groups will be positioned side by side at vertical positions. Editing is available in both representations. Every signal group has its defined position each signal group will be displayed on the same position for every stage where it is in state “free”.

Graphical positions of signal groups can be adapted by using the dialog “Stage Layout”. The view of this dialog can show all signal groups (cumulated) or filtered only those in green state for a single stage, changes to the position of a signal group will be immediately be reflected in the stage preview, as well as in the stage sequence. As soon as the position of a signal group has been adapted manually here, changes to this signal group within the topology will NOT affect it anymore. You may reset the position of all signal group by selecting button “Reset layout”.

In addition to that, the dialog “Stage Layout” can be used to set up the layout/display of signal group arrows and labels as desired.

You can use the “Add”, “Delete” and “Duplicate” functionality to create new stages, to remove selected ones or to copy them. By switching to “User sort mode” you can sort the stages according to your needs. You must finish this mode manually before the other options can become active again.

The toggle button “Stage view” can be used to toggle between the standard view, showing traffic technology related states, and the detail view, showing explicit colors. When switching colors, only available colors of the selected state are available.

You can edit the outstation number for manual stages and traffic actuated dependent stages by setting “O no. BS” or “O no. TA”. The numbers do not have to be identical and it is not mandatory for each stage to have a “O no.” to be set.

7.6.1.2. Stage sequence

The previously defined stages can be used to define stage transitions, to calculate signal programs and to combine traffic actuated controls into a stage sequence plan.

You may define which use case is relevant for the stage sequence plan. If you select “Used as BS”, then the stage sequence will be used for manual stages, when selecting “Used as TA”, it will be used for traffic actuated stage control. Only one stage sequence can be selected for “BS” or for “TA”. You may select a stage sequence plan for both use cases and this gives you the advantage, that it is not necessary to maintain two separate sequence plans. If you do not select one of those use cases, the stage sequence plan has only a planning related purpose and will not be sent to the controller.

Every stage sequence plan will refer to an intergreen time matrix and may also refer to an offset time matrix begin and/or end. Those will be used as a base for several algorithms and validation checks.

Defined stages, that are not yet used within the stage sequence can be added to it by dragging/dropping from “Stage pool” onto the stage sequence canvas; stages in the “Stage pool” might be filtered by software partial intersections.

You may at any time arrange the stages (anew) within the sequence by clicking the button “Arrange in circle layout”.

You can create a connection between stages by left clicking the center of the source stage and by moving the mouse (with the left button still pressed) to the target stage. A connection between two stages without a defined stage transition will be shown as a dashed line.

Every connection provides a context menu where you can set up the type of stage transition, either you select one of two dynamically generated variants or a specific one of the already existing stage transitions. You may also select “Reset connection” and you can even completely remove the connection.

Defined connections will be shown as solid line, if also a specific stage transition is assigned, a label showing the source- and target-stage short name/name or number will be displayed, if the corresponding “show/hide” options button has not been deactivated.

The intergreen and minimum times of the current stage sequence can be checked with the "Validate stage sequence" button. In the background not all possible signal programs of the stage sequence will be calculated, but all relevant partial sequences, which is significantly more efficient with complex stage sequences.

Accordingly, the partial sequences are listed as a result for which an intergreen time violation or minimum time violation could occur, with the specification of the delta time, i.e. the missing time.

The second section shows a summary of how much time is missing in which stages. Since it may not be clear which stage has to be extended in a sequence with several stage transitions, a distinction is made between the minimum time and the suggested time.

7.6.1.3. Calculations

For any already existing stage transition, that should “only” be assigned to given connections, you can use the corresponding functionality within the “Calculate” menu.

In other cases, you can calculate stage transitions only for selected or alternatively for all connections. Please select the relevant connections and call the appropriate menu item (“Calculate selected stage transition(s)”) or select option “Calculate all stage transitions” within menu “Calculate”.

The upcoming dialog gives you several options to define options/settings for the calculation of the stage transitions. Now the calculation will also include the offset times (only in case those were defined and selected) with or without minimum green time.

Please note, that when selecting the option without observing the minimum green time it will result in calculating the minimum stage transition duration and therefore by a given transition time the real free state of the signal might be reached after the transition end!

It is also possible to calculate a switch-off stage transition. To do this, select the stage within the stage sequence that is required as the target stage of the switch-off transition. The dialog for the calculation can then be opened via the pop-up menu. The prerequisite for the calculation is that an intergreen time matrix has been assigned to the stage sequence.

The calculation of signal programs can also be started within menu “Calculate”.

You will be asked to select stages of the current stage sequence, one after the other in the desired order, until you reach the first stage again. You may continue selecting stages in order to add/create a second turn.

After selecting a stage, you can only continue selecting such stages, that are connected to the last marked/selected stage. In case the connection is in an undefined state, a stage transition will be calculated for this connection automatically.

By clicking “Continue” you may select options related to the signal program calculation.

The following methods of signal program calculation are currently available:

1. The signal plans will be generated based on the selected intergreen time matrix and by concatenating the given stage transitions. Hereby the minimum green times will be adhered, even if they are not included in the stage transition. In order to comply with both criteria, the stages might be inflated.
2. The signal plans will be created analogously to method 1), but without overall intergreen time check. The created signal plan might therefore contain intergreen time violations.

As an option a cycle time can be predefined. If you set this value, the generated signal program will be inflated evenly for all stages, if the calculated cycle time does not exceed the predefined cycle time.

Calculated stage transitions and signal programs will get visible only after saving the data within the stage definition/-sequence editor.

7.6.2. S-L Stage data

As a prerequisite for editing S-L stage data, the S-L component must be configured within the intersection version.

You can assign S-L stage data to signal plans within the properties of the instances.

By selecting the corresponding source stages (“From stage”) on the left-hand side you can edit the S-L data of the corresponding target stage (“To stage”)

You already should have prepared in advance the demand and assessment conditions. Because only existing conditions will be available for selection for the corresponding stage.

7.6.3. Stage transition (including manual stages)

The following tasks should be completed before commencing work in this area:

Intersection objects (signal groups etc.)

Intergreen times

Stage definition

Optional: stage sequence, offset times

In the new editor, all stage transitions including the switch-off stage transitions and the manual stages are displayed and edited.

As usual in the new editors, new instances can be created in the left part of the editor, and existing instances can be selected, duplicated or even deleted. The saved order can also be changed via the user sorting.

In the stage transition editor, the display of the instances can also be switched between the standard view (only display of the short names) and a detail view (many other properties of the instances). The message with the highest priority is displayed in the first column of the detail view.

The order of the instances is usually identical in both views, but the order in the detail view can be adjusted by clicking in the header of the individual columns, and this order can then optionally be saved via the button "Apply current order…".

Individual instances can be temporarily detached as a separate window so that several stage transitions can be viewed at the same time.

The size of the middle (graphic) part of the editor can be adjusted using the zoom setting in the toolbar.

The visualization of the different validations can be activated or deactivated in the menu under "Violations". The validations themselves always take place and messages are generated accordingly. The selected and visible validations are also displayed as information above the graphic representation of the stage transition. Intergreen time violations are shown with red lines, offset time violations with blue lines and reserved times with green lines. If the minimum time is violated, the name of the signal group is highlighted in red and if the signal sequence is violated, the signal group name itself is written in red.

Additional settings can be made in the menu under "Visualization". So, for example, it is possible to switch between switching times and the beginning / end of green, and additional columns with information (i.e. conditioned switched) can also be displayed.

The graphic display of the individual colors can be adjusted via the "color combinations", see signal program editor for a description.

It is possible to filter by software partial intersections, i.e. in this case only the relevant stage transitions and signal groups of the selected partial intersection are displayed.

Stage transitions for the basic data input and the PDM method permit dependent to the controller type a maximum of one or more than one pattern change per signal group.

Stage transition functions are:

Editing of stage transition properties

Stage transition calculation

Adjustment of individual signal times of the stage transition

Editing of stage transition properties

The properties of the selected stage transition are displayed and edited in the right part of the editor. If several instances are selected, the change is made for all selected instances. The most important properties are:

O no., O no. BS and O no. TA

In addition to the "normal" O no., the O no. BS defines the instance in the basic supply of the controller (e.g. for the manual stages) and the O no. TA indicates the TA instance within the traffic actuation.

Duration (tL) of the stage transition

It is necessary to specify the duration (tL) of the stage transition in seconds, whereby the duration of 0 seconds is also permissible. The duration can also be increased or decreased graphically in the upper seconds bar. Move the mouse anywhere on the scale, wait until the double arrow is displayed and then drag to the right with the mouse button pressed to increase the duration, or to the left to reduce it.

Matrices

The intergreen time matrix (IT) is necessary in order to be able to calculate stage transitions, and of course only validations regarding intergreen times and offset times can be displayed if these have also been selected.

Switch-off stage transition

Stage transitions can be marked as switch-off stage transitions via a checkbox, in this case the specification of a "Source stage" is irrelevant. The marking occurs automatically when a switch-off stage transition is calculated.

As a processing aid, each stage transition can be marked as “Confirmed” without any further conditions.

Stage transition calculation

Two buttons are available for the calculation of stage transitions directly above the graphic display, one for the normal calculation and one for the calculation of a switch-off stage transition.

These buttons open the dialogs for "Calculation settings". There are different methods of grading and including minimal free times available, which can be selected by clicking the checkboxes.

The following options are available for both ending and beginning signal groups:

Graded switched

Without graduation, the stage transitions are calculated with simultaneously ending or starting free times. This can be useful for special applications, but it leads to reserve times.

With graduation, the stage transitions are calculated graduated while observing the intergreen times. The graduation is mandatory for existing / selected offset times.

With a minimum release time

Here you decide whether the minimum free times of the respective signal sequences should be included when calculating the switching times.

There is also the following option for switch-off stage transitions:

Switch off all signal groups

With this option, signal groups whose target state is free can be forced to be locked up front.

Adjustment of individual signal times of the stage transition

You can use several methods to optimize the calculated stage transition. Violations and request times are displayed for each entry. Signal changes can also be placed at the transition end. Any existing transition time will then be shown in the area behind the stage transition itself.

Dependent to the PDM method version or controller type or version it is additionally possible to differentiate between **conditioned green** and **conditioned red**. To include these options, select the check boxes in the **COND1** and **COND2** table columns.

Edit switching points

The switching points can be edited in the diagram or table. The system distinguishes uninfluenced, free and locked states.

With graphic editing, the actual switching point or, in the case of two switching points (e.g. green start and green end), the entire interval can be shifted.

New switching points can only be inserted via the graphic, either by clicking on the relevant point or via the graphic's context menu.

Individual or all switching points can also be deleted.

Change signal sequence of signal groups

To supply intersections in Yutraffic Office, you must assign each signal group a signal type (car, PT, cyclist, etc.) that includes a list of associated signal sequences.

In the stage transition, you can only choose the signal sequences listed in signal groups. To make your selection, open the context menu of the respective signal group and choose “Change signal sequence”.

Change color of switching points

The sequence of signals generated for a standard case consists of the signal sequence of the signal group.

To change the stage transition for individual signal groups, you can manually adjust the color of each individual switching point using the function “Change signal pattern of switching point” on the context menu.

Therefore, only for the signal group defined (special) colors can be selected.

7.6.4. Stage frame plans

The following tasks should be completed before commencing work in this area:

Defaults

Definition of stages and stage transitions

Signal program creation

PDM frame plans for defining stage time ranges can also be supplied as parameters via Yutraffic Control.

The number of permitted frame plans depends on the controller and control method used. A fixed-time signal plan is required as a fallback level for every frame plan.

In the header, assign a signal program to allow for editing:

Name	Freely editable.
No.	Automatic pre-set, editable
SP name	A signal program must be assigned
Cycle time, Switch on point, Switch off point, Switch over point	Automatically transferred from assigned signal program (read only); You can only change the values in the signal program

Tab. 20: Stage frame plans - Header

The stage frame plan visualizes the permission ranges of individual stages, including their IT and PT range. In addition, you can calculate and show the green ranges of individual signal groups based on the permission ranges. You can also use additional frames to define additional ranges. These can then be queried and processed via the individual traffic actuated logic.

The stage frame plan functions are:

Editing stage frame data, including display options

Calculation of stage frames and green ranges.

7.6.4.1. Editing stage frame data, including display options

After you have assigned the signal program, the time grids for additional frames, green ranges and permission ranges are shown in the editor.

The following editing modes are available in the **additional frame** and **permission ranges** sections (at the top and bottom of the editor):

Lengthening or shortening a frame or range with the related button or a Drag&Drop operation. If you click and drag the middle of the frame range, then the frame is also moved to this mode.

To move a single stage, click the **Move stage** icon.

Click the button to move all stages within the cycle time range simultaneously.

In addition to deleting one or all ranges, it is also possible to set a permanent frame.

The start, end and durations are output in the table at the right side of the editor.

Under **Options**, you can change display parameters and add comments.

7.6.4.2. Additional stage frame

Stage additional frames can be used to define freely definable areas for subsequent processing in Sitraffic Language (e.g. for fire department operations). To edit them, double-click the section of the respective time grid (i.e. the cycle time of the assigned signal program).

The first double-click creates an additional frame of 10 seconds (depending on the cursor position). The second double-click lengthens the additional frame, depending on where the cursor or crosshairs were positioned.

The number of additional frames depends on the controller and control method selected.

7.6.4.3. Permission ranges

You can define the permission ranges in the bottom section of the editor.

In addition to the stage permission range which is created by double-clicking in the area of the time grid, for each stage you can define the ranges PrT demand, **PrT extension**, **PT demand** and **PT extension**.

Click the squares on the left-hand side of the editor to open it and define the stage area type (selected in list box). A row is added for each area in which a time range can be specified.

After defining the ranges, you can use two filter functions to display the selected permission ranges or all defined stage areas.

The filter function setting is relevant for the display in the editor as well as for the print out. The setting is only displayed simultaneous with a data transfer.

Not all stage ranges are available for the S-L method.

An editor **records** remarks for all main elements of the stage frame plan.

7.6.4.4. Calculation of stage frames and green ranges

The main functions of the editor are the generation of a frame plan from the assigned signal program and conversely the generation of a signal program with the earliest and latest green start or end respectively from the previously defined frame:

Generating a frame plan from the signal program via

To start calculation, open the context menu in the middle or bottom section of the editor.

The following objects must be supplied:

Signal groups, intergreen times

Stages (optional, mandatory for stage-oriented plans)

Stage transitions (for stage-oriented signal program)

Signal program (stage-oriented)

Table of required ranges per stage.

All previously created stages can be assigned in a table to PrT and PT demand ranges and extension ranges in a dialog. The results are entered.

You can also use M-X frame plan calculation, described in chapter 7.6.4.5.

Calculation of green ranges based on stage frame plan

Various green ranges can be derived from frame plans (from the context menu, choose **Calculation green time periods**).

To do so, you must first define all stage permission ranges and transitions.

You can specify the calculation method in a dialog. For the individual signal groups of the stages based on the frame plan, the signal program calculated is shown with the earliest and latest green start and end time in the cycle time range.

The program checks internally whether the specified stage sequence matches the sequence of stage permission ranges in the stage frame plan - if a clear stage sequence can be identified from the stage frame plan. This is e.g. only possible if the stage permission ranges are contiguous and overlap. It is also checked whether there are complete stage transitions for this stage sequence. A message is output if there are any deviations.

The minimum and maximum states of the signal groups are displayed in the green range, in the middle section of the editor:

Minimum (latest green start and earliest green end)

- Stage end = start of frame of the PV extension range; this is conditional on another stage being permitted, otherwise the stage end is the permission start of the following stage.
- Without an extension range, the earliest end = start of permission of the following stage.
- Stage start = latest end of pre-stage (frame end) + stage transition (pre-stage -> observed stage). Condition: frame permission or PT demand range.

Maximum (earliest green start and latest green end)

- Stage end = frame end of extension range
- Stage start = start of overall frame + stage transition (for PT: start of demand range + stage transition of previous stage -> observed stage).

If the stage transition end lies after the end of the following stage, or if a stage cannot be entered, the green range cannot be generated (error message).

Green ranges are also used to generate threshold values for quality management.

7.6.4.5. Generation of an M-X frame plan

The following tasks should be completed before commencing work in this area:

Intersection objects

Intergreen matrix

Stage definition

Stage transitions

Stage sequence plan

Definition of the basic stage sequence

Input of the M-X stage parameters

M-X generates a stage-oriented frame plan based on a signal timing plan. To this end, a stage-oriented signal program containing permission ranges without overlaps is determined from the fixed-time signal program using the stages, stage sequences, and stage transitions supplied.

The permission ranges are then extended accordingly depending on the parameter settings so that overlaps occur. All other auxiliary ranges of the frame plan such as demand ranges and extension ranges are then determined from the recalculated and in some cases overlapping permission ranges. The result is a frame plan containing one permission range and a maximum of four auxiliary ranges for each stage.

The auxiliary ranges are automatically determined based on the permission ranges, i.e. parameterization is not required for the auxiliary ranges themselves.

7.6.4.5.1. Input of the M-X stage parameters

The M-X stage parameters facilitate advanced influencing of the frame plan to be calculated with respect to the type of frame (frame entry) and its form (frame priority).

Signal programs: Frame entry

Selection of the signal programs to which the respective M-X parameter set is assigned.

The parameter can be supplied for each stage and each of the five-frame range.

AS_CALCULATED	Entry in the frame plan as calculated by M-X.
PERM_FRAME	Entry of permanent permission in the frame plan.
NO_ENTRY	Frame range goes not get permission in the frame plan.

Tab. 21: M-X stage parameters: frame entry

Signal programs: Frame priority

Selection of the signal programs to which the respective M-X parameter set is assigned.

These parameters can be used to set the degree of overlap of stages in the basic stage sequence.

Designations:

New stage	Stage to be prioritized
Current stage	Stage before the new stage
Previous stage	Stage before the current stage

Tab. 22: M-X stage parameters: frame priority

The parameters **Priority value IT** and **Priority value PT** are used to set the percentage of available time by which the new stage is to be given priority. The percentage prioritization of a stage is calculated from the available green time of the current stage. Calculation is also still possible from the green time of the new stage for compatibility reasons with predecessor versions.

The parameters **Priority value PrT** and **Priority value PT** are assigned the value range 0 through 100, where 0 means no prioritization and 100 % means maximum prioritization.

Priority type IT parameter:

This parameter can assume the values **Permanent previous stage**, **Forward**, and **Permanent stage**.

Permanent previous stage: The new stage is prioritized by the percentage of the available green time of the current stage specified in the **Priority value PrT** parameter.

Forward: The new stage is prioritized by the available green time of the current stage, plus the percentage of the time by which the current stage was defined via the Priorities IT parameter, maximum up to the frame end of the previous stage. This parameter allows the total available green time accrued since the SOP stage to be assigned to a stage.

Permanent stage: This value was provided for compatibility reasons with predecessor versions. It should not be used for new systems. The new stage is prioritized by the percentage of the green time of the new stage specified in the Priority value IT parameter, maximum up to the minimum green time of the current stage.

Priority type PT parameter:

This parameter can assume the values **Permanent previous stage**, and **Permanent stage**.

Permanent previous stage: The new stage is prioritized by the percentage of the available green time of the current stage specified in the Priority value PT parameter.

Forward: The new stage is brought forward by the available green time of the current stage, plus the time percentage defined via the prioritize PuT parameter by which the current stage was brought forward - maximally, however, up to the frame end of the previous stage. This parameter allows the total available green time accrued since the SOP stage to be assigned to a stage.

Ext. value PT parameter:

This parameter can be used to extend the frame of the current stage by a percentage of the available green time of the new stage – value range 0-100.

The separate parameterization for IT and PT means it is possible for the demand ranges for IT and PT to start at different times and for the extension frames to end at different times. The beginning of the stage frame always corresponds to the demand range with the earlier start, the end of the stage frame corresponds to the PT extension frame.

The basis for calculation of prioritization and extension is always the available green time of the basic stages. If the basic stage sequence only comprises two stages, the total of Priority value IT or Priority value PT and Ext. value PT must not exceed 100 per cent as this could result in a stage frame longer than the cycle time.

7.6.4.5.2. Generation of an M-X frame plan

In addition to the **Calculate frame plan** command, Yutraffic Office also provides the **M-X frame plan generation** command.

7.6.4.5.3. The components

SP name	Specifies the stage-related signal plan for which the M-X frame plan is to be calculated. The algorithm takes the stage transitions used and the stage durations of the "fixed time" from this plan.
Stage sequence plan	Selection of the required stage sequence plan provided with a basic stage sequence
M-X frame plan generation	The button initiates automatic M-X frame plan generation. The frame plan produced can then be post-edited manually.
Visualize nominal M-X frame plan	If post-editing of the frame plan takes place, the button can be used to display the frame calculated by M-X as a bar in the graphic. This option is only active if a nominal frame plan can be calculated based on the references set (SP name and stage sequence plan) when the frame plan editor program starts. The following steps are therefore required after creating and opening a frame plan to use the visualization option: • Assignment of the signal program via the SP name field in the header of the editor • Assignment of the stage sequence plan via the Stage sequence plan field in the header of the editor The button is enabled.

Tab. 23: M-X components

7.7. Annual automatic/calendar

With version 4.5, the annual automatic or the calendar can be edited via the Yutraffic Office interface – call up in the tree via **Intersection_version_Name > Basic supply > Annual automatic**.

The basic structure of the dialog is based on the established annual automatic editor of Sitraffic® Control.

There are some tabs available for the respective data or day types. Each page displays the corresponding data in a list for example. A popup menu can be opened with a right mouse click on the respective editor elements (such as lists), via which the respective functions can be called up:

Creating an object

Deleting an object

Renaming an object

etc.

Depending on the controller type and the data version used

some tabs are not available (basic data is relevant for M devices for example).

some input fields are locked or pre-set with default values.

some columns are locked in some lists or are not visible.

A plausibility check is carried out when opening and before saving the data. The result can be seen in the lower area of the dialog. Incorrectly supplied data or missing entries are listed here.

Depending on the controller type selected, plausibility checks are performed when you open the Annual automatic display (e.g. checks for correct supply of priority of holidays, special days; checks for valid supply of PrT, PuT and TA states, SP changes, etc.). If invalid values are found, the program offers to correct them automatically. After automatic correction, the values are displayed in the list of plausibility checks for manual validation. The user then must save the corrections made by the program.

7.7.1. Templates

In the main Yutraffic Office window you can get to the template management of the annual automatic, via the menu **Data > Defaults tab Annual automatic (calendar)**. Here you can preconfigure diverse data you need often (e.g. holidays, DST rule). These can then be imported in the respective annual automatic of the intersection version. You can create several templates and name them accordingly. Deleting templates does not delete the annual automatic data, where it was imported.

On the toolbar of the Annual automatic dialog there is a button that allows you to adopt data from a template. Click the button and confirm the subsequent safety prompt with yes to open the dialog. Then select the template and categories (e.g. day types) you want to import. Click **OK** to carry out the import.

Most tabs allow you to read the data from an annual automatic template (*.jvl). Furthermore, you have the option of saving the data of the selected page in a Yutraffic Office template.

These functions can be found in the respective popup menu of the respective page(s) / tab(s).

7.7.2. Basic data

Note: Basic data can only be supplied or is only relevant for M controllers.

Select a controller status that has not already been supplied (controller status is normally queried when you open the editor). Please note that it is now used internally and cannot be supplied for that controller.

You can directly enter the data in the respective fields of the list.

Depending on the controller status, individual data or tabs are not available (no floating holidays for GS (device status) < 33).

7.7.3. Day plans

You can add day plans until the maximum permissible number is reached. To edit the switching times, open the respective day plan entry in the list. For M controllers, you can edit the relevant data directly in the list. For other controller types, in the "Edit" dialog, double click an entry to open it (or choose the respective menu option from the popup menu). The respective possible parameters and settings are then provided in this dialog.

For C900 controllers, grouping according to "Overwritable by VSR" was deleted. This grouping is only relevant for C800 controllers. This allows for an OCIT-compliant supply of day plans (e.g. ascending sorting of switching times).

7.7.4. Day plan assignment/week plans

The day plan assignment/week plans allow you to specify a day plan for the days of the week. Which week plans are available and if you can create additional plans (in addition to default ones), depends on the controller types used. The default week plans are highlighted in the list (**Internal column)** and cannot be deleted.

As of C900 V2 you can assign your own names for the week plans.

7.7.5. Special days

With **Special days** you can manage one-time special days. The respective functions are available via the popup menu.

7.7.6. Fixed bank holidays

With **Fixed bank holidays** you can manage annual bank holidays which reoccur on the same date. The respective functions are available via the popup menu.

7.7.7. Floating bank holidays

Using Floating bank holidays, you can manage annually recurring bank holidays that depend on the Easter Sunday date or another reference day (see 7.7.9). The respective functions are available via the popup menu.

7.7.8. Relative bank holidays

"Relative bank holidays" allows you to manage annually recurring bank holidays that depend on fixed given dates (e.g. Day of repentance). Specify a date of which the week day to be supplied is dependent on. The respective functions are available via the Popup menu. This option is only enabled for controllers that support it, e.g. C900, BD 3.1.

7.7.9. Reference days

In **Reference days** you have the possibility of editing the basis of calculation for the floating bank holidays.

As calculation method (for Easter Sunday as a reference day), choose calculation according to the Gregorian calendar (Gauss algorithm, e.g. for Germany) or calculation according to the Julian calendar, used by the orthodox people (e.g. in Greece). The third possibility is to enter the data of your choice manually for the respective years. The default time range for the Easter Sunday list is: 1990-2089.

7.7.10. Time intervals

The Time interval section allows you to manage time periods (e.g. school holidays). For each period, enter a start and an end date. The respective functions are available via the popup menu.

7.7.11. DST rule

In DST rule you have the possibility of entering the start and end of summer time. Select on which day and month summer time should start and end. By clicking Standard the time period is set to "Last Sunday in March" – "Last Sunday in October".

7.7.12. Calendar

The **Calendar** tab contains a diagram of the supplied switching times/day plans/day types,etc. In the calendar element, you can navigate between the individual days as customary in Microsoft Windows. A right mouse click on the **Calendar page** displays a popup menu, via which you can change the calendar display. This is how you can select between daily, weekly and monthly overviews for example. The **Settings** tab allows you to change the display color for the individual day types

and objects according to your needs. You can further deactivate/activate the display of switching times (displaying switching times for a lot of days/weeks in the calendar might affect system performance).

On the **Calendar page**, double-click an element to select the respective object in the editor and bring it to the foreground (e.g. double-click a special day to switch to the **Special days** tab and select the respective entry).

7.8. Traffic actuation (signalized intersection)

To edit this parameter, you need the **Intersection traffic actuation** license chapter 4.3).

7.8.1. Assignment

Under Assignment, signal programs are assigned to parameter sets of demands, extensions, stage frame plans, PuT saving or TL parameters.

Fixed time plan, **Frame plan** and **W_Plan** can be selected as operating modes.

Initially there is always an assignment with the label **SP 0**. This assignment is required for operating modes without a running signal program (off state, switch-on or switch-off pattern).

When you open the editor, synchronization with the supplied signal programs is performed. Assignments referring to signal programs that have been deleted are deleted and missing assignments for newly created signal programs are supplemented with default values.

Assignment stage frame plans

As described in chapter 7.6.4 , the stage frame plans can already be assigned in the **stage frame plan editor** signal programs.

To transfer the supplied information to the assignments, use the toolbar button **Stage frame plan calibration**. The respective operating modes are then set to **Frame plan** and the frame number is transferred to the column Frame parameter set.

7.8.2. User parameters

User parameters are definable parameters from the user, which can be used within TA logic programming and which are linked with an intersection version, by the component User parameter.

The object structure can be changed via the context menu **Edit interface**.

Via "Drag and Drop" elements can be dragged from the left area of the window to the structure overview. In each case the mouse cursor indicates if inserting at this point is possible.

The detailed properties for an input field can then be edited in the right parameter list.

A MOD file can also be imported here from the product Yutraffic Control.

With the transfer of this structure information, the actual parameters can now be edited in their possible instances (dependent on the controller type and the version).

7.8.3. PuT directions

The PuT directions define the route dependent parameterization of the public transport at the intersection as well as the PT memory in the controller. A PuT direction is signal program independent, one or more PuT – memory parameter sets can be supplied, which can later then be assigned to individual signal programs.

To carry out this supply, in the intersection version, select a traffic actuation component (e.g. PDM, S-L,…) that also offers a PuT memory function.

The editor is divided in four sections:

General PuT direction parameter

Line and route parameters

Reporting point sequences

PuT storage of parameter sets.

The PuT direction is important for many "users". E.g. Yutraffic Scala visualization or quality control and quality analyses use information based on the PuT direction. Without the PuT direction, these functions are only available to a limited extent.

PuT directions are also necessary for VS PLUS. It is not enough for the functions mentioned above, to only determine the data within the VS PLUS supply.

7.8.3.1. General PuT direction parameters

The general PuT direction parameters define in addition to the name especially the respective signal group and the emergency call.

The following entry fields are available:

Name and **short description** are the freely assignable names of the PT direction.

No.: clear direction number (This must be supplied continuously)

Signal group: Signal group which affects the direction

Mod after green end: Time in seconds after green end, in which the logoff in GN is identified, value range: 0-6554

Over takers: Specification if public transport vehicles can or cannot overtake each other in the acquisition range.

Emergency call

- **Type**: Emergency login function, possible entries: NONE, PULS, ASSIGNMENT, GAP
- **Detector**: emergency login detector
- **Assignment period**: Assignment period in seconds for emergency login at assignment
- **Delay time**: Emergency login delay time at impulse, value range: 0-6554
- **Position**

Evaluation

- **Hand direction**: Evaluation of direction by hand

  NONE

  STRAIGHT AHEAD

  LEFT

  RIGHT
- **Vehicle tracking**

  WITH LINE AND ROUTE

  WITHOUT ROUTE

  WITHOUT LINE AND ROUTE
- **Line/Route**

  WITH LINE AND ROUTE

  WITHOUT ROUTE

  WITHOUT LINE AND ROUTE

7.8.3.2. Line and route parameters

The number of pairs is different for each control method.

7.8.3.3. Detection point sequences

There are up to five detection points for each direction (in the order they are driven on).

Ref. to RP: Reference to a reporting point

Position: Position of detection point relative to position of stop line (distance from stop line). The value is negative when the detection point is in front of the stop line and positive when it is behind the stop line This attribute is evaluated by TDD, OTDD and quality analysis to calculate the detection point position.

7.8.3.4. PuT – parameter sets memory

There are up to four parameter sets for each direction in the range **PuT direction instances** (dependent on control methods).

There are detection point comprehensive parameters and parameters which can be supplied for each detection point and each parameter set.

Detection point independent parameters

Higher-ranking in the header of the range:

Self-counting time: in seconds

TW Timer: The detection point whose travel time is entered in the PT memory. The five reporting points of the reporting point sequence list can be selected

Delay login: Delay time at login

Delay logoff: Delay time at logoff

Detection point dependent parameters

Detection point function: Possible selection

Not active

Person logging on

Person logging off

Block entry: Block entry in the PT memory

Calibration value: Calibration value for route timers at logon

Theoretical travel time: Theoretical travel time from the detection point to logoff [in seconds].

Here you specify the function of the detection point for this PT direction. The same detection point could have a different function for another PuT direction.

Therefore certain data is transferred from the detection point supply to the PuT direction as a default but can be changed at this point. So, in this case, automatic synchronization does not make any sense.

7.8.4. Signal group-oriented method SDM

Another microscopic control method is the signal group-oriented method SDM (signal group control with decentralized modification). Like the creation of parameters for the PDM control method, Yutraffic Office also supports this control method in the sections:

SDM supply,

SDM frame plans and

SDM table

These sections are sub tabs created in the **SDM signal group control** tab. The S**DM supply object** is created automatically, if there is only one instance of this object class. The user must create the necessary supply objects of the sub tabs SDM frame plans and **SDM table**, the number depending for example on the various traffic situations.

With the SDM control method, the control process is managed by so called permission ranges for the signal groups received from the central control computer. The user initiates the actual switching of signal groups according to the planning specifications (request from detectors etc.). SITRAFFIC Language (TL) is the tool used to formulate logical control flows.

To formulate the conditions for using the additional frames defined in Yutraffic Office, see the Sitraffic Language documentation.

7.8.4.1. SDM supply

The following tasks should be completed before commencing work in this area:

Defaults

Basic data of signal groups

Supply of Intergreen time matrix

Signal programs

The SF channel assignment is defined in the SDM supply. In addition to the usual fields for names, short names and descriptions, the intergreen time matrix used for traffic actuation is displayed or selected in the header.

The desired intergreen time matrix must be marked respectively in the matrix. Only one intergreen time matrix can be selected.

The **SF channel assignment** tab contains a table showing the assignment of the real signal groups to the information channels of the traffic control computer. The control concept is SF (signal group remote control).

Transmitted information is interpreted as permission frames for a possible green of the assigned signal groups.

In addition to real signal groups, demanding ranges for specific signal groups are so-called dummy signal groups can be assigned to the information channels.

Based on this information the behavior of the control process can be influenced by the central traffic control computer in such a manner that for example demands are only evaluated during specific periods or additional information like queue is processed.

By positioning on an exit lane, the distance is the absolute difference to a fictitious "Start line" after the intersection, thus the start of the intersection exit. Thus, it is also possible to transmit additional information frames and flags whether the traffic actuated control should be activated or not. The meaning of the information must be defined for each channel.

When the SDM channel assignment is opened for the first time, the table is pre-set with real signal groups transmitted from the signal groups table in the register **topology**, i.e. there are as many channel numbers as there are real signal groups. The meaning of the channels is set to **SG_Permission**. The channel names are filled with the names of the signal groups. The respective signal group is entered into the column **assignm_1**.

Remaining channels get the name **dummy** and the meaning is set to inactive. The table contains the following values:

Channel number	This column is automatically numbered in the range from 1 to 45 and is not editable.
Name	Name of channel, freely editable; Note: Information channels which of are assigned real signal groups should get the name of relevant signal group
Meaning	Selection field to define the meaning of the information transmitted via this channel; A list box offers the following possibilities for selection: • INAKTIVE • SG_PERMISSION

	• DEMAND_FRAME • STRUCTURE_BIT_1 • STRUCTURE_BIT _2 • STRUCTURE_BIT_3 • STRUCTURE_BIT_4 • STRUCTURE_BIT_5 • ADDITIONAL_FRAMES_01 • ADDITIONAL_FRAMES_02 • ADDITIONAL_FRAMES_03 • ADDITIONAL_FRAMES_04 • ADDITIONAL_FRAMES_05 • ADDITIONAL_FRAMES_06 • ADDITIONAL_FRAMES_07 • ADDITIONAL_FRAMES_08 • ADDITIONAL_FRAMES_09 • ADDITIONAL_FRAMES_10 • TA_Active
assignm_1	Selection field for assignment of the real signal groups; All signal groups supplied in the **Topology tab** are available for selection in a list box. The field may remain blank, if the information of the channel is related to other events evaluated during the control process, e.g. queue.
assignm _2	Analogous field **assignm _1;** Several signal groups can be assigned to the information of one channel.
assignm _3	Analogous field **assignm _1**
assignm _4	Analogous field **assignm _1**
assignm _5	Analogous field **assignm _1**

Tab. 24: SDM supply - values

The background color of assignment fields assignm _1 to **assignm _5** are set to grey if the user selects additional information in the field **meaning**, like **additional frame**, **structure bit** or **TA_active**, because in the case of these markings no assignment of real signal groups takes place.

The field **name** is automatically set to the selected meaning.

The following examples show several constellations during editing.

Request signal groups may be inserted between real signal groups. These request signal groups can be assigned to another signal group or completely set to defaults, see example for channels 5 and 6.

Channel number	Name	Meaning	assignm_1	assignm _2	assignm _3	assignm _4	assignm _5
1	1/1a/1b	SG_Permission	1/1a/1b				
2	2/2a	SG_Permission	2/2a				
3	3/3a	SG_Permission	3/3a				
4	4/4a/4b	SG_Permission	4/4a/4b				
5	Request	Inactive					
6	Request	Demand frame	3/3a				
7	F21	SG_Permission	F21	F22	F23	F24	
8	F22	Demand frame	F21	F22	F23	F24	
9	F23	Demand frame	1/1a/1b				
10	F24	Demand frame	4/4a/4b				
11	Pseudo	Demand frame	2/2a				

Tab. 25: SDM supply – Expl. 1

You can assign several signal groups to one channel, which signal groups consequently have the same permission ranges. The free channels can then be used for other signal groups. The following example shows pedestrian signal groups F21 to 24 having common frames, and channels 9 (F23) and 10 (F24) are assigned to signal groups 1/1a/1b and 4/4a/4b using as demand range. Channel 11 (dummy signal group) is also assigned to signal group 2/2a as a demand range.

Channel number	Name	Meaning	assignm_1	assignm _2	assignm _3	assignm _4	assignm _5
1	1/1a/1b	SG_Permission	1/1a/1b				
2	2/2a	SG_Permission	2/2a				
3	3/3a	SG_Permission	3/3a				
4	4/4a/4b	SG_Permission	4/4a/4b				
5	Request	Inactive					

6	Request	Demand frame	3/3a				
7	F21	SG_Permission	F21	F22	F23	F24	
8	F22	Demand frame	F21	F22	F23	F24	
9	F23	Demand frame	1/1a/1b				
10	F24	Demand frame	4/4a/4b				
11	Pseudo	Demand frame	2/2a				

Tab. 26: SDM supply – Expl. 2

The information for structure_bit and TA_active must always be transmitted beyond the range of real signal groups. The maximum number of structure bits transmitted is 5. It is possible to use less structure bits, however no gaps (column meaning) are allowed. The following example shows transmission of 3 structure bits.

Channel number	Name	Meaning	assignm_ 1	assign m _2	assign m _3	assign m _4	assign m _5
1	1/1a/1b	SG_permission	1/1a/1b				
2	2/2a	SG_permission	2/2a				
3	3/3a	SG_permission	3/3a				
4	4/4a/4b	SG_permission	4/4a/4b				
5	Request	Inactive					
6	Request	demand_frame	3/3a				
7	F21	SG_permission	F21	F22	F23	F24	
8	F22	demand_frame	F21	F22	F23	F24	
9	F23	demand_frame	1/1a/1b				
10	F24	demand_frame	4/4a/4b				
11	Pseudo	demand_frame	2/2a				

12	ADDITIONAL_FRAME_1	ADDITIONALFRAME_1					
13	STRUCTURE_BIT_1	STRUCTURE_BIT_1					
14	STRUCTURE_BIT _2	STRUCTURE_BIT _2					
15	STRUCTURE_BIT_3	STRUCTURE_BIT_3					
16	TA_Active	TA_Active					

Tab. 27: SDM supply – Expl. 2

In addition to the real signal groups, the dummy signal groups are used to create additional frames in the frame plan to control the flow of certain information.

Only the frame plan and SDM table contain dummy signal groups for the definition of frames. You can assign real signal groups to them.

In the SF mode the central traffic computer has to transmit the dummy signal groups for structure and TA_ACTIVE also in the case of fixed time programs, so that it is possible to detect which parameter structure is active and that the central computer is not currently transmitting frame plans.

In the defaults the signal type “dummy signal group” is preset to the state sequence “green – red” by the system.

One dummy signal group can be assigned to several real signal groups. On the other hand, one real signal group can be assigned only to one dummy signal group.

Transmission of structure bits, TA_active marking and additional frames takes place without assignment of real signal groups.

7.8.4.2. SDM frame plans

The following tasks should be completed before commencing work in this area:

Defaults

Basic data of signal groups

Supply of Intergreen time matrix

Signal program creation

SDM supply

The number of permitted frame plans depends on the controller and control method used. A fixed-time signal plan is required as a fallback level for every frame plan.

SDM frame plans contain the permission ranges for the signal groups, the green ranges for the signal groups and if necessary existing additional frame data.

You can use frame plans as permission or demand ranges in accordance with the **SDM channel assignment** table (see chapter 7.8.4.1).

In the case of signal group remote control, the meaning and assignment of the signal groups and the dummy signal groups are transferred from the table SF channel assignment.

The following functions are available in the SDM frame plan:

Editing the various permission ranges both in graphs and tables, incl. display options

Generating / calculating the permission ranges from a selected signal program on the basis of SDM intergreen time matrix

Generating green ranges with minimum and maximum green times

An SDM frame plan can be generated from a signal time plan of your choice, or you can create a new one and edit it.

Select the menu **Editing –Defining SP Parameter** for creation. Following selection, a dialog appears to **input cycle time**, **switch on point**, **switch off point** and **switch over point**.

SDM frame plans for defining stage time permission ranges can also be supplied as parameters via Yutraffic Control. Double greens are possible.

Editing the various permission ranges incl. display options

After the signal program is assigned, the time grids for **additional frames**, **signal program** and **permission ranges** appear in the editor.

Several functions are available in the **additional frame** and **permission ranges** sections (at the top and bottom of the editor):

Extending, **reducing** or **moving** a frame or range by selecting in the toolbar and clicking and dragging & dropping the desired area.

Click button to move all permission ranges within the cycle time range simultaneously.

In addition to deleting one or all ranges, it is also possible to set a permanent frame.

The start, end and durations are output in the table at the right side of the editor.

Various display parameters can be changed, and comments added via the **Options** menu.

An editor records remarks for all main elements of the SDM frame plan.

Additional frames

Additional frames are used to specify freely definable areas for subsequent processing in Sitraffic Language (e.g. for fire department operations). To edit them, double-click the section of the respective time grid (i.e. the cycle time of the assigned signal program).

The first double-click creates an additional frame of 10 seconds (depending on the cursor position). The second double-click moves the additional frame to where the cursor or crosshairs are positioned. Editing additional frames is possible analogous to editing permission and demand ranges.

Maximum number of additional frames is 10.

Permission ranges

You can define the permission ranges in the bottom section of the editor.

In addition to the signal group permission range (created with double-click of the area of the time), you can define a demand range for each signal group. Normally this definition is done in the object SDM supply with attention to the maximum number of channels.

Click on the squares on the left side of the editor to open an editor for additional defining of a demand range. A row is added for each signal group permission range where a demand range can be specified.

After defining the ranges, two filter functions can be used to display either the selected permission ranges or all defined areas.

Generating / calculating permission ranges

The main functions of the editor are the generation of a frame plan from the assigned signal program and conversely the generation of a signal program with the earliest and latest green start or end respectively from the previously defined frame:

Before you calculate a frame plan, in the header, assign a signal program:

Name	Freely editable.
No.	Automatic pre-set, editable
Signal program	A signal program must be assigned
Cycle time, Switch on point, Switch off point, Switch over point	Automatically transferred from assigned signal program (read only); You can only change the values in the signal program

Tab. 28: Generate / calculate permission ranges

Generating a frame plan from the signal program

To start calculation, open the context menu in the middle or bottom section of the editor.

The following objects must be supplied:

Signal groups, intergreen times, offset times (optional)

Signal program (signal group-oriented)

Table of required ranges per stage

Starting calculation, a dialog appears where you can select frames to be created. Permission ranges for signal groups are set automatically.

Demand ranges are either completely marked by using the **Select all** button, or by using the SF channel assignment button. Only demand ranges for signal groups are marked to which the meaning "Demand range" was assigned in the register **SF channel assignment**. If demand ranges have been created the markings for these ranges are also set in the dialog window.

The following calculation rules are used for creating:

Calculation of permission frames

- Start of permission range = start green of the respective signal group of the selected signal plan minus maximum intergreen time of the clearing conflicting signal groups (on the basis of SDM intergreen time matrix)
- End of permission range= end green of the respective signal group of the selected signal plan

Calculation of demand frames

- Start of demand range = start of the permission range of the respective signal group
- End of demand range = latest end of the permission range of the conflicting signal group plus 1 s
- The end of the demand frame is always located within the range of the related permission frame and the demand frame has a minimum duration of 1 s.

Generating green ranges

Generation of a signal program based on a stage frame plan

Green ranges can be derived from frame plans (via the context menu **Calculation green time periods**).

For this, all plans must have been defined.

The green ranges are displayed in the cycle time range with the earliest and latest green start, and earliest and latest green end of the individual signal groups resulting from the frame plan.

The minimum and maximum states of the signal groups are displayed in a signal plan in the middle area of the editor:

Minimum (latest green start and earliest green end)

Maximum (earliest green start and latest green end).

These signal plans with a display of minimum and maximum green can also be used in a time-distance-diagram to check if the traffic actuated modified signal timings in specified limits allow a coordination with adjacent traffic lights.

In the time-distance diagram, the ranges for the earliest and latest green start and green end are marked with a square on the stop line (if you selected this option).

7.8.4.3. SDM table

The following tasks should be completed before commencing work in this area:

Defaults

Basic data of signal groups

Supply of intergreen time matrix (TA marking)

Signal program creation

SDM supply

SDM frame plan

The SDM table contains the information on the frame plan and the green range plan from the SDM frame plan in a table. According to the list SF channel assignment and the selected options in the SDM frame plan, values can be available for the permission and demand range for each signal group.

The values are also output for double greens, if it is available in the SDM frame plan.

The table can be displayed in signal group view (line group according to the real signal groups) or channel view of the SF controller (line group for the 45 information channels) according to the supply object SF channel assignment.

In the header, assign an SDM frame plan to allow for editing:

Number	Automatic pre-set, editable
Name	Freely editable.
Short Descr.	Freely editable.
Description	Free remark text
SDM frame plan	An SDM frame plan must be assigned
Cycle time	Automatically transferred from assigned signal program (read only); You can only change the values in the signal program
Table view	Selection field; You can select between the displays signal groups or SF – channels.

Tab. 29: SDM-Table - Header

The table contains values in the signal group view with the following meaning:

Channel no.	Output of the channel number of the signal group

Signal group	This signal group identifier is output in this column
GBE	Earliest green start of min./max. – signal time plan of the SDM frame plan – field can be edited
lastGT	Latest green start of min./max. – signal time plan of the SDM frame plan – field can be edited
REE	Earliest green end of min./max. – signal time plan of the SDM frame plan – field can be edited
lastGTE	Latest green end of min./max. – signal time plan of the SDM frame plan – field can be edited
Permission from	Start of the permission range – field can be edited
Permission to	End of the permission range – field can be edited
Demand from	Start of the demand range – field can be edited
Demand to	End of the demand range – field can be edited
Remark	Remark field - field can be edited.

Tab. 30: SDM-Table - Values in the signal group

After the column **Demand to** columns **GBE on"** to **Demand to** are repeated for double greens.

Output fields have a grey background. Fields with a green background indicate the range double greens.

The fields for additional frames which do not contain any information, have a yellow background. Values are entered in the permission range fields.

In the SF – channel view, the table contains the following values:

SF channel no.	Output SF channel number
SF channel	All identifiers are output in this column for all occupied SF channels
GBE	Earliest green start of min./max. – signal time plan of the SDM frame plan – field can be edited
lastGT	Latest green start of min./max. – signal time plan of the SDM frame plan – field can be edited
REE	Earliest green end of min./max. – signal time plan of the SDM frame plan – field can be edited
lastGTE	Latest green end of min./max. – signal time plan of the SDM frame plan – field can be edited
Permission from	Start of the permission range – field can be edited
Permission to	End of the permission range – field can be edited

Demand from	Start of demand ranges – only output; The entry can be made in the SF channel row, which is assigned to this demand range, in column **Permission from**.
Demand to	End of demand ranges – only output; The entry can be made in the SF channel row, which is assigned to this demand range, in column **Permission to**.
Dem SG	Output of the name of the SF channel, which is assigned to this demand range.
Remark	Remark field - field can be edited.

Tab. 31: SF-channel values

After the **Dem SG**, columns **GBE** to **Dem SG** are repeated for double greens.

Demand range columns for SF channels, which were assigned signal groups with demand range, are highlighted yellow in the SF – channel view. The respective SF channel, via which this permission is switched is specified. When editing the permission values for this demand range, the values with the values in the yellow highlighted demand range columns are synchronized.

Structure bits and the TA_Active identification are only output in the SF channel view or can be changed there by the user. The value adjustment takes place in the column Permission from. When you show the SDM table for the first time, its fields are initialized with **permanent red**.

7.9. System data

System data according to controller configuration

System data is only visible, if all controller components configured were fully integrated into Yutraffic Office.

If you are using synchronization, then you can only edit and show controller objects within the system data that have not already been covered by Office data.

Example: You can edit signal groups under Basic supply / Topology objects /. This is why "Signal definition\sigDescription" is hidden in the BD component of the system data.

The color of the system data folder tells you which option is set for automatic synchronization:

Green: automatic synchronization is activated.

Grey: automatic synchronization is deactivated.

You can find a detailed description of the system data in the Yutraffic Control manuals.

7.9.1. System data synchronization

To have the system data synchronized automatically after you change Office data, in the General editor of the intersection version, open the Components tab. Then select the corresponding option.

Independent of this option, you can perform a manual synchronization into the system data. To do so, from the context menu, choose Data synchronization system data.

7.9.2. Synchronization out of the system data

To import (sop) data from previous versions (e.g. Sitraffic Office 4.5), copy non-synchronized intersection versions in Version management or reserve non-synchronized intersection versions, you can synchronize the system data with Office data. This corresponds to the synchronization of Control data via Yutraffic Control.

Configuration and settings

When you choose the functions mentioned (import, copy, reserve) in the standard version, a prompt is displayed asking whether you want to synchronize the data. You can decide for each individual intersection version whether you want to synchronize the data or not.

Select Extras – Additional settings – Migration/Synchronization tab, to configure the synchronization prompt.

The following options are available:

1. "Ask every time if data should be synchronized". The system will ask you for each individual intersection version whether you want to synchronize the data.
2. "Always synchronize automatically (without asking)". You are not asked whether you want the data synchronized. The system automatically synchronizes the data of the respective intersection version after you select one of the before-mentioned functions.
3. "Do not synchronize data (without asking)". You are not asked whether you want the data synchronized. The system does not synchronize the data automatically.

With option (1), you can further set whether you want to be asked again what configuration (1, 2 or 3) to use during the import process. To do so, under the option "During import process, offer this option again for "synchronization of system data", select the setting of your choice.

Synchronization of Yutraffic Control/Office interface for non-integrated components

For *non-integrated* components, under the option"Activate synchronization Control – Office for non-integrated components", you can specify whether during back transfer of data from Control to Office, you want to the system data (Control data) to be synchronized with the Office data.

Note: This option is not relevant for integrated components.

7.9.3. Importing default values

You can import new templates via the "System data" context menu in the tree view. Proceed as follows:

In the tree view, right-click "System data" to open the context menu. Then select "Import default".

All component versions of the intersection version and their templates are displayed.

For each component you can choose "template" or "no template".

The templates selected are imported and the default values are adopted into the system data.

If you use the context menu to import templates, all existing system data is overwritten with the respective components.

7.9.4. Saving default values

You can export the system data supplied as a template:

In the tree view, right-click "System data" to open the context menu. Then select "Save default".

All component versions available are listed.

You can choose one or several component versions.

Specify a template name. The names of all component versions are generated according to the following:
[Name]_[ComponentName+MajorVersion.Version]_[Languague].[Extension]
whereas:
[Name] - is specified by the user.
[ComponentName+MajorVersion.Version] Name and MajorVersion of the component version to be exported.
[Language] - Language set in Office.
[Extension] - The file extension automatically generated for the respective component.

For each component version selected, an attachment with the generated name is added to the respective controller library.

If there already is an attachment of the same name, it is replaced by the new attachment.

7.9.5. Saving default values

In the Component Wizard (Data – Import controller library tab, see chapter 4.17.1), open the context menu of the controller components of the respective version. Then select "Attachments" to view the existing templates of the component version.

You can also delete templates, save them locally to a file or import them from a template file.

7.10. Supply across manufacturers (VD server)

With Yutraffic Office, intersections can be supplied via the OCIT-I or OCIT-C interface of the VD server.

Requirements: The intersection version has to be locked.

Before the supply it is checked if the user checksums correspond. If this is not the case, first a read-out process takes place.

7.10.1. The supply procedure

Plausibility check must be error free. The data is checked before starting the supply process with regard to the OCIT format. If there are still messages with the identification **Error** or **Critical error**, the supply process is not started.

The URL of the server should be set in the profile GUI.

The password must currently contain at least one character.

Unlike the manufacturer-specific supply, the BD no. of offset time and intergreen time matrix are not considered, but all matrices are transferred.

7.10.2. Notes

The required license for the VD server is:office.otec.data.basic (feature no. 30).

If the error message "**UnitNo unknown**" is displayed, the IG was not started during start of the Config server. That is why the intersection numbers are unknown. Please restart the server to solve the problem.

8. Supplying / reading out the controller

There are several intersection version functions that allow you to supply the controller or read out data.

First, however, you have to set up a connection to the controller. This is described in the following chapters "Communication settings" and "Setting up connections".

8.1. Communication settings

under **Settings** – Communication, you can make the PC communication settings.

For details, please refer to the respective chapters that describe controller supply.

8.1.1. C900V local/modem

These settings are available under **Settings** – Communication – C900V local/modem.

Here you specify the dial up connection for local access to C900V controllers via the serial interface and modem.

You can select a dial up connection from the list on your PC, change one ("Properties" button) or create a new one ("New" button). Start the Windows Wizard to set up a dial up connection.

Please refer to the "Sitraffic BBX" manual for the settings of the dial up connection.

8.1.2. FTP login

You can find these settings under **Settings** – Communication – FTP login.

The default setting for the passwords for FTP access is also listed here. As long as the passwords were not changed for the modules (BBX, MPM, PCV, PCM), you do not have to change the default settings.

The password for FTP access is not the same as the one required for supply/read out.

8.2. Connection settings

Right-click the intersection version. From the context menu, choose "Settings" to set the controller connections. A connection allows you to supply the controller with data or to read out its data.

First, however, under Intersection version / General, at least the controller family has to be set.

Connections are grouped under so-called connection modules. These are described in the following chapters.

8.2.1. Connection module: M controller

This connection module is automatically created, if the controller family "M controller" is selected under Intersection version / General.

8.2.1.1. Connection: telex interface (serial)

The settings for the COM interface of the PC are made under Extras – Communication – MDevice-local. The baud rate set there is displayed here.

8.2.2. Connection module: C800 (BBS)

This connection module is automatically created, if the controller family "C800" is selected under Intersection version / General.

8.2.2.1. Connection module: C800 (BBS)

The settings for the COM interface of the PC are made under **Settings** – Communication – C800V-local.

8.2.2.2. Connection: modem

Settings for the PC-side modem are made under **Settings** – Communication – C800V-modem.

8.2.3. Connection module: C900 (BBX)

This connection module is automatically created, if the controller family "C900" is selected under Intersection version / General.

8.2.3.1. Connection: local with default address (fg9999.eth0)

This is the connection "Local (eth0)" with the default factory IP address.

8.2.3.2. Connection: local (eth0)

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.eth0".

The "Device no." is found under Intersection version / General.

Please note that access via this connection, e.g. for transfer of supply data, is not possible if a Firewall, blocking FTP services, is activated. On the access PC, you have to set up a second IP address within the number range of the control unit network. Note: When doing so, make sure the IP address complies with the IT guidelines.

8.2.3.3. Connection: central system access

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.z<C. no.>.<Domain>".

The "Domain" is found under Project / Properties.

The "Transmission type" is determined via Scala / Intersection connections. However, only if in the inventory, an intersection with the corresponding device no. and C. no. actually exists. So, the transmission type can be: "Canto 1.0", "Canto 1.3", "OCIT" or "OCIT dial up connection". Otherwise, the transmission type is "Other“, and the connection cannot be used.

The "Device no." and "C. no." are found under Intersection version / General.

The PC-side settings are specified under **Settings** – Communication – TCP-IP-System access.

8.2.3.4. Connection: service (PPP, serial)

This connection requires a dial up connection to the controller. You can specify such a connection under **Settings** – Communication – C900V-local/modem – Dial up connection serial (see chapter 8.1.1). The dial up connection is automatically made during supply.

8.2.3.5. Connection: remote service (PPP, modem)

This connection requires a dial up connection to the controller. You can specify such a connection under **Settings** – Communication – C900V-local/modem – Dial up connection modem (see chapter 8.1.1). The dial up connection is automatically made during supply.

8.2.4. Connection module: PCM

To select this connection module, on the toolbar, click "Select connection module".

Requirements

Under Intersection version / General, the controller family "M controller" is selected.

Under Scala / Intersection connections, an intersection connection with the corresponding C. no./Device no. is listed in the OCIT inventory.

8.2.4.1. Connection: local (PPP)

The "IP address or hostname" should be set according to the PCM manual.

8.2.4.2. Connection: central system access

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.z<C. no.>.<Domain>".

The "Domain" is found under Project / Properties.

The "Device no." and "C. no." are found under Intersection version / General.

The PC-side settings are specified under **Settings** – Communication – TCP-IP-System access.

8.2.5. Connection module: PCV

To select this connection module, on the toolbar, click "Select connection module".

Requirements

Under Intersection version / General, the controller family "C800" is selected.

Under Scala / Intersection connections, an intersection connection with the corresponding C. no./Device no. is listed in the OCIT inventory.

8.2.5.1. Connection: local (PPP)

The "IP address or hostname" should be set according to the PCV manual.

8.2.5.2. Connection: central system access

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.z<C. no.>.<Domain>".

The "Domain" is found under Project / Properties.

The "Device no." and "C. no." are found under Intersection version / General.

The PC-side settings are specified under **Settings** – Communication – TCP-IP-System access.

8.2.6. Connection module: MPM

To select this connection module, on the toolbar, click "Select connection module".

Requirements

Under Intersection version / General, the controller family "M controller" or "C800" is selected.

Under Scala / Intersection connections, an intersection connection with the corresponding C no./Device number is listed in the inventory for OCIT, OCIT dial up connection, Canto or Canto 1.3.

8.2.6.1. Firmware version

The firmware version is relevant for automatic controller update. Automatic controller update is supported from firmware version 3.0. From firmware version 3.0, enter the version you are using here.

8.2.6.2. Connection: local with default address (fg9999.eth0)

This is the connection "Local (eth0)" with the default factory IP address.

8.2.6.3. Connection: local (eth0)

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.eth0".

The "Device no." is found under Intersection version / General.

8.2.6.4. Connection: central system access

If no "IP address or hostname" is specified, the "Actual IP address or hostname" is determined via the schema "fg<Device no.>.z<C. no.>.<Domain>".

The "Domain" is found under Project / Properties.

The "Transmission type" is found via the intersection connection with the corresponding C no./device no., which is listed in the inventory, under Scala / Intersection connections. So, the transmission type can be: "Canto 1.0", "Canto 1.3", "OCIT" or "OCIT dial up connection".

The "Device no." and "C. no." are found under Intersection version / General.

The PC-side settings are specified under **Settings** – Communication – TCP-IP-System access.

8.2.7. Connection module I: BEFA 15 via Scala

This connection module is automatically created, if under Scala / Intersection connections, an intersection connection with the corresponding C no./device no. is listed in the inventory for BEFA 15.

8.2.7.1. Connection: BEFA 15

The "Domain" is found under Project / Properties.

The "Device no." and "C. no." are found under Intersection version / General.

The PC-side settings are specified under **Settings** – Communication – Central/Scale/SICOMP Lan.

8.2.8. Connection to sX controller

The sX controller is connected to your PC via an IP based WEB access. You need to use a compatible browser to connect to the sX. You can setup the used browser in the Yutraffic Office application settings. This browser wil be started when you need a connection to the sX controller. A configuration file will be down or up loaded in the background.

8.3. Selecting a connection

From the context menu of the intersection version, choose "Select connection". Under "Settings", you can select the connection of your choice.

This connection is then used per default for the menu options "Manufacturer-specific supply (Yutraffic Control)", "Manufacturer-specific supply_" and "Manufacturer-specific readout…". The dialog is also displayed when you select one of these menu options (unless you selected the option "Do not show dialog before communication").

Under "Settings…", you can configure the connections of your choice (see chapter "Configuring connection").

8.4. Manufacturer-specific supply

After the supply has been created, the data or a controller file can be transferred to the controller. To do so, from the context menu of the intersection version, choose "Manufacturer-specific supply". If under Intersection version / General / Components, components are selected that have not been fully integrated in Office, instead the menu option "Manufacturer-specific control (Yutraffic Control)" is displayed (see chapter 8.7).

However, the intersection version must have been reserved and the perspective "Intersection supply" selected (from the main menu).

After data verification, the "Select connection" dialog is displayed, if it has not been deactivated (also see chapter "Selecting a connection"). After data processing, click OK to open the Supply Wizard.

Please note that according to the device family, workflow status and connection selected, some functions in the Wizard might be disabled.

The different types of data are saved to the flash drive and RAM of the C800V controller, if the communication type

allows for it. The RAM serves as a temporary storage space for data that the controller is currently using. However, this data can be lost during a reset.

If data is only saved to the flash drive, the controller continues to work with the data available in the RAM. The data is only saved from the flash drive to the RAM after a reset (at switch setting 1) or via Sitraffic Service.

For C900V, the data is always automatically saved to the flash drive and then immediately loaded into the RAM.

The Appendix contains detailed information on the storage location of the individual data types and on follow-up supply.

For sX controllers please use the Transfer Button on the sX overview page. After the dialog, where you can adapt the transfer parameters and select the configuration parts which you want to transfer, the data will be exported, and you will be forwarded to the sX Service GUI.

8.4.1. Compiling current project data

When you select the "Compile data from current project" option, the next Wizard page lists the following data types:

Basic supply

TA parameters

TA code

VA-Para and VA-Code

Signal monitoring

All project components

Simulation.

For new supply of a C900V controller, we recommend that you select all components. And if you need to transfer TA parameters and code, do so in one step.

Before the data is saved, a plausibility check is performed. Its results are displayed in the log window. Before data transfer, the controller password is queried. In addition, the data structure version is compared with the controller version for basic supply and signal monitoring.

For basic supply and TA parameters, you can also select individual structures in an additional dialog (e.g. if you want to change a signal plan, you should choose the variant individual structures). In this case, you need to select the instances in another additional dialog by selecting the corresponding checkboxes.

Next you have to choose a storage location. At the same time, you can still save the supply data as a controller file. To keep the controller data consistent, specify a RAM and flash drive. Dependent on the communication type and controller version, for C800V, data can only be transferred to a flash drive or the RAM. The steps required for data transfer (controller status, switch position required, etc.) are shown in the Wizard. If you want to transfer the data of a whole project step-by-step, make sure that the basic supply data is transferred before you load the signal monitoring data.

Only select "Initial supply" if no data has been saved on the flash drive or it has been deleted via Sitraffic Service.

Sitraffic C900 controllers do not distinguish between initial supply and total supply.

All differences between the intersection version and controller status are marked as "delta supply". If the controller status does not correspond to the latest supply status, the controller requires total supply.

8.4.2. Send device file to controller

Use this option in the Wizard to send a device file created (see next chapter) to the controller.

8.4.3. Creating a controller file

You can create supply files for individual data types. To do so, you might have to change the directory path. These files can be transferred individually to the controller.

For signal monitoring and simulation, only total supply is possible. For basic supply and the TA parameters, you can also select individual structures in an additional editor.

Before the device files are written, a plausibility check is performed. Its results are displayed in the log window that is automatically opened.

Then the device files are generated and saved to the sub-directory specified.

8.5. Manufacturer-specific readout

From the context menu of the intersection version, choose "Manufacturer-specific readout" to save the readout data from a controller or device file to the intersection version. If under Intersection version / General / Components, components are selected that have not been fully integrated into Yutraffic Office, instead the menu option "Manufacturer-specific control (Yutraffic Control)" is displayed (see chapter 8.7).

However, the intersection version must have been reserved and the perspective "Intersection supply" selected (from the main menu).

After data processing, the "Select connection" dialog is displayed, if it has not been deactivated (also see chapter "Selecting a connection"). After the data has been processed, click OK to open the Supply Wizard.

Please note that according to the device family, workflow status and connection selected, some functions in the Wizard might be disabled.

From Sitraffic C800V controller, version 4.0, all basic supply data is read via BEFA. Regarding data from previous C800 controllers, only signal plans are read via BEFA.

8.5.1. Read data from controller

Before you read out data via this option in the Wizard, check the current version of the controller under Intersection version / General / Components / Read from controller. The possibilities of importing data depend on your controller version.

For basic supply and TA parameters, you can also read out part of the data. The TA code and signal monitoring, however, can only be read out completely.

Select All project components to import all components of an intersection version from the controller. In this case, the system code is not imported.

Next, for a C800V controller, specify whether you want to read out Basic supply data, TA parameters and Signal monitoring from the main memory or a flash drive. The TA code can only be read from a flash drive. The main memory contains the supply currently used by the controller. It does not necessarily have to be identical with the data on the flash drive.

When you import data into the intersection version (select check box "Import into opened project"), you can import data into a device file at the same time. To do so, select the Save as device file check box.

Click the Continue button to read out data from the flash drive or RAM and save it to the intersection version.

Click the Back button to continue with reading out the next component.

For sX controllers please use “Readout sX configuration” within the context menu of the object tree under “Intersections” or an already existing intersection. After the dialog, where you can adapt the transfer parameters, the configuration data will be imported into a new intersection version.

8.5.2. Import data from a file

Using this option in the Wizard, you can import the data saved to a device file into an intersection version. When doing so, you might overwrite existing data in the intersection version.

8.6. Read out controller data into new intersection

Proceed as follows to create a new intersection from the data of a controller:

Create a new intersection.

Under Intersection version / General, select a controller family and accept the changes.

Establish a physical connection to the controller. For Sitraffic C900V, e.g., this could be a local connection via Ethernet.

From the context menu of the intersection version, choose Intersection version / Settings to establish a connection with the controller (also see chapter 8.2).

Then under Intersection version / General / Components, select "Read from controller…". Select the connection and click "Readout". All component versions are read out from the controller. Click "Apply" to accept the configuration set. Check the components and some, if required. To accept the changes, click the corresponding symbol in the editor.

Read out the configuration data from the controller as described in chapter 8.5.

8.7. Remote supply

This chapter describes remote supply for the case that under Intersection version / General / Components, the option "Only components fully integrated into Office" is selected. Otherwise, remote supply is performed via Yutraffic Control (also see chapter 8.7).

8.7.1. General

Remote supply for individual components and objects can be carried out via a modem or the control center.

For remote supply via the control center, there are the following options:

Sitraffic C800V:

BEFA 15: data upload and download

OCIT: data upload and download

Canto: data upload and download.

M controller:

BEFA 15: send or read out of signal programs, read out of intergreen times / minimum green times via text commands in order to support external devices.

OCIT: as for BEFA 15, via accessory device PCM or MPM

Canto: as for BEFA 15 via MPM.

Sitraffic C900V:

OCIT: data upload and download

OCIT/GSM (dial up connection): data upload and download

Canto: data upload and download.

Sitraffic sX:

For a sX controller the connection is “always” remote. You use the WEB access of the sX controller for the up and download of configuration files.

8.7.2. Objects that need to be supplied

You will certainly have to supply some of the objects. The following overview shows you which objects have to be supplied for which controllers:

Control center

EPS plans

Demand plans

L6000 plans

S7 signal programs

IEC signal programs

Controller compartments

Detectors.

8.7.3. Data available via the control center

Via Yutraffic Scala, you can read out the following data:

With Sitraffic C800V controllers, in versions 2 and 3: signal plans

From version 4: basic supply data and TA parameters

With Sitraffic C900V controllers, all data.

With Sitraffic sX controllers, all data.

The following basic supply data can be supplied to the controller:

Basic data parameters

Signal plans

Fire department plans

Detector parameters (response thresholds for permanent assignment and permanent gap)

Detector plausibilities (plausibility times)

Annual automatic (default calendar, annual plan, annual calendar, day plan assignment)

Log control

SZP on-line

Acknowledgement lamps (SENLI)

Time parameters for DCF, GPS, synchronization

Modem initialization

Red light runners

Customer's name for signal monitoring

Special inputs/outputs (assignment of BAZ to a logical detector).

Traffic actuation:

TA parameters

Via OCIT, OCIT/GSM (dial up connection) or Canto: TA code.

8.7.4. Data available via modem

The same data can be supplied to the main memory (with Sitraffic C800V) and flash drive (with Sitraffic C800V and C900V) as is supplied via the control center.

Additionally, total basic supply and the TA code can be supplied to the flash drive (with Sitraffic C800V and C900V).

Controller data can be read out as with a direct connection.

For security reasons, remote supply is not possible for signal monitoring data.

General conditions for post-supply are listed in the Appendix.

8.7.5. Supply via BEFA 15

Under Intersection version / Settings, make sure the connection module "BEFA 15 via Scala" is selected (see chapter 8.2).

If Sitraffic C800V is downloading large amounts of data, the log messages of the controller might be transferred time-delayed, i.e. after the supply data has been transferred.

Supply data can only be transferred via BEFA to the main memory of Sitraffic C800V (up to level 4.0). In the Sitraffic view, select "Save memory" to save the supply data to the flash drive. From level 4.1, the data is supplied to the flash drive via Yutraffic Office or Yutraffic Control.

General communication settings

You can find the general communication settings for BEFA under **Settings** – Communication – Central/Scala/SICOMP Lan.

Sitraffic C800V: For faster data upload, readout of the BD version can be suppressed. When adopting data into the project, a prompt is displayed asking whether you really want to import the data, as the version cannot be checked.

M controller: For data upload, you can choose to a) read out signal programs / intergreen times, etc. via text commands or b) to read out memory areas via rows / columns. The second option is faster, as it might not support external devices.

8.7.6. Supply via OCIT

Under Intersection version / Settings, check whether a corresponding module has been entered and configured (see chapter 8.2). OCIT is supported by the connection modules C900 (BBX), PCM, PCV and MPM.

For data supply to connection devices and how to establish system access on the PC side, see chapter 15.

8.7.7. Supply via Canto

Under Intersection version / Settings, check whether a corresponding module has been entered and configured (see chapter8.2). Canto is supported by connection modules C900 (BBX) and MPM.

For data supply to connection devices and how to establish system access on the PC side, see chapter 15.

8.7.8. Supply via modem

You can a establish a connection to Sitraffic C800V or C900V via any Hayes-compatible standard modem (V32 to V34) or GSM modem on the PC-side. The modems supported on the controller-side are listed in the corresponding release note.

8.7.8.1. Initialization of controller modem

For Sitraffic C900V, the modem parameters are available on the Web.

For Sitraffic C800V, the controller-side modem has to be initialized via basic supply. To do so, under Intersection version / System data / C800V, supply the following objects:

Special / ModemInit

Supply modem type and PIN, if required. The initialization strings are hard coded. They cannot be changed via supply.

Special / Serial interfaces / Ext3 or Ext5 (is automatically set).

8.7.8.2. PC modem settings for Sitraffic C900V

The settings for the PC-side modem are made under **Settings – Communication** – C900V-local/modem tab – Dial up connection modem.

For a detailed description of how to establish the dial up connection, refer to the BBX installation guide.

8.7.8.3. PC modem settings for Sitraffic C800V

The settings for the PC-side modem are made under Settings – Communication – C800V modem tab.

Connection is possible via a Hayes compatible modem or radio modem.

Hayes compatible standard modem

Modem type:	Standard Hayes
Interface:	COM1
Baud rate:	38400
Modem commands	
Dial prefix:	(see below)

Dial suffix: ^M
Dial cancel: ^M
Initialization (see below)

Hang up: +++~~~ATH0^M

Monitoring times: (see below)

Dial prefix

AT DT. For telephone systems, external line number and dialing pause are added (e.g. AT DT0W).

Initialization

AT .... ^M. The switches described below (e.g. U.S. Robotics Sportster Flash) must be set. However, they partly correspond with the factory default values.

The settings marked with an asterisk * are factory setting.

For ELSA MICROLINK 56K PRO, the settings required correspond to the factory setting (&F).

Setting	Possible value (depends on modem)	Description
Load basic settings	&F or &F1	Load saved profile or factory setting
Data compression	&K1 *	Switch on data compression
Error correction	&M4 *	on
Software flow check	&I0 *	deactivated
Hardware flow check	&H1 *	activated (CTS)
Control line DCD	&C1 *	DCD only ON if connection is made
Control line DTR	&D2	Connection cancelled with ON/OFF change
ResultCodes	V1	alphabetical
Extended outputs	X3	activated
Echo	E1 *	on
Loudspeaker	M1 *	Loudspeakers on until "Connect" message

Tab. 32: ELSA MICROLINK 56K PRO

Monitoring times

Data transfer is automatically cancelled after a maximum period (specified in minutes), if no real data is transferred. The value 0 switches monitoring off.

Radio modem

Radio modems (e.g. Siemens M20 Terminal) must be reset to the factory settings. Otherwise, you will have to enter all values for initialization manually and there might be some problems with data transfer.

Enter the following information:

Modem type: radio modem

Interface: COM1
Baud rate: (see below)

Modem commands

Select prefix: (see "Hayes compatible standard modem")

Dial suffix: ^M
Dial cancel: ^M
Initialization: (see below)

Hang up: +++~~~ATH0^M

Monitoring times: (see "Hayes compatible standard modem")

Baud Rate

Select baud rate required for modem according to its manual. We recommend that you save the factory setting for the baud rate to the user profile. Otherwise, you have to set all switches individually in the initialization string and cannot use the &F function (reset to factory setting).

Initialization

AT &F …^M. This function resets the radio modem to the factory setting. The other settings have to be entered manually one after the other (without using any spaces).

The switches described below (e.g. Siemens M20) must be set. The settings marked with an asterisk * are factory setting.

Setting	Possible value	Description
Load basic settings	&F	Load saved profile or factory setting
Data compression	+DS=3.0,1024.6	Switch on data compression
ResultCodes	V1 *	Alphabetical
Extended outputs	X3	activated
Control line DCD	&C1 *	DCD only ON if connection is made

Setting	Possible value	Description
Control line DTR	&D2	Connection cancelled with ON/OFF change
Control line DSR	&S1	DSR is set identical to the CD line
Answer call	S=0 *	Do not accept any call
Echo	E1 *	on
ConnectMessage	+ILRR=0 *	Only report DEE data transmission speed
DCE baud rate	+IPR=19200 *	Set modem interface to baud 19200 (Note: baud rate must correspond to PC interface baud rate)
DCE parameter	+ICF=3.3 *	8 data bits, no parity, 1 stop bit
Flow check	+IFC=2.2 *	RTS/CTS flow check

Tab. 33: Monitoring times initialization

8.8. Manufacturer-specific supply (Yutraffic Control)

If under Intersection version / General / Components, components are selected that have not been fully integrated into Yutraffic Office, in the context menu of the intersection version, the menu option "Manufacturer-specific control (Yutraffic Control)" is displayed instead of "Manufacturer-specific readout".

However, the intersection version must have been reserved and the perspective "Intersection supply" selected (from the main menu).

Yutraffic Control is started with the data of the intersection version. Its functions allow you write and read supply of the controller. For details on the operation of Yutraffic Control, refer to its manual.

8.9. Communication components (Sitraffic KSNET)

Information between the controller and PC or notebook is exchanged via the communication server Sitraffic KSNET. Sitraffic KSNET is automatically started by Yutraffic Office, if required. In this case, the KSNET symbol is displayed on the Windows Start bar.

Yutraffic Office and Sitraffic Service run in parallel.

when Yutraffic Office supplies or reads out data, Sitraffic Service is automatically "cut off", i.e. is no longer sent operating status messages or visualization data.

After the procedure has been completed, Office is connected to Sitraffic Service again.

9. TA logic

9.1. Introduction

Yutraffic Office provides an integrated development environment for traffic-actuated controls (TA logics). The development environment allows the planner to implement traffic engineering tasks without knowledge of a programming language in program code. A structogram or flowchart editor graphically supports the user in formulating logical conditions. System libraries already offer elaborated solutions for a number of traffic engineering partial problems. The functions only have to be parameterized and the results are available for the user for further editing. Functions developed by the planner can also be grouped to a user library. With this number of pre-formulated standard solutions, the part of the individually created conditions are reduced to a minimum and creation or test times are reduced immensely. Using a compiler, the traffic logic is translated into programming code for the simulation of the traffic-actuated control system. A debugger simplifies the test and error search by evaluating a log generated by a traffic actuated program.

9.1.1. Overview

The TA logic is displayed in the following chapter (chapter 9.2) and then the TA logic is explained (chapter 9.3). There is then information on creating user libraries (chapter 9.4) and how to use system libraries (chapter 9.5).

Users who are familiar with Sitraffic Language, can find useful information in the section "Switchover from Sitraffic Language".

A language reference ends the chapter (chapter 9.6).

9.2. System environment

Using the Development environment, a TA logic is created which is implemented in a controller or for simulation.

Not all functions which are required for this complex procedure are covered by the development environment. System libraries provide basic functions which can be extended by user libraries. Editing the user parameter structure and the parameterization or supply in Sitraffic is executed outside of the development environment.

9.2.1. System libraries

System libraries provide controller and control method functions. An example is the controller procedure PDMx. It is a traffic actuated controller procedure, where the signal group control is executed in the stage transitions. The system library PDMx is based on a system library of the controller core for the controller.

9.2.2. User libraries

In addition to the libraries, you have the possibility of grouping self-created functions to user libraries, for example those which are already being used, so that they are available for further projects.

Compared to system libraries, a complete user library is always included in the program code. This also means, that unused functions make up the size of the program code.

9.2.3. User parameter structure

Parameterization of the controller procedure and the TA logic is carried out in Yutraffic Office outside of the development environment. TA logic can be parameterized through so-called user parameters.

9.2.4. Simulation

The applications Aimsun.Next and/or VISSIM are used to test and evaluate controller procedure (fixed-time control, S-Le, PDMe, etc.)

The simulation consists of:

the application Aimsun.Next and/or VISSIM

a traffic actuation (compiled TA logic).

Communication takes place via an interface, where detector measured values and signalization states are exchanged.

The compiled TA logic in offline mode can be tested on the computer using the given applications. By changing the parameterization during simulation, an optimization of the traffic actuation can be achieved. After the traffic related test, the data can be exported and loaded in the controller, after generating the basic supply.

More detailed information on the applications Aimsun.Next and VISSIM can be taken from the supplied user manual.

9.2.5. Development environment

The TA logic of an intersection version or a user library is edited in the development environment.

Existing Sitraffic language projects can be read in with the Import. Source code editors allow the logic to be edited. With Compilation the source code is compiled in an executable code for the simulation or the controller. The Debugger supports the test and error search together with the simulation. The Documentation allows the printout and the page preview of the TA logic.

9.2.5.1. Import

Existing Sitraffic language projects (*.tlp) and source codes (*.sor) can be read in for further editing. This can be done in three ways:

Automatic import during the import of an intersection from a scx file.

Import of a Sitraffic language project (*.tlp) from respective attachments of the intersection version.

Import of a Sitraffic language project (*.tlp) and individual source codes (*.sor) from the respective files.

9.2.5.1.1. Scx import – TA method with standard code

If you import a scx file that

contains a TA method with standard code (SL, VS-PLUS) and

no individual logic was created with Sitraffic Language for the imported intersection,

after the scx import you must delete a standard code possibly imported in the process from the file attachments of the imported intersection version. This is necessary so that the standard code that is now contained in the TA components (SL, VS-PLUS) is used.

For this you should

open in the object tree the development environment for the user logical system by double-clicking on **Traffic Actuation (TA) / User Logical System** of the intersection version.

Click on the icon for deleting the user logical system in the toolbar of the development environment and answer **Yes** to the confirmation

9.2.5.2. Source code editors

The TA logic can be created and edited with these different editors.

A structogram or flowchart editor supports the user through graphical display of procedures, curves and intersections and thus makes setting the logic considerably easier. With the TA logic elements, the user can also work without having programming skills. The structured entry helps prevent errors.

9.2.5.3. Compilation

With the compilation, TA logic source code is converted in several steps in an executable code for the simulation or for the controller:

Source code for the programming language ANSI-C is created from the TA logic source code.

An ANSI-C compiler which is specific for the target platform and linker finally compile the C source code in an executable code, for example for VISSIM (exe-file).

9.2.5.4. Debugger

It is possible to log the process of a TA logic while running the simulation and to analyze it with the debugger.

9.3. TA logic of an intersection

The TA logic of an intersection can be found in the object tree in the intersection version under **Traffic actuation (TA) – TA logic**. Double-clicking in the object tree or in the detail view opens the respective TA logic in the development environment.

9.3.1. General information on the development environment

In order to use the development environment, you require a license. The development environment is made up of docking windows. This can be used to adapt the interface to the individual requirements. The window layout is saved user specific.

9.3.2. TA logic structure

This section gives an overview on how a TA logic is structured.

More information on language elements of a TA logic can be found in chapter 9.6.

A TA logic is made up of general information, integrated system libraries and user libraries and the actual Source code modules of an intersection. System libraries, user libraries and source code modules of an intersection contain definitions, i.e. functions, constants, variables and types. User parameters can be used in functions of the source code modules.

C source code modules are determined for special use cases.

9.3.2.1. General information

General TA logic information includes:

Name

Short name

Description

Password protection (read-only)

Version, build no.

These can be edited in the **General** window. Version and build no. can be used for documentation and have no further relevance in the TA logic of an intersection.

Please note, that when first opening the TA logic, the name and short name are initialized according to the intersection version.

9.3.2.2. System libraries

System libraries are parts of components, which are selected in **Intersection version / General**.

System libraries which are thus integrated are listed in the **Libraries** window. System libraries cannot be edited.

Which system libraries are required, depends on the controller type and the desired control method.

9.3.2.3. User libraries

User libraries are selected in **Intersection version / General**.

Source code modules thus integrated are listed together with the source code modules of the intersection in the corresponding window. These source codes cannot be edited in the user logical system of the intersection version.

9.3.2.4. Source code modules of an intersection

The actual intersection specific TA logic can be found in the intersection source code modules. More than one source code modules can be used, for example for logical distribution of the TA logic.

9.3.2.5. Intersection source code modules are listed together with source code modules of integrated user libraries in the corresponding window. Definitions

System libraries and source code modules may contain definitions, i.e. functions constants, variables and types. These are listed in each window.

Functions contain the actual logic code in function bodies. For functions, these can be edited from intersection source code modules as structogram or flowchart.

9.3.2.6. User parameters

User parameters are defined outside of the TA logic in the object tree under **Traffic actuated (TA) – User parameters**. Individual parameter values can be requested in functions via the user parameter structure, which was created in the tree via **Edit interface**.

9.3.2.7. C source code modules

C source code modules are used together with specific system libraries, for example VS-PLUS 6.1.

C source code modules are listed in the corresponding window.

9.3.3. Recreating a TA logic

Below it is assumed, that an intersection version already exists for which a TA logic should be created.

The basic supply and definition of the TA parameters, the determination of the number of stages and partial intersections, etc. should be done in advance.

9.3.3.1. Selecting components

By selecting the components under **Intersection version / General** you determine which system libraries and user libraries (optional) should be used in the TA logic.

You should also set the subversion in the added components. This specifies the third and fourth position of the version, for the selection of the system library for the TA logic.

If the desired system or user libraries cannot be selected, they have to be imported (see chapter 9.5.1and 9.4.7).

Now supplement the selection with the respective GD component and select the component **AWP/user parameter** to define user parameters.

In the TA logic development environment, you can see the selected system libraries in the Libraries window.

9.3.3.2. TA procedure with standard code

The system libraries of different TA procedures, such as S-L for example, already supply a standard code for VISSIM and the controller.

Please note the following for VS-PLUS:

As of the version for controller C900, the system library no longer contains a standard code for VISSIM (*.exe). The manufacturer will provide these from VS-PLUS.

In order to use the function under Intersection / Simulation parameter to export the exe file, the exe file should be added manually to the intersection version.

If the standard code functions are sufficient for you, you do not have to create your own TA logic and you do not have to adhere to the following topic.

For TA procedures you also have the possibility of creating an individual TA logic. In this case the compiled TA logic replaces the standard code.

By creating and using an own user library, you can define your own "standard" (see chapter 9.4).

9.3.3.2.1. Return to standard code

If you have created an individual TA logic and want to return to the standard code, you should

save the individual TA logic, if you need it later on. You can copy the intersection version for example, and then continue working with the new intersection version.

open the development environment for the TA logic by double-clicking the **Traffic actuation (TA) > TA logic** of the intersection version in the object tree.

Click on the symbol to delete the TA logic in the toolbar of the development environment and answer the request with **Yes**.

The TA logic source code and possibly existing compiled code is thus deleted in the file attachments of the intersection version and as a result the standard code is used again.

Deleting the TA logic cannot be undone.

9.3.3.3. Definition of the user parameter structure

The user parameter structure can be changed and complemented any time while creating the TA logic. To do so, call up **Edit interface** in the context menu under **Traffic actuated (TA) – User parameter – User parameter … – User_Parameter**.

A „ready-made“ structure can be a *.mod (old format) or *.tlx file which can be imported – a „particular“ structure can be imported as *.tlx file!

9.3.3.4. Using user parameter structure templates

If intersections exist which often include required user parameter structures, you can use these as a template.

You also have the possibility to create intersections which only serve as a template:

Create an intersection in the object tree which contains the template. Name the intersection `User parameter template 1` for example.

Under **Intersection version / General / Intersection version** select a controller family, for example C900.

Under Intersection version / General / Components select a BD component and the entry **AWP / User parameter …**.

To copy such a user parameter structure from such a template intersection to the destination intersection,

From the context menu, choose **Edit interface** under **Traffic actuated (TA) – User parameters – User parameters … – User_Parameters** of template intersection.

From the context menu, choose **Edit interface** under **Traffic actuated (TA) – User parameters – User parameters … – User_Parameters** of destination intersection.

Select a structure in the opened AWP editor of the template intersection or click in the empty area of the structure list to undo the selection and thus to copy all structures. Then select **Edit – Copy structure** or press Ctrl + C.

Click in the structure area of the AWP editor of the destination intersection (make sure you do not select a structure entry). Then from main menu, choose **Edit – Insert structure** or press Ctrl + V.

9.3.4. Editing a TA logic

Open the development environment for the TA logic by double-clicking the**Traffic actuation (TA) / TA logic** of the intersection version in the object tree.

If you are not familiar with the TA logic yet, you can find details under 9.6.

At least one source code module is required for formulating the TA logic. Below you will find out how to add a source code module by Copying source code templates or with Creating a new source code module.

9.3.4.1. Using source code templates

Depending on the system libraries, source code templates exist as user libraries. More information on using source code templates can be found in the description of each system library.

Source code templates should not be referenced as user libraries. User can import source code templates in Source code modules window. After clicking on Import template library icon , new dialog is shown, where user can choose template to import, to new or existing source code module. Imported template can be further edited. These changes do not persist in original Source code template. You create source code templates in terms of user libraries yourself. Follow the instructions in chapter 9.4 on creating and editing a user library. Select a name for the user library which clearly states that it is a template.

9.3.4.2. Creating a new source code module

If there is no source code template for your use case, new one is automatically created. You can add another new source code module by clicking on the symbol in the **source code modules** window. Set the name as desired and optionally enter a description for the source code module.

9.3.4.3. Default settings for the constants

Clicking on the icon automatically generates a source text module in the form of a constants definition with all object entities present in the intersection version and relevant for the user logical system, such as signal group numbers and detector numbers, for example.

9.3.4.4. Defining the user installation function

The **UserInit** function is called up by the controller procedure. The user has the possibility to initialize the variable at certain times (see below). The function head of the user initialization function is defined and is not allowed to be changed. This user initialization function is therefore usually provided as source code template, see chapter 9.3.4.1).

The function argument **Init time** specifies the call time:

START_TL = Switching on the controller

PAS_TA = Starting the traffic actuation

PAS_SEC = every second

> You may not be able to use all variables and functions of the controller procedure with the user initialization function. More information can be found in the description of each system library.

Open the function body by double-clicking the entry **UserInit** in the **Functions** window **or via the icon of the** entry. Here you can enter the logic of the user initialization function. The image below shows an example of the function body of the user initialization function.

9.3.4.5. Defining the main function or user function

The main function is called like the user initialization function, by the controller procedure. It is the starting point for the TA logic process. The function head of the main function is defined and is not allowed to be changed. The main function is therefore usually provided as a source code template, see chapter 9.3.4.1).

More information can be found in the description of the system library used.

In the system library *PDMe* the user function takes over the role of the main function for PDM, for example.

9.3.4.6. Adding functions

To create a new function, proceed as follows:

Select an entry in the **Functions** window in order to determine the corresponding source text module and the category for the new function. If no source text module or category is selected this way, the function will be entered into the first source text module or with a blank category in the following.

Click on the icon. A new function is added.

Change the name. Note that a distinction is made between upper and lower case when using names.

Set the result type. **EMPTY** means that the function does not supply a result.

If necessary, add function arguments. To do so, in the description window, click on the symbol in the argument list. Change the name and type of the added function argument and set **Output** if necessary.

The **category**, if needed, can be changed at a later time with the corresponding column. Indicating a **category** is optional because categories only serve as an organizational criterion.
Also note the information below on **grouping**.

The assignment to the source text module can be changed at a later time with the column **Defined in**.
Also note the information below on **grouping**.

Insert a description in the description window if needed.

Grouping

The table can be grouped according to any columns. With the preset the table is grouped according to **Defined in** and **Category**, for example.

Using the **Grouping field,** you can set the columns according to which grouping takes place. The grouping field is normally located above the column header of the table. You can hide or show the grouping field in the menu item **Hide grouping field** and **Display grouping field**, respectively, in the context menu of the column header.

To remove the grouping for a column, drag it with the mouse from the grouping field into the column header of the table. Alternatively, you can select the menu item **Do not group according to this column** in the context menu of the grouping field for the column. Conversely, in order to group according to a column, you can drag a column into the grouping field or select **Group according to this column** in the context menu.

You should not use the data type **GLKOMMA**, because there is no available system library momentarily which supports this data type.

The function body can be edited like in the following description.

9.3.4.7. Editing the function body

You can define the logical system as a structure chart or a flowchart in the block body.

The display type, i.e. whether you are working with a structure chart or a flowchart can generally be set in Yutraffic Office under Settings / Options or in the User logical system. Documentation also takes place in accordance with this setting. It can be changed at any time. Mixing the display type is, however, not possible.

Function bodies in the source code files can be edited by the user. You cannot access the function bodies in the system library and password protected user libraries.

Open the function body by double-clicking an entry in the **Functions** window **or using the icon in the row of the corresponding function**.

In the function body, the logic is realized with the following control structure.

Conditioned intersection

Count loop

Conditioned loop

Furthermore, the following instructions are possible:

Instruction

Function end

Comment.

Compared to the instructions, the control structures can in turn contain further control structures and instructions whereby the structogram or flow-chart is produced.

The case analysis with cases, familiar from Sitraffic Language and earlier Yutraffic Office versions is no longer available and is replaced with a conditional branching for each case upon first opening the relevant flowchart.

The "real" comments from the structure chart are replaced with commented-out instructions upon first opening the relevant flowchart.

9.3.4.7.1. Inserting control structures or instructions

Structure chart

To insert control structures or instructions, select the desired inserting position in the structogram and click the corresponding symbol on the left corner of the window. Note that you cannot always insert at any position. Cases can only be inserted in case differentiations.

Control structures and instructions can be copied and inserted using the clipboard as well.

Flowchart

To insert a control structure or instructions at the desired insert position in the flowchart and then select the desired control structure or instructions from the context menu.

All other functions of the flowchart are available in the form of buttons on the toolbar of the function window; these are:

Undo and redo

Copy and paste

Cut and delete

Comment out or comment back in

The zoom factor can also be set using a slider.

9.3.4.7.2. Commenting out control structures or instructions

Selected control functions or instructions can be commented out, i.e. they are displayed as instructions and evaluated during compilation. This possibility can be used, if the logic is to trial run without this code.

For this use the function **Comment in the context menu in the structure chart. Use the corresponding button in the toolbar for this in the flowchart.**

Comments appear in the flowchart in the form of commented-out instructions. That is, no "real" comments like in the structure chart exist in the flowchart.

9.3.4.7.3. Inserting access to a constant

You can access a constant via its name.

You can insert the access on an existing constant as follows:

Open the structure chart or flowchart and scroll to the control structure or instruction, to which the access on the constant should be added.

Click and then drag an entry in the window Constants in the structogram or flowchart with Ctrl key pressed, to add the access at the mouse cursor position in the text area. Make sure that you click in the selecting column on the left border of the desired entry with Ctrl key pressed and not in the entry itself.

Alternatively, use the icon in the row of the relevant constant.

9.3.4.7.4. Inserting access to a variable

Access on a variable is carried out according to the schema:

Name

Index in brackets for variable fields

Element names with prepending point, if the type is complex.

Indices start at 0. They are not checked for validity, unless the debug function is activated for VISSIM.

To add an access on an existing variable, see chapter 9.3.4.7.3.

9.3.4.7.5. Inserting access to a user parameter

User parameters are defined outside of the TA logic in the object tree under **Traffic actuated (TA) / User parameters**.

Access on a user parameter is carried out according to the following schema:

Keyword 'PARA'

optional ".instanz" or ".global" with consecutive space

Sub module name

Group: Index in brackets or name with prepending point

Parameter: Index in brackets or name with prepending point.

A parameter index can only be specified if all parameters have the same type.

The group and parameter indices start at 0.

You can insert the access on an existing user parameter as follows:

Open the structure chart or flowchart and scroll to the control structure or instructions to which access to the constants should be added.

Open the user-parameter editor in the object tree under **Traffic Actuation (TA) / User Parameters / User Parameter ... / User_Parameter**. Then, with the Ctrl key pressed down, drag a field of the open editor into the structure chart or flowchart in order to insert access at the mouse cursor position in the text area.

9.3.4.7.6. Inserting a function call

The call of a function is carried out according to the schema:

Name

Function parameter in parenthesis, separated by comma; output arguments have to be stated with prepended '&'.

To add a call of an existing function, see chapter 9.3.4.7.3.

9.3.4.7.7. Inserting operators

Select the control structure or instruction where an operator should be added.

Then select **Insert operator** from the context menu in the structure chart. All existing operators are carried out in a dialog. Select the desired operator and confirm with OK to add the operator to the end of the text area.

In the flowchart simply enter the desired operator as text.

9.3.4.8. Adding a constant

To create a new constant, proceed as follows:

Select an entry in the **Constants** window in order to determine the corresponding source text module and the category for the new constant. If no source text module or category is selected this way, the constant will be entered into the first source text module or with a blank category in the following.

Click on the symbol. A new constant is added.

Change the name. Note that a distinction is made between upper and lower case when using names.

Set the type.

Enter the value as a constant expression. It can be a decimal number, e.g. "123", a hexadecimal number, preceded by "0x", e.g."0xAB", another constant, e.g. "PAS_SEK" and combinations with operators, e.g. "MAX_A + MAX_B / 2".

The **category**, if needed, can be changed at a later time with the corresponding column. Indicating a **category** is optional because categories only serve as an organizational criterion. Also note the information below on **grouping** in section 8.3.5.5.

The assignment to the source text module can be changed at a later time with the column **Defined in**. Also note the information below on **grouping** in section 8.3.5.5.

If necessary, enter a description in the des description window.

9.3.4.9. Adding variables

To create a new variable, proceed as follows:

Select an entry in the **Variables** window in order to determine the corresponding source text module and the category for the new variable. If no source text module or category is selected this way, the variable will be entered into the first source text module or with a blank category in the following.

Click on the symbol. A new variable is added.

Change the name. Note that a distinction is made between upper and lower case when using names.

Specify a type. Please note that apart from an elementary type the name of a complex type can be specified.

If necessary, add dimensions.

To do so, in the description window, click on the symbol in the dimensions list. In the newly created entry, enter the dimension size as a constant expression.

The category, if needed, can be changed at a later time with the corresponding column. Indicating a category is optional because categories only serve as an organizational criterion.
Also note the information below on grouping in section 8.3.5.5.

The assignment to the source text module can be changed at a later time with the column Defined in.
Also note the information below on grouping in section 8.3.5.5.

If necessary, enter a description in the des description window.

You should not use the data type **GLKOMMA**, because there is no available system library momentarily which supports this data type.

9.3.4.10. Adding a complex type

To create a new complex type, proceed as follows:

Select an entry in the **Types** window in order to determine the corresponding source text module and the category for the new complex type. If no source text module or category is selected this way, the complex type will be entered into the first source text module or with a blank category in the following.

Click on the symbol. A new complex type is added.

Change the name. Note that a distinction is made between upper and lower case when using names.

Add elements. To do so, in the description window, click on the symbol in the element list. Change the name and type of the added element.

If necessary, add dimensions. To do so, click + before entering the element to extend the dimensions list. Enter the dimension size in the * row and press the arrow down button to confirm.

The **category**, if needed, can be changed at a later time with the corresponding column. Indicating a **category** is optional because categories only serve as an organizational criterion. Also note the information below on **grouping** in section 8.3.5.5.

The assignment to the source text module can be changed at a later time with the column **Defined in**. Also note the information below on **grouping** in section 8.3.5.5.

If necessary, enter a description in the des description window.

9.3.4.11. Source code autocompletion

This feature is available only in flowchart mode. Autocompletion feature helps you to create valid source-code. While typing expressions in flowchart, autocompletion box pops up automatically and shows all items relevant for current context.

Global context:
Relevant for editing of instructions, decisions, function parameters etc.

Operators and keywords: All arithmetical, logical, binary, assignment, and enumeration operators.

Function parameters: Parameters of currently edited function.

Variables: All variables defined in source-code modules or referenced libraries

Constants: All constants defined in source-code modules or referenced libraries

Functions: All functions defined in source-code modules or referenced libraries

Complex type context:

Active when typing identifier following “<ComplexVariable>.” expression. If the variable of complex type exists (user-defined or system), all complex type members are listed in the autocompletion box.

User parameter context:

Active for expressions following PARA, PARA.instance or PARA.global with consecutive space. Autocompletion works similarly for complex types too. At each level user is provided with list of relevant members (modules\ group rows\ columns). See chapter 9.3.4.7.5.

Common features:

Each item in the autocompletion window has its popup information defined containing usefull information like type of the variable\ constant or function signature.

When available for current context, autocompletion dialog can be shown by pressing CTRL+SPACE keyboard shortcut.

Clicking on an item from the list or pressing ENTER inserts the selected item.

ESCAPE key will cancel the autocompletion dialog keeping the written text intact and the mouse coursor inside of the text.

Toggable icons at the bottom of the autocompletion dialog can be used to filter desired item type.

Moving mouse cursor above text in the node will show quick info about variable \ constant or function signature. This quick info can be also shown by keyboard shortcut Ctrl + I.

Function parameters info can be shown, when writing function call, by pressing keyboard shortcut Ctrl + Shift + Space.

9.3.4.12. Managing incorrect identifiers

In the window **Incorrect identifiers** problems with identifiers (function names, constants, etc.) can be identified and solved.

It contains a list with the following information:

I**dentifier**

References: Specify how often the identifier is used in the TA logic

Definitions: Specify how often the identifier was defined

Identifiers can therefore be divided into:

Undefined identifiers ("Definitions" = 0):

These are identifiers which are used while creating the TA logic but have not yet been defined.

Multiple defined identifiers ("Definitions" > 1):

Definitions with the same identifiers.

Correctly defined identifiers ("Definitions" = 1):

These are usually hidden by the filter **Hide defined identifier** at the bottom edge of the list. By deactivating the filter all identifiers are listed including the correctly defined ones.

In order to compile the TA logic into executable code, no Incorrect identifiers are allowed.

9.3.4.13. Defining incorrect identifiers

Definitions for undefined identifiers can be added to the TA logic as follows:

In the window **Incorrect identifiers** select one or more undefined identifiers ("Definitions" = 0) which you want to define.

Select **Defining…** in the context menu.

Select the definition type (constant, type, variable, function) and the source code module for the definitions.

Confirm with OK.

The selected identifiers are then added to the selected source code module and the first definition is selected in the respective definitions window. You can now further edit the definitions.

The defined identifiers are listed in the message window. By double-clicking an entry, you can jump to and edit the corresponding definition.

9.3.4.13.1. Search incorrect identifiers

You can search for an incorrect identifier in the TA logic:

In the window **Incorrect identifier** select an identifier you are searching for.

In the context menu select **Search all**.

The search results are listed in the **Search results** window. You can jump to the corresponding position by double-clicking on a search result.

This corresponds to the normal search function with selected **Code** field (see chapter 9.3.5).

9.3.5. Flowchart usage

9.3.5.1. Basic usage

User can pan the view with the right mouse button, zoom it while holding Ctrl key + mouse wheel up / down. User can scroll vertically with mouse wheel up / down, horizontally with holding Shift key + mouse wheel up / down.

9.3.5.2. Editing content of the node

To edit content of the node, select particular node and press key Enter, or just start typing. Text will be added to the end of the node content. User can leave edit mode by pressing Enter or Esc key. Changes are accepted in both ways.

9.3.5.3. Selection of nodes

User can select particular node with left mouse button. Selected node is highlighted by light blue node background and blue node borders.

Selection of multiple nodes is done by holding left mouse button key and dragging rectangular area around nodes to select. Also, selection of multiple nodes can be done by holding Ctrl key and clicking with left mouse button on desired nodes.

9.3.5.4. Focused node

Focused node is highlighted by dashed black line around the node. It is a node, which accepts node operations as delete, copy & paste and drag & drop. User can focus another node by clicking on it by left mouse button or move to another node with arrow keys.

9.3.5.5. Context menu on extension point

There is a context menu available on any extension point with commands to create new block – instructions, conditions, comments, cycles and function ends. New block is added in place of the extension point by clicking with left mouse button on the particular block type or by selecting desired block type with arrow keys Up and Down. Another option is to press key 1-6 to create desired block type. Context menu is accessible by clicking left or right mouse button on the extension point, or pressing key Enter on focused extension point.

9.3.5.6. Operations with multiple nodes

After selection of one or more nodes, user can carry out following operations:

Delete, via toolbar button or key Delete

Copy, via toolbar button or key shortcut Ctrl + C

Paste copied block to focused extension point via toolbar button or keyboard shortcut Ctrl + V

Comment, via toolbar button

Uncomment nodes which are marked as comments via uncomment toolbar button

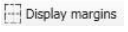
All operations are reversible via toolbar buttons Undo and Redo, or keyboard shortcuts Ctrl + Z (Undo), Ctrl + Y (Redo)

All of the mentioned operations with exception of Paste, are also accessible from context menu on node. Paste is accessible from context menu of extension point

Selected nodes can be moved by dragging with pressed left mouse button to some extension point

Selected nodes can be copied by dragging with pressed left mouse button and Ctrl key to some extension point

9.3.5.7. Customizable diagram page size for printout

Flowchart allows user to specify custom printing page size. To display margins, press icon 

in the Flowchart toolbar, or keyboard shortcut Ctrl + B. When margins are shown, blue lines marking custom diagram page size are displayed. These blue lines defining page border in diagram are draggable (vertical and horizontal separately), so printout size can be changed. It is possible only for the two lines closest to the start node. Diagram is then cut according to the defined page size to separate print pages. Page definitions are also preserved next time you open Office. If the chosen printout size is smaller than the page size it will be placed to the page with standard size of elements. If the chosen printout size is bigger than standard page size, it will be shrunk to fit the page.

9.3.5.8. List of all Flowchart shortcuts

View	
Pan	Right mouse button
Vertical scrolling	Mouse wheel up / down
Horizontal scrolling	Shift + Mouse wheel up / down
Zoom by mouse	Ctrl + Mouse wheel up / down
Zoom by keyboard	Ctrl + key + / -
Selection by mouse	Mark area while holding left mouse button or pick particular nodes by left mouse button while holding Ctrl key
Selection by keyboard	Hold key Shift and select nodes by arrows keys
Edit	

Delete selected nodes	Key Delete
Start edit node	Key Enter or F2
Stop editing node and commit changes	Enter, Esc
Change of focused node	Arrow keys
Context menu on extension point	Enter
Select node to add from context menu	Key 1-6
Select All Nodes	Ctrl + A
Print	Ctrl + P
Undo last operation	Ctrl + Z
Redo last undo	Ctrl + Y
Copy selected nodes to clipboard	Ctrl + C
Cut selected nodes to clipboard	Ctrl + X
Paste nodes from clipboard	Ctrl + V
Mark node as comment	Ctrl + K
Remove marking of node as comment	Ctrl + M
Display print margins	Ctrl + B
Drag & Drop move of nodes	Drag selected nodes by mouse to extension point
Drag & Drop copy of nodes	Drag selected nodes by mouse to extension point while holding Ctrl key
New line in node text	Ctrl + Enter
Autocompletion	
Show autocompletion window in edit mode	Ctrl + Space
Hide autocompletion windows	Esc
Show info about function parameters	Ctrl + Shift + Space
Show quick info	Ctrl + I

Tab. 34: Flowchart showcuts

9.3.6. Search and replace

When creating a logic with the planer, existing projects and their functions, variables, etc are often accessed, which are copied to the new project and then adjusted according to the requirements.

This method makes work a lot easier and helps you to save time. It reduces the risk of errors compared to a completely new finalized logic.

The development environment therefore offers the functions Search and Replace in the menu **Edit**.

A more detailed search is possible with the so-called regular expressions, where special characters are used to search for certain character sequences, outside of the usual options.

Replacing is only possible, if the TA logic can be written.

In the menu **Edit** select the entry **Search** / **Replace** or click on the respective symbol in the toolbar.

The **Search** / **Replace** dialog appears.

Enter the character string which you want to search or replace for in the text field **Search after**.

In the text box **Replace by** enter the character string which is to replace the **Search after** character string.

Select the desired search options in the group **Options**.

The following options are possible:

Differentiate between upper and lower case

If this option is activated, only character strings with the exact same notation as the character string searched for are activated (including upper and lower case).

Only whole words

Only character strings which are whole "words" are found in the search run. This means, that the character string found has to be limited by characters, which are not letters, numerals or underscores.

Regular expression

If this option is activated, the character string searched is interpreted as a so-called regular expression (see chapter 9.3.6.1).

Reverse search

This option allows the search direction to be reversed.

From the list box in the group **Search in** select the area where the character string should be searched for:

(all)

The entire TA logic, including the integrated system libraries and user libraries are searched.

Functions,

constants,

variables or

types.

Only the respective definitions in the TA logic, including the integrated system libraries and user libraries are searched.

With the **Code** filed in the group **Search in** select if the search should only take place in the code of the TA logic. If **Code** field is selected, only areas which are included in the created code during compilation, are searched. Descriptions, e.g., are then not searched for.

To search in function bodies (and function arguments) only, select Functions and **Code** in the group **Search in**.

Click **Search** to display the next search result, and then click Replace if necessary, to replace this search result and display the next search result.

– OR –

Click **Search all** to list all search results.

Click **Replace all** to replace the current (if applicable) and all search results.

In both cases, the search results are listed in the window **Search results**. With **Search** the search result may be selected in the respective window, which can be done by double-clicking on the entry in the window Search results.

Please note, that when making changes in the **search** dialog and in the TA logic, the search is reset which means, that with the **Search** button the search starts all over again then.

With **Replace** and **Replace all** the respective entries are added to the window **Search results**.

Please note, that when making changes in the **replace** dialog and in the TA logic, the search is reset which means, that with the **Search** button the search starts all over again.

9.3.6.1. Regular expressions

The search function enables you to enter a so-called regular expression for the character string you are searching for. Regular expressions enable a more complex and more exact search.

There are two types of expressions: Single-character expressions and multiple-character expressions.

"Single-character expressions" are used to compare a single character and are created according to the following rules:

All characters that are not special characters stand for themselves. Special characters are: . $ ^ { [(|) * + ? \

A backslash (\ ) followed by a special character stands for the special character itself. When you enter "*", e.g., "*" is found.

A full stop (.) can stand for any character except for line feed. "Function" finds the character string "Function1", "FunctionA", etc.

A character set in square brackets ([ ]) stands for on character out of the specified set. For example, "[akm]" stands for "a", "k" or "m".

You can use a hyphen to specify a range: "[a-z]" stands for any lower-case letter.

Enter "^" as the first character of a set, to specify a character that does not belong to the set. For example, "[^akm]" means the system will search for any characters except for "a", "k" and "m". "^" loses this meaning when it is not placed at the beginning of a character set.

Multiple-character expressions are created as follows:

A single-character expression followed by an asterisk (*) either means that this single-character expression does not occur at all, or only once, or more times. "[a-z]*" thus either stands for no lower-case letters, one lower case letter, or several lower-case letters.

A single-character expression followed by an asterisk (+) either means that this single-character expression occurs once or than once. Use the character set "[a-z]+" to search for one or more lower-case letters.

A "single-character expression" followed by a question mark (?) either means that the "single-character expression" does not occur at all or that it occurs only once, e.g. "xy?z" would find "xyz" or "xz".

A sequence of single-character expressions stands for the respective character set. Use "[A-Z][a-z]*" to find all character strings that start with an upper-case letter and then contain any number of lower-case letters.

You can also specify a search for character strings that are either at the beginning or the end of row:

If the regular expression starts with "^", then the string must be found at the beginning of a row.

If the regular expression starts with "$", then the string must be found at the end of a row.

9.3.7. Compiling a TA logic

With the compilation, TA logic source code is converted in several steps in an executable code for the simulation or for the controller:

Creating C code: a syntax check and TA logic source code conversion into C source code

Compiling the C source code

Linking the codes to a file, which contains the executable code.

Compilation and linking are carried out with a compiler driver, which is the interface to the C compiler and linker for creating an executable code.

9.3.7.1. Starting compilation

Select **File –/ Compiling TA logic…** in the main menu or click on the respective symbol in the toolbar.

The dialog **Compile TA logic** appears, if you carry out the following instructions:

Target Aimsun.Next or **VISSIM (e.g. Borland C++ 5.0)**

Standard option

If you later wish to use the debugger to perform an error search, select the with log option. The system library used (the controller core) must support logging, otherwise errors will occur during compilation.

Use output directory: Here you can optionally enter a directory to which you want to save the executable code (exe file). In any case, the executable code will be saved as an attachment to the intersection version.

- Click **OK** to start the compilation.

A progress dialog is displayed that allows you to cancel the compilation.

9.3.7.2. Errors during compilation

After completion of the compilation, an information window is displayed showing the number of the errors occurred and warnings.

Please note the following when you use the **with log** option for compilation:

To evaluate the log, you need an unchanged TA logic. Entries are not allowed to be changed, removed or added,

This means, that when changing the TA logic, the correct display of logs, which were created with the original compiled TA logic, cannot not be guaranteed.

After closing the window, you can see the errors and warnings, if they exist, in the message window.

Warnings are information on inconsistencies in the logic, which however are not so severe, that the compilation cannot be carried out.

Errors however cause the compilation to be cancelled. In this case, severe errors occurred, and the EXE file is not created.

Compiler messages are set up according to the schema

(<File> <Row number> <Function>): <Error text>

. <Row number> and <Function> are optional.

As long as a message only refers to one location in the TA logic source code, you can jump to this location by double-clicking on the message. You can now correct the error and carry out the compilation again.

For an error-free compilation, an EXE file for VISSIM is available as an attachment in the intersection version or as a file in the attached output directory. The file name corresponds to the TA logic name, whereas if necessary special characters are replaced by underscores.

9.3.8. Compiling a TA logic for external devices

Use this feature together with system libraries, for example VS-PLUS 6.1. More information can be found in the description of the respective system library.

Select **File –/ Compiling TA logic…** in the main menu or click on the respective symbol in the toolbar.

The dialog **Compile TA logic** appears, if you carry out the following instructions:

Target Aimsun.Next or **VISSIM (e.g. Borland C++ 5.0)**

C export option

Select the **Use output directory** and specify a directory, where the C source code should be written.

Click **OK** to start the export.

The TA logic is compiled for VISSIM and the C source code files exported to the specified directory. The C source code can then be compiled with an external C compiler, to produce code for a controller of a third-party manufacturer.

9.3.9. Test of a TA logic using VISSIM with log

After compiling the TA logic for VISSIM with the option **with log**, you can load the created exe files in VISSIM and carry out a test in Test in steps.

The TA logic is run through once and a log is written to a file about the TA logic process.

The log is evaluated passively, i.e. the debugger does not control program execution (for example by cancelling the program) nor does it have direct access to the program itself (to variable contents which change the program run, etc.). Error search outside of the TA logic source code (e.g. in system libraries) or in real operation on the controller is also not covered.

The debugger can also be used for the documentation of a TA logic test.

To evaluate the log, you need an unchanged TA logic. Entries are not allowed to be changed, removed or added,

This means, that when changing the TA logic, the correct display of logs, which were created with the original compiled TA logic, cannot not be guaranteed.

9.3.9.1. Executing the simulation of the traffic actuation program

You can only use the debugger with VISSIM. Furthermore, a system library (controller core) is required, which supports the debugger.

Compile the TA logic, if you have not already done so, for VISSIM with log (see chapter 9.3.7).

Start the program VISSIM and load the compiled traffic actuated program (exe file).

To do so, you can use the function under Intersection > Simulation parameter.

In the menu select the command **Test/Step**.

Every time you start a test or simulation, a new log file is created (*.TPR) that is saved to the same directory as the EXE file.

Perform a step. The TA logic will be run once. The procedure will be written to the log file (*.TPR).

After analyzing the log files, you can perform further steps and then continue with the analyses.

In the VISSIM program, select the **Test/Stop** command. The log file created at the start will be closed. It is no longer possible to write further logs to this log file.

You can also do the logging (VISSIM) and analysis (debugger) in parallel. The debugger and VISSIM are then "connected" via a log file. In this case the debugger guarantees display of the current log.

9.3.9.2. Monitoring

Each instruction in the TA logic will be monitored in VISSIM regarding the following aspects:

Invalid index when accessing variable fields

Division by zero

Special monitors can be implemented by functions from the system libraries.

Corresponding error messages are displayed on the screen and output in the log.

9.3.9.3. Open debugger log

Proceed as follows:

From the main menu, choose **Log – Open…**, or click the respective toolbar button.

A dialog for file selection is displayed in which you can select the log file.

If you have not copied the traffic actuated program to another folder, the correct file will already be highlighted (last log file in the folder to which the compiled code was saved).

The log file name (*.TPR) consists of the first 5 characters of the TA logic name and a consecutive number with a maximum of 3 digits. The 3 digits are added to the name with a "-". It is incremented by one for each new log file, e.g. KN528--0.TPR, KN528--1.TPR.

When creating a new log file, the system will check for the next file name available from the number 0. It can thus happen that the numbering does not correspond to the sequence in which the files were created.

Example:

Files *KN528--0.tpr*, *KN528--1.tpr* and *KN528--3.tpr* exist. File *KN528--2.tpr* was deleted. The next log file therefore receives the name KN528--2.TPR.

It is not checked whether the log file and TA logic correspond with each other. If you analyse a log file without the corresponding TA logic, you receive wrong results. For instance, wrong identifiers could be listed, or the function body might not match the instruction numbers.

The log file format (*.tpr) was imported into Sitraffic Language without changing it. Still, it is not possible to use the TPR files of Sitraffic Language, since when you import the corresponding Sitraffic Language project, the sequence of the definitions is changed.

Select a log file to display it in window. Besides the log tree it contains the subsections **Info** and **Navigation**.

9.3.9.4. Log information

Information on the open log are displayed in this area of the log window:

from: Date and time of the exe file that generated the log

Logging start: Date and time when logging was started.

Corresponding TA logic: Name of TA logic that was compiled into the EXE file specified under **Created by**.

Generated by: Name of the exe file that generated the log.

Interval per second: Number of intervals per simulation second.

9.3.9.5. Log tree

The log is opened as a log tree in the main section of the log window:

At the bottom of the window you can see the position of the row selected. The interval and the row number within the interval are indicated.

At the top of the window, use the toolbar buttons to activate or deactivate the following options:

Only functions

Function calls only, no results or output values are shown.

Only current functions

Only the current function is shown (where the current position is).

Set current position and jump to

The current position is marked by the symbol in the left margin of the log. If the current position is in an area that is collapsed, this is shown by in the next higher entry visible.

The current position

serves as an orientation help. Click the button to jump back to it any time,

will be highlighted in the structogram,

is linked to the **Log - Navigation** window.

To set the current position

highlight the entry of your choice in the log.

Click .

To jump to the current position,

Click .

The log is positioned, so that the current position is visible. In addition, the structogram will be opened, showing the current position.

9.3.9.6. Log navigation

You use this section of the log window to move within the log time periods.

The values show the current position (see chapter 9.3.9.5).

Change values

Click the relevant spin boxes to change their values.

The values are counted forwards or backwards.

- OR-

Enter a new value in the spin box.

Click the **Apply** button to confirm your entry and set the current position.

Interval

An interval is each program run. The current interval, i.e. the interval on which the current position lies, is determined by

Interval no.: consecutive number of the interval

Time: The consecutive number of the interval is converted into hours, minutes and seconds.

The time in seconds results from the consecutive number divided by the number of intervals per simulation second (momentarily always an interval per second). The time "00:00:00" is assigned to the first interval.

- tx: This field contains the time switch for the set interval. The entry is carried out in seconds with a decimal place. An entry can change the current interval within the "cycle".

A cycle is created by a number of intervals, whose time switch is ascending.

Monitoring

This spin box only contains a value, if the current position is set to triggered monitoring (see chapter 9.3.9.8).

In this case, the spin box will contain the consecutive number of the triggered monitoring within the log (otherwise 0 will be displayed).

9.3.9.7. Showing the structogram or flowchart of the current position

When you correct errors, it is often helpful to correct erroneous functions in the structogram or flowchart.

When you set the current position in the log tree or the navigation section, this opens the relevant structogram or flowchart and highlights the current position.

To later jump back to the current position in the structogram or flowchart, click the button in the main section of the log window.

A structogram or flowchart is only then displayed, if the current position is in a function of the source code in the TA logic of an intersection.

9.3.9.8. Analysis of the program run

The log tree in the main window of the log window will be explained with different examples below:

9.3.9.8.1. Interval

You will find information on the interval on the highest level of the log tree. An interval is a run of the traffic-actuated program:

Consecutive number of the interval:

The intervals are numbered starting with 1.

Time (in brackets):

The consecutive number of the interval is converted into hours, minutes and seconds.

The time in seconds results from the consecutive number divided by the number of intervals per simulation second (momentarily always an interval per second). The time "00:00:00" is assigned to the first interval.

Time switch (tx):

This specification displays the time switch state.

9.3.9.8.2. Executed instructions

The information on the instructions carried out are chronologically. Only values on actual carried out operations are displayed.

Example:

For instructions

FRAME_PLAN(5,STA,ALLOWED)=1

OR

((FRAME_PLAN(1,OEVVERL,ALLOWED)

OR

FRAME_PLAN(1,OEVVERL,NOT_ALLOWED)=1)

AND lag<>0 AND dem5=0)

the following values are displayed:

FRAME_PLAN (5, 0, 1) (0x05, 0x00, 0x01)

Result: 0 (0x00)

FRAME_PLAN (1, 4, 1) (0x01, 0x04, 0x01)

Result: 0 (00h)

FRAME_PLAN (1, 4, 0) (0x01, 0x04, 0x00)

Result: 1 (0x01)

lag: 0 (0x00)

No value is shown for dem5, since the condition lag<>0 is not fulfilled and thus the second operator dem5=0 of the AND operation cannot be utilized.

Display of identifiers:

Identifiers are not saved in clear text in the log, but as references to the TA logic. The identifiers in clear text are determined via the opened TA logic.

If an identifier could not be determined, e.g. because the TA logic does not belong to the log or was changed, a question mark and a reference are displayed instead of an identifier, e.g.

? 53 (1) (0x01)

instead of

Init function(1) (0x01).

9.3.9.8.3. Information on the instructions carried out

Information on the instructions carried out consists of the following:

Instruction number

Function call

Function end and

Variable/parameter content

Monitoring is added after certain criteria

Instruction number

Each instruction is assigned the consecutive number of the instruction within the interval (row **Instruction in the interval**) and within the function body (row **Instruction in function**). The latter are displayed in the structogram.

Function call

The instructions carried out within the function are one level beneath the function call and are connected with a vertical line. By tracing back, the vertical line you can determine the function call.

It is apparent that function **ST_INFO** was called from the **Main function** and **UserInit** was called from ST_INFO. In **UserInt**" instructions 1, 3, 4, 5, were executed.

The values transferred to the functions are displayed in brackets. The values of output variables are displayed before being executed. The values are also stated as hexadecimal.

Function end

If a function supplies a result or an output variable, these are displayed at the end of the execution:

Result: <Value> (<Value hex.>)

Output: <Value of the output variables>

`Result` is only displayed, if the function really provided a result.

`Output` is only displayed from functions which have output variables. The output variable values are only displayed after the function call.

The values are also stated as hexadecimal.

`<Value>` displays the function result as a decimal number,

`<Value hex.>` supplies the result as a hexadecimal number with the prefix "0x".

In the above figure, function call `OEV_WERTE_HOLEN (5, 0)` supplies the result `0`.

Variable/parameter content

Variable and parameter content are displayed according to the following schema:

<Identifier>: <Value> (<Value hex.>h)

<Identifier> specifies the name mentioned in the instructions.

<Value> illustrates the content of the variables or the parameter as a decimal number, <Value hex.> as a hexadecimal.

Variable accesses or parameter accesses which occur more than once in the instruction, are displayed multiple times.

For variables which are set via an assignment, the content is displayed after the assignment.

Variables which are transferred to functions as output variables, are not displayed. In this case, the content is evident from the function call

When accessing parameters, variable fields and variable groups, only the subordinate identifier is displayed. Further access (index, element of a variable group, etc.) is not illustrated.

Complete access can be determined by the structogram or flowchart window. To do so, set the current position to access in the log window. This makes the current instruction which contains the access, visible in the structogram or flowchart.

9.3.9.8.4. Monitoring

Each instruction in the user code is monitored during execution. A message is displayed according to the following schema when monitoring is activated:

Monitoring no. <Consecutive no.>: <Activation cause>, <Reaction>

Example:

Monitoring no. 1: Invalid index: 33, program cancelled

It concerns monitoring no. 1.

The invalid index 33 was used here, while accessing a variable field.

As a reaction the program was cancelled.

Possible causes for activating monitoring

Invalid index

A variable field or a parameter were accessed with a valid index. The index it is either smaller than zero or larger/equal to the size of the field. The traffic actuated program is cancelled prior to execution of the invalid access.

Division by zero

Division by zero was carried out the traffic actuated program is cancelled.

Invalid function call

An invalid call of a function was executed from a system or traffic engineering system library. Monitoring is carried out by the called function, i.e. the type of monitoring depends on the function.

Possible reactions due to monitoring

The program is cancelled before the invalid operation is carried out.

As a <Reaction> Program cancelled is reported.

The program is running.

As a <Reaction> Program running is reported.

When activating monitoring

Invalid index and

Division by zero

the traffic actuated program is always cancelled.

The reaction of the called function is determined for an invalid function call.

9.3.9.9. Saving logs

If you change the TA logic, the log which has been created cannot be called, because the references do no longer correspond to the TA logic.

In this, it is recommended to delete the log. Deleting prevents you from later opening an old, not up-to-date log by mistake, resulting in incorrect results.

If you want to continue accessing the log, copy the log files and export the intersection to another directory. Subsequent evaluation is thus possible.

Then delete the log file connection in the original directory.

9.3.9.10. Printing logs

You can print out any part of a log.

Mark the desired rows in the log tree.

Keep the Shift key pressed while marking the rows, either with the "down / up" button or by mouse click.

Keep the Shift key pressed and click to either select or deselect individual rows.

When marking non-continuous areas please note, that this case is not apparent at first sight and can thus lead to misinterpretations.

Click **Print** or the **Page preview** icon in the log window.

The selected log area of the is printed or shown in the page preview. The beginning of the printout contains the **log information**.

9.3.10. TA logic documentation

9.3.10.1. Overall documentation

In the **file** menu of the TA logic editor, select **Print** or **Page preview**.

If instead this menu point **Press selection…** and **Page preview for selection…** appears, complete rows have not been selected in the definition lists (functions, constants, variables, types).

Undo this selection by clicking in the respective definitions list, to create an overall documentation.

The following information is documented:

TA components

The TA system libraries and TA user libraries selected under **Intersection version / General** are listed here.

The last entry defines the TA logic itself.

Modules

This list shows source code and C source text modules of the TA logic (without selected TA components).

Definitions – Overview

All TA logic definitions itself (without selected VA component) are listed here alphabetically.

Details on each definition can be found in the following lists **Functions**, **Constants**, **Variables** and **Types**.

Functions, **constants**, **variables**, **types**

These lists contain TA logic definitions itself (without selected TA components) in alphabetical order.

Please note, that the structogram of the functions are output at the end of the documentation.

Descriptions

For each definition of the TA logic itself (without selected TA components) - if available – the description is documented alphabetically.

Structograms or flowcharts

For each TA logic function itself (without selected TA components) the structogram or flowchart is displayed.

Please note, that this point does not apply for a password protected TA logic.

9.3.10.2. Individual documentation

To document individual definitions:

Select the entire row in the definition lists (functions, constants, variables, types) with a left mouse click in the marked column. Keep the Ctrl button pressed while clicking, to execute multiple selection.

Select **Press selection…** or **Page preview for selection…** in the **file** menu of the TA logic editor.

If instead this menu point Printing and Page preview appears, complete rows have not been selected in the definition lists (functions, constants, variables, types). In this case check the selection.

The following information is documented:

Functions, **constants**, **variables**, **types**

These lists contain the selected definitions in alphabetical order.

Please note, that the structogram or flowchart of the functions are output at the end of the documentation.

Descriptions

For each definition of the TA logic itself (without selected TA components) - if available – the description is documented alphabetically.

Structograms or flowcharts

The structogram or flowchart is displayed for each selected function from the TA logic itself and non-password protected user libraries.

9.4. User libraries

User libraries

allow you to create libraries with often required functions,

like system libraries have a name, a four-digit version number and are language dependent,

can be selected like system libraries under **Intersection version > General** for application in a TA logic.

9.4.1. User libraries in the object tree

The existing user libraries can be found in the object tree, divided into the following levels:

User libraries

This is the root element for all user libraries.

User library

The names of the existing user libraries are displayed on this level.

Version

This level describes the first two positions of a user library version.

TA logic (in the detail view)

This level in the detail view illustrates the TA logic of a user library version.

The TA logic at the same time contains the sub version and the language setting of the user library.

9.4.2. Creating a user library

To create a user library, proceed as follows:

- Select **new user library** in the context menu of the entry **User libraries** in the object tree
- Enter the name of the user library in the following dialog.

A new user library entry is created.

- Select **new library version** in the context menu of the new user library entry.
- Enter the first two positions of the version in the following dialog.

A new version entry is created.

- Select **new library version** in the context menu of the new version entry.
- Enter the last two positions of the version and the language (see chapter 9.4.5).

A new TA logic entry is created and opened in the TA logic editor.

A version entry or subversion entry / TA logic entry can be added in the same way to existing user libraries.

You can now edit the TA logic of the created user library as described in the next chapter.

9.4.3. Editing a user library

Under **User libraries / User library / Version** in the object tree, select a user library version and double-click in the detail view on the TA logic with the desired subversion and language.

In the opened TA logic editor, the user library can be edited similar to the TA logic of an intersection (see chapter 9.3.4). Because no system and user libraries can be linked, the following procedure is recommended:

Create an intersection / an intersection version for editing and testing the future user library.

Configure this intersection version according to the future implementation of the user library. Especially select the components, i.e. system and user libraries. Ideally create a "real" intersection with the functions of the future user library.

This allows the future user library to be tested extensively under VISSIM. It is also enough, to create a "dummy" intersection, which does not have to be compiled.

Create a new source code module in the development environment of the intersection version, which will contain the content of the future user library.

Create the functions of the future user library in this source code module.

Test the validity of the source code of the future user library. Make sure that there are no "incorrect identifiers" available.

If you edit a "real" intersection, you can compile the TA logic and later on under VISSIM test it together with the functions of the future user library.

After having created and tested the user library, copy the source code module into the clipboard in the actual user library.

9.4.4. Protecting a user library

Accessing a TA logic can be protected with a password. Active password protection only allows read-only access and the structograms or flowcharts cannot be viewed.

This is how you protect a TA logic with a password:

In the main menu of the TA logic editor select **Edit – Change password…**

Enter a new password in the following dialog.

The password can be changed in the same way. To do so, enter the old password and the new password.

Note, that the password will only be changed after transferring the changes of the TA logic and saving them in the main window of Yutraffic Office. This means, that if you discard changes in the TA logic or altogether, the old password remains.

A password is requested when opening a protected TA logic. Enter a password to enable the access or click on **Read** for protected access.

9.4.5. Multilingual user libraries

User libraries of a certain version can like system libraries exist in several languages. This allows you to create descriptions in the TA logic of the user library in several languages.

You can currently choose between German and English.

To create a multi-lingual user library, proceed as follows:

First complete a user library sub-version (TA logic) in the main language.

Create a new TA logic with the same subversion for each foreign language.

Copy the source code modules from the main language to the TA logic of the foreign language.

Compile the descriptions in the TA logic of the foreign language.

This procedure ensures that the TA logic code is identical for every language and only the descriptions are different.

When using a multi-language user library in the TA logic of an intersection, the TA logic of the user library is selected by the language setting under **Settings – Language – TA logic** in the main menu of Yutraffic Office. If no TA logic exists for the language set there, the first TA logic of the user library is used.

9.4.6. Exporting a user library (*.soa)

Proceed as follows:

Select **Export…** in the context menu of a user library version in the object tree or in the context menu of a TA logic in the detail view.

Select the file.

All TA logics of the selected user library version are exported to the target file. The file can now be transferred and imported onto another computer.

9.4.7. Importing a user library (*.soa)

Proceed as follows to import a user library with the original name:

Select **Import…** in the context menu of the **User libraries** in the object tree.

Select the import file.

All TA logics of an existing user library with the same name and version are replaced by the imported TA logic and cannot be restored.

Proceed as follows to import a user library to a certain user library entry:

Select **Import…** in the context menu of the desired user library entry in the object tree.

Select the import file.

All TA logics of an existing user library version with the same version are replaced by the imported TA logic and cannot be restored.

9.5. System libraries

System libraries

provide controller and control method functions,

have a name, a four-digit version number and are language dependent,

cannot be modified,

are part of AWP components, which are selected under **Intersection version / General** for the application in a TA logic.

Which system libraries are required, depends on the controller type and the desired control method.

9.5.1. Importing system libraries

To use system libraries, these have to be imported as part of components (see chapter 4.17.1).

9.5.2. Multilingual system libraries

The system libraries, i.e. the contained descriptions, are multilingual.

When using a system library for TA logic of an intersection, you can select a language. To do, from the Yutraffic Office menu, select **Settings – Language – TA logic**. If the language chosen is not available in the system library, the standard language (e.g. English) will be set.

9.6. Language reference

The following section describes the language elements of the TA logic.

9.6.1. Identifiers

Identifiers are the names of definitions (functions, constants, variables, types), function arguments, elements of complex types and user parameter structures.

The first character of an identifier must be a letter (a to z or A to Z) or an underscore (_). The name can further consist of numbers (0 to 9).

In Yutraffic Office the maximum length of an identifier and other names is 250 characters. However, you should avoid creating identifiers any longer than 28 characters. When the TA logic is compiled a differentiation between the identifiers is only guaranteed up to a length of 28 characters.

Upper- and lower-case spelling

When creating identifier, you distinguish between upper- and lower-case spelling. The spelling convention for identifiers of system libraries is upper-case letters, e.g. PT_DEM_DET.

Words not permitted

Keywords, i.e. names of data types and operators, e.g. WORD, AND or PARA (used for parameter definitions) must not be used as identifiers.

For a list of keywords, see chapter 9.6.18.

9.6.2. Simple types

Integer types

The integer types "byte", "word" and "long word" can be divided into signed and unsigned integer types:

Type	Keyword	Required memory	Range
Unsigned byte	BYTE	1 byte	0 to 255
Unsigned word	WORT	2 bytes	0 to 65535
Unsigned long word	LWORT	4 bytes	0 to 4294967295
Signed byte	VBYTE	1 byte	-128 to 127
Signed word	VWORT	2 bytes	-32768 to 32767
Signed long word	VLWORT	4 bytes	-2147483648 to 2147483647

Tab. 35: Integer types

You can enter the value of an integer type as a decimal or hexadecimal number (preceded by a '0x' or optionally with a negative sign).

Data type floating decimal (GLKOMMA)

You can only utilize the data type GLKOMMA if it is supported by the system libraries used.

Because there are no system libraries available momentarily with such a support, you should not use the data type GLKOMMA.

A floating decimal value consists of the following parts:

Sign (optional)

Decimal number with a point

Exponent of the base 10 (optional) with a sign (optional).

The memory space required, and the value range depend on the system libraries used.

Example

-10.0

12.34E5 = 12.34 x 10^{5}

52.1E-2 = 52.1 x 10^{-2}

The weighting of data types differs and is specified according to the following rank order:

9.6.2.1. Weighting of data types

For an operation with operators of different data types, the data type with the lower weighting is converted into one of a higher weighting.

The following list shows the rank order of data types. The data type with the highest weighting is the first on the list:

1. Floating decimal

- Unsigned long word
- Signed long word
- Unsigned word

- Signed word
- Unsigned byte
- Signed byte.

9.6.3. Functions

Functions are used to create the source code. They consist of a function head and a function body. It is not possible to access the function body in system libraries and password-protected user libraries.

The function head contains the following information:

Name (Identifier)

Type of result (simple data type)

Argument list (name, type, input or output).

The function head contains the logic in a structured form (see chapter 9.6.8).

9.6.4. Constants

Constants are used to assign identifiers fixed values.

They contain the following information:

Name (Identifier)

Type of value (simple data type)

Value.

You can access a constant via its name.

9.6.5. Variables

Variables are placeholders for data that might change during runtime. The variables of system libraries may be write-protected.

They contain the following information:

Name (Identifier)

Type of data they contain

Dimensions list.

The data type may be a simple or a complex (see below).

You can use dimension lists to define variable fields. For each dimension the size is specified as a constant expression.

You can access variables according to the following schema:

Name (Identifier)

Index in brackets for variable fields

Element names with prepending point, if the type is complex.

Indices start at 0. They are not checked for validity, unless the debug function is activated for VISSIM.

9.6.6. Complex types

Complex types include several structured data types.

They contain the following information:

Name (Identifier)

Element list (name, type, dimension list).

Complex types are used as a variable type. This means you access them indirectly via the variable defined (see above).

9.6.7. User parameters

User parameters are defined outside of the TA logic in the object tree under **Traffic actuated (TA) / User parameters**.

Access on a user parameter is carried out according to the following schema:

Keyword PARA

optional ".instanz" or ".global" with consecutive space

Sub module name

Group: Index in brackets or name with prepending point

Parameter: Index in brackets or name with prepending point.

A parameter index can only be specified if all parameters have the same type.

The group and parameter indices start at 0.

9.6.8. Function bodies

In the function body you define the logic as structogram. Function bodies in the source code files can be edited by the user. You cannot access the function bodies in the system library and password protected user libraries.

Function bodies can contain the following control structures:

Conditioned intersection

Count loop

Conditioned loop

Furthermore, the following instructions are possible:

Instruction

Function end

Comment.

Comments appear in the flowchart in the form of commented-out instructions. That is, no "real" comments like in the structogram exist in the flowchart.

Compared to the instructions, the control structures can in turn contain further control structures and instructions whereby the structogram is produced.

9.6.9. Conditioned intersection

This control structure consists of two parts, of which only one is executed:

The yes-instruction block is executed when the result of the condition is "true" (unequal 0).

The no-instruction block is executed when the result of the condition is "false" (equal 0).

9.6.10. Count curve

A variable and its start and end value (as an expression) are specified for this curve.

The variable is set to the start value and increased by 1 after each curve cycle. The curve ends when the end value has been reached.

9.6.11. Conditioned curve

The control structure 'Conditioned curve' consists of an expression which is requested and an instruction block.

The instruction block is carried out until the specified expression is "false" (result equal to 0).

The expression is requested before executing the instruction block. An instruction block can be executed 0 to n times.

9.6.12. Expression

An expression consists of operators combined with values, accesses made to contents, variables, user parameters and function calls. For details on accesses and calls, refer to the sections on constants, variables, user parameters and functions.

In the simplest case, an expression consists of only one access or function call without an operator.

9.6.13. Constant expression

A constant expression only contains values and constants. At certain positions, e.g. for a constant value, only constant expressions are allowed.

9.6.14. Operators

Operators can be assigned to five different categories:

Arithmetic operators

Comparison operators

Logical operators

Bit operators

Assignment operator.

Direction and rank order of the operators depend on the category (see chapter 9.6.14.6).

9.6.14.1. Arithmetic operators

Each arithmetic operator requires two operands.

The result is of the higher weighted operand type.

Addition (Op1 + Op2)

Subtraction (Op1 - Op2)

Multiplication (Op1 * Op2)

Division (Op1 / Op2).

The result of an integer division is always rounded down (9.9 = 9).

Another rounding procedure has to be realized via a function call.

Modulo (Op1 MOD Op2)

Calculation of the carryover from the division of the operand.

A spill of the results of arithmetic operations (value too high/too low) is not monitored.

9.6.14.2. Comparison operators

Each comparison operator works with two operands, the result is of type *Byte unsigned*.

If the comparison is true, the result is 1, otherwise it is 0.

larger (Op1 > Op2)

larger / equal (Op1 >= Op2)

smaller (Op1 < Op2)

smaller / equal (Op1 >= Op2)

unequal (Op1 < Op2)

equal (Op1 = Op2).

9.6.14.3. Logical operators

An operand whose value is equal to zero is "false". An operand whose is unequal to zero is "true".

The result of a logical operation is either *0* or *1* and of type *Byte unsigned*.

Und link (Op1 AND Op2)

If the 1. operand is "false", the 2. operand is not evaluated.

The result is 1, if both operators are "true". Otherwise the result is 0.

Or link (Op1 OR Op2)

If the 1. operand is "true", the 2. operand is not evaluated.

The result is 1, if at least one operator is "true". Otherwise the result is 0.

Negation (NOT Op1)

If the operand is "true", the result is 1 and 0.

9.6.14.4. Bit operators

These operators can only be applied to integer types. The result is of the higher weighted operand type (for "shift left" and "shift right", it is the type of the first operand).

And (`Op1 BAND Op2`)

The first operand is linked to the second operand. In the result, a bit is set to 1 if the respective bit is 1 for the two operators.

Or (`Op1 BOR Op2`)

The first operand is linked to the second operand with a bit OR operator. In the result, a bit is set to 1 if the respective bit is 1 for at least one of the operators.

Exclusive or (`Op1 BXOR Op2`)

The first operand is linked to the second operand with a bit exclusive OR operator. In the result, a bit is set to 1 if the respective bit is 1 for only one of the operators.

Complement (`BNOT Op2`)

The bits of an individual operand are complemented, i.e. each 0-bit is set to 1 and each 1-bit is set to 0.

Shift left (`Op1 BLEFT Op2`)

The bits of the first operand are shifted to the left by the number of bits of the second operand.

Shift right (`Op1 BRIGHT Op2`)

The bits of the first operand are shifted to the right by the number of bits of the second operand.

9.6.14.5. Assignment operator

You can use the operation

Op1 := Op2

to set a variable.

You can only put an assignment operator at the first position of an instruction.

The first operand must be a variable.

The second operand specifies the value assigned to the variable.

9.6.14.6. Rank order of operators

Operators can be divided into categories with a specified direction and can have a different rank order within an expression.

If an expression has operators of the same category, it is interpreted in a certain direction (left-to-right or right-to-left).

Operators of different categories are interpreted according to their rank order as listed in the following table (the operator with the highest rank is listed first):

Category	Direction
NOT, BNOT	Right-to-left
*, /, MOD	Left-to-right
+, -	Left-to-right
BLEFT, BRIGHT	Left-to-right
<, < =, >, >=	Left-to-right
=, < >	Left-to-right
BAND	Left-to-right
BXOR	Left-to-right
BOR	Left-to-right
AND	Left-to-right
OR	Left-to-right
:=	Right-to-left

Tab. 36: Rank order of operations

By bracketing parts of the expression (round bracket), you can change the sequence. Nested bracketing is allowed.

9.6.15. Instruction

An instruction consists of an expression.

9.6.16. Function end

A function end is used to finish a function, the following instructions are then no longer considered.

An expression is specified whose result is given by the function. For functions that do not supply any results, this expression is omitted.

9.6.17. Comment

A comment contains any text that is not used by the compiler. It allows you to describe the logic entered and thus later comprehend it more easily.

Comments appear in the flowchart in the form of commented-out instructions. That is, no "real" comments like in the structogram exist in the flowchart.

9.6.18. Keywords

Keywords are names used for data types and operators. They must not be used as identifiers.

List of keywords:

9.6.18.1. Data types

BYTE

WORT

LWORT

VBYTE

VWORT

VLWORT

GLKOMMA

9.6.18.2. Parameter access

PARA

9.6.18.3. Operators

AND

OR

NOT

BAND

BOR

BXOR

BNOT

BLEFT

BRIGHT.

9.6.18.4. Access to output variables in the function body

AUSG.

10. Central Intersection Data

The central intersection data is the connection between the actual intersection data (i.e. of an intersection version) and the central configuration of Yutraffic Scala.

When processing central intersection data, the system will also resort to data of intersection versions. The versions of central intersection data show the states of this supply data. A version of central intersection data always has a reference to an intersection version. This is the central intersection version used by the Yutraffic Scala.

All versions of central intersection data are grouped under the element **central intersection data** (unversioned). In addition, general data is grouped under **General** (unversioned).

Yutraffic Scala will always use the referenced intersection version in the central intersection data (inventory), even if it is not (or no longer) in the inventory.

10.1. General (central intersection data unversioned)

Applied from the intersection data.

10.2. Versions of the central intersection data

Yutraffic Scala will use the version in the inventory. Currently, Sitraffic S4 takes care of workflow status management and versioning. This is why you cannot create new drafts or add a DRAFT to the INVENTORY in Yutraffic Office.

10.2.1. Signalization

10.2.1.1. EPS signalization program

In general, there are two ways to control controllers remotely from a traffic computer center:

Signal group remote control (SF)

Advance step control (ASC).

With advance step control, the central computer calls a signal program in the controller. The controller executes it step by step by means of advance pulses or synchronizes it once per cycle by sending a central synchronization pulse.

ASC signal programs are also required for OCIT control. They serve as a connection between the central and local signal program.

When a signal program is run, the range between the pre-hold point and the main hold point is skipped (overflow area). At the advance time the controller waits until the respective advance pulse arrives from the central computer. Once the pulse arrives, the controller continues, and the signal program is processed. Analogously, synchronization is performed.

Besides the name, short name and description, you can also enter the offset and the structure number to the header data and select the local BD signal program. The latter is then displayed write-protected to give you an overview.

In the ASC signal plan editor, you can supply the switch-on point (SONP), the switch-off point (SOFFP), the synchronization point SY (center) and 7 advance times AT (center).

11. Network

Each network may comprise one or several compartments (links). Ideally, the entire city or project is one network.

Within the network, the system also resorts to versioned data.

The versions of a network show the states of its supply data. A version of central intersection data always has a reference to a specific intersection version.

All versions of the network are grouped under the element **Network** (unversioned). In addition, general data is grouped under General (unversioned).

Within a network, you can define lower traffic areas. These can be used by Yutraffic Motion as "motion areas", i.e. you can define or "cut" segments to use them in time-distance diagrams (TDD) and/or online time-distance diagrams (Visu Green Wave in Yutraffic Scala).

11.1. General (network unversioned)

In this Editor, independent of its single versions, the **Name**, a **Short name** and optionally a **Description** are created. The name specified for the network here is also the name which appears in the tree and this name is also specified in the version description.

11.2. Network version

11.2.1. General (network versioned)

The **Name**, **Short name** and optionally the **Description** for each version of the network are set in this Editor.

11.2.2. Simulation parameter - Exporting networks

Prerequisite for the export of a network is that at least one simulation parameter set exists on each intersection, which is assigned to the intersection version used in the network version.

Many elements of the simulation parameter editor dialog for intersections, can be found in the simulation parameter editor dialog for the export of networks.

In the upper section export settings are made:

The **network version** determines, which data set should be exported.

The parameter set n**a**me

The **minimum leg length** defines the length of the route which form the connection to the non-exported part of the network. The input flows are positioned at the end of this route.

Into the **VISSIM file** field, enter the name of an existing VISSIM file (either in file attachment of intersection or network, or available on hard disk) or the name under which you want to save the data. If you choose the **Export…** function for an existing VISSIM file, data import is always adaptive.

With the switch **Use geometry**, the application of the layout plan geometry can be deactivated for the entire network, independent of the settings in the individual simulation parameter sets of the assigned intersections.

In the bottom section of the editing dialog a simulation parameter is selected for each intersection of the network version. If an intersection is selected in the selection list, the respective parameter set is displayed on right. Below the section field for the intersection parameter set, you will find the sections intersection geometry settings and the load line, which were already introduced in the editing dialog for simulation parameters of intersections. If an intersection was locked for writing, the selected simulation parameter set settings can be edited directly.

The program always processes one simulation parameter set of an intersection at a time. This means that before you select another intersection (or before the export), you must first save changes made to the current parameter set.

The minimum leg length and the load line resulting flows are only evaluated for legs "not connected to each other".

When you export networks, in VISSIM the intersections are placed at the coordinate supplied during coordinate measurement for the scaled layout plan. If you use the UTM coordinate system, with zone "North 1", the right and up values will be interpreted as X and Y coordinates (in meters) of the intersection in the VISSIM network. It is your responsibility to make sure that the intersection positions supplied in the scaled layout plan correspond to the partial route lengths of the network definition.

If you want to export a network, it is necessary that the exit and approach sections of the partial routes correspond to the exit and approach sections of the intersections linked by the partial route, otherwise a message is displayed, and export is cancelled.

The ANM network model which is used for the export of a network to VISSIM, only allows route sections for partial routes. Therefore, only one partial route section should be supplied in Yutraffic Office, where possible. If it is not possible, at least the number of lanes have to be the same in the first and last partial route section. The other sections between these two partial route sections will be not be included in the export to VISSIM. Furthermore, it is necessary to ensure that the number of lanes in the last exit section correspond to the number of lanes in the first partial route section and the number of lanes in the first approach section. If required, exits or approaches have to be extended with another section of a length of 0.

To avoid that lanes which are restricted to a specific vehicle type (e.g. tram tracks or cycle lanes) are used by other types of vehicles, separate routes are created when exporting the data to VISSIM. If there are tram tracks or cycle lanes in the last exit section or in the first approach section, they also have to part of all partial route sections and the opposite end of the partial route. For example, if a cycle lane ends or starts along the partial route, this has to be included in the exit or approach section and not in the partial route sections.

11.2.3. Default network version

When you create an intersection, you can copy global defaults into it. You can change these defaults according to the intersection version whenever required. You can also copy global defaults from a newly created or changed template (see chapter 4.8).

11.2.4. Lower traffic areas

A lower traffic allows a large network to be split up into single areas. This makes it clearer and can be structured functional. An area can therefore correspond exactly with a Motion control area.

The Editor **General area data** contains the general described information of an area.

You can call the dialog via the tree entry **Network / Version / Lower traffic area/Motion area / Area# / General**.

are currently not evaluated.

11.2.5. Intersection assignment to the ranges

The single intersections can be selected and exactly one version of this intersection can be added to a range, from all intersections created in the project.

This restricts further editing within the area to each currently open area assigned intersection.

You can call the dialog via the tree entry **Network / Version / Network** definition.

The intersection assignment and its versions can be edited, if changes occur in the system. This ensures that the data is consistent within Office.

On the left side of the Editors there is a list of all known intersections, including their versions in the project. However, not intersections with all their versions can be added, but an intersection version must rather be selected and added to an area.

To do so, an intersection has to be opened in the left area (mouse click on the plus sign) and then the row with the desired version must be selected. The intersection version can then be applied to the area via the arrow (>) between the two display

areas. A version from another intersection can also be added, as this was the case before because another version was raised to the inventory for example.

With the **X** button you can delete the assignment of the intersection selected in the left area. It is not necessary to select the respective assigned intersection version, but it is sufficient to select the intersection or any subordinate intersection version.

In the right section of the editor, the intersections (or intersection versions) are displayed that were assigned to the corresponding area. The desired area can be selected via the tab, above the intersection view. A selected intersection row can be removed via the arrow (<) between the display box. To remove all intersections from the area you can use the button with the double arrow symbol (<<).

If an intersection version that you used has been deleted in the meantime, a dialog appears offering the possibility to select another version of the same intersection.

Every time you change the intersection assignment, you must update the references in the network version. You might also have to check and update segments in any Motion versions affected. A corresponding dialog appears automatically. This may take a few minutes depending on the size of the project. If there is no automatic update, the user has to adjust all references manually. To do so, switch to the respective General editor. In the general editor, the Update reference icon is automatically activated, if the program recognizes that an update is necessary.

11.2.6. Network definition

Partial routes and those assigned sections and lanes are edited in the network definition. The module therefore has a graphical display of the network. Requirement for this is, that the areas have already been created for the network version and intersection versions have been assigned to the areas.

You can call the dialog via the tree entry **Network / Version / Network definition**.

Network modelling basically carried out by object types

Areas

Intersection

Partial routes

Dependent objects are:

- Legs
- Turning relations
- Lanes

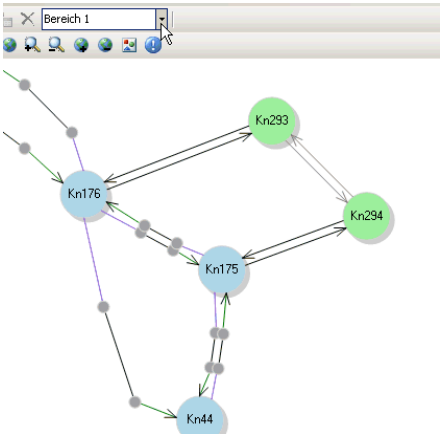
Stops.

The module has comprehensive functions for editing intersections and link elements (e.g. partial routes, network approaches/exits). Editing can be carried out graphically or tabular, and thus enables comfortable operation within the network plan.

Objects which were assigned to the intersection topology, i.e. legs, turning relations and the partial routes which correspond to the intersection approaches and exits, are not edited. The latter are applied from the intersection topology to the partial route definition.

11.2.6.1. Areas

Via the list box **Selection for areas,** a single area can be emphasized graphically. The intersections of the selected area are colored green. All intersections which do not belong to the not selected areas are colored blue (or according to the **Options** dialog).



Img. 6: Network Definition - Select area

11.2.6.2. Intersections

The intersection version selected in the intersection assignment must be inserted and positioned.

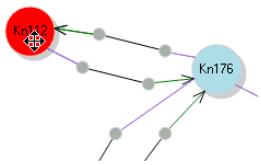
Insert intersection

The intersections of the network version have to therefore first be placed on the network plan. With the mouse, point to the respective position in the network plan and select the intersection via the context menu **Selection Intersection (Version)**.

The newly selected intersection appears on the plan.

Positioning intersections

Intersections can be moved to any position on the network plan. Select the intersection by (left) mouse click and with the cross cursor move it by keeping the left mouse pressed.



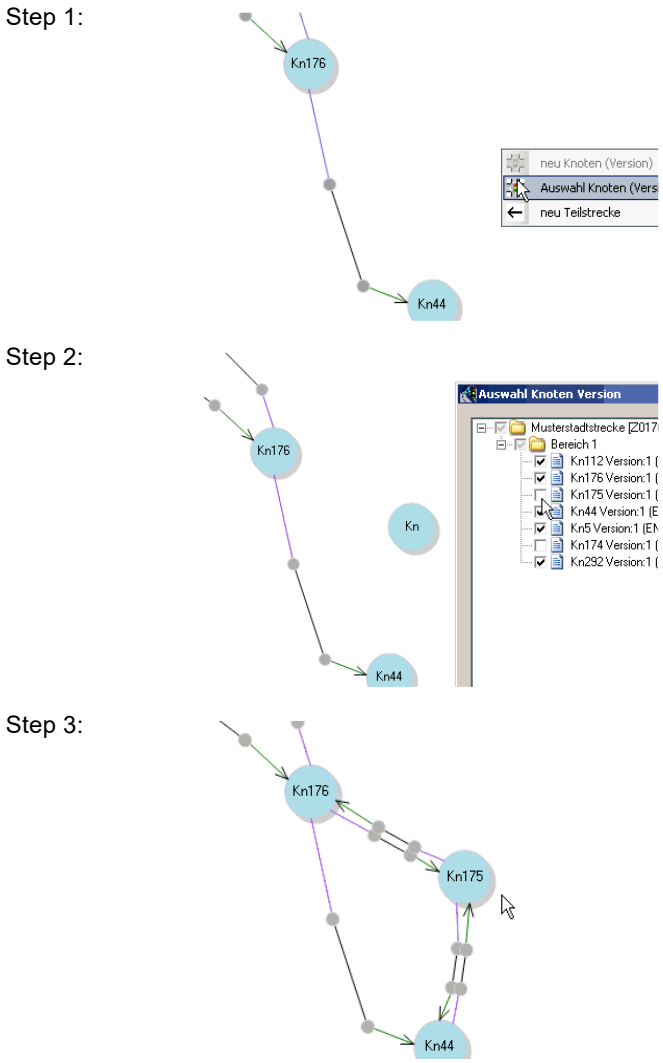
Img. 7: Network definition - Moving intersections

Delete intersection (from network plan)

Intersections can be "deleted" from the network plan via the selection dialog **Remove display intersection**. Only the display in the network plan is deleted and not the intersection or the intersection assignment. Make sure that the position information from the network plan has been deleted.

Selection dialog "Selection intersection (version)"

More than one intersection can also be selected simultaneously or deleted from the network plan, via the selection dialog **Selection intersection (version)**.



Img. 8: Network definition - intersection selection

The newly selected intersections in this case appear to be moved by default, diagonally to each other on the network plan.

11.2.6.3. Partial routes

The network model "driving routes" consist of partial routes and turning relations (in terms of turning partial routes). Both are direction based and represent the routing.

Partial routes by definition are either found between intersections or partial intersections. They are either a "network approach" from the network boarder onto an intersection or lead from an intersection to a network border ("network exit"). Network exits and approaches are also partial routes in terms of the following description.

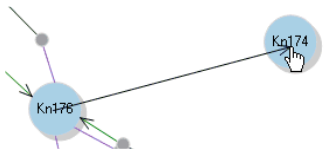
The link between the partial routes / turning relations and the intersections (signalized and unsignalized) causes the illustration of the network. This link is made via the so-called "legs".

Per definition partial routes cannot be successive. Accordingly, there is always only one partial route between intersections in each direction. More precise modelling of the routing is executed via the sections of a partial route (or a turning relation).

Partial routes between the intersections are created graphically via the network plan.

Insert partial route

By pressing the left mouse of the hand cursor starting from the start intersection and going to the destination intersection, you can create a partial route. A **Leg selection** dialog automatically appears which can be used to select the start leg and target leg of the partial route.



Img. 9: Network definition - Create partial route

The allocation can be changed subsequently via the partial route list. This, however, only applies as long as no sections have been applied from the intersection approach or exit.

After you enter the start and destination leg, the approaches and exits of the start and destination partial intersections are automatically adopted (see chapter 0) and an additional section, c, is created between them.

A prompt appears of the distance A between the start stop line and the destination stop line. "A" is then used to automatically calculate the length of the partial link section c.

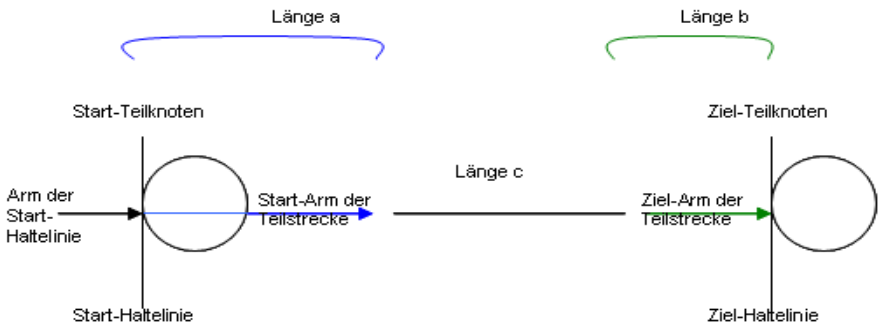
Formula:

c = A - a – b

A = Stop line length from the stop line of the start leg to the stop line of the destination leg

a = Length of the turning relation from the leg of the start stop line to the start leg of the partial route

b = Length exit



Img. 10: Partial route length

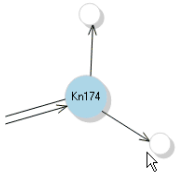
Partial route c remains unchanged when approach and exit data are subsequently transferred to the network.

If there is no return direction, this can be created both manually and automatically. For automatic generation, the legs of the partial route in forward direction as well as the entry of distance stop line to stop line are transferred. Furthermore, the approach and exit sections are also transferred from the partial intersections.

The partial route automatically appears as a check mark in the matrix of the neighboring relation in the respective position in the matrix. The matrix is only used as a display.

Create network exit/approach

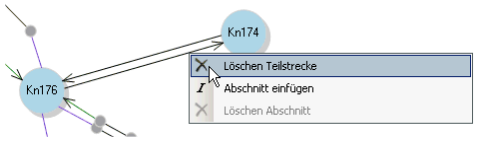
Network exits are created, by creating a partial route without a destination intersection. In order to create a network approach, a graphical object has to first be created via the context menu New partial route, from which the approach is to be drawn from.



Img. 11: Network Definition – Network approach / exit

Delete partial routes

Deleting partial routes is also possible via the network plan. Move the mouse pointer to the partial route in the network plans; select the context menu **Delete partial route** in order to delete the partial route.



Img. 12: Network Definition - Delete partial route

Partial routes details

Double-click the partial route in the network plan to jump to the detail list of the partial route. The selected partial route is focused in the detail list.

A partial route can be selected in the network plan (highlighted) from the detail list of the partial route. To do so, click in the respective partial route in the list.

Table network definition – Partial route list

Here you can only create partial routes and section via the graphics. Click the **Add lane** and **Delete lane** or go to the context menu if you want to create or delete additional lanes for sections which have not been transferred from an exit or approach.

Name	Name of the partial route.
Short Descr.	Short description of the partial route
Start intersection (read only)	Start intersection version of the partial route
Start leg(read only, if the sections were applied from the intersection exit)	Start leg of the partial route
Destination intersection (read only)	Destination intersection version of the partial route
Destination leg (read only, if the sections were applied from the intersection exit)	Destination leg of the partial route.
Length (read only)	Length of the partial route in meters. Results in the sum of the length of all sections.

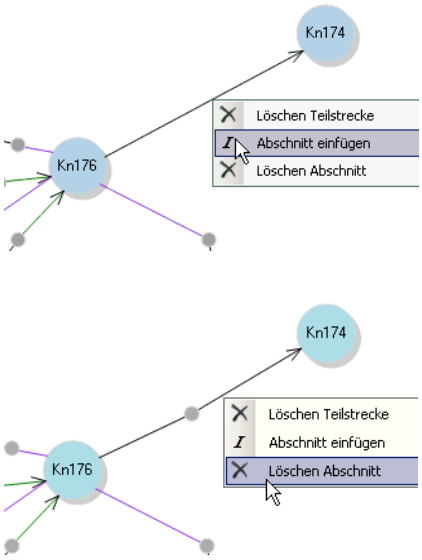
Tab. 37: Network definition - partial route list

11.2.6.3.1. Partial route sections

Lane extensions and restrictions within a partial route are modeled via separate sections. A partial route usually consists of three sections, provided that an intersection topography is available in the respective intersection versions, and these are transferred. The three sections are exit (Intersection A, read only) – a standard partial route section (editable) – approach (Intersection B – read only).

Partial route sections can be created and deleted via the network plan. To do so, select **Insert section** in the partial route in the context menu.

To delete a section in the context menu select **Delete section**.



Tab. 38: Network definition - Sections

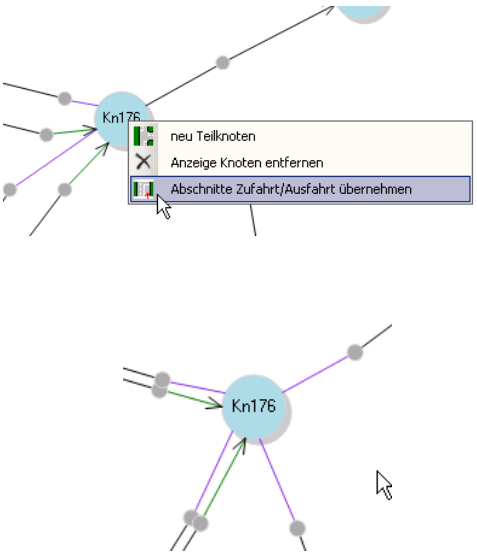
By double clicking on the section in the network plan you can jump to the partial route list, to continue editing the section.

The partial route sections which correspond to the approaches and exits of the intersection topology, can only be edited in the intersection topology and can then be applied to the partial route on demand.

The adopted partial route section can be initiated via the context menu **Accept sections approach/exit**. These sections cannot be changed on the partial route. These sections can be deleted.

The approach sections are displayed green and the exits purple in the network plan.

Note that the approach/exit lanes which have different lengths, when adopted are split into several sections. Sections defined by length in the approach, are automatically adopted with a length of 0m onto the section of the partial route.



Tab. 39: Network Definition - Sections approach/exit

Sections details

Sections which have been applied from the intersection approach or exit cannot be changed.

Name: Section name.

Length: The length of the section in meters.

11.2.6.3.2. Partial route lanes

Each partial link section contains a number of lanes.

These can be edited in the partial route list.

Lanes

Lanes which have been applied from the intersection approach or exit cannot be changed. Except for some fields such as:

"Source lanes" can be edited in the first section of the intersection approach adopted.

Capturing type (not in perspective **Planning Motion**) can always be edited.

"Irrelevant signal group" can be edited in the last section of the intersection approach adopted.

Name	Lane name.
Source lanes (only read in first section)	Lanes of the previous section are available for selection here. You should note that it is possible to select which partially overlaps with the selection in another lane of the section. This restriction is necessary because of internal data modelling. Example: In another lane "FS1; FS2" is selected. It is therefore possible to simultaneously select "FS2; FS3" (in this case "FS2" would be removed from the other lane selection). Selecting from „FS1; FS2“ would also be possible as well as from „FS3“ or „FS3; FS4“ etc..
Marking	Lane marking

Width	Width of the lane in meters
Longitudinal gradient	Longitudinal gradient in [%]. You may enter an integer value between -5% and +5 %.
Queuing area [veh]	Queuing area for turning traffic (number of vehicles).
Capacity [veh/h]	Capacity measured in vehicles per hour.
Flow types	Selection of flow types from „Default intersection version“ of the destination intersection if it is a partial route between partial intersections.
Capturing type **(not in perspective** Motion planning)	
Irrelevant SG	Selection of not relevant signal groups from the subordinate signal group references.

Tab. 40: Partial route lanes

Signal group references

This list cannot be changed.

Signal group references can only be created by adopting sections from the intersection leg. They can thus only be found for the lanes of the last section of a partial link.

SG: Signal group name

Features

Sorting and grouping

Sorting and grouping are not allowed, since the table structure represents a logical hierarchy. It would be lost if you restructured the table (e.g. a vehicle type would no longer be on the level of the lane it was assigned to, etc.).

The filter function is still available.

Partial links:

Division into partial routes of networks and intersections of the intersection versions selected in the intersection assignment.

Partial routes whose basic intersection supply has not been reserved cannot be edited!

Sections

- Approach/exit sections:

  Sections and lanes cannot be edited. Exception: Source lanes of lanes which have been applied from the intersection approach.

- Other sections:

  Lanes can be created, edited and deleted.

Lanes:

If the subordinate section is in "read only" mode, this also applies to the lane. Except for source lanes or approach lanes.

Flow types

- of lanes:

  For partial routes of intersections, the default flow types of the intersection version are adopted.

- of partial links:

  All flow types assigned to the lanes on the partial route are displayed.

of signal groups:

These only exist if lanes were adopted from the intersection approach; they are merely displayed.

Table Network definition – Parameter sets (relevant for Motion)

This list can also be edited in sections of an intersection Approach/Exit which have been applied.

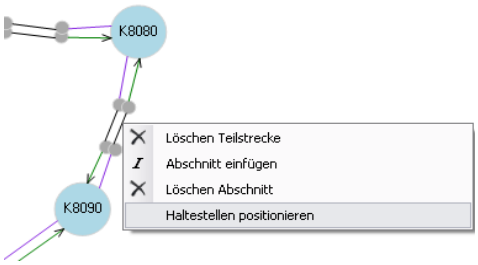
Also see table in the intersection topography.

PRName	Name of the respective partial route
LName	Name of the respective lane
No.	Consecutive number of the parameter set. The parameter set with number 1 must always exist.
Progressive speed	Ideal driving speed for the coordination calculation (in km/h).
Desired direction	Not relevant.
Time demand value	Time demand value which should be used when the signal group capacity is not estimated in s/Veh.
Estimated min. [s]	Specification of the bottom threshold for the estimate.
Estimated max [s]	Specification of the top threshold for the estimate.

Tab. 41:Table Network definition - Parameter sets

11.2.6.4. Positioning stops

This functionality is not offered in the SegmentMode, but in normal network mode. The stops are then automatically applied for a newly created segment. Right-click the desired partial route to open the **Positioning stop** context menu.

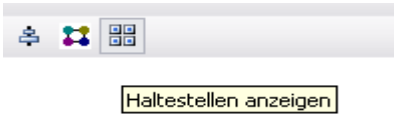


Img. 13: Positioning stop

The **StopDialog** displays the network stops which lie on the partial route.

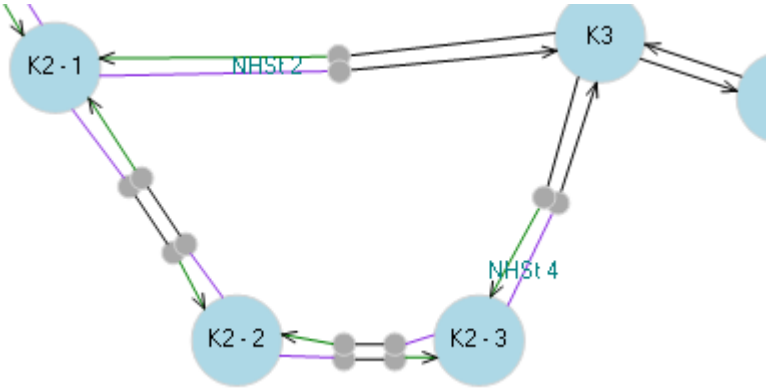
Deselecting stops for the route sections can be done retrospectively in the "Routes" tab (segment mode needs to be enabled).

The selected stops can be displayed via the graphic symbol.



Img. 14: Display stops

The stops are positioned on the respective partial route relatively to the distance entered



Img. 15: Stops on respective partial route

11.2.7. Network objects

This merely concerns objects in the network, which have no reference to an intersection. "Normal" detectors or stops in the intersection area have to be created in the intersection.

11.2.7.1. Network objects - Detectors

The network detectors, which are supplied in Yutraffic Scala, can be read in via an import.

You can open the dialog via the tree entry **Network / Version / Network objects / Detectors**.

Import the file with the network detectors (*Detectors.txt*).

This detector editor is only used to display the existing network detectors.

11.2.7.2. Network objects - Stops

The stops in the network can be edited in the "Stop editor". You can call the editor via the tree entry **Network / Version / Network objects / Stops**.

No.	Number of stops. Should be clear
Short Descr.	Short description of stop
Name	Name of stop must be clear.
Description	Freely editable
Position	Position of stop
Length (m)	Freely editable length of stops in meters
Type	Cap/bay/center.
Waiting time [s]	
Geo. Pos. start (optional)	Position of stop (start).
Geo. Pos. end (optional)	Position of stop (end).

Tab. 42: Network obkects - Stops

PuT lines

PuT lines (line, course, route, waiting time) can be supplied for stops in this subordinate list.

11.2.8. Merging two network versions

Requirements

The network versions use only one intersection version. If this condition is violated, the program will cancel your operation and output a corresponding message. If the network versions have several intersection nodes (i.e. nodes included in both networks), reduce the number of network versions in Yutraffic Office or Sitraffic P2.

Result

The destination network version is expanded to include the data of the source network version (the source network version remains unchanged).

Procedure

In the intersection node, the network version referenced by the destination network version becomes the master for the shared structure.

All network versions that are not included in a destination network version are assigned to this master network version.

If there is an intersection node, then all intersection versions are put in its target area. Otherwise, they are included in the first area (could be the first one that is newly created).

All list objects of the source network version are copied to the destination network version (network stops, lines, network detectors, routes, partial routes, neighbouring relations, flow types).

Segments are copied from the source network to the target network, if the network versions you want to merge are not in the same network.

References around the intersection node (i.e. to the relevant intersection version and its objects) are adapted in the background.

Neighbouring relations of the destination network version are reduced by the intersection node.

Remark:

Old network approaches and exits (replaced during data merger by other intersections using partial routes) are not deleted automatically yet. You have to delete them manually.

11.3. Segments

A segment is a section (a route) from a network (area).

To display segments, they must be selected in the tree view. You can find them under the tree entry **Network**.

A segment always has a reference to a network version, is itself however **not** versioned. All network-specific data lie within the network, the segment itself only has the following objects:

Segment definition: Selection of the intersections, legs, signal groups and PuT direction (is edited via the network definition)

If necessary, offset time and switching time specifications for Motion

Time-distance diagram: Flows within the "route" based on the segment definition and signal programs.

PuT and PrT trips (are only edited via the time-distance diagram).

11.3.1. General

General segment information and the references have to be specified in this editor.

After each network version assignment or the assignment of the intersection version in the network version, the references must be checked, if necessary updated.

The **References** button is automatically enabled as soon as the program recognizes the need for an update.

11.3.2. Simulation parameters - export of coordinats

Prerequisite for the export of a coordination is that at least one simulation parameter set exists on each intersection, which is assigned to the intersection version used in the respective network version.

Many elements of the simulation parameter editor dialog for intersections, can be found in the simulation parameter editor dialog for the export of coordinates.

In the upper section export settings are made:

The **time-distance diagram** specifies which data set will be exported.

The parameter set n**a**me

The **minimum leg length** defines the length of the route which form the connection to the non-exported part of the network. The input flows are positioned at the end of this route.

Into the **VISSIM file** field, enter the name of an existing VISSIM file (either in file attachment of intersection or network, or available on hard disk) or the name under which you want to save the data. If you choose the **Export…** function for an existing VISSIM file, data import is always adaptive.

With the switch **Use geometry**, the application of the layout plan geometry can be deactivated for the entire coordination, independent of the settings in the individual simulation parameter sets of the assigned intersections.

In the bottom section of the editing dialog a simulation parameter is selected for each intersection of the coordination. If an intersection is selected in the selection list, the respective parameter set is displayed on right. Below the section field for the intersection parameter set, you will find the sections intersection geometry settings and the load line, which were already

introduced in the editing dialog for simulation parameters of intersections. Signalization is already specified by the selection of the time-distance diagram and cannot be changed here anymore. If an intersection was locked for writing, the selected simulation parameter set settings can be edited directly.

The program always processes one simulation parameter set of an intersection at a time. This means that before you select another intersection (or before the export), you must first save changes made to the current parameter set.

The minimum leg length and the load line resulting flows are only evaluated for legs "not connected to each other".

When you export a coordination, VISSIM positions the intersections according to the leg angles, the partial route lengths in the primary coordination direction and the lengths of turning relations in the intersection topology. Coordinates supplied in the scaled layout plan are not considered.

11.3.3. Segment definition

Segment definition is carried out within the network definition in the network definition.

You can call the dialog via the tree entry **Network / Version / Network definition**.

The icon **Create and edit segment** must be selected in the network plan

The following objects are created and edited in segment mode:

Segments

Approaching and emerging traffic

Additional signal groups

Routes or route sections.

Requirement for this is, that the areas have already been created for the network version and intersection versions have been assigned to the areas. If possible, the intersection should also exist on the turning relations of the intersections.

In the list box, click the element of your choice. After selection, the segment is displayed in the network plan and in the Route tab.

Subsequent changes of the network definition (e.g. partial route lengths) or intersection topography are currently not automatically transferred to existing segments.

To update the segment data, click the respective button:

The current segment is updated in the segment mode and all segments are updated in the network mode.

Conditioned by the adjustment of the link definition, restrictions arise with the data migration of Office versions before V4.3.2 after V4.3.2 or later.

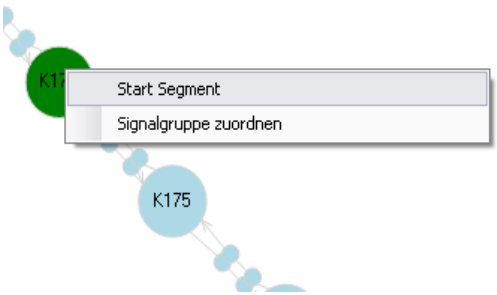
Restrictions:

During data migration, lines are converted into chains of detection points. If required, PT directions are also generated. However, you must correct the line numbers in the PT directions.

Old lines can only be transferred to the new data structure, if their definition can be assigned to a single primary route (outward and inward bound direction).

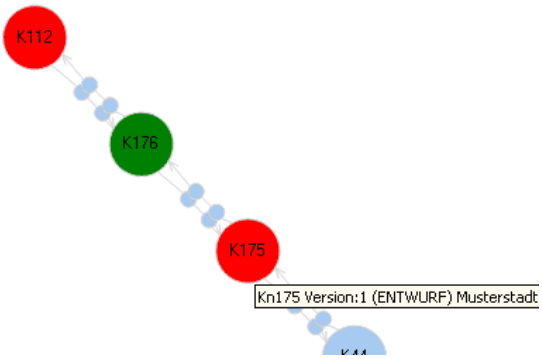
11.3.3.1. Create a segment

Right-click the starting intersection of the segment. Then select Start Segment.



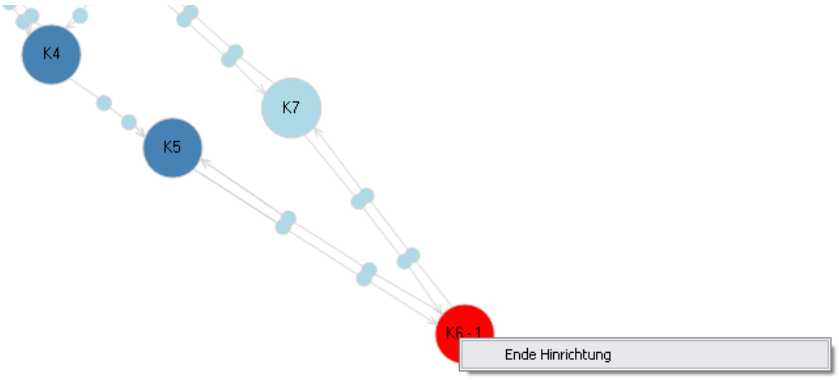
Img. 16: Start segment

Next intersections which can be selected are colored red.



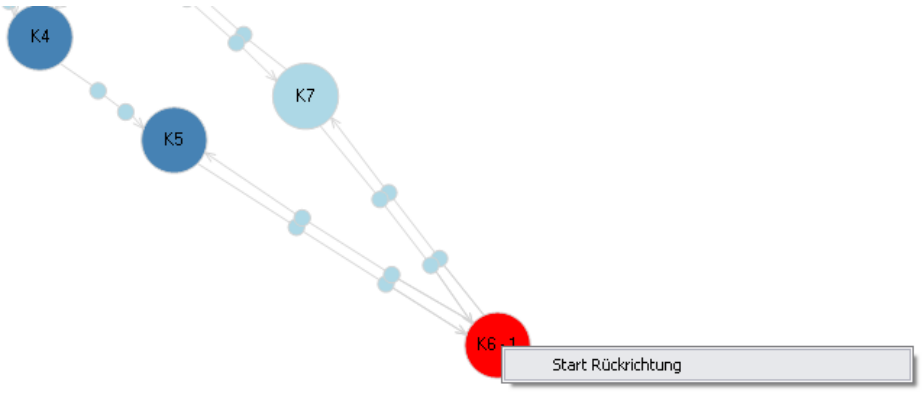
Img. 17: Display of next intersections

Click all intersections you want to assign to a segment, then right-click the end segment and select **End of forward direction**.



Img. 18: End of forward direction

A dialog is displayed in which you are asked if you want to create the return direction manually or automatically. Creating it manually: Start with "Start Return Direction" and end with "End Return Direction" after you have selected all intersections for the return direction.



Img. 19: Start return direction

In the segment wizard, select the signal group and PT directions for the route point on each intersection.

The wizard runs you through the forward and return direction.

Turning relation lengths are copied from intersections and partial route lengths of the network.

In the Wizard, you can change the length of a turning relation in a segment, if no turning relation is specified or its length is 0.

When you create partial routes or turning relations, default values are used for their length. These are set under **Settings – Options - Segment** defined.

After ending the wizard, a new segment with 2 main routes in forward and return directions was created. Segment intersections and partial routes are displayed in dark blue.

Note: An offset between forward and opposite direction may occur, if partial routes and route relations in forward and return directions have different lengths.

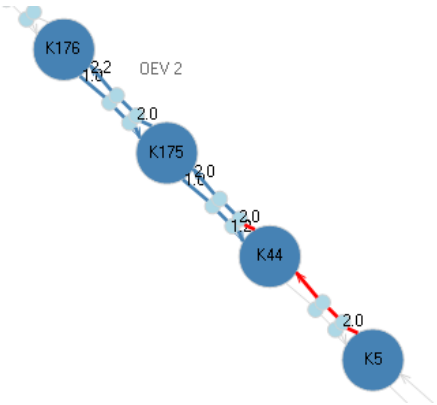
In the "Route" tab the individual route sections including signal groups, stops, detection points, PT directions and additional signal groups are displayed. They can also be deselected, if required.

11.3.3.2. Add approaching traffic to segment

Right-click on an intersection which is not in the segment and select Start approaching traffic in the context menu.

Intersections which can be selected are colored red. Click the desired intersections in the order they are listed. The last two intersections must be on the segment. Right-click the last intersection (– End approaching traffic). The segment Wizard is then displayed. Proceed as if you were creating a segment.

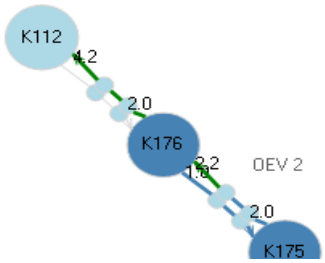
Partial routes for approaching traffic is displayed red.



Img. 20: Colored partial route

11.3.3.3. Add emerging traffic to segment

Adding emerging traffic is identical to adding approaching traffic, but the **first two** intersections must lie in the segment. Partial routes for emerging traffic are displayed green.

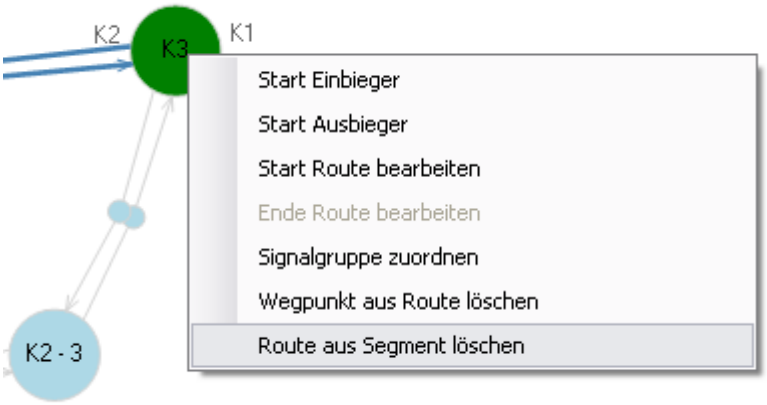


Img. 21: Parallel approaching traffic

Note: Parallel approaching/emerging traffic in forward and return directions are not supported in this version.

11.3.3.4. Deleting approaching/emerging traffic

Right-click on a route point lying in the segment and select **Delete route from segment** in the context menu.



Img. 22: DDelete route from segment

A selection of all approaching and emerging traffic appears where the route point exists. Routes of the main direction cannot be deleted. A message appears, in case there is no approaching/emerging traffic for this route point.

11.3.3.5. Assigning additional signal groups

To illustrate additional signal groups in the TDD (e.g. minor direction, pedestrians) you can proceed as follows.

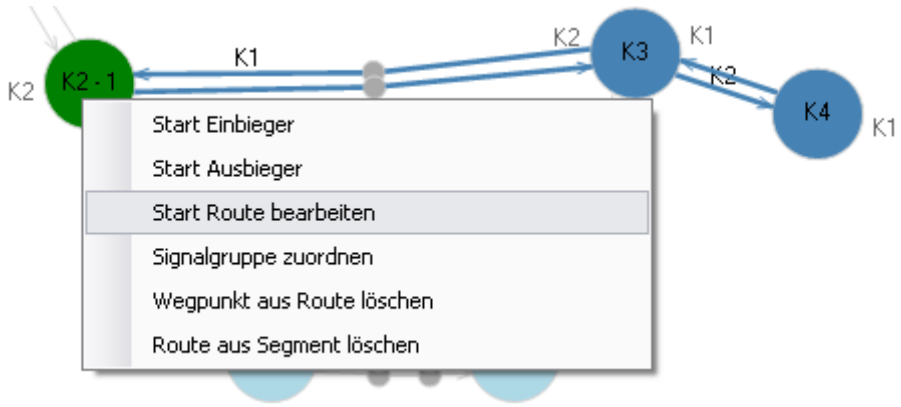
Right-click an intersection in the segment. From the context menu, choose **Assign signal group**.

In the SG dialog, select a route and signal group. The route is required to deduce the level information, in order to display the signal group in the time-distance diagram in the correct levels.

11.3.3.6. Editing route points of a route

Right-click a route point in a segment and select **Edit Start Route**.

Intersections which can be selected are colored red. You can now change the route. You can add a route point to the beginning, middle or end of the route and redefine existing route points.



Img. 23: Edit start route

Right-click the last route point and select **Edit End Route**.

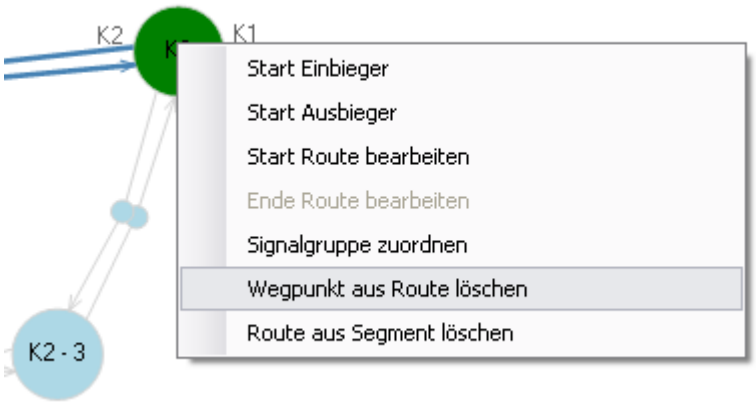
Options for the route you want to edit are displayed. Multi-select is possible.

The segment Wizard is then displayed. The procedure from this point is the same as when creating a segment.

The TDD is adjusted based on the edited data.

11.3.3.7. Deleting a route point from the route

Right-click a route point in the segment and select **Delete route point from a route** in the context menu.



Img. 24: Delete route point from a route

The routes are displayed that currently contain this route point. Multi-select is possible.

The route point is deleted from all the routes selected.

11.3.4. Offset time specifications

Here specifications can be made between 2 signal groups from 2 different intersections. (13.2.3 Offset time specifications below Motion can no longer be edited in Office)

11.3.5. Switching time specifications

Here, specifications can be made for the switching time of a signal group of an intersection. (13.2.513.2.4 Switching time specifications underneath Motion can no longer be edited in Office)

11.3.6. Time-distance diagram

A time-distance diagram (TDD) graphically depicts the geometry of a link with its intersection center points, the position of stop lines and the distance between intersection points on the x-axis as well as the chronology on the y-axis. Besides platoon and green bands for motorized individual traffic and public transport, you can also find information on the coordination of route intersections here.

In addition, the names of signal groups for stop lines and intersection names are shown.

The main functions of the TDD are:

Editing the time-distance diagram

Displaying trips

Display options

Printing / plotter

Providing data for Visu Green Time.

Working with TDD, the following must be considered:

All network relevant data is in the network version (intersection assignment, network topology, etc.). The network version has to be network version locked for editing.

All segment-relevant data is in the segment (selection stop lines, signal groups, etc.) and has to be changed there in locked state.

In the TDD itself only the assigned signal plans and the graphical positions of the objects are saved. If these have to be changed, the segment has to be locked.

The visualized green times are directly from the intersection version, this means, if for example a signal group or a complete signal plan are moved, the respective intersection version has to be locked. Otherwise, the modification is only temporarily and is discarded when closing the TDD.

sX control units can indeed be incorporated in ZWDs but are write-protected, that is, the green times cannot be offset via the ZWD, for example. In this case you must open the sX configuration and offset the signal program or signal groups.

11.3.6.1. Editing the time-distance diagram

When you create a new time-distance diagram, the intersections specified in Network definition as well as the stop lines, route and line segments, stops and detection points defined in Segment definition will be used. Additional (free) signal groups are also shown.

The following tasks should be completed before commencing work in this area:

Network definition completed

Segment definition executed

Signal program executed.

If partial intersections are supplied, they are illustrated as individual route intersections in the time-distance diagram, who have the same planning intersection assigned.

Specify the general route data in the header of the time-distance diagram:

Name	Freely editable.
Number	Range 0-255.

Short Descr.	Maximum 32 characters (specified by OCIT)
Description	Freely editable (maximum 60 characters).
Cycle time	Adjustment of the time grid along the vertical borders of the time-distance diagram.

Tab. 43: General route data - Header

The route dimensions are specified in the time-distance diagram footer. They include, dimensions of the route (length between the stop lines) and (listed at the bottom), the intersection dimensions, i.e. the distances between intersection centers.

For visualizing the green times, a signal program can be assigned to each intersection **Extras – Signal program assignment** menu option). The green times per intersection can be fixed or linked with the intersection version.

Intersection	List of all route intersections
Signal program	Selection of available signal programs for the intersections Signal programs with different cycle times can only be selected if the network cycle time is a whole multiple of the individual cycle times. For example, this means that one part of the signal programs can have a cycle time of 45s and another 90s and still be displayed in one time-distance diagram.
Fixed	YES: Changes to a signal program in the intersection processing dialog have no effect on the representation in the time-distance diagram. The signal program cannot be changed in the time-distance diagram. NO: Changes can be made to the time-distance diagram. These changes, however, will only be applied in the signal program for the intersection if a linkup exists. Changes made to a signal program in the intersection processing dialog will also be applied in the time-distance diagram.
Linkup	YES: Changes to the time-distance diagram will also be applied in the signal program for the intersection. NO: Changes to the time-distance diagram will not be applied in the signal program for the intersection.
Not fixed, no linkup	Green times can be planned freely.

Tab. 44: General route data - Extras

After you have assigned a signal program, the green times of the selected signal groups at stop lines are automatically displayed in green (default setting) with their start and end seconds.

The time-distance diagram can be modified in different ways and the planning demands adjusted. The planner thus has the possibility of manually adjusting project-specific modifications of the time-distance diagram and thus the green wave plan.

The following functions are available to carry out this task.

Editing possibilities in signal/frame plans:

- modification of signal times in time-distance diagrams (move, prolong or shorten)
- move a signal program
- move a signal program in terms of partial intersection
- move signal program offset

- move selected intersections
- delete signal times

Adjusting and firmly defining the position of drawn objects

Coordinating with green time start or end.

To visualize the coordination quality, the following views are available:

Fixed platoons

Dynamic platoons

Fixed green channel

Dynamic green channel

Ideal channel

Calculate speeds

Hide platoon view.

Editing possibilities in signal/frame plans

Modification of signal times (move, prolong or shorten)

The green times can **later be extended and/or shortened or postponed**. To do so, in the time-distance diagram, use the mouse functions (Drag&Drop operation), or in the context menu, click Edit green time.

A maximum of 2 starts can be supplied per cycle. Multiple starts, as possible with the C800V controller, are not supported.

The data in the assigned signal program is adapted according to the setting made (linkup, fixing).

The signal program can be opened simultaneously (by double-clicking on the signal program name in the header), the data will be changed online, i.e. even without first being accepted. The changes should always be accepted in the time-distance diagram to prevent changes rejected in the time-distance diagram still being applied in the signal program editor.

For editing purposes, you can show the stage frame plan or signal group frame plan (instead of the signal time plan), including the green ranges, if available for the signal time plan selected. To do so, in the header, right-click the signal plan name and select the appropriate menu options.

The generated green ranges are shown or hidden for the primary direction (PD) and secondary direction (SD) via **Options – Display**.

Moving the signal program

In the POSTPONE SIGNAL PROGRAM mode, you can postpone the signal times of all signal groups of the intersection.

Moving the signal program for a specific partial intersection

In **Postpone signal program for specific partial intersection** mode, only the signal groups of the selected partial intersection are postponed.

Moving the signal program offset

In **Shift signal program offset** mode, only the offset of the signal program is changed. The absolute times in the cycle do not change here. The changes can be reproduced in the header line.

Moving selected intersection

In **Shift selected intersections** mode, a number of intersections can be shifted simultaneously in their signal programs. The intersections to be shifted can be selected in open windows.

The window must remain open until shifting of the intersections has been completed.

The option is provided for both shifting the signal program and the offset using the **Shift signal program offset** option activated in parallel.

Deleting signal times

You can delete the green time by calling up the editor for manual editing (context menu **Edit green time**) and removing the values entered there.

Adjusting and firmly defining the position of drawn objects

You can use Drag&Drop operations to move stops or stop lines. To do so, position the mouse pointer on the line. The positions you change are only relevant for display in the time-distance diagram. The positions and distances of the network version are not changed.

After adjustment, you can fix the PT stops and stop lines (**Options** menu).

You can also move an entire route intersection on the distance axis without altering the distances between the stop lines (also via the **Options** menu).

If positions and distances in the time-distance diagram deviate from those in the network version, this is considered in the display. Above the arrow head, the graphical length of the section is shown. If the actual length in the network version is different, it is shown in brackets below the arrow head.

To calculate the arrival times, the system uses the actual lengths. In the platoon representation, the difference in length is visualized via "Offsets" ("broken" platoons).

Coordinating with green time start/end

This option allows you to modify several green times simultaneously. If you coordinate according to the green time start, all further green times along the route are coordinated, so that their start coincides with the arrival of the platoon.

If you coordinate to the green time end, the end of the green times is coordinated with the end of the arriving platoon. The forward and return directions are differentiated.

To select this option, open the context menu at the first stop line of the route intersection (position cursor on the line).

The green times are coordinated accordingly up to the first stop line of the next route intersection.

Route optimization

With route optimization several green times are adapted at the same time. If you choose as optimization direction „MAIN DIRECTION OUTWARD BOUND“ at first all green times in the course of the route are adapted in a way that their start corresponds with the arrival of the platoon. Following this, all green times of the opposite direction are optimized in a way that their green channel is maximized without worsening the green channel for the inbound direction.

With optimization direction „MAIN DIRECTION INWARD BOUND“ at first all green times are adapted in the course of the inward bound route and following this all green times of the outward direction are adapted to the optimal green channel.

Calculation can be selected via the „Start route optimization…“ menu.

For adaptation of the green times several shifting options are available. The signal programs of the intersections in the routing are adapted accordingly.

Platoon views

The calculated vehicle platoons can be displayed in the time-distance diagram with different values (View menu):

Fixed platoons: A constant average speed is assumed from stop line to stop line on the route (in accordance with values of the TD running time parameters edited in the defaults).

Dynamic platoons: A distribution of speeds (according to the specifications in the defaults) from stop line to stop line is assumed (with green start Vmax and green end Vmin).

Fixed green channel: A vehicle platoon is observed over the entire route starting from the outer starting stop line in each direction.

Only the part of the platoon that arrives during the green time of the respective signal group (at a constant average speed) is then included at each stop line.

You can thus see which traffic flow is able to progress unimpeded through the route, under the above conditions.

Dynamic green channel: Again, the vehicle platoon is observed over the entire route. Only the part of the platoon that arrives during the green time of the respective signal group assuming the predetermined speed distribution is then included at each stop line. You can thus determine what traffic flow can progress through the route under the above conditions.

Ideal channel: Starting from the outer stop line, the vehicle platoon is observed over the entire route at a constant average speed (uninfluenced by intermediate stop lines).

You can thus determine where the green times of the individual signal groups should ideally be, to allow for the maximum possible traffic flow through the route.

Calculate speeds: The speed is calculated from stop line to stop line, from green start to green start or from green end to green end. If the speed lies between Vmin and Vmax for the pulk speed, then the value calculated is displayed. If the speed lies beyond these values, Vdef is visualized.

Hide platoon representation: You can hide the platoon representation.

To display a traffic-actuated, modified signal program, the areas with the earliest and latest green start and green end are highlighted with a square at the stop line. Precondition is that the option has been selected and that there is a frame plan with green ranges.

The different traffic directions are assigned to different graphical levels. To hide them, click the respective buttons (E*, E1,…) in the header.

You can vary the image size using different zoom arrows or restore it to its default size. Hide or show the buttons via the **View** menu.

If you want to calculate how long a vehicle requires to travel on the route from A to B for example, hold down the Ctrl key while drawing the path with the mouse (right mouse). The distance (x-axis) in meters, duration (y-axis) in seconds and speed (km/h) are shown in the status bar.

11.3.6.2. Displaying trips

The display of the trip profiles for public transport and individual traffic for various starting positions are available via the context menu (Create PT trips; **Create PV trips**).

The following tasks should be completed before commencing work in this area:

Network definition completed

Segment definition executed

Signal program creation

Editing the time-distance diagram.

You can freely select the starting second. If you simultaneously hover the mouse pointer over a stop line or PT stop, the trip is created from this point. If the mouse pointer is in a "free" area, or you use the menu to create the trip, the trip is calculated for the entire route, starting at the green start.

For trip generation, Yutraffic Office uses an algorithm that takes the acceleration and delay into account:

Acceleration from the start up to the permitted speed, continued travel at this speed to the PT stop or next intersection (if there is a green signal).

For trips with a red signal, the speed is reduced accordingly.

In the time-distance diagram, a green line indicates acceleration, a blue line indicates a constant speed and a red line stands for deceleration.

The different trips are assigned to different graphical levels. To hide them, click the respective buttons (F*, F1, etc.) in the header.

The functions available are:

Manage trip line

Edit waiting times at stops

Visualize trips.

Manage trip lines

If you hover the mouse pointer over a trip line, the details of the trip are displayed. The Delete (the trip) and **Properties** functions can be accessed by right-clicking.

Edit waiting times at stops

Select the **Editing – Waiting times on stops** menu option to adjust the times already specified in the stop. In this way, you can follow the different patterns for different times of the day. All PT lines and stops are routed to each other in a matrix.

Visualize trips

Select the **Extras – List of trips** menu option to view the trips already calculated. In this list, you can select trips. Click Statistic to show further data, e.g. if you want to compare normal trips with the ideal trip.

11.3.6.3. Display options

There are various settings for the display of signal times, green wave ribbons or the TDD.

Select the **Options – Display** menu option or right-click to set a number of output options, adjust line types and colors, and modify the default vehicle types properties (TD travel time parameters).

From the **Options – Display**. Then click the **General** tab to show the green ranges for the primary direction (PD) and secondary direction (SD). The corresponding green ranges in the stage frame plans of the intersections must be supplied to this end.

To show /hide the cycle time at the left and right border of the window, from the **Options – Display** and then click the **General** tab (number of cycles, displayed cycle time). In addition, the time grid can be set in the header of the editor.

You can also hide the distance axis and the grey footer area.

To obtain a clearer overview, routes and the PT lines and trips can be organized on different levels, which can then be hidden or displayed. The routes are identified with the letter E, the PT lines with L and the trips with F.

- Example (keep button pressed):

  E*: All levels are displayed

  E1: All routes on level 1 are displayed

  L*: All lines are displayed

  L1: Line no. 1 is displayed

  F*: All trips for motorized individual traffic are displayed

  F1: Trip no. 1 is displayed

A **list of trips** can be called up via the **Extras** menu. The statistics function currently presents the data in a list.

The **signal program assignment** list also offers an (editable) overview of the signal programs assigned to the route intersections and the fixing or **coupling** options set when the intersections were defined.

The **platoon speed** list also offers an (editable) overview of the platoon speeds assigned to the route sections.

11.3.6.4. Print / plot

From the File menu, choose –> Set up plotter, to access a range of default settings for printing the time-distance diagram with a plotter or printer. You can also print several pages next to one another on the latter.

You can specify the left, right, top and bottom margins.

You can set the scales for distance and time separately:

- **Distance**: 1:1000 means that 1m on the route will be reproduced as 1mm in the drawing.
- **Time**: Indicates the ratio on the vertical axis, e.g. 1s = 2mm means that 2 millimeters are requested for every second of a cycle. Before plotting, it is checked that this vertical scale is not too large.

You can also pre-set the Plot section (specification in meters from - to). You can limit print/plot output to a section of the route.

Option **Fit in distance scale**

If this box is checked, the distance scale is adjusted to fit the sheet size when plotting.

Option **Fit in time scale**

If this box is checked, the distance scale is adjusted to fit the sheet size when plotting.

An alternative to plotting is to print in A3 format. The settings are possible via **Settings - Options**....

11.3.6.4.1. Problems with plotting

When plotting with PCL printer drivers, problems might occur, in particular with "Canon – iR Cxxxxx" printers. This causes the settings which appear in the dialogue to be overwritten by the settings in the profile. You can solve this problem by creating a new plotting profile with the desired properties. You must carry out this transaction once. Afterwards, you can easily switch between your profiles.

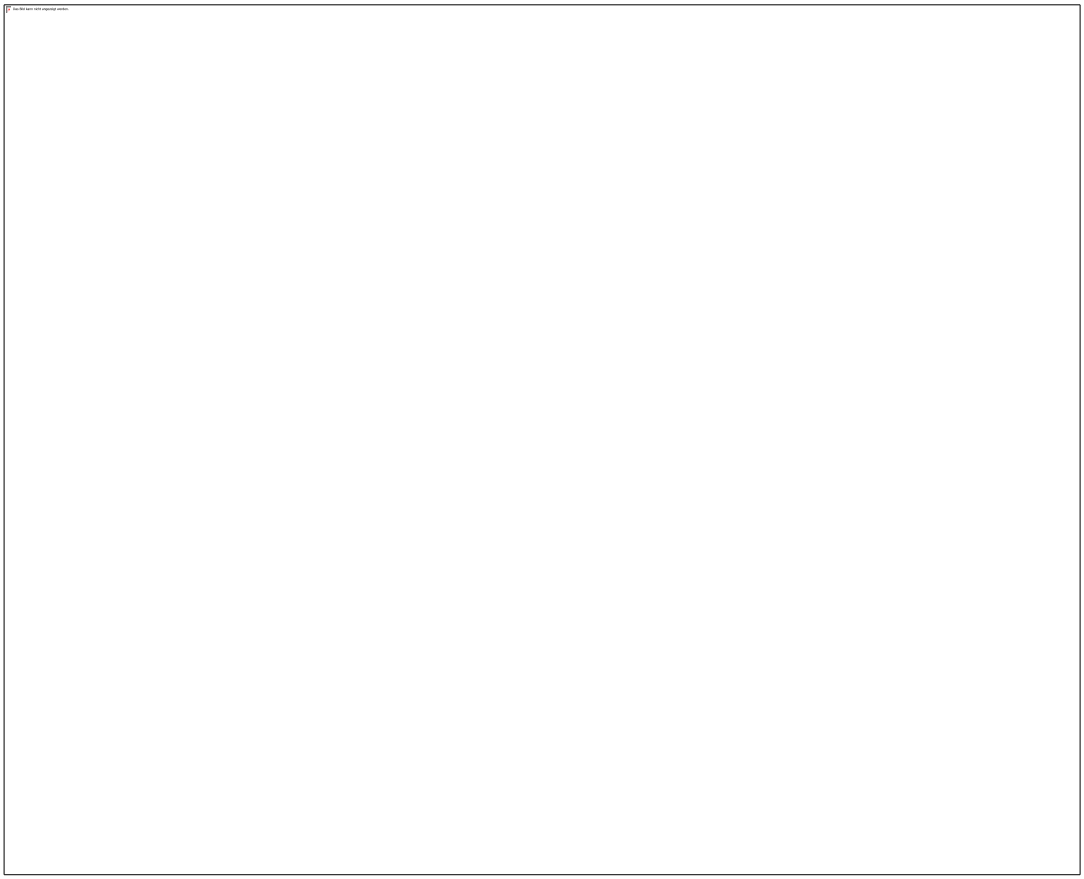
1. Open the "Printer settings" dialog via the popup menu. (Windwos Start – Settings – Printers and Faxes)

- Changing the settings required for plotting the TDD (e.g. A3, horizontal).
- Then create a new profile.
- Select the name and symbol and save them. The current settings are automatically adopted.
- The new profile is automatically enabled or selected:
- After plotting you can select the "Standard settings" profile (or any other profile).

12. Yutraffic Scala Supply

12.1. Basics

12.1.1. Scala supply components at glance



Img. 25: Scala supply components

The following components are used in Yutraffic Scala supply.

Yutraffic Office provides editors for the supply to the controller and supplies the controller via a remote supply interface (reads and writes subsets).

Yutraffic Office provides editors for the Scala subsystem supply and the user can transfer this data via a supply procedure to the central processes onto the subsystems.

The supply procedure is run in the Supply server component (on the Sitraffic server) and provides the Yutraffic Office client with the generated messages.

Supply control center completed successfully.

Supply was denied. Central process messages and plausibility check are displayed.

Remark: Data supplied by a Scala system (process supply data) cannot transferred back to the Config database.

12.1.2. Elements

An element is the smallest unit that can either be requested or released, deleted irretrievably or restored. Elements are exchanged as a whole between client and server.

This is also the smallest unit that can be versioned.

Scala elements:

Subsystem (type: IG, ES)

Intersection connection

Central intersection

Central network detector (for subsystem type: ES)

DEM detector

MESS detector

Special messages (for subsystem type: ES).

Request and release

Request and release are used to request and release exclusive write access. To edit an object, you first need to reserve it (for yourself). Another user, however, can see and read the object, but cannot edit it. Concurrent access and inconsistencies are therefore avoided.

Requested elements can be changed and are disabled for other users. Reservation can be undone again with "Release".

12.1.3. Element version

Elements are assigned with versions. The version is continued with every element change and so allows changes to be more transparent.

Examples of Scala element versions:

Subsystem version

Intersection connection OCIT version,

- Intersection connection CANTO version,
- Intersection connection BEFA15_17, etc.

Special message version.

An element version always has:

a superordinate logical element (e.g. a subsystem version always has a subsystem)

version number and

workflow status.

12.1.4. Workflow status

General information on v workflow (for Scala objects):

Workflow status	Number	Semantics	Methods (right mouse click in the tree)
DRAFT	0-n	Plans	► Copy version (as a DRAFT) ► Editing, (double-click) ► Delete, ► Status DRAFT CHECKED
CHECKED	0-1	Supply data are activated in Scala or (ordered to be deleted) removed from the inventory	► Status CHECKED > INVENTORY (export)

Workflow status	Number	Semantics	Methods (right mouse click in the tree)
			► Status CHECKED > DRAFT
INVENTORY	0-1	Activated supply in the Scala system	► Copy version (as a DRAFT) ► Status ARCHIVE (delete)
ARCHIVE	0-n	Archived versions which were supplied in the Scala inventory	► Copy version (as a DRAFT)

Tab. 45: Workflow status

All Scala element versions can each only have one workflow status displayed in the table.

The meaning of methods for modifying and changing the workflow status of the Scala element versions are an integral part of the Scala supply and are specified.

A customer specific parameterization of the workflow status and its transitions analogous to the Office (intersection) versions is possible.

12.2. Data storage / data handling

Version management is integrated into Yutraffic Office. This is directly connected to the necessary steps for a multi-client system. All data are in a database on the Sitraffic Server.

Request and **release** are used to request and release exclusive write access. A user can only edit an object if he has requested it (for himself). Another user, however, can see and read the object, but cannot edit it. This is how concurrent access and inconsistencies are avoided.

If an element (e.g. an intersection) is created completely new, this is done locally on a client; the database object is added and only becomes visible for other users it is saved. As of this moment you can find it under version management and also has to be requested for reediting.

The methods used for Scala elements are Yutraffic Office methods that have been simplified or partially automated (Data management operations, as releasing and requesting elements, are mostly handled by the application.)

12.3. Yutraffic Office perspective: Supply control center

This perspective is not available in the "Serverless" profile!

The perspective shows the Yutraffic Scala-relevant

Tree entries : folder (Scala, Subsystem, etc.)

Information tab: "Central versions:CHECKED"

Display of the Scala Supply objects (multi-selection or subsystem-related selection is possible for the status change Status CHECKED > DRAFT)

Info/Selection tab: "Central versions:DRAFT"

Display of the newly planned versions and for ordering potential versions (multi-selection or subsystem-related selection is possible for the status change "Status DRAFT > CHECKED")

Editors: New dialogs, edit (double-click on version)

Statistics Scala inventory list (cannot be edited).

If the perspective is not activated, the tree entries are not visible.

To improve clarity, we recommend that Scala subsystem suppliers activate the perspective "Supply control center" and complement it, if required.

Optional: Intersection planning (if extended intersection specific data are to be edited or displayed)

Optional: Supply network (if links/segments are to be edited or displayed)

12.4. Yutraffic Office profile / Yutraffic Scala connection

If you want to connect Yutraffic Office to a SCALA Sitraffic server (incl. Scala runtime system), you need to enter the Sitraffic server host name and the communication port in the Office profiles.

The Scala supply method status CHECKED > INVENTORY (export) is only activated if you have made a valid selection.

If a profile with topology has been activated, you can show additional information on the subsystem type (IG or ES) that has a direct effect on the functionality of the Scala editors and the Scala tree.

As a user with administrator rights, you can also access hardware parameterization of the topology for individual subsystems.

If a topology is not activated in the Yutraffic Office profile, a control of the subsystem-dependent features is not carried out, i.e.

all editing methods are available.

You can assign any connection type to a subsystem.

Message detectors, demand detectors and special messages can be created with any subsystem.

However, any status change CHECKED > INVENTORY (export) made later will be rejected.

12.4.1. Main window (extensions for SCALA supply)

If you have activated the perspective "Supply control center", two further tabs with information on supply relevant objects for Yutraffic Scala will be displayed in the bottom section of the main window.

The following windows can be found at the bottom of the main window.

If you are dealing with large amounts of data, especially mass data supply during Migration from previous systems, this might lead to longer loading times for displaying and updating the data in these windows.

During your daily work with "Supply control center", you will need to process less versions in these lists, since planning with n draft versions is not be required for most central elements.

12.4.1.1. Central versions: DRAFT window

Here, all planned and released elements, which can be selected for a central supply, are put together with some additional attributes:

User

Last changes

You can use the columns C no. and Device no. for data preparation and sorting.

In this window, you can manually select or use the context menu to activate the method Status: DRAFT > CHECKED for one or several objects at the same time.

Only versions that have been released are displayed.

12.4.1.2. Central versions CHECKED window

Here, all elements which have been selected for a central supply (and are considered for the next subsystem-related supply procedure, are put together with some additional attributes:

User

Time stamp of the status change > CHECKED

Elements which are available for a solution procedure from Scala inventory (here: controller C. no.:11 Device no.:74 and the respective intersection connection)

You can use the columns C no. and Device no. for data preparation and sorting.

You can highlight all or individual elements and carry out a Status: CHECKED > DRAFT.

The method Status: CHECKED > INVENTORY always works exactly for one subsystem and uses all versions and their C. no. that are shown in this window.

12.5. Yutraffic Office – Central supply regulator

12.5.1. Data storage

Rules, restrictions and processes shall apply to Sitraffic Supply Scala 1.2 and future versions).

The Sitraffic Server Config DB of the productive Scala plant may or must contain exactly one project with a domain name that corresponds to the Scala plant.

All Scala-relevant objects have been created under this project.

Per Scala object, only one "versioned element" is allowed, with up to n versions (e.g. subsystem with C. no. 11 may be created once only).

12.5.2. Scala supply procedure

The same rules, restrictions and processes shall apply as to Sitraffic Supply Scala 1.xx).

You can only activate one Scala supply procedure for the system.

Only subsystem data can be exported.

The Scala supply procedure takes all versions with the status CHECKED into account.

For an initial supply procedure (new supply of a subsystem), you need to order (at least) the subsystem version.

With the new data supply for a central intersection version (intersection version must first be set to INVENTORY) there must also be an order for the intersection connection (Version C. no. – Device no.).

When deleting an intersection (from the Scala inventory), also delete its corresponding intersection connection. If MESS detectors and DEM detectors were assigned to the controller, you must delete them as well.

To change the address of a MESS detector you first have to use a delete supply and then a new supply (if no deletion is used, the respective ES subsystem is denied by the export)

You can only delete the subsystem after you have deleted all objects.

The Scala supply procedure is started on the Office Client and then runs on the Sitraffic Server.

You cannot cancel the Server action (Scala supply- export) through the Client.

If the Office Client is ended abruptly (e.g. by exiting the process) further Scala supply procedures will be blocked.

To continue with the export, you need to restart the Sitraffic Server service.

If a Scala supply process is still active, use the method (in **Scala folder**) to show information on the procedure or to check if it was ended.

12.6. Detail Scala element / element versions

12.6.1. Subsystem

12.6.1.1. Subsystem IG

For this subsystem No.: corresponds to C. no. in the topology.

Type: Scala for subsystems with hardware specification ES and IG

ComTask: Enter the highest Com no. used here if you want to connect XKOM- / XKOM-F controllers. Possible values are Com1 - Com5.

Irrelevant fields: Entry not allowed / necessary or used for other subsystem types.

Replacement system available

Operation displays, test cells, synchronisation ports.

12.6.1.2. Subsystem ES

For this subsystem No.: corresponds to C. no. in the topology.

Type: Scala for subsystems with hardware specification ES and IG

Replacement system available: EES will be supplied, if required

NAP / SIP Operation displays, test cells, synchronisation ports

Irrelevant fields: Entry not allowed / necessary or used for other subsystem types.

ComTask.

12.6.2. Central intersection

Controller supply (for the control center) always includes the central intersection version, the referenced intersection version and the intersection connection version.

The different versions are part of the tree to ensure quick navigation between the individual versions (here: central intersection version environment).

In the central intersection version, you can enter the signal plans required for the control center (ASC intention plans or demand signal plans) and the reference to the intersection version (General editor).

Supply data required in central intersection version:

Subsystem Type	Intersection Connection	Control procedure	Central intersection version (CIV) element
IG	Canto Canto1.3	-	Min. 1 central signal plan (intention plan)
IG	OCIT	-	Min. 1 central signal plan (intention plan)
ES	BEFA5-15	SF	If required, DEM signal plans and DEM detectors
ES	BEFA5-15	ASC	Min. 1 central signal plan (ASC plan)

ES	BEFA16GDN		L6000 signal plan

Tab. 46: Central intersection

12.6.3. Intersection connections (general)

An intersection connection must be available for an intersection which is to be operated at the control center. C. no. and Device no. (relIntersecNo.)specify the intersection type.

In each intersection connection there are type specific parameter (addressing, channels, etc.), which determine the communication between control centers and device.

These have to be entered prior to the supply procedure to the control center.

For initial data supply of the control center, the intersection connection version and the corresponding central intersection version (C. no., Device no.) must have the workflow status CHECKED. The corresponding intersection version must have the status INVENTORY.

Yutraffic Office provides help functions, which create this state. (automatically set to CHECKED, starting intersection connection editor, etc.)

For most intersection connections there is the possibility of entering a tariff. In the Concert environment, this tariff is used to inform users of the costs for communication with the device. These costs might be considerable, e.g. if a phone connection is used and Visu SZP or data archiving is permanently activated.

The intersection connection types are dependent on the subsystem type.

Relevant for subsystem IG: Canto, OCIT, NCOM, XKOM/XKOM-F

Relevant for subsystem ES: BEFA15 - BEFA17, BEFA5 - BEFA12.

12.6.3.1. Intersection connection Canto 1.3 and Canto 1.0/1.2

You should not select intervals shorter than 5 min.

VDS relevant: Do not select this check box for Canto in connection with "old" controllers (previously operated at BEFA 5-12 or BEFA15, without text interface functionality).

If you have selected "VDS relevant", you can order online values for these controllers with the online visualization tools VISU SZP, VISU Intersection and VISU Green wave.

For the above controllers or connections this activation will lead to a fault.

12.6.3.2. Intersection connection OCIT: all versions V01.V02..

Intervals should not be less than 5 min.

Type: switched connection phone number expected

Type: Leased line: Entry modem connection expected

<prefix><address in HEX> ttyr0d (lower-case letters)

or: for dynamic assignment the <dhcp scope-identifier>

The values allowed are preset under signal control / OAP configuration (rc.oap).

Example: ttyr05, MOXA hardware address: 05

12.6.3.3. Intersection connection NCOM

Phone number,

Modem connection: dialpool1 (configured dial pool in ODS for communication with the controller).

The **priority** (high, medium, low) defines the switching sequence for different intersections.

12.6.3.4. Intersection connection XKOM/XKOM-F

TASK1: Elements of the interface parameterized in IG, here: COM1

For XKOM-F (external device to XKOM) you can assign the individual alarm ports (each with an increasing and decreasing flank) separate message numbers.

Permitted values for IO5 module, delete count data, Summer time clock change:

1:Yes

0:No

12.6.3.5. Intersection connection Befa 5-12

BESI address and status: command memory for the control commands of signal control.

MESS address and status: input buffer address for controllers.

Highest or effective signal group no.: Unless filled in for control procedure SF, signal times cannot be switched.

12.6.3.6. Intersection connection Befa 15-17

BEFA unit:

BEFA line number:

Highest or effective signal group no.: Unless filled in for control procedure SF, signal times cannot be switched!

In the example, 4 intersection special messages are assigned to the ports.

12.6.4. MESS detector (relevant for subsystem type ES)

No., C. no., NAPSIP, address and default status belong to the identification attributes of the MESS detectors and specify the hardware connection.

Changes to identifiable values should be carried out in 2 steps in the system:

Method status change INVENTORY > ARCHIVE deletes the version from the subsystem inventory.

Only then the status changes DRAFT > CHECKED, CHECKED > INVENTORY are allowed to be carried out for a new detector version.

Curve geometry data: SINGLE CURVE - curve length and DOUBLE CURVE - curve distance are used to calculate and prepare measured data. They must therefore correspond to real physical curve data.

You can optionally assign a MESS detector to a controller via the attributes Device no., RelIntersecNo. In the Concert environment, these detectors are then displayed in the intersection list.

In the Sitraffic Concert environment, MESS detectors without controller device no. are represented in the subsystem.

12.6.5. Demand detector (relevant for subsystem type ES)

Umbrella command variant:

Command text: umbrella command (is executed when activated).

Umbrella commands are often used, e.g. to activate roads for the fire department or locally influence TASS control in Sitraffic Concert TASS/STRAMO environments.

Variant SIAB: (controller-based demand)

Signal plan demand for control procedure SF and intersection connection types BEFA 5 - 15.

When the detector is activated, the control center switches from the basic plan to the demand plan and after resetting the demand, switches back to the demand in the basic plan again.

The controller no.: 1, has been supplied fixed schedules and DEM signal plans for the central intersection version. The DEM signal plan must contain a reference to the corresponding basic plan and the DEM detector number (in the No. editor). When the latter is activated, the system switches from the basic plan to the DEM signal plan.

The supplier sets the times BDE, RDE and EDE (begin, reset and end demand) according to the switching logic desired.

12.6.6. Special message (relevant for subsystem type ES)

No.., C. no., NAPSIP, address in report frame, status

For special message numbers (18001-18999) there are default texts in Sitraffic Concert:

Special message xxx coming in

Special message xxx going out

These can be adapted to customers' requirements in SEM.

In the example, the semantics of the special message (analogous adjustment of message text in SEM) were used in the name.

12.7. Information – Service features in Yutraffic Office

Scala folder:

Method Info topology:

The Office message window displays some information of the Topology.xml file (of the Sitraffic Server).

Method Info activated Scala Supply procedures:

The Office message window displays information on activated Scala Supply procedures. (Who supplies data from which client to which subsystem).

Method Statistics Scala:

List view of versions supplied with data via all subsystems (default: workflow status INVENTORY; the workflow status filter can be parameterized via options).

A longer runtime is required when composing the data throughout all subsystems and all workflow statuses.

Normally, 2 seconds are needed per controller device.

"Starting statistic" for a subsystem reduces the loading data volume.

Element subsystem/subsystem version:

Method Info topology:

The Office message window displays general information of the Topology.xml file (of Sitraffic Server) as well as the subsystem-specific parameterization in the topology.

Method Statistics Scala:

List view of versions supplied with data via this subsystem (ZNR.xx). Default is the workflow status INVENTORY, the workflow status filter can be parameterized via options, if required.

Examples with Statistics Scala:

All central intersection versions with the workflow status INVENTORY and their intersection connection version with the workflow status: INVENTORY and referenced intersection version (INVENTORY or ARCHIVE). Some important attributes of the intersection version, e.g. controller data, control procedure, maintenance teams, signal groups supplied with data as well as detectors and signal programs, including <(channel)no. name> are listed.

Table structure (conventional, flat structure) was changed manually.

This view allows you to quickly find all central intersections with an intersection version set to workflow status ARCHIVE and whose control center needs to be updated (to a new intersection version). To do so, filter the Intersection version column by the workflow status ARCHIVE.

Double-click a column to navigate to the relevant central intersection version in the tree view.

The Address column contains connection parameters relevant for intersection connection.

If you sort by this column for BEFA15, you will receive a mapping list of the BEFA units line number.

12.8. Supply procedures

12.8.1. Data migration/transfer of old systems

For an overview, see separate document: *DataMigrationToScala1.6*.

If for migration of an old central system you need a new subsystem hardware, first carry out the steps for migration perform data supply of the new subsystem.

To do so, follow the procedure described in chapter 12.8.2. (Step 1 has already been carried out during the setup, with the installation sequence).

12.8.2. Extension of a SCALA system by a new subsystem

Step 1: Import the Topology.xml file onto the Sitraffic Server (for extension of a Scala 1.5 system by one or several subsystems).

Before extending the system, install the hardware, start the processes and make sure they are accessible. After importing the topology file, restart the Sitraffic server.

Step 2: Method "New subsystem": (in the tree view, select the Subsystem folder, or from the menu, choose **File – New**).

Then call the method: Generate from topology.

Step 2a: (If subsystem type is ES)

In the Subsystem version editor, you can enter customer-specific NAP-SIP test cells, operation displays and synchronization times.

Step 2b: (If subsystem type is ES and default text interface configuration differs from standard case).

In the text or XML editor, you can make customer-specific changes to the file *DefaultTextinterfaceconfiguration.xml* (e.g. edit row-column values, add text interfaces; the number is an identifier and has to be unique). The file is on the SITRAFFIC server, in the directory *\SITRAFFIC\supply\cfg\com\siemens\is\its\s3\cfg*.

Step 3: Call the method DRAFT status > CHECKED (in tree view, select Subsystem version or open the DRAFT status window).

Step 4: Start the method CHECKED status > INVENTORY (Export). In the tree view, select Subsystem version or another subsystem entry. Alternatively, open the CHECKED status window.

The supply procedure for a new subsystem is triggered.

12.8.3. Supply new controller of Scala system

General procedure: All steps for supplying a new field device are carried out in Yutraffic Office.

The following consistently supplied elements and workflows are compulsory.

Workflow status:

- The intersection version must have the workflow status INVENTORY.
- For status change: Version management
- The central intersection version must have the workflow status CHECKED with a reference to the intersection version with the workflow status INVENTORY.

- For status change: Right-click the central intersection version.
- Intersection connection version, workflow status CHECKED (C. no. - Device no.)
- For status change: Right-click the central intersection version.

Supply data/content

- Intersection version: General editor:

  C. no., Device no., controller type, control procedure, signal groups, signal plans, detectors

Central intersection version: general editor, diverse editors, e.g. central signal program

etc.

C. no., Device no., reference to intersection version

Depending on the control procedure and connection type, you additionally need to enter central signal plans:

E.g. control procedure EPS, subsystem ES: Central signal program(s) EPS

e.g. control procedure SF, subsystem ES: optional demand signal programs

For example, connection type Canto, OCIT, subsystem IG: Central signal program(s) intention

Intersection connection version: (connection types depend on the subsystem type and the extension level of the system supplied)

C. no., Device no., connection parameter

Subsystem ES: BEFA 5-12; BEFA 15-17

Subsystem IG: Canto, Canto 1,3, OCIT, NCOM, XKOM/XKOM-F

(NCOM and OCIT GSM require ODS)

You can only activate a Scala system after a successful supply procedure method:Status CHECKED > INVENTORY (export) required.

Scala System can refuse data supply because of the content or dynamic state of the data (In this case, you might have to post-edit the supply data or create dynamic states in Scala System).

You can find all methods and objects for Scala supply of a field device in the Yutraffic Office folders **Intersection**, **Intersection version** and **their subfolders.**

Navigation into other tree areas does not apply.

12.8.3.1. Field device data was created in Yutraffic Office and the controller device has been supplied with the data.

Basic condition: The device is in the field and has been supplied with data.

The intersection version has the workflow status INVENTORY, central attributes have been set.

Edit the central intersection version.

If required, add intention or EPS plans depending on the connection and subsystem type. Save the central intersection version and enable access to it.

In the central intersection version, select the "new intersection connection" method.

Note: Depending on the C. no. and topology connection, there are several connection types available.

Identifier attributes, e.g. C. no. and Device no., are adopted from the central intersection version.

Select the connection type and confirm with OK.

In the opened intersection connection editor, enter the hardware address or additional parameters.

Close the editor and enable access to the intersection connection.

In the intersection connection version, call the method Status DRAFT > CHECKED.

The workflow status of the central intersection version will be automatically set to CHECKED, if there is only a single version in DRAFT status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

12.8.3.2. Import field device data from device supply data file(s)

Basic condition: The device is in the field and has been supplied with data.

The supply is provided as CRP, for example (however, it is not yet available in Yutraffic Office or Config).

Import the controller data (cpr, sip, scx, sop, OTEC, etc.)

Check the center-relevant attributes, procedures and supply objects and adjust them, if required.

In version management, set the intersection version to workflow status INVENTORY.

For reasons of archiving, the controller IBS time can be entered here.

Switch to the central intersection version and, if required, enter intention plans, EPS plans, etc. depending on the connection and the subsystem type).

Save the central intersection version and enable access to it.

In the central intersection version, Start the "New intersection connection" method.

Note: Depending on the C. no. and topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the opened intersection connection editor, enter the hardware address or additional parameters. Close the editor and enable access to the object.

In the intersection connection version, select the method Status DRAFT > CHECKED

The workflow status of the central intersection version will automatically be set to CHECKED, if there is a version in DRAFT status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

12.8.3.3. Manual data supply of a field device

Basic condition: The device is in the field, but data has not been supplied.

Variant 1

Provide a controller file (cpr / OTEC) or another format that can be imported and proceed as described in chapter 12.8.3.2.

Variant 2

The data is only available on paper.

Create intersections or controllers manually and select the method "New intersection". Edit

- control center and intersection relevant attributes, procedures, C. no., Device no., controller types, control procedures, etc.
- Signal groups, signal programs, detectors, etc.

In Version management, set the intersection version to INVENTORY.

(Please note that the supply must not differ from the controller supply).

Switch to central intersection version.

If required, add intention or EPS plans depending on the connection and subsystem type. Save the central intersection version and enable access to it.

In the central intersection version, call the "New intersection connection" method.

Depending on the C. no. or topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the intersection connection editor, add the hardware address and additional parameters and close the editor.

Set the intersection connection version from DRAFT status to CHECKED status.

The workflow status of the central intersection version will be automatically set to CHECKED, if there is only a single version in DRAFT status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

Variant 3

Communication / remote supply with device (independent of control center) is possible via local modem access for example.

Enter all required controller data (C. no., Device no., controller type, etc.)

Read the data from the controller via remote supply (without possibility of central access) and import them into a draft version, etc.

Check the center-relevant attributes, C.no., Device no., controller types, control methods, etc. and adjust them, if required.

Switch to the central intersection version and, if required, enter intention or EPS plans depending on the connection. Save the central intersection version and enable access to it.

In the central intersection version, select the "new intersection connection" method. Depending on the C. no. or topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the intersection connection editor, add the hardware address and additional parameters and close the editor.

Set the intersection connection version from DRAFT status to CHECKED status.

The workflow status of the central intersection version is automatically set to CHECKED, if there is a version in DRAFT status.

Start the method CHECKED status > INVENTORY (Export). The Scala supply process is started.

Variant 4

Communication with / remote supply to the controller is possible via control centers

Supply all relevant controller data.

Check the center-relevant attributes, C.no., Device no., controller types, control methods, etc. and adjust them, if required.

In Version management, set the intersection version to INVENTORY.

In the central intersection version, and, if required, enter intention or EPS plans depending on the connection. Save the central intersection version and enable access to it.

In the central intersection version, select the "new intersection connection" method. Depending on the C. no. or topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the intersection connection editor, add the hardware address and additional parameters and close the editor.

In the intersection connection version, change the DRAFT status to CHECKED.

A central intersection version is automatically created.

Select the method CHECKED status > INVENTORY (Export). The Scala supply process is started.

Import the controller data into a new draft version via remote supply and set the intersection version to INVENTORY.

Create a new central intersection version which is referenced to the new inventory intersection version.

Set the intersection connection version from DRAFT status to CHECKED status.

Call the method CHECKED status > INVENTORY (Export). The Scala supply process is started.

12.8.4. Changing controller supply data

12.8.4.1. Changes only affect data in the central intersection version

After you have created a new intention EPS plan or parameter changes in a central signal program, proceed as follows:

In the central intersection version with INVENTORY status, start the "Copy version as DRAFT" method.

Edit this new central intersection version in DRAFT status and change the intention plan or edit the central signal program,

etc. Save the central intersection version and close it.

Set the intersection connection version from DRAFT status to CHECKED status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

12.8.4.2. Changes regarding intersection version (device supply, etc.)

This method is used if a basic plan or a controller plan has to be changed, or a detector has to be added.

Create an intersection version as DRAFT, edit and save it.

In Version management, set the intersection version to INVENTORY status.

The following dialog shows you that the control center needs to be updated:

Step 3 or step 3 and step 4 can be triggered automatically here.

If manual editing and central intersection version check were selected, the following steps have to be carried out manually.

Set the intersection connection version from DRAFT status to CHECKED status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

12.8.5. Removing field device from Scala system / runtime system

The intersection version represents the controller supply and can therefore remain in the INVENTORY workflow status.

When you remove the controller, you should set the workflow status to ARCHIVE.

Variant 1:

Start in the intersection connection version.

In the intersection connection version, in INVENTORY, run the method Status INVENTORY > ARCHIVE.

A central intersection version with the status INVENTORY is automatically created.

If the controller is connected to the subsystem ES, you must transfer the latter via Sitraffic Concert to the local program or switch it off before starting the Scala supply process.

If the controller is connected to the subsystem ES and there are demand detectors for this controller, you must call the method "Assign for deletion" manually.

If the controller is connected to the subsystem ES and there are MESS detectors for this controller, call the method "Assign for deletion" manually.

The tree view and the Central versions CHECKED window show the central intersections, including the intersection connection version, with a delete attribute. This means they will be deleted after a successful Scala supply procedure (the INVENTORY version is changed to ARCHIVE).

Start the method CHECKED status > INVENTORY (Export). The Scala supply process is started.

Note: The controller remains in Sitraffic Concert until it is removed with Concert methods. This feature is required for changing the C. n. or "reassigning the intersection connection.

Variant 2

In the central intersection version, start in the INVENTORY status.

Proceed as described for variant 1.

12.8.6. Changing the intersection connection

12.8.6.1. Changes affect internal hardware parameters (no structural changes)

Copy the intersection connection version in INVENTORY status as a new DRAFT.

Edit the intersection connection version in DRAFT mode, for example change the communication parameters, etc. Save and close the intersection connection version.

Set the intersection connection version from DRAFT status to CHECKED status.

Start the method CHECKED status > INVENTORY (Export). The Scala supply process is started.

12.8.6.2. Structural changes within a connection family

OCIT <> OCITGSM,

Canto <> Canto 1.3,

BEFA5 > BEFA12 (as long as no changes to intersection version attributes are necessary such as control procedures for example)

Please proceed as described in chapter 12.8.6.1.

12.8.6.3. Structural changes (subsystem assignment)

This step is required if you change a subsystem of the type ES to a subsystem of the type IG, for example.

Remove the controller from the Scala system (see chapter 12.8.5).

Create an intersection version in DRAFT status. Make the changes to the C.No. and further structural changes to the controller supply data.

In version management, set the intersection version to INVENTORY status (Please note that the supply for the controller supply must be the same).

Switch to central intersection version.

If required, add intention or EPS plans there, depending on the connection and subsystem type. Save the central intersection version and enable access to it.

At the intersection connection, select the "new intersection connection version" method. Depending on the C. no. or topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the intersection connection editor, add the hardware address and additional parameters and close the editor.

Set the intersection connection version from DRAFT status to CHECKED status.
The workflow status of the central intersection version will be automatically set to CHECKED, (if there is only a single version in DRAFT status).

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

12.8.6.4. Structural changes (keep the subsystem)

(OCIT > Canto)

Delete the controller from the Scala system (see chapter 12.8.5).

In the central intersection version in ARCHIVE status, create a new draft version with reference to the intersection version in INVENTORY).

At the intersection connection, call the "New version" method. Depending on the C. no. or topology connection, there are several connection types available. Select the connection type and confirm with OK.

In the intersection connection editor, you can add the hardware address or additional parameters. Then close the editor.

In the intersection connection version in DRAFT status, run the method Status DRAFT > CHECKED.

The workflow status of the central intersection version will be automatically set to CHECKED, if there is only a single version in DRAFT status.

Start the method Status CHECKED > INVENTORY (Export). The Scala supply process is started.

13. Motion / Adaptive Control

13.1. Motion – general unversioned

Creating Motion in the menu is done via **Start – New**.

Motion parameter:

Motion interval [min]: Time difference between the traffic situation calculation

Normal value: 5 minutes.

Motion interval factor: Specifies after how many traffic situation calculations, optimization should be executed.

Normal value: factor 3.

Application prediction: Activating the detector prediction values application for optimization.

Max. optimization time [min]: Time limitations of the (iterative) optimization calculations in the online system in minutes.

Export directory: specifies the directory in the online system receiving the supply file. The complete path on the Motion server could be as follows:

C:\Sitraffic\Motion\motiondata\online\enginecfg

However, only a part of the path will be defined via C:\Sitraffic\Motion (cf. fig. 88) as the rest of the path will be automatically generated after export from Office.

13.2. Motion version

The optional supply data from 13.2.3, 13.2.4 and 13.2.6 can also be edited outside of Office. You can find more information about this in the Motion documentation.

13.2.1. Motion – general versioned

The network version is assigned for the versioned general Motion data.

Depending on the Motion engine version used, you can set the **Algorithm Variant** at this point.

Further basic data which is version related can only be edited, if the respective Motion version is requested.

Every time you change the network version assignment, you must check if you need to update the references in the Motion version. In the general editor, the Update references icon is automatically activated, if the program recognizes that an update is necessary.

13.2.2. Measuring points

Measuring points have to be supplied completely for Motion (Assignment detector and lane) via the menu item **Motion** – **Measuring points**.

Motion-specific parameters:

Type: Intersection detector, network detector or MESS detectors can be selected as a type. MESS detectors cannot be used at the moment.

If you also want to use intersection detectors that do not belong to the area, these have to be supplied as network detectors (see chapter 11.2.7).

Capacity estimation: Activating the queue length calculation for intersection detectors.

Special measuring point is not supported in the current version.

The lower table references the lanes on which the measuring points are assigned:

Subordinate object / lane: Selection of the lane via **Partial route/Turning relation > Section > Lane.**

Factor: Factor which is used to multiply the count values for the application on the partial route.

13.2.3. Offset time specifications (optional)

To specify the offset times between signal groups of an intersection or two different intersections, select Motion / Motion Version / Offset time specification.

Start / End: Selection, if the start and end of the green time is specified as offset time for the first and second signal group

The following settings are possible: start/start and end/end, start/end and end/start.

Cycle times: Selection of the cycle times for which offset time shall be relevant

Specification of the **minimum and maximum offset times** for the respective cycle times

After optimization an offset time between **minimum offset time** and **maximum offset time** is complied. This refers to the Green-Start or Green-End times of the respective signal group at both intersections.

13.2.4. Switching time specifications (optional)

Specifications of switching time of an intersection's signal groups:

Start / End: Select whether the start or end of the green time is predefined.

Cycle time: Selection of the cycle times for which switching time specification shall be relevant.

Predefine the **earliest and latest wave second** for the respective cycle times.

After optimization, the Green-Start (or the Green-End) of the signal group lies between the **earliest wave second** and the **latest wave second**.

13.2.5. Traffic situations

To specify traffic situations, select Motion / Motion Version / Traffic situations.

The first 5 situations are specified and can be defined by the "from-to" times. The first 3 situations must be supplied.

These apply if none of the (optional) following traffic situation dependent situations are active.

The following parameters can be used for the definition of a traffic dependent situation:

Queue length [veh]: Maximum queue length of a measuring point

Fault (0/1): Is a measuring point overloaded (0=No, 1=Yes). Is currently not being used.

Saturation [%]: Saturation of a measuring point (detectors which are assigned a signal group). Is currently not being used.

Traffic volume [Veh/h]: Traffic volume at a measuring point.

STRAMO variable: Prompting the value of the state variable of the Scala system.

To use STRAMO variables of the Scala system, the *Variable.txt* file has to be read via *Edit – Import StramoVariables*.

Each single prerequisite (**PRE**) consists of

Parameter (see list above)

Object (Measuring point / variable selection)

Comparison operation

Comparison value.

The link of conditions with "or" and "brackets" is currently not supported.

13.2.6. Strategies (optional)

Via **Motion / Motion Version / Strategies** you can allocate strategies to situations and objects to parameter sets. The supply of the object types is described in the respective manual and chapter.

Several strategies can be activated at the same time.

A strategy becomes active when one of the assigned situations are active.

The priority of the strategy is from top to bottom.

ObjectType: Selection of the type of object.

Subordinate object / object: Selection of the concrete object.

Parameter set: Selection of the valid parameter set in this strategy for the specified object.

The following parameter set-dependent object types are available:

Intersection data

Signal group in "SG Optimization parameter"

Minimum green time **–** Maximum green time **–** Queue reduction **–** Ideal saturation **–** Weight.

Basic stage sequence in "Stage sequence plans"

Assignment to cycle time

Signal program in "Signal programs"

Permit identification.

Network data

Lane in "Partial routes – Lane"

Progressive speed **–** Time demand value **–** estimated min. **–** estimated max.

Motion data

Offset time specifications in "Offset time specifications"

Minimum offset time**-**Maximum offset time

Switching time specifications in "Switching time specifications"

Earliest wave second**-**Latest wave second

13.2.7. Motion consistency test and Motion-Export

Motion optimization in a Scala system is based on data prepared for a Yutraffic Office project. For a description of Motion relevant data, please refer to the documentation of the individual editors at the beginning of the chapter.

13.2.7.1. Settings in Office

Before checking Motion optimization for consistency (performing a consistency check) or supplying data to the Motion Server (Motion online export), check the Motion settings of the system. To check the Motion settings which were made in Yutraffic Office, from the main menu, select Settings in **Options** in the **Motion** tab.

Set the path to the online export directory in general motion data (unversioned).

The timeout specifies for how long the Office client waits for a response from the Motion Engine. The default value is 10 minutes (or 600 seconds).

13.2.7.2. Motion data export

The Motion context menu contains two starting points for triggering Motion calculation:

Consistency test

Checks Motion supply for consistency / completion

The supply data is checked for completion and correct value ranges. The data is not distributed in the system or transferred to the Motion server, but it is checked by means of a locally installed Motion engine during a test run.

Inventory export

(including Motion export, export of the Motion supply to the Motion server)

The Motion (on-line) export is checked for completion and correct value ranges. The data are then distributed in the system or transferred to the Motion server.

Both menu options open the same dialog. There are three types of export: consistency check, offline and online (cf. fig 97). Online stands for Online Motion export. The Offline case is currently only used in the Motion simulation use case.

The Motion export dialog shows the export type, its Motion Engine Version which is supplied in the general Motion data (versioned) and the target file path.

At the bottom of the dialog, there is a field with areas selected that are relevant for export. If you wish to select only part of the Motion network for data export, this is where you set the restrictions. Only the intersection version data that has been assigned to a selected area is written to the target file.

During area selective export

Partial links of relevant areas, whose start and destination intersection are not in a relevant area, are fully exported.

References to intersection legs (start or destination) that are not in the area are exported empty.

Measuring points, with references to lanes or detectors, which are not in a relevant area are not exported. In this case, the Motion engine displays a warning message.

13.2.7.3. Details and checks before Motion data export

After you confirm the settings in the Data export dialog with OK, Yutraffic Office performs some checks before actual data export. Some checks might result in a cancellation of the data export, others will generate messages for your information.

Online export is only possible if the Motion version has the status DRAFT or INVENTORY. Otherwise, a dialog is displayed, and the process is cancelled.

Offline export for Motion simulation is only possible if the Motion version has the status ARCHIVE, DRAFT or INVENTORY. Otherwise, a dialog is displayed, and the process is cancelled.

Any type of Motion data export is only possible, if the Motion version has either already been reserved by the current user, of can be reserved by the system for the current user during the export process. If the version has been reserved by another user or cannot be reserved for other reasons, an info dialog is displayed, and the export process is cancelled.

If one or several of the intersection versions used do not have the status INVENTORY, corresponding message is displayed.

If the network version used does not have the status Inventory, an info dialog is displayed.

The results of the plausibility check must be confirmed with OK.

13.2.7.4. Consistency test

After the data has successfully passed the consistency test and plausibility checks and the info dialogs have been shown, it is exported into the Motion proprietary data format and transferred to the Motion engine. The result of the consistency test of the Motion engine can be displayed in a dialog window. After a successful consistency test, the status of the Motion version remains unchanged.

13.2.7.5. Motion inventory export

Before data transfer via inventory export to the Motion server, a consistency test is performed to ensure consistent data supply, even if the test has already been performed earlier. After the successful consistency test, the actual Inventory export is started. Once the Motion server has accepted the new data supply after inventory export, the Motion version goes into the INVENTORY status.

When first using a Motion Engine, please note the following:

The Client login has to be executed as an administrator, otherwise write access is not guaranteed on the Motion server drive (e.g. *N:*).

Enable drive *E*: on the Motion server and connect to the Office client as a network drive (e.g. N).

The target directory of the inventory export is defined under Motion – General (s. Motion – General unversioned).

After successful export, the *motionconfig.mcx* file, written by Motion export, is available on the connected network drive under *motiondata**online**enginecfg*\.

14. OCIT

14.1. General information on OCIT Outstation (OCIT-O)

Yutraffic Office allows you to supply data to the Yunex Traffic controllers via OCIT-O. Supply of OEM devices is not possible via OCIT-O as the data has not yet been standardized.

Go to Intersection version / General to enter the control center and controller number. The relative intersection number is always 0 for Yunex Traffic controllers.

14.2. Supply of connection devices

The OCIT functionalities for the controllers MS and Sitraffic C800 are covered by the PCM and PCV or MPM module. For Sitraffic C900 they are integrated into BBX.

There are several module supply options:

Via the MPM's or BBX's web interface.

Via "Manufacturer-specific supply (Yutraffic Control)" in the context menu of the intersection version, cf. chapter 0. This option is not available unless you have selected Intersection version / General / Components not completely integrated into MS Office.

Manual file editing and transfer via FTP.

The AP values can be supplied as described in chapter 14.2.1.

Supply details are available in the manual of each module.

14.2.1. AP values

14.2.1.1. For Yunex Traffic controllers or licensed control procedures

The variables of the user programs in Sitraffic Canto are called AP values. You know these variables from the wtt-files in VISSIM, Sitraffic Service and the control methods PDM, S-L, VS-PLUS, etc.

In OCIT variables are identified by names. Therefore, the modules need transcoding between the symbolic name and the APW variables.

For more information about the supply, please go to chapter 7.1.3.3.

14.2.1.2. For OEM devices in a Yutraffic Scala environment

For OEM devices, AP value definitions are only provided for licensed control procedures. Therefore, please note the following procedure for supply:

1. Create new user library (view: Intersection planning)

- Create new version of user library (via context menu)
- Edit the properties of the new user library version (via context menu)
- Import WTT or XML file with AWP values (properties of user library version via context menu)
- Save all data and release for use.
- Integrate the newly created user library version into the intersection version (do not search under AWP!)
- Check by editing/supplying AWP values
- Set intersection to Inventory status and then export it

After successful export of the intersection to Scala, the new AWP values can be assigned and visualized.

Yutraffic Office provides various WTT/XML files for VS Plus.

The following table shows the relationship between the VS Plus version and the Yutraffic Office WTT file.

VS Plus version	WTT file
6.2.5	vse.30100.wtt
6.2.3	vse30000.wtt
6.2.2	vse20000.wtt
6.2.1	vse10000.wtt
6.1.4	vsc60703.wtt
6.1.3	vsc60103.wtt
6.1.1	vsc60103.wtt
5.x	vsp50203.wtt
4.x	vsp40103.wtt
3.x	vsp30100.wtt

Tab. 47: VS Plua vs. Yutraffic Office WTT file

These files can be found in the WTT directory.

14.3. System access

General Communication settings

For general communication settings for OCIT-O go to the main menu and select **Settings – Communication – TCP IP Access to the System**.

Here you can enter the settings for the PC used for access to the system.

Select the type of access in the group **Access to the system**.

If the PC is connected to the control center, select "Center/Ethernet (local)".

If you want to work locally on the controller using a service PC, select "local with connection to the control center" or "lo cal without connection to the control center".

Enter the **Control center number**, the **Controller number** and the domain or IP address of the PC used for system access. These details must correspond to the data in ocit_route 1 in the connection module. Otherwise larger data objects, such as signal programs, cannot be exported from the controller.

If "Use FTP for data transfer to MPM" is ticked, the File Transfer Protocol (FTP) is used for data transfer to MPM instead of OCIT-O.
For more information about FTP settings, go to chapter 8.1.1.

14.4. Supplying / Reading out controller data via OCIT-O

After configuring the OCIT-O interface you can start with the supply of the controller (see chapter 8).

14.5. Connection to an external center via OCIT - Instation interface

14.5.1. Overview

The OCIT Instation interface allows you to connect an external center to the Yutraffic Scala system, as long as it supports OCIT Instation. The external center can then operate any type of field device via different connection types. Yutraffic Scala treats the external center analogous to a Yunex Traffic subsystem IG / ES. This means that the general data supply procedures are the same.

Yutraffic Office provides editors and functions that enable you to create an external system as a new subsystem. Under this subsystem, you can then locally supply the light signal systems connected to the external system with data for the Yutraffic Scala system. The standard central supply mechanisms distribute this data among the processes in the Yutraffic Scala system.

The supply process described allows you to access the traffic data (raw data) of the external system. For further functions (e.g. control) additional supply processes are required in the Yutraffic Scala system.

14.5.2. OCIT Instation editors and functions

The basic parameter settings for connecting an external center via the OCIT Instation interface are made by a service employee in the Topology.xml configuration file. After the Topology.xml file has been extended and made available to the Sitraffic server and subsystems, you can use the editors and functions for data supply of OCIT Instation elements.

14.5.2.1. Supply / editors in Yutraffic Office

14.5.2.1.1. Subsystem

Using the type OCIT Instation, the external center is represented as a subsystem in Yutraffic Office and is assigned a unique subsystem central number (Cno).

Since basic information about the external system you want to connect was specified in the Topology.xml file, to create the new subsystem, choose "Subsystem - new" and select "Generate from topology". The new subsystem is then automatically created.

Alternatively, you can create the new subsystem manually: Choose Subsystem - new and as type select OCIT Instation. In the dialog window that is subsequently opened, enter the same central number as in the Topology.xml file (OcitCentralNo.).

You do not need to make any further entries in the general subsystem editor.

Then activate the newly created subsystem, set its status from DRAFT to CHECKED. To export the subsystem, change the status from CHECKED to INVENTORY.

14.5.2.1.2. Controllers

In Yutraffic Office, you can supply the light signal systems connected to the external system as if they were directly operated by Yutraffic Scala.

You can create light signal systems manually or import them into the system using the intersection import function.

The important attributes are:

CNo, Device no., Name

Controller procedure

Controller device types

Manufacturer

if required, signal groups, detectors, signal programs (for Visu SZP etc.)

Since you cannot save all OEM controller device types and families to Yutraffic Office, we recommend that you use the editor Intersection version / General as follows for supply:

OEM devices:

Controller device family: Other

Controller device type: Unknown

Type: any text, e.g. customer or controller name

OCIT OEM devices:

Controller device family: OCIT OEM

Type: any text, e.g. customer or controller name

Yunex Traffic controllers:

In this case you can use all known controller device families and controller device types.

14.5.2.1.3. Intersection connection

For each controller device, exactly one intersection connection is supplied. Go to "New Intersection Connection" and select the option "OCITInstation".

For OCIT Instation communication, enter the unique identifier unit no. The default setting is the OCIT controller number (device no.).

If the external center communicates with the light signal systems via OCIT (Outstation), you can alternatively use the intersection connection type OCIT. Please note that you must then enter the unit no. in the Short name field.

14.5.2.2. Supply procedure

The data supply procedure uses the same methods (status change) as for data supply of subsystems ES and IG and locally connected light signal systems:

Status DRAFT > CHECKED

Status: CHECKED -> INVENTORY

The status change CHECKED-> INVENTORY (export) accounts for the special case of an OCIT Instation external center. During data supply and export of OCIT Instation subsystems, processes that are not required (e.g. OAP, ODS, SIGCTRL, central adapter) will be ignored.

After successful data export, the workflow statuses of OCIT Instation relevant element versions are set to INVENTORY and the field device data is available for further use, e.g. data visualization or the assignment of data collection tasks.

15. Sitraffic Canto

15.1. Supply of connection devices

Sitraffic's Canto functionalities for the controllers MS and Sitraffic C800 are covered by the MPM module. For Sitraffic C900 they are integrated into BBX.

There are several module supply options:

Via the MPM's or BBX's web interface.

Via "Manufacturer-specific supply (Yutraffic Control)" in the context menu of the intersection version, cf. chapter 0. This option is only available if you have selected Intersection version / General / Components not completely integrated into MS Office.

Manual file editing and transfer via FTP.

The AP values can be supplied as described in chapter 14.2.1.

Supply details are available in the manual of each module.

15.1.1. AP values

The user programs' variables in Sitraffic Canto are called AP values. You know these variables from the wtt-files in VISSIM, Sitraffic Service and the control methods PDM, S-L, VS-PLUS, etc.

In Sitraffic Canto variables are identified by names. Therefore, the modules need transcoding between the symbolic name and the APW variables.

For more information about the supply, please go to chapter 7.1.3.3.

15.2. Access to the system

The settings for accessing Sitraffic Canto correspond to the OCIT settings, cf. chapter 14.3 .

16. Profile

Yutraffic Office is a Client Server Application. Connection settings are required for the communication between the workstation and the server.

You need settings for the following connections:

Configuration data (Config Server)

User management

License management

Additionally, you can configure the settings for the following servers:

Topology server

VD server

When you install a planning workstation (standalone installation), a server is installed on the local PC.

With the installation in the SCALA surrounding the server can be distributed to different computers.

Yutraffic Office profiles are created and managed with the program *SitrafficOfficeProfile.exe*.

The program is placed in the Windows **Auto start** folder, by the installation program. It can also be started via the **Start** menu.

The program has a "Tray-Icon" on the Windows toolbar (per default at bottom of the screen): .

A left mouse click displays the parameters of the selected profile:

Img. 26: Profile

With a right mouse click a menu starts for further editing.

Via the selection, you can define the desired profile as a standard profile.

This profile is then used when starting Yutraffic Office.

Via the **Start** Yutraffic Office an Office client is started.

This is only possible if no other program instance is running.

Select **Settings** to open a dialog for editing profiles.

Possible actions

New: Creating a new profile

Delete: Deleting the displayed profile

Select: Defines the displayed profile as standard profile

Import: Selection of profile file and import of parameters

Export: Saves the profile displayed to a file to pass it on to other users

Create link: Creates a desktop link in order to start Yutraffic Office with the profile displayed, without changing the default profile

Check connection settings: The data entered in the current profile is checked for correctness.

The default profile is created automatically and sets the parameter for the „Standalone planning space“ i.e. client and server run on the same computer.

in order to define a certain profile when starting Yutraffic Office, you have to specify the parameter /PROFILE="Profile name" in the Yutraffic Office prompt.

You have to enter the **computer name (= Host)** and the http **Port** of the Web service connection into the respective fields. "Param" is only used for internal purposes.

The selected profile is displayed in the Login dialog.

If you want to use another profile, exit the Login via **Cancel** and start Yutraffic Office via the Windows taskbar by selecting another profile.

17. Sitraffic CoreServer

This chapter includes basic information on checking the Sitraffic CoreServer functionality and data storage of the Config database.

17.1. Performance test

A quick performance test of the Sitraffic CoreServer allows you to check whether both its central and internal functions work properly. To do so, you must first have installed the Sitraffic CoreServer and all relevant hotfixes.

For the test please proceed as follows:

Start the Sitraffic CoreServer manually:

Start – All Programs – Sitraffic CoreServer – Start CoreServer Services

After the start of the CoreServer services you will have access to the following service programs:
Service WebGui:

Start – All Programs – Sitraffic CoreServer – Service – Service WebGui

To control the run time functions of the Sitraffic Core Server and its sub components. Here you can check most of the run time data (e.g. topology, license data, user administration, configuration data).

Service processGui

Start - All Programs - Sitraffic CoreServer - Service - Service ProcessGui

To control the start process and resource utilization (memory consumption, etc.).

17.2. Data backup Config DB

All customer-specific data managed by and stored on Sitraffic's *CoreServer* (e.g. configuration database content, user management data such as users, user groups, etc.) can be secured and restored.

17.2.1. Data backup

Data backup is called via the start menu of the computer which runs the *CoreServer*. For the system configuration *Office Standalone* the *CoreServer* runs on the 'wsXX' computer on which the *Office Client* is installed as well. For the system configuration *Office Client*/Server the *CoreServer* runs on a remote computer 'configsrv'.

To call data backup, select the following start menu item:

Sitraffic CoreServer – Service – Data Backup

A start screen which includes a default backup directory is displayed.

Click the *Change* button to select another backup directory. A subdirectory *Backup_CoreServerV6_<current time stamp>* of the selected backup directory is used for the backup. Click the Start button to *start* data backup.

After successful completion of the backup process, a dialog is displayed which can be closed via the *Exit* button.

17.2.2. Data recovery (restore)

Please note that using this function means that the current data will be irreversibly overwritten. If you are not sure whether you still need the current data, you should save it as described in chapter 17.2.1 before restoring the data.

Before starting this function, you have to close all *CoreServer* services via the start menu item of the computer which runs the *CoreServer* (see chapter 17.2.1):

Sitraffic CoreServer – Stop CoreServer Services

Data recovery is called via the following start menu item:

Sitraffic CoreServer – Service – Data Restore

A start dialog which includes the default backup directory is displayed.

You must select a subdirectory *Backup_CoreServerV6_<current time stamp>,* of the backup directory which you selected for data backup. Once you have selected a directory which contains valid backup data, you can start the data recovery process via the corresponding button.

After successful completion of the recovery process, a dialog is displayed which can be closed via the *Exit* button.

18. Use cases

The following section describes some use cases.

18.1. Export of versioned supply data

You can edit versioned files in Yutraffic Office only, which means that data can only be transferred to a local Office installation via the Office file format *.sop, for example.

Versioned editing requires a lot of discipline!

How to provide inventory data for external staff.

The same procedure applies for other versions with a different workflow status.

For Versioning: Checking the current status of versioned data (see separate use case).

Create an export file

Start Yutraffic Office and select the desired project.

Go to the Office object tree and select the intersection

Select the desired intersection version.

In general, the inventory version or the draft version generated from the inventory version (usually the control center) should be used as basic version.

Use the intersection version and select the context menu item **Export…**

Select Data export Export option in **Office (sop).**

Optionally, you can specify a password for the file.

Make sure you forward it to the data recipient.

Enter a path and file name and start the export.

You can then forward the file to the recipient.

18.2. Import of versioned supply data

You can import the intersection version from an "external intersection" into the intersection of an Office project.

During data import, Office automatically creates a new version. So, you need not reserve a version. If you make changes to the data after export, forward these changes in an appropriate way if they affect processing at the site.

Importing a data file (SOP)

Start Yutraffic Office and open the desired project.

If the intersection has not yet been imported, import the intersection as a new intersection into the tree. If an intersection has already been imported, import the intersection as a new intersection version on the intersection.

Please note that if you import data as inventory and this intersection already includes a version with the status INVENTORY:

1. The versions differ:
    - Therefore, you must specify the latest version in the import dialogue. The import will be cancelled with the following message "**Please specify in the import dialogue the steps to be taken if both the import data and the existing intersection data have the status INVENTORY!"** After you

have selected the required steps in the import dialogue, run one of the two options:

- If the import version is decisive, the status of the existing inventory version is set to ARCHIVE and the import version is imported as INVENTORY.
- If the existing version is decisive, the following message is displayed: "Import has not been performed as the existing inventory data shall not be overwritten according to the import settings."

- The versions differ from each other: The following message is displayed: "Import has not been performed as the inventory data you want to import do not differ from the existing inventory data."

Select **Import…** with a right mouse click.

Highlight the **Office (sop). file you want to import.**

Import this version.

The imported version is available on the target system (e.g. service PC) with the

- current internal version and
- workflow
- from the original Office installation.

18.3. Check status of versioned data

18.3.1. Option A: Without connection to control center

Exporting the latest version,

see Export of versioned supply data.

Export the inventory version for the relevant intersection from the control center.

The sop file can be transferred to the service.

At the location: Check if data in the inventory and supply are identical,

see Import of versioned supply data.

Import the sop file into a service PC with local Office installation.

Open the version management for the intersection version (in the tree select the intersection version and select "Version Management" with a right mouse click).

In the version management section click the checksums in the left submenu.

Read the checksums in the checksum window via the "Reading from device" button.

In the "Current data" column you will find the checksums generated by Office based on the data from the data storage. In the "Active data" column you will find the checksums from the last supply to the controller, in the "Device data" column the currently read checksums are displayed.
If the sums from the current data and the controller data are identical, the supply in the controller and in Yutraffic Office are identical.

18.3.2. Option B: With connection to control center

Checking the actual status at the traffic control center

Check the current version installed on the controller, selecting the individual actual status in the **Master data** tab.

Control center status: Version:xx Build:yy Office Version no. zz indicate which supply status is valid in the control center.

Device status: Version:xx Build:yy indicate which supply status is valid in the controller.

If the two data records are not identical, please contact the project manager or the maintenance manager and check if the supply can be continued.

Synchronisation of controller data with Office

Select the desired intersection in the left window and highlight it.

Right-click version management.

Copy the inventory version into a new DRAFT.

Go to the context menu of the new draft and select the option "Manufacturer-specific reading".

Read the entire basic supply and the TA parameters in the project that you opened (the control center can only read these components).

Close the Wizard and return to Yutraffic Office.

Go to the context menu and select the option "Manufacturer-specific supply".

When starting the supply Wizard in the control center go to the Plausibility – Options menu item and tick the box "Remote data supply under version control" for "Exclude signal control from the check". This setting will then apply to all intersections.

In the supply Wizard select "Delta supply" (this option is selected as default) and start the process.

The tick (OK) should be colored grey, which means that the Office data corresponds to the controller data.

Highlight any element with remote supply in the basic supply (e.g. parameters in the basic data) or TA parameters.

The supply process is started and the version number from Intersection supply / General will be transferred to the controller for the controller version and build.

Please note:

The controller version consists of three sections:

00.00.00
== == ==... Draft variant (Build)

I I..... Controller version

I..... planning version

Return to Yutraffic Office and confirm the request for the "active date".

In Yutraffic Office the version is in the TEST workflow status.

Check the controller version in the actual status - it should correspond to the status of the Office version.

If the versions are identical, go to the version management and change the TEST status of the intersection version to INVENTORY status – the previous INVENTORY becomes ARCHIVE.

In the actual status the master data are now the same.

18.4. Data transfer per sop file

We recommend the following for data transfer, e.g. between a central database and a local installation or between two local installations:

First specify the scope of data you want to process locally:

Are you only processing the data of an intersection version?

Do you only need the network version, or do you also need its segments and intersection versions?

If data transfer is for a Motion project: Do you only want to change data in the Motion version, or do you also want to edit the network versions and segments it has been assigned or make changes in intersection versions?

After you have clarified the scope of data required, you can start the export process from the source system.

18.4.1. Exchanging intersection versions

Export the intersection version as sop file from the source system.

Import the intersection version into the target system.

Edit the intersection version in the target system.

Export the intersection version as a sop file from the target system.

Import the intersection version into the original version

- Check the changes in the data transfer catalogue and confirm them

or

Import the intersection version as new version into the original intersection.

- Compare the original version and the newly imported version.

18.4.2. Exchanging network versions

18.4.2.1. With dependent data

If you have to make changes to the network version and its intersection versions or segments, select the option **Also export dependent data as sop file** for data export.

Export the network version and the allocated segments or intersection versions as sop file from the source system.

In the import dialog, use multi-select to perform a multiple import of the exported sop files into the target system. If it is a multiple export from Sitraffic Office Version 4.6, there will be only one sop file which includes all files. This file can be imported individually.

Edit the files in the target system.

Export the network version and the allocated segments or intersection versions as sop file from the target system.

In the import dialog, use multi-select to perform a multiple import of the exported sop files into the source system. If it is a multiple export from Sitraffic Office Version 4.6, there will be only one sop file which includes all files. This file can be imported individually.

18.4.2.2. Without dependent data

Exchanging a single network version is only possible, if the dependent data (all intersection versions and segments) is already available on the target system. This usually applies for multiple transfer.

Standard procedure:

Export the intersection version as sop file from the source system.

Import the network version into the target system.

Edit the network version in the target system.

Re-export the network version as sop file.

Import the network version as new version into the source system.

If a message appears during the import, that the dependent data (all intersection versions and segments) are not consistent in the target system, these may be the following causes:

Intersection versions exist in another project, because they were already exchanged.

Intersection versions are in the recycle bin, because they were already exchanged and deleted.

18.4.3. Exchanging projects

Standard procedure planning workstation:

Export the project as sop file from the source system (server).

Import the project into the target system (standalone installation).

Edit the project data in the target system.

Export the project as sop file from the target system.

Import the project back into the source system.

Special case Scala environment: Export the project as sop file from the source system for further editing on local data storage.

After editing, only the changed versions (intersection, network, Motion) should be reimported.

If the complete project should be imported back into the original source system, the old project has to be deleted and removed from the recycle bin. It is recommended to create a database backup.

Background:

To avoid duplicates, the new project is provided with completely new database identifiers during the import, in case the project already exists in the database.

The original data is, if applicable, used by other applications (S4, perspectives, Visu,…) and is not found in the case "new database identifiers".

Only one project with supplied domain is allowed to exist

18.5. Merging planning data and supply data

Merging planning data and supply data should be carried out as follows:

Import the planning file (*.sip) into an intersection. A new version is thus created.

Via the context menu **Import** of the created planning version you can import the relevant data of the supply file (*.cpr, *.scx).

Check the differences in the data transfer dialog and confirm.

Select **Supply data**. This applies to the standard transfer of supply data to planning data

To reduce the number of differences, the planning objects and attributes can be suppressed (deselect check box).

Select the option **Update file attachments** so that the control files are applied as attachments to planning version.

18.6. Modification and remote supply

18.6.1. Create a supply version

In version management, select the inventory version.

Go to the section on the left of version management and select the option **Copy version (as DRAFT)**.

Yutraffic Office automatically displays the next version number available.

You might have to adjust the planning version (first digit) manually, if data are adjusted in planning.

The next possible version for controller supply is automatically selected.

A new draft version is created.

The build number (last digit) is 1.

18.6.2. Editing / changing data

Select the created draft version.

Right-click to select the context menu item **Request version** (or make request from opened editor).

Open the desired dialogs in the tree.

Make the changes.

If data is changed at the control center, please note that it is only possible to perform a total supply for components without remote supply – this will be shown in delta supply. In this case the changed data can only be supplied locally to the controller.

18.6.3. Supply of changed data

Select the changed draft version.

Right-click the context menu item **Manufacturer-specific supply**.

Click "Compile data from current project".

- For versioning: Select **All project components** and **Delta supply**.
- Without versioning: Select objects or project of your choice.

Submit the data to the controller.

For an OCIT transfer, please enter the password for the transfer.

The checksums are read

- For versioning: a mask is displayed in which checkmarks show where changes were made. Check whether the changes were only made to the sections of your choice (total supply can be used as an alternative to delta supply).
- Without versioning: Total supply (not possible from the control center) or manual selection of the desired objects.

Start supply.

Should an error occur during data transfer, then the status will remain unchanged.

For versioning: After data transfer and closing the supply wizard, the status is set to **TEST** and the current date of supply is **Last data transfer / change**. This is the current date of supply.

The supply can then be run on the controller.

For further changes you have to go to version management in order to reset the **TEST** status to **DRAFT** status. For versioned operation, the Build number is incremented. The above process will then start again.

These states can be run but have not been archived. Make sure that you release changes that have to be archived!

18.6.4. Generating supply

Select the changed version (you only have to select the right intersection).

Right-click version management.

In version management, select the controller version which has the status **TEST** or **CHECKED**.

On the left side of the window, select the **workflow status INVENTORY.**

The workflow transfer TEST > INVENTORY must be specified in the workflow configuration.

A message is displayed, saying that the current inventory version is written to the archive and that the version selected is set to "inventory".

You are prompted to confirm the individual steps. Then the change of status is performed.

Edit the following dialogs and make your settings to adapt or create a new central intersection version.

18.6.5. Report / export inventory version to control center

In S4.3, move the intersection to the workspace.

Export S4.3 from the workspace.

18.6.6. Update inventory version in network and segment

If the network version has the INVENTORY status, go to version management and copy the inventory version to create a new draft version.

In the intersection assignment of the network version, adapt the references to the changed intersection versions.

Go to version management and set the network to the INVENTORY status, if required.

In the segment, go to **General** and click the **Update references** button.

If required, make changes to **TDD definition for route plan/geometry.**

18.7. Modification and local supply

The procedure is identical to "Modification and remote supply", apart from the fact that the supply is performed via a stand-alone PC:

Create the supply version.

Edit or change the data.

18.7.1. Exporting the data

Select an intersection version.

For versioning: Export the sop file.

Without versioning: Export the sop or scx file (depending on the tool used on the service PD).

18.7.2. Local supply of data

A local Yutraffic Office or Yutraffic Control runs on the service PC.

Import the sop file (Office) or scx file and open the cpr file (Control)

Supply the data for the connected controller as described above.

For versioning: After data transfer the status is set to **Active** in the project tab Control and the supply date **Last data transfer / change** is updated. This is the current date of supply.

The supply can be run on the controller.

Save the data.

- For Yutraffic Office: Export the intersection version as sop file
- For Yutraffic Control: Save the control project (*.scx, *.cpr)

18.7.3. Importing the data

Import the *.sop6, *.sop or *.scx/*.cpr file as new intersection version in Office.

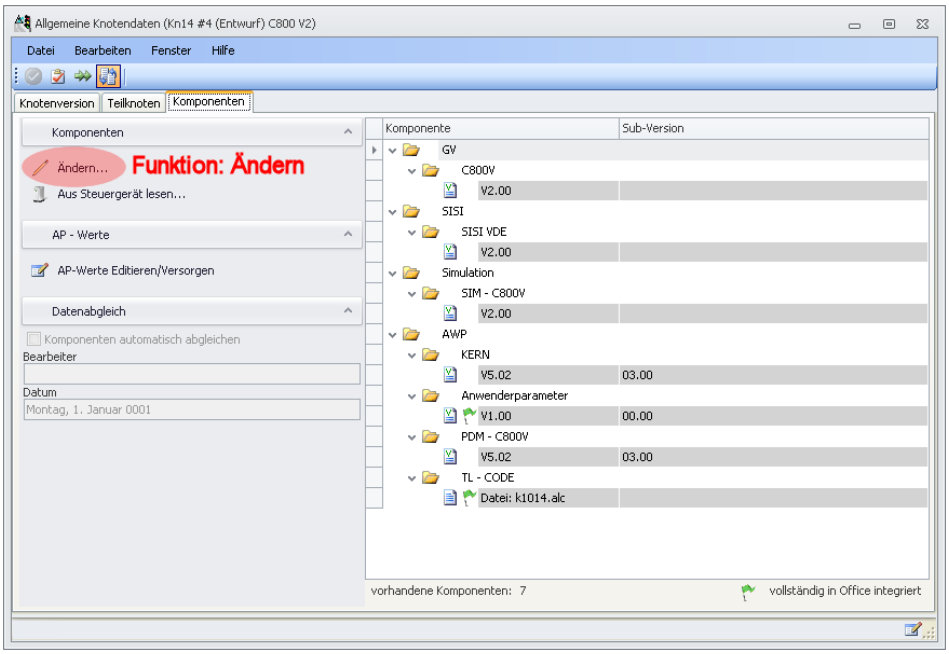
In version management, set the imported intersection version to INVENTORY status.

18.7.4. Pulling up a device supply (Not integrated -> integrated components)

The steps described in the following represent the essentially recommended worksteps that occur when pulling up to the current version of device components.

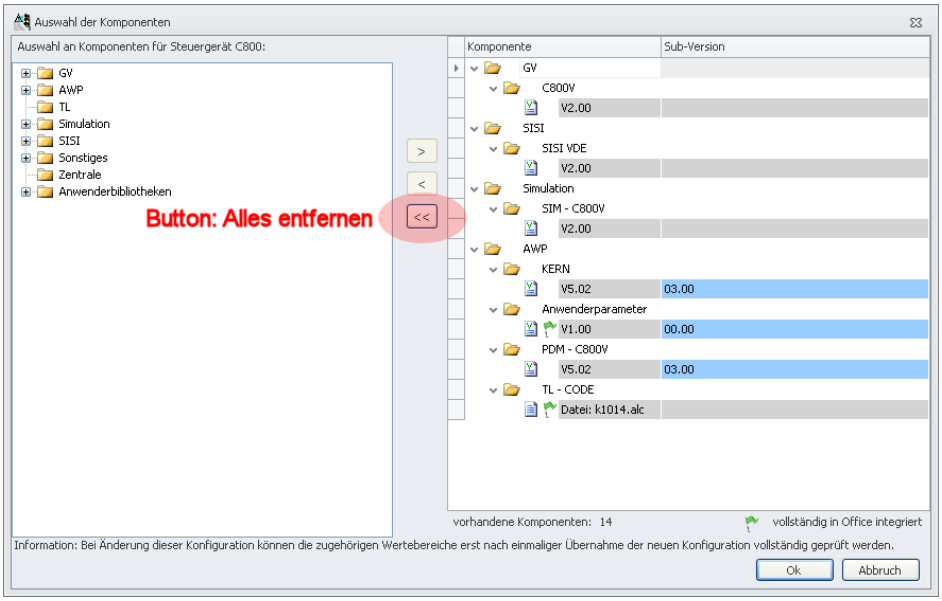
1. Creating a new draft copy from the original version

- Opening the intersection version General - Component Index



Img. 27: Open intersection version General - Component Index

- Select the "Change" function



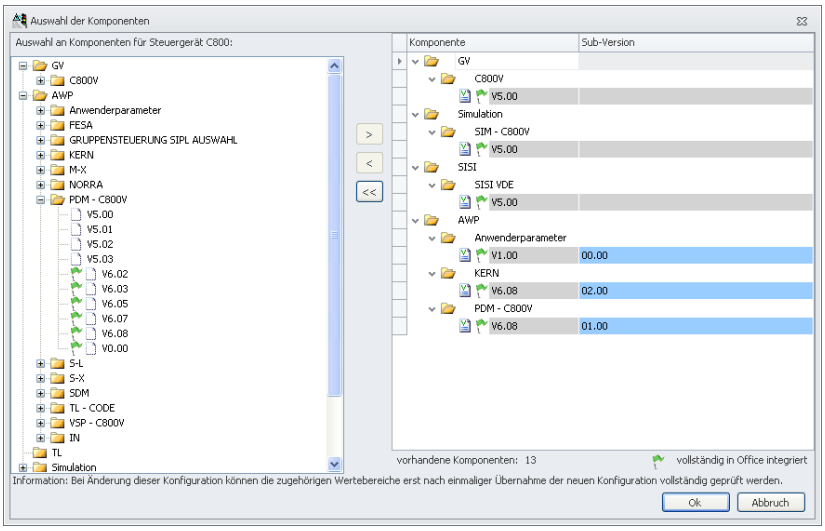
Img. 28: Change function

After none of the "original" versions remained when pulling up, the component selection can be completely deleted using the "Delete all" button.

Note: Make a note of the configuration, the components that the previous configuration was made up of. If you already know that an existing component matches the new configuration, it can of course remain unchanged. However, in this case, every old component that should be pulled up must be removed from the configuration one by one. In this case above, the user parameters might be kept, for example. However, what might be more important are such scenarios that concern signal monitoring. If the existing component is compatible to the new configuration here -> leave it as is, do not transfer data within SiSi = no checksum change.

When upgrading to new TA components, generally the code file (.alc for C800 and .so for C900) must be deleted. The code file must always be re-created from the user logic and is then automatically added from there to the configuration.

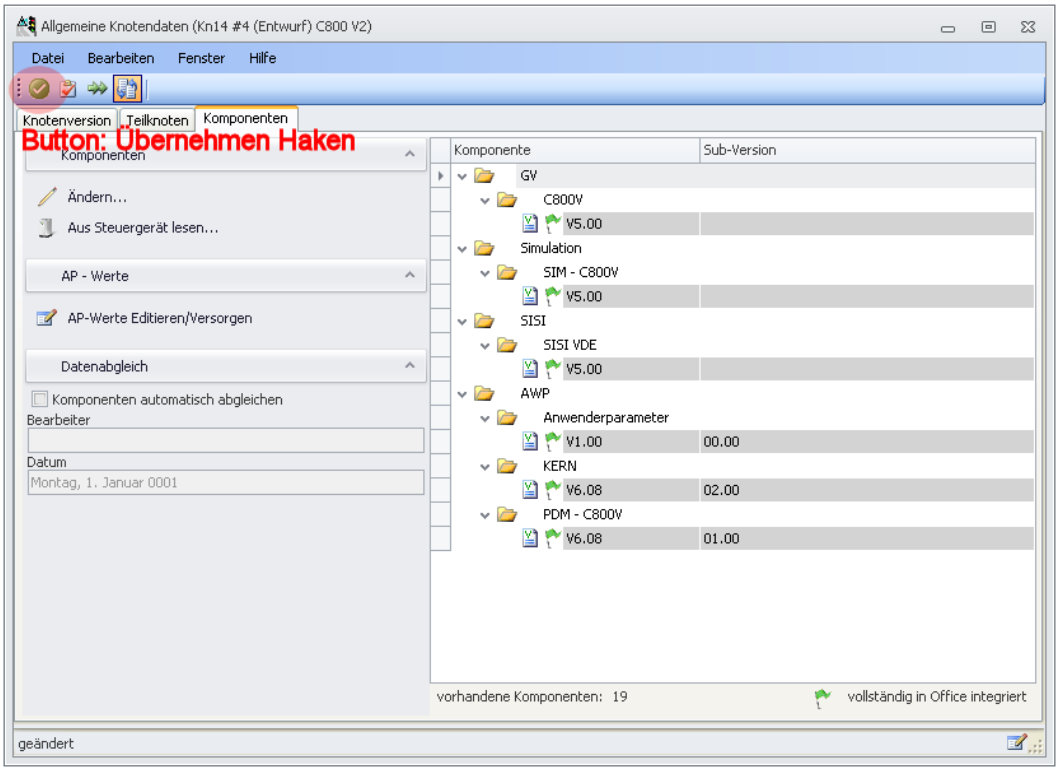
- Adding new components



Img. 29: Adding new components

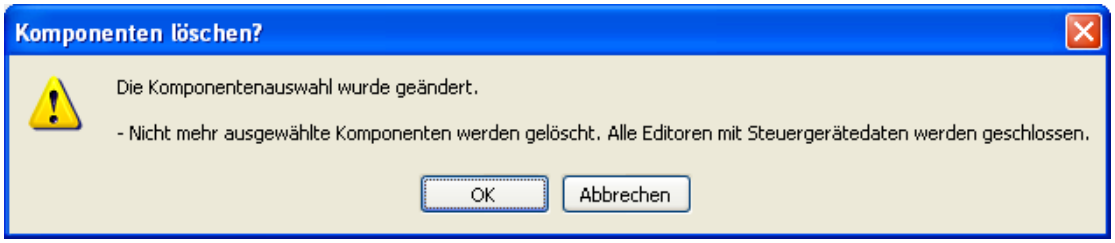
Select the new components you want to use from the left tree and add them to the current configuration. Confirm the new configuration by clicking on OK. This step will only confirm the definition of the new components. No data has been transferred yet!

- Transferring data into the new configuration
  If you now close the editor without saving, the original "old" configuration incl. the corresponding data remain unchanged.



Img. 30: Transferring data into the new configuration

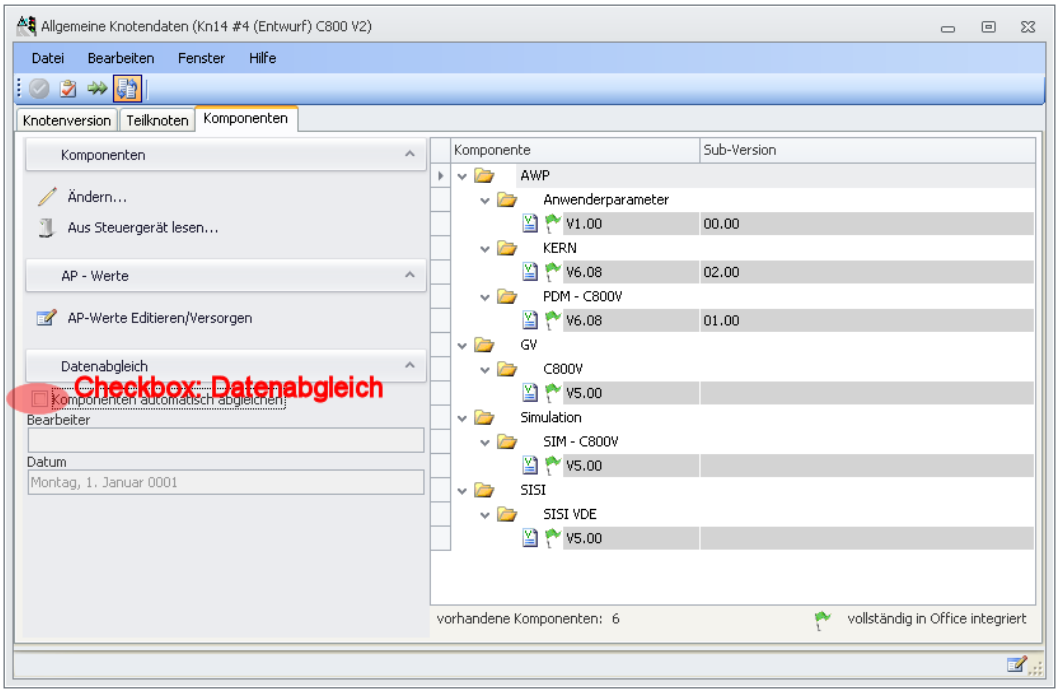
By saving the new configuration – either by selecting the Transfer checkmark or by saving and then closing the editor, a security question will appear.



Img. 31: Komponenten löschen

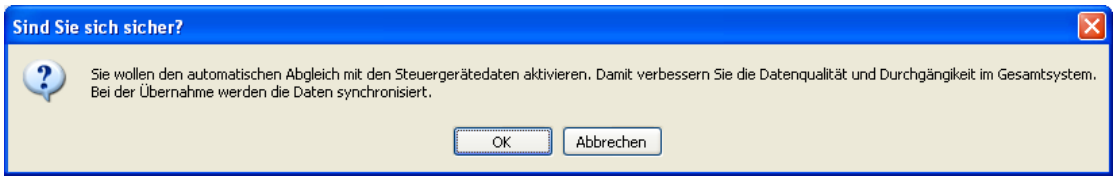
After confirming by clicking on OK, a data transfer of all old components into all new components runs automatically in the background.

- Switching on data synchronizing



Img. 32: Switching on data synchronizing

We recommend to generally always work **with** **Data synchronizing** between the Office data model and the system data. In this case, all changes to objects that are included in both data models are only necessary at one point - in the Office model. The checkmark can be set either before or after the data transfer.



Img. 33: Data synchronized

We strongly recommend continuing working in a synchronized state!

- **Next processing steps**
  - Check and make any necessary adjustments to the supply in Office editors
  - Check the user logic and make any necessary changes (e.g. necessary changes when switching from C900 <V3 to >=V3 because the PDU and VKU libraries no longer exist), re-translate for device and possibly for VISSIM
  - Check and make any necessary changes to the supply in the system data
  - Supply in the test location / load device and check
  - …

18.7.5. Version / supply guidelines

Topic: Scala and device data consistency

Goal: Master data in Concert show the identical version status of the control center's intersection version and in the device

Assumption: As the leading system, the control center has the valid supply status for all intersection versions

Pre-requisite for versioned working is that Service has a notebook with a stand-alone Office installed to supply the device locally.

Example: Intersection 518, stored intersections, version 2.29.1 in the control center and in the Device

Scenario 1: Accident damage / defective module on the device

sop export of the stored version at Scala

sop file transferred to Service

Service imports the stored sop from Scala into the stand-alone Office

Subsequent supply of this version to the device

where necessary, supply of the add-on module (C900 = BBX, C800 = PCV/MPM) for OCIT/CANTO connections from existing backup (included in sop)

if necessary, supply AP values into the attachment module

After resetting, the device should connect to the control center automatically and show the identical version status.

Note:
It is possible to query the version states locally with Sitraffic Service from the menu item Device data - Upgrade - Versions standard Listed in the device are up to four different versions -> Basic supply, SiSi data, VA code and VA parameters. The highest version number is reported to the control center.

Keep in mind: when exporting a complete supply into a new intersection version, these version numbers are **not** considered! The version number pre-assigned by Office applies.

Scenario 2: Changes that can be supplied remotely at the intersection

copy a new draft version from the stored version on Scala - the version number is automatically increased by one number in the center block = 2.30.1

e.g. changing a switching time in a signal program

Calling up the Supply Wizard

Delta supply shows the supply for the changed signal program

Executing supply

Return to Office as active status = workflow text

After a time, the status of the traffic technology changes on Scala from OK to Warning -> in master data the deviation in the versions between Control Center = 29.1 and Device 30.1 is visible.

Additional changes are possible in Office by setting the test version as the draft (with an increase in the build number) - in this example, the next would be version 2.30.2.

The relevant version number for the supplied components are stored in the device after each supply process (basic supply or TA parameter) and is displayed in the control center as the "highest" version number.

Once all changes have been made, the intersection version must be set using version management from the test status to the data store and be exported to Scala.

After exporting, the versions in the master data are identical again, the warning traffic technology switches back to OK status.

Scenario 3: Changes made locally at the intersection

If changes are necessary that are not possible using remote supply (e.g. all data from the signal monitor, safety-relevant data in the basic supply, etc.), the corresponding supply processes must be performed locally.

Export stored versions from the control center (provided that central data storage is located here) as intersection sop.

Import stored version sop onto the planning computer on which the changes are made.

Copy a new draft. Of course, this step could also be made on a Scala client without using the data store export workaround.

Perform all changes, supply the test location and export the "final" version in the test status as sop and then forward to Service.

Service then imports the exported sop on a service notebook with an installed stand-alone Office.

The intersection version in the test status is imported into the device locally and is put into operation while maintaining the usual instructions.

If any other changes become necessary, a new draft must be set from test status, which will increase the build number, and must be supplied in the device -> new "Test" status.

After the supply, the control center is notified of the new version status - in Actual Status, a "Warning Traffic Technology" is displayed - the different version numbers can be seen in the master data.

Note:
Depending on the transmission type CANTO or OCIT, this deviation will not be visible until after the control unit is reset, or after the network has been re-established or after re-connecting after a wire break.

The final intersection version in "Test" status must be exported as a sop by the service PC and be transmitted to the central data storage (Scala).

Import the sop on Scala and compare the device version in KV-General with the returned device version in the master data (if available, see note).

Setting the applicable test version as data store

After exporting, the versions in the master data are identical again, the warning traffic technology switches back to OK status.

Scenario 4: Version comparison in the control center without sop export (not recommended)

Supposing that only changes were made to the basic supply or to the AP values locally, it would also be possible for the version numbers to be synchronized remotely in the control center. These two components can be exported completely via remote supply from the device. However, the version numbers of both components are not included in the supply data, so the match is only possible using a workaround by resupplying them. As such, that actual latest version is not referenced in the device. Changes that were made in signal monitoring or in the TA code in the device could never arrive in the control center this way - so, as far is this kind of scenario is concerned, any theory relating to central data storage is therefore irrelevant.

However, if the basic conditions are just right and you are aware of the risks involved, you can take the following steps:

A Traffic Technology warning is present on Scala for stored intersections; master data show a difference in versions

Make sure that the reported version is in fact the highest version. To do so, you can read the versions of each of the components from the addition module directly via the web interface under
Versions – Supply (or supply data).
For basic supply, signal monitoring and TA supply, the last two numbers each represent the data version (e.g. 3.0.33.1 = BBX 3.0, data 33.1)

If the SiSi version is smaller than at least one of the two exportable components, the synchronizing can be run.

From the stored version on Scala, copy a new draft version - check in the window that opens whether the version shown for the draft is not lower than the highest data version in the device - if it is, correct the version manually to a highest version (e.g. highest version in the device = 33.3, draft copy displayed = 33.1 -> then set this to 34.1 manually).

Import the BDS and TA parameters into the new draft one after the next using "Export by manufacturer specifically". Note: after a component has been imported, do not close the supply wizard, but instead select the second component by pressing Back and export it.

Then, pull up the supply wizard via "Supply data by manufacturer specifically" and only select those parameters in the BDS via "separate project component - single structures" and resupply those.

During this process, the version number is transferred by Office (in the example the 34.1) to the device into the component BDS. After closing the wizard, the intersection version is found in the test status.

Setting the applicable test version as data store

After exporting, the versions in the master data are identical again, the warning traffic technology switches back to OK status.

Scenario 5: Transferring a scx and local supply via Control

Warning: Choosing this process will void out continuous versioning!

If Service only works with a stand-alone Control locally, it can import the transferred scx file and open it as a cpr file.

The versioning checkmark in the project tab is not set, the version number matches the intersection version exported from Office.

Version numbers can be adjusted manually - no automatic increase and no changes in the workflow status after supply processes ...

If only one date for the basic supply is changed in the device - even if one that can be supplied remotely - it will no longer be possible to supply Delta from the control center.

If one date changes in the TA parameters, when the next change is made by the control center, all TA parameters will always appear - they may all be supplied remotely, however you will not have a clear overview of what was in fact changed.

When returning the changed data to the control center as a scx, there is an increased amount of effort needed to synchronize existing planning data with the device data - a merge is required, etc.

The version numbers merge between the control center and the device generally works in the same manner as described in scenario 4.

18.7.6. Template concept for control units

If a control unit is newly configured in Yutraffic Office or re-configured to another component, some basic settings can already be set correctly in the system data using a template. Generally, the mechanism works in a similar manner as the process known from Yutraffic Control - how the components are selected determines how an existing template is imported.

Concept:

In the Sitraffic Installation Index for Client / standalone PC, the German (DE) and English (EN) template indexes are available under \Office\ComponentsTemplates. Stored there compliant with Office are the templates for each control unit component - in terms of content, the templates match the templates known from Yutraffic Control.

Newly configuring / reconfiguring a control unit:

Depending on the language version (German = DE, all others = EN), when configuring a control unit through Intersection version - General - Components - Modify after confirming and transferring, the corresponding template, depending on the component version, is imported.

For example: GV C900V V3.00 -> Default_FAM_C900_4_C900V3.00_de.VGG

Important: the **automatic import** of a template is based on the relevant file name starting with **Default_,** the device family **FAM_ C900_** (or C800_), an ID **4_** (0 for C8xx, 4 for C9xx), the component name with version **C900V3.00_**and finally the language **de**.VGG (en in the EN directory for all other languages other than German)

This pattern also applies when reconfiguring a control device - e.g. C900V2 to C900V3.1 -> the old component is deleted first, then the new component is added, and its default template is imported and then the data is transferred from the temporarily backed up old data into the new component.

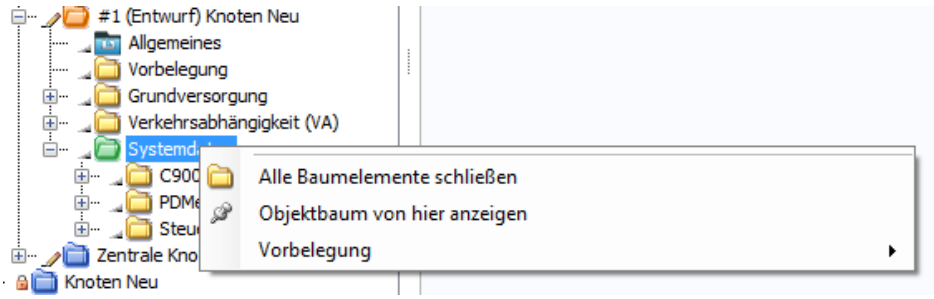
Importing the template into the system:

The default template from the language directory DE or EN are available by default. If the template you want to use - e.g. for the Austrian control device list in the OES directory - is not available for subsequent import (see explanation later), take the following steps:

Create a new C8x or C9x device via the new dialog – the "highest" released component is predefined in every case and therefore its default template

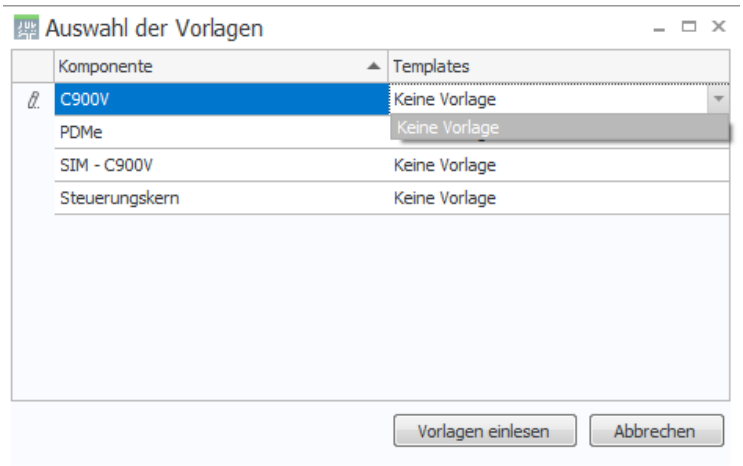
Other components can be selected at a later time using the components dialog under intersection version - General. Here the default components area always selected after a change.

It is possible to load a non-conforming template in the "Supply" view on the system data via right mouse-click – this should take place prior to continued supply process in Office:



Img. 34: Importing template into the system

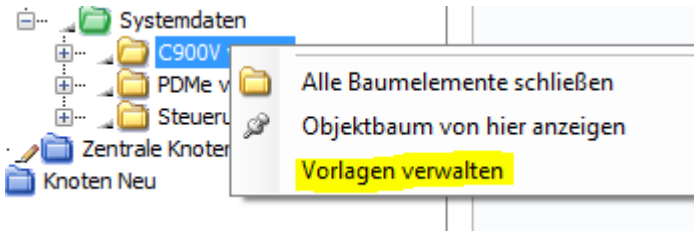
Via Load template the following dialog appears:



Img. 35: Load template into the system

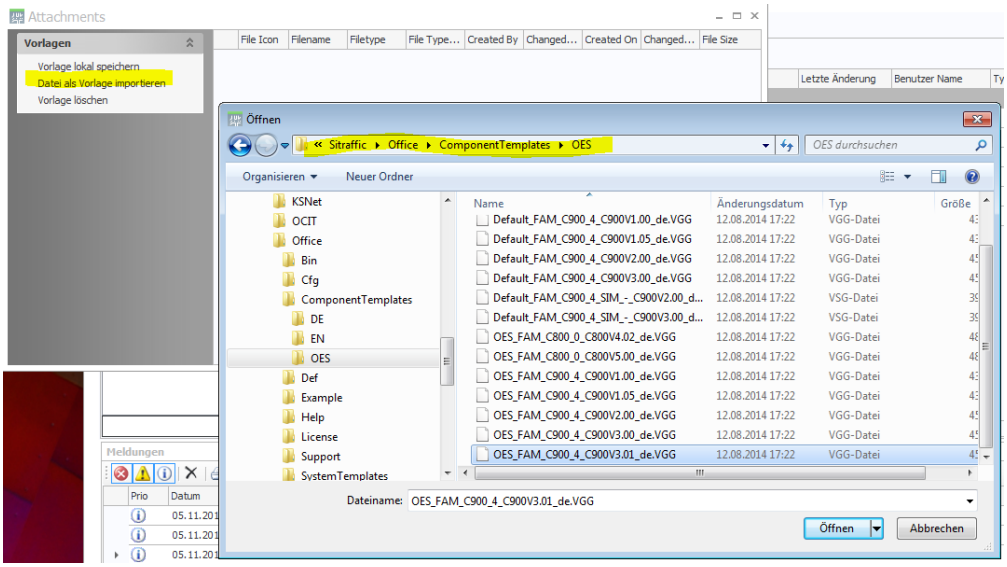
Normally, no non-conforming templates can be selected – the default template was automatically loaded upon creating the component.

To have a new template available for a component, on the component below the system data via the right mouse key open the context menu "Manage templates":

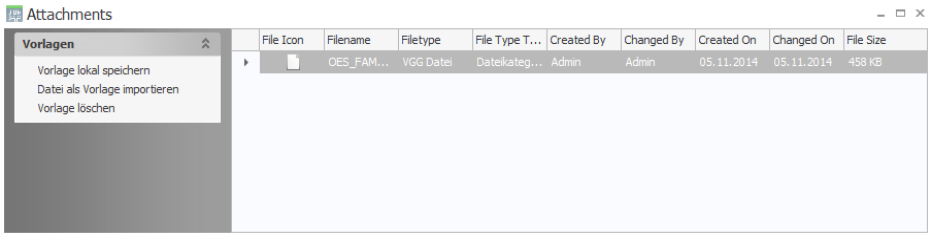


Img. 36: Manage templates

A non-conforming template can now be imported in the selection menu:



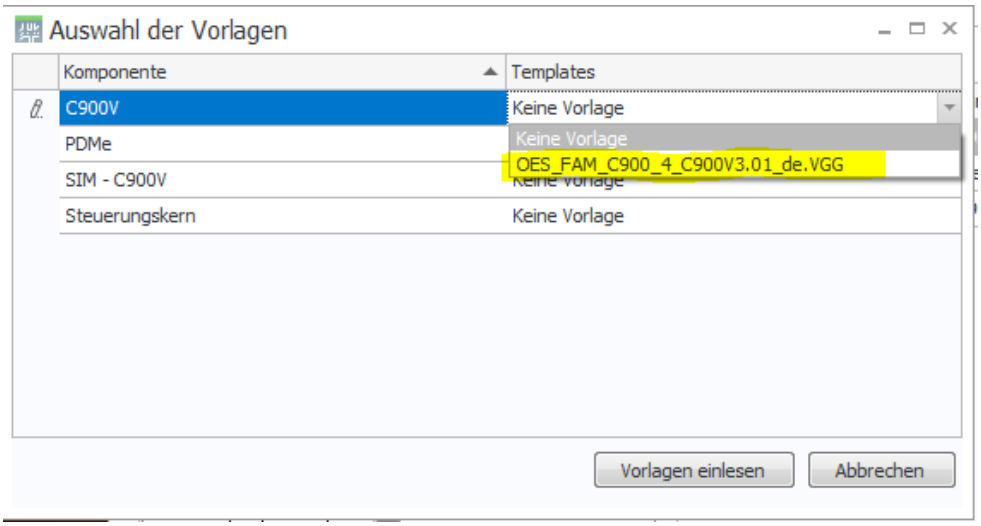
Img. 37: Import a non-conforming template



Img. 38: Attachments for importing a template

Doing so will make the template permanently available in the future for configuring a control unit on the client / standalone PC. However, the newly imported template is **not automatically** pulled when assigning a component in Intersection version - General - Components. If this is the effect you want to achieve, **the default template must be renamed in the file system and the new template of your choice must be stored under the default name** (similar process as described in Yutraffic Control). The advantage of this method is that the new template is automatically taken when creating a new one or when reconfiguring one.

After the import, the imported template can be selected on the system data under Load default settings:



Img. 39: Selecti template

The template file contains the complete device dump!

This means, importing the templates into the existing device supply at a later time will delete any definitions that already exist in the system data, such as signal group definitions, etc.

So: The best thing to do is to apply the template on empty control device definitions from the start!

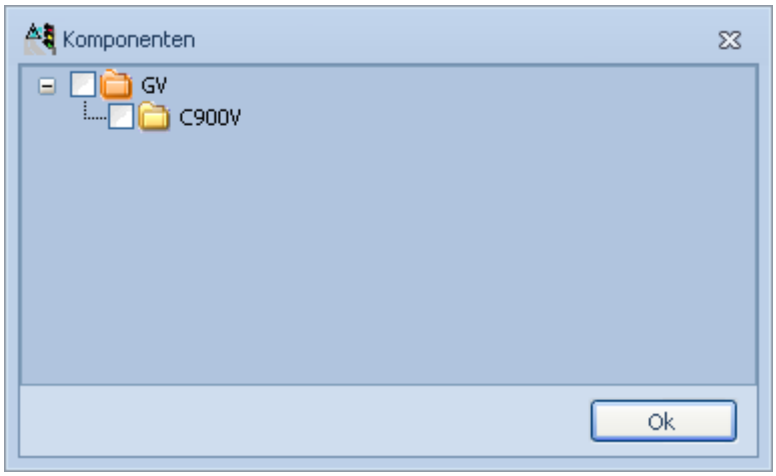
That is, after completing the first component assignment under the Intersection version General (ideally with the option "Automatically synchronize components"), select the system data folder in the tree (only visible under the perspective "Intersection supply").

Saving your own templates

As a rule, any device in any version can be "pre-defined". You supply a new intersection version according to the user needs so that the initial state for any new device is created in system data (e.g. one 8 signal group device with one specific platter / input definition, etc.)

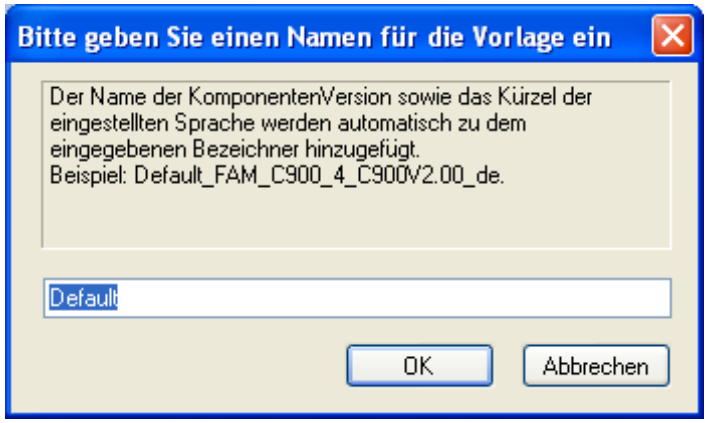
If the work process is not synchronized, the supply can only be performed directly in the system data. However, we recommend to only work synchronized and to only input those entries into the system data that is not available in the Office data model.

The selection editor can be opened on the system data folder using the right mouse button from the context menu "Pre-assignment - Save...".



Img. 40: Save own templates

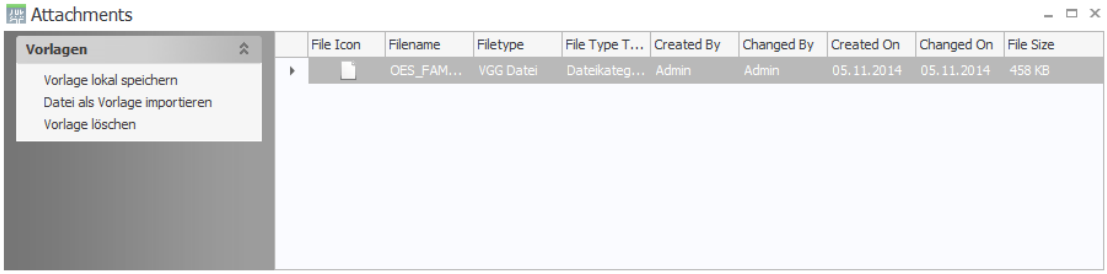
The components are shown, which were defined according to the component definition under Intersection version - General - Components (so in the example above, only a BDS). By checking it and clicking on OK, the input for the template name appears:



Img. 41: Name own template

If you leave the default name, the system adds the rest in compliance with current conventions as shown. If you enter "Test", based on this example the results for the template name will show "Test_FAM_C900_4_C900V2.00.de"

The template is now only available on the Client / Standalone PC. To transfer the template to another system, the file must be saved locally. The way to do that is described above under "Importing templates into the system" - only using the menu item "Save template locally".



Img. 42: Save template locally

18.8. Supplying an sX control unit

18.8.1. Importing sXData

There is the option to select a *.c10 file from the Import Dialog by selecting the menu item "Converting, Migration".

The importation/exportation of *.C10 files of the version-1 control unit sX is not possible anymore since Office 4.6.8. Please migrate the data prior to importing with the corresponding tool.

You can import to a selected intersection so that the sX files are imported as new draft versions; otherwise a new intersection is generated automatically.

If the unit is connected to a Scala, and if it has information about the FNo./CNo. from the relevant system configuration, the file is supplemented under the already existing intersection as a draft.

The control unit's version number is not automatically adjusted during the import process, but instead it is transferred from the unit. For current versions, they are consistently issued in the unit itself.

18.8.2. Transmitting the configuration to the device

Intersection Versions for an sX unit are only transmitted using smartCore integrated in Office. The **Online help tool in smartCore** provides all of the information necessary to transmit sX data.

18.8.3. Plug & play

Functional expansion for the family of sX devices: connection and supply data updates for the Scale central device using plug and play functions.

With the sX family of products, a new set of functions is made available in the Scala environment that makes it possible to announce sX devices in the Scala system and to also update the unit's supply data in the Scala central device.

The interactions with the Scala system needed and the Config database are performed with the user ID FDPnPUser, this includes, among other things, reservation, release, intersection / central device intersection version creation and workflow state changes (incl. the Scala supply procedure).

Comment:

If you do not wish to allow any PnP functions in the central device, by deleting the user you can: deactivate the FDPnPUser function from the user management

19. Glossary

Definitions of terms in the field of traffic planning.

The glossary is sorted alphabetically.

Logoff point

An active logoff of the public transport vehicles after passing the stop line, specifies the influence of the signal program, i.e. is limited to the required minimum and minimizes the disturbances of other road users.

Section

Part of a > route or > route

Adaptive control

Control of coordinate signal systems according to specified signal plans and time-distance relations, whose features have to be adapted.

All red

Special case for an intersection. "All red" enables immediate green (e.g. for all signal groups) in response to pedestrian or vehicle demand (e.g. during the night when there is little traffic), without observing the > minimum green time of a traffic flow that has just been released or observing an > intergreen time for the demanding traffic flow.

Central office number

Intersection control is identified via central office number and external intersection number. This information is required when exporting the control data.

Requirement (release requirement)

Demand logon to release time by road users via detectors.

Logon point

PT vehicles have to be detected early enough when approaching the intersection, so that all measures for prioritization can be taken on time and no delay times are caused, if possible.

A difference is made whether there is a stop before the intersection to be influenced or not.

Waiting area behind the stop line

This specifies the available queuing area for left-turning vehicles in situations where left-turning vehicles can only move by taking oncoming traffic into consideration. The waiting area is measured between the stop line of the light signal control and a fictive stop line where oncoming traffic is waited for.

Degree of saturation

Proportion of the capacity, for example a carriageway on motorways (ns) or a single or multi-lane intersection approach per signal group at an intersection (ng) or a fully signalized intersection or network.

Depending on the use (e.g. for calculating a signal plan, updating dynamic green time, or running green time calculation to achieve a constant saturation of the intersection approach) the degree of saturation can be calculated once for each traffic situation, cycle or second.

Switch-off signalization / program

The switch-off signalization defines which traffic signals run in which order before the traffic light is switched off; also see -> Switch-on signalization / program.

Switch off point (SOP)

When switching off the intersection in operating state, the transition from signal control to the Right of Way regulation must be made via a signalization state that is safe in terms of traffic safety. The SOP is the time at which the order of the switch-off signalization states begins.

Outer signal group

There are types of outer signal groups: "outer SG (wide crossing)" and "outer SG (narrow crossing)". For progressive signalization with 2 signal groups only the 'outer SG (width crossing)' is specified, namely the signal group which is assigned to the signal heads on both lane kerbs.

When applying 3 or 4 signal groups both signal groups have to be indicated separately at the lane kerb for 'wide crossings'.

Demand trip / stage

On demand is inserted in the given stage sequence at a suitable time.

Signal groups which can be influenced

Is called upon for the evaluation of the capacity of a signal program.

For semi-compatible signal groups, the crossing directions are controlled by the Give way regulations. Here you can specify up to 3 influencing signal groups which have precedence over the signal group being considered.

The first two signal groups are the influencing signal groups which have precedents over the left turning lane. The third signal group is the one which has precedents over the right turning lane - both from the point of view of the respective signal group.

Prioritized pedestrians signal groups can also be specified as influenced signal groups.

If the intended positions for the opposite signal groups (2 for LEFT, 1 for RIGHT) are not sufficient, specify the decisive signal group.

Load quotient

Ratio of the sum of vehicles which at the beginning of a time interval wait in front of the outbound cross section or arrive during this time interval, to the number of vehicles which could pass the outbound cross section in the same interval.

Capacity used

In flowing traffic: Ratio of the sum of the vehicle stay times in the perception area of a detector during a time interval to the length of the interval.

Calculation speed

A planned aimed at mean value of the travel speed of all vehicles with the provided road conditions and the calculation of the traffic volume.

Calculated intergreen time (cal. intergreen t.)

This is composed of

Clearing time tC + Transition time tPass - Entering time te

Acceleration

The approach curve in the time-distance diagram line display is calculated in m/s² by the acceleration.

Standard values:

- Bus:1.20 m/s²
- Tram:1.00 m/s²

Operating state

Intersections are differentiated between:

normal operation, flashing amber and off state.

Prioritized traffic direction

Specifies the traffic flow direction, which can flow unimpeded with green (by the oncoming traffic) (STRAIGHT AHEAD, RIGHT, LEFT).

Braking deceleration (PT)

Calculating the brake curve in the time-distance diagram line display.

Standard values:

- Bus:1.20 m/s²
- Tram:1.00 m/s²

Gross lane gap

Lane gap between congenial reference points of contiguous vehicles.

Gross time gap

Time gap between congenial reference points of contiguous vehicles.

Bus sluice

Mechanism, using traffic lights, that allows buses in front of an intersection change from a bus lane to another lane, unhindered by traffic.

Permanent green

Continuation of green for a traffic direction at a traffic-actuated signal control without demand from the released direction.

Detector

Controller for automatic recording of states or state changes (e.g. induction curves, radar detectors).

Dimensioning distance

For progressive signalization of subsequent pedestrian crossings with 2 signal groups, according to the Noll/Hamann calculation method, enter the route for crossing the wide crossing until the opposite lane here.

Double green

Second release time in the cycle: For example, for left turners, if the length of the left turning lane required for a release per cycle cannot be provided or if the delay time for pedestrians is > 60 s per cycle.

Real-time control

Control principle for intersections, where signal states are constantly being adapted to the current traffic situation.

Effective intergreen time

The larger value from theoretical intergreen time and minimum green time.

Entering acceleration (aC)

On the basis of entering acceleration the entering time is calculated in the intergreen time form.

Entering acceleration is specified in m/s² for the default of different flow types.

Standard values:

- Bus flow type: 1.20 m/s²
- Tram flow type: 1.00 m/s²

According to RiLSA '92, no acceleration values are to be applied for other traffic modes. In this case the entering time is calculated on the basis of the speed vC.

Entering speed

Time required to cover the entering time in connection with determining the intergreen time when calculating the signal program.

Certain entering times have to be taken into consideration for vehicles, PT, cyclists and pedestrians

Entering speeds are preset according to RiLSA 92:

- Vehicle flow type: 11.10 m/s
- Bus flow type: 11.10 m/s
- Tram flow type: 11.10 m/s
- Cyclist flow type: 5.00 m/s
- Pedestrian flow type: 1.50 m/s

Clearing speed in the approach (vC ap)

Entering speed in the approach is only important in connection with public transport. If there is no compulsory stop immediately before an intersection, the speed at which PT vehicles enter the intersection can be entered here.

Entering distance (aE, Edist)

Route from the stop line to intersection point with the clearing distance of the terminating traffic flow or to crossing. For pedestrians it is the route between the beginning of the crossing to the beginning of the conflict area.

Clearing/entering distances are required to calculate the intergreen times and can be determined graphically by drawing reference lines.

Entering time (te)

Time required to cover the entering time.

Junction

Three leg intersection in a level where a street is connected to another continuous street at a right or an acute angle.

Advance step control

Traffic light control, controlling the signalization states via defined operation points. Signal programs saved to the controller are influenced by the higher-ranking controller, so that you can create and change release and cycle times.

Switch-on signalization / program.

Defining which traffic signals should be followed through in what order when switching on the traffic light, before the usual signal sequence comes into effect.

Switch on point (SOP)

Time at which a signal program is switched on. After the switch on signalization state has been followed through, the selected signal program starts in SOP.

Single intersections

Category for a traffic light which is not operated in the network (i.e. is not coordinated).

Isolated controller

Controller at an intersection that is not in the network and therefore not coordinated.

Single control

Controlling the traffic flow with an intersection without harmonizing with other intersections.

Backup signal plan

Signal plan which becomes effective when the higher-ranking controller fails.

Route relation

Possible routes, i.e. a journey which is determined by source and target.

Driving speed

Mean vehicle speed of a route calculating the stop times.

Lanes, track

Lane parts which are determined for each vehicle row.

PT track areas are also regarded as separate lanes.

Trip

Vehicle movement between two specified points.

Trip profiles

When you plan a progressive signal system, the trip profile should be displayed in the time-distance diagram with the trams and buses. According to RiLSA, accelerations and delays of 0.7 to 1.2 m/s^2 can be permitted for buses.

Vehicle registration

For PV and PT.

For the acceleration of PT, vehicle registration takes place via contact wires, inductive curve in the lane, transmitter/receiver systems with coupling coils, antenna curves or infrared beacons or via radio data transmission.

Vehicle length

Is calculated with a double curve.

Is included for calculation of clearing/entering distances and therefore in the intergreen time calculation.

According to RiLSA '92 the vehicle lengths are preset with:

- Flow type vehicle: 6.00 m
- Flow type bus: 6.00 m
- Flow type tram: 15.00 m

Color sequence

According to RiLSA: RED - RED+AMBER - GREEN - AMBER - RED.

Conflict matrix (CM)

All possible calculation cases are created on the basis of the conflict matrix and pre-set with data.

In the intergreen time matrix the reference is used to label the conflicts on demand.

Remote supply

The system-specific data of a local controller (e.g. instructions, parameter settings) is in alphanumerical characters. These are transferred from or to a traffic control computer, using the corresponding transmission system. Is required for intersections, test purposes, etc.

Fixed time signal control

Traffic light control with fixed signal times without influence through road users.

In fixed time controlled single intersections, the switching time point for switching signal programs for each day of the week is set.

Fire department operation / plan

Intersection control for which a fire department operation has highest priority in signalization.

Flow types

Characterize the movement properties of carriers. When you edit intersections, they are assigned to individual lanes. Their speed and acceleration values determine the times required for clearing and entering distances. They are thus included in intergreen time calculation.

Follow up lane distance

Gross lane gap between contiguous vehicles of the same convoy of vehicles.

Follow up time gap

Gross time gap between contiguous vehicles of the same convoy of vehicles. The follow up time gap is smaller than the critical time gap and can be set as a constant.

Release flow time

Time between the first requirement from the blocked traffic direction and the end of the release time of the running stage.

Release time

Time during which a traffic flow is released to the entrance in the inner intersection area. For vehicles, pedestrians and cycle flows also referred to as green time.

Crossing

For crossing pedestrians/cyclists on a lane designated crossing who do not have priority.

According to RiLSA signalized crossings for pedestrians and cyclists.

Time series

Graphical display of traffic values across time during for day/week/month/year.

Area calculator / control

Traffic control computer which in larger cities is assigned an urban area. Area control means all controllers are controlled and monitored by a control center. This allows higher demands for single or group control to be fulfilled.

Amber time (tC)

Transition time between the signal states GREEN and RED.

Speed time series

Speed progression of a vehicle over time.

Smoothing, exponential

The possibility of calculating a value at present, which takes values calculated in the past into consideration as well as representing the compiled size value.

The relation between weighting past and present values is defined by the ss smoothing parameter. With increasing ss the current measuring value is weighted more strongly.

Regarding the demand for faster or slower reaction times, good results were obtained for normal traffic actuated controls with ss = ¼ or 1/8 (according to the significance of the measuring value tendency). MEXWA is a calculation algorithm which takes that type of tendency into consideration by constantly adjusting ss.

Green, maximum / minimum

Green in road traffic = induced green. Maximum/minimum green are extreme release time values that can be set at the intersection with traffic-actuated release time adjustment (tgmax, tgmin). tgmax guarantees that other approaches are not heavily affected by a very high release time requirement from one direction. tgmin = 15/10/5 s (according to RiLSA) ensures that signalization at the intersection remains transparent to all road users.

Green time

Time in time-distance diagram that represents the flow of vehicles across several intersections.

Green end, released time

Point of time at which green and therefore release time ends.

Green wave

Coordinated signal control, where the number of vehicles when complying with the recommended speed, can pass several intersections without stopping.

Green time calculation

Adaptive release time adjustment in the broader sense.

Green time offset

Time difference of the start of green times for a respective traffic flow at two successive intersections.

Basic clearing distance

Part of the clearing distance which is composed of the clearing distance and a fictive vehicle length. The clearing distance is required to calculate the intergreen times of the signal program.

Group control

Controlling the traffic flow via several mutually harmonized intersections.

Switch over point (SOP)

To switch from one signal point to another, an SOP has to be defined in both signal programs in such a way (usually the green time of the main direction), that at the point of the switch over (SOP) the signalization state in the old and new signal program are the same and the minimum green times are met.

Waiting times on stops

Parameter you need to consider when defining a signal control in order to avoid unnecessary dead time for public transport. The waiting times on stops also has an effect on the travel time and the logon and logoff point.

Position of the stop

Stop types:

- Bay: The stop is at the side of the lane and does not block the remaining traffic.
- Cap: The stop is part of the lane. Public transport vehicle stopping there block the traffic in the respective traffic direction.
- Center: The stop is in the middle on a dedicated lane.

Manual advance point, rest point

An advance switch command is required which is triggered manually (manual operation with grid steps).

Main signal

Signal which according to its information content, gives binding commands by red or green of the flow of road users via conflict areas.

HBS

Manual for calculating traffic engineering systems, Edition 2001, Forschungsgesellschaft für Straßen- und Verkehrswesen (German Road and Transportation Research Association).

Auxiliary signal

Signal which gives a warning or recommendation for the amendment of traffic engineering measures.

Ideal trip

Only PT stops are considered, not signalization.

Pulse length

Quotient from assignment and traffic volume per minute.

Large approached reciprocal measurement for the speed of traffic flow, which can be calculated by accepting a mean vehicle length and known, electronically effective curve length.

Individual traffic (IV)

Traffic, allowing only a single person or a limited subgroup of persons to use the transportation.

Intersection

Construction which enables roads to be routed. In Yutraffic Office, the intersection can be identified by name, version and number.

Conflict areas

Limited area on a traffic engineering system which arises from the overlapping motion strips of non-compatible traffic flows.

Conflict point

Intersection of the central line of the lane (or crossing center line or track axle) of traffic flows.

Coordination speed, Progression

Incline of the central line of a green time to the time axis in the time-distance diagram. It may be useful to deduce the coordination speed from the movement of the top of the bulk. The progression speed on successive route sections (with constant extension standard) can deviate from each other by 5 km/h. The progression speed is usually selected equal to the speed limit, but can be adjusted to the mainly driven route speed, if it less than the speed limit:

0.85.v per <= Vp >= V per

Layout plan

Geographically oriented, drawn display of an object with entries for construction, entries/exits, masts, trees, hydrants, shafts, etc.

Capacity

L = q max

Largest traffic volume q max (in vehicles per time unit), which can use a traffic center at given route and traffic conditions.

Traffic signal

Light signals according to §37 StVO (German Road traffic act). For traffic signals controlling the traffic flow at intersections, junctions and other parts of the road, the legal traffic term used is "LED traffic light".

Traffic signals for vehicles have the color sequence GREEN - AMBER - RED - RED and AMBER - GREEN, in special cases DARK - AMBER - RED - DARK according to RiLSA.

According to RiLSA, traffic signals for pedestrians have the color sequence GREEN - RED - GREEN.

Public transport receives special traffic signals with a special signal sequence according to tram regulations, if they have not been signalized together with the vehicle traffic.

Signalized intersections (traffic light)

Combination of traffic light providers and required equipment for controlling the traffic flow.

Left turners

Left turners cause special problems for signal control, as for them there are the most conflict possibilities with other traffic flows. A difference is made between protected, partially protected and non-protected left turners.

Pole, traffic light pole

Traffic light poles or pole extensions serve as a suspension for signal heads next to or above the lane. The latter can be used as wire poles or installed as gantries with a straight extension and must correspond with the static requirements (loads and wind). You can specify the pole type in the signal group editor.

Maximum time

Largest release time extension for time dependent control after the first vehicle login of crossing traffic and after start time has expired.

Measuring value preparation

Acceptance of analogous vehicle signals, e.g. pending at induction curves, as long as there are vehicles in the curve area; measurement of these signals (digitalization) to some extent saving accumulation, > exponential smoothing of the same, depending on the type of measuring values and measuring interval.

Minimum green time (tMinG)

Shortest release time to be specified independent of the traffic volume. It must not be exceeded.

Depending on the traffic flow, the minimum green times vary between 3 and 20 seconds.

Minimum red time (tMinR)

Definition of the smallest independent of the traffic volume given red time, which by no means is allowed to be exceeded. The minimum red time does not include the signal transition times.

Depending on the traffic stream, minimum red times range between 1 and 20 seconds.

Drag effect

Dragging with clearing in the release time (additional clearing).

Late release time

Time around which, for coordinated signal controls, the release time for a traffic flow ends later, as would be necessary after the time-distance stream.

Minor flow

A subordinated priority stream at an intersection (e.g. coming from a non-prioritized direction) that crosses or is turns into the main direction.

Net lane distance / gap

Lane gap which is measured between the trailing edge of the vehicle driving in front and the leading edge of the vehicle behind.

Net time distance / gap

Time gap which is measured by a measuring section, between the trailing edge of the vehicle driving in front and the leading edge of the vehicle driving behind. This corresponds with the net distance of two vehicles minus the length of the induction curve.

Network

Two-dimensional road and signal system.

Closed network: System of progressively controlled arterial roads, in which the latter form closed polygons.

Open network: System of progressively controlled arterial roads that do not form polygons.

Coordinated network: Network of signalized intersections in which the individual intersections have a common, continuously synchronized time base and are grouped based on existing volume flows - and at least within these groups are operated with the same cycle time and mutual green bands.

Public transport

Public Transport

The entire public transport company (rapid-transit railway, underground railway, tram, bus) in a community or defined region.

PT direction

Specifies in what direction (STRAIGHT AHEAD, RIGHT, LEFT) public transport road users are moving (from the corresponding lane), provided that public transport has to be considered on the lane.

For intergreen time calculation (in the IC form) only the directions mentioned in the form are taken into consideration for the flow types BUS and tram. If a public transport direction is specified, the lane directions are deployed by default settings.

PDM

-> Stage control with decentralized modification

Permission signals

Signal for recommended departure at stops, bus exit control out of bay or bus lane.

Stage

Part of a signal program, while a certain initial state of the signalization remains unchanged. The flow green times are allowed to start an end at different times.

Stage sequence

Chronology of different stages of a signal program.

PDM stage control with decentralized modification

In the PDM method, the signal group control is carried out in the stage transitions. The state of the signal groups is retained within a stage. Starting is initiated by the user according to the planning specifications demands from detectors etc.).

Stage change diagram

Graphical display of signalization by stage images (diagrammatically, compatible partial flows reproduced in the plan view) and their time sequence.

Car units

When entering the volume flows, the traffic flow is either directly specified in vehicle units/interval or is differentiated after the individual traffic modes (BIKE/interval, etc.).

In the latter case, the measuring points are converted on demand and added in vehicle units using the default factors (conversion factors).

Progressive signalization

To avoid pedestrians having to stop on the island, if necessary, it can be made use of that the pedestrian signal on the island is switched from GREEN to RED earlier than the signal on the opposite lane.

Progressive lane signalization, is for example, blocking a lane by clearing to the front, i.e. switching the individual lane signals to the second, alongside the route section which has to be blocked according to a defined clearing speed.

Progressive control

Switching the green times of both coordination directions of an intersection against each other (staggered green times). > Default times and release times are created. Only possible for requested times in the signal plan.

Platoon, vehicle

Group with minimum distance of successive or moving vehicles, which influence each other when moving.

Crossing speed

A dynamic pedestrian behavior can be simulated separated according to 'green start' and 'green end' . The values are only required for progressive pedestrian guidance according to Noll/Hamann.

Defaults:

- Green start: 1.50 m/s
- Green end: 1.20 m/s

Clearing acceleration (aC)

Specifies which acceleration value has to be set for intergreen time calculation for the clearing traffic in m/s².

Clearing accelerations are preset according to RiLSA:

- BUS flow type: 1.20 m/s²
- Tram flow type: 1.00 m/s²

According to RiLSA '92, no acceleration values are to be applied for other traffic modes. In this case the entering time is calculated on the basis of the speed vC.

Clearing speed (vE)

Is required in connection with the intergreen time calculation of signal programs (transition time, clearing time as well as entering time). The > clearing distance calculation is based on the vehicle length and the clearing speed. You have to differentiate between vehicles, trams, cyclists and pedestrians.

Clearing accelerations are preset according to RiLSA:

- Vehicle flow type: 10.00 m/s
- Bus flow type: 11.10 m/s
- Tram flow type: 11.10 m/s
- Cyclist flow type: 4.00 m/s
- Pedestrian flow type: 1.20 m/s

Entering speed in the approach vEap

Only important in conjunction with public transport.

If there is no compulsory stop immediately before an intersection, the speed at which PT vehicles travel through the intersection (i.e. clear it) can be entered here. If no 'vRan' has been specified (vRan = 0), it is assumed that there is a stop before the intersection and PT vehicles always accelerate and clear 'from zero'.

Clearing distance (Cdist)

Route which the road users have to cover when clearing a conflict area.

It is composed of the basic clearing distance and the vehicle length.

The basic clearing distance is the route between stop line (SL) and the intersection point, with the entering distance of the beginning traffic flow, the 'conflict point'.

Clearing/entering distances are required to calculate the intergreen times and can be determined graphically by drawing reference lines.

Clearing time (tC)

Time required to cover the clearing distance.

Frame signal plan

Signal program, whose > stage transitions (adhering to > intergreen times) cannot be changed. However, the time lengths can be increased or decreased within a time frame communicated by the traffic control computer to the controller. This is used as a basic coordination. Within the frame of being able to move each stage transition, the green times in terms of traffic actuated release time adjustment can be determined in the device. Although the transitions cannot be changed, depending on the planning requirements, they can also deviate. If the frame signal plan contains a permission range across the entire transition for all signal groups, this means that the respective controller can use all controlling algorithms available.

Travel speed

Mean vehicle speed within a monitoring interval as a quotient from the route covered and required time (mean value of a speed time series).

Travel time

1. The travel time calculated by the vehicle device on one routing distance including all congestion times and stops.
2. Time between source and destination of a route including (subtracting) the stop times.

Request times

Request times are those times within a signal program (or Switch-on/switch-off programs), by which a green time could be increased, without intergreen times or violating other criteria.

Red end

End of red time. This usually does not characterize the end of RED, but the end of RED+amber, if such a > transition signal is available.

Red/amber time (tra)

Transition time between the signal states RED and GREN.

Saturation flow (Qs)

Maximum possible traffic volume in the cross-section of a lane during a one-hour green time.

Leap second

Specification of the process to the second of individual signal states changing within the process of the program.

SDM

> Signal group control with decentralized modification

Signal sequence

Time sequence for traffic signals of a signal head, which is defined for main signals (according to RiLSA: GREEN - AMBER - RED - RED/AMBER - GREEN, for pedestrians GREEN - RED - GREEN).

Signal heads

Light, acoustic and mechanical signal heads are telecommunication devices which transmit visible, audible or tactile signals (signals for the blind) to the road users.

Signal group

One or more traffic signals which always show the same states are combined into a signal group.

Signal group remote control (SF)

During each cycle two commands are sent from the higher-ranking controller, in which the signal programs are stored, to the individual signal groups: the red end and green end commands. Apart from that, only switch-on and switch-off commands and a switchover command are required. Transition times are calculated in the respective controller.

SS/SS: Used in stage control for the frame plans. Provides changeover from central control to local operation and vice versa, via SOP, SUMI or STRETCH switchover method.

SS/EP: Synchronisation with central synchronisation points and SIPCO recoding ("translation" of the structure number from the central computer to the signal program).

Signalisation state

All traffic signals produced at an intersection at the same time.

Signal program

Signal times of a signalized intersection which were specified with regard to duration and allocation.

Signal layout plan

Layout plan with entries for the traffic light control which are necessary for traffic actuated devices (usually on a scale of 1:50 or 1:250).

Signal mapping (SM)

Allocation of the individual signals to the point of operation.

Signal monitoring

As defined by DIN VDE 0832.

Measures and equipment for protecting against signalization states that might endanger traffic (non-appearing or erroneously appearing signals, signal time changes).

Signal program

Graphical display of the signal program in the time scale.

Signal state

Signal states define unambiguous states a signal may assume during program execution. For motor vehicles, for example, these are RED indicating the vehicle must stop and GREEN indicating the vehicle may pass, in addition the auxiliary signals (flashing lights) for which a separate signal state can be defined.

Blocking group

Amount of signal groups (at least two) that are not compatible.

Decisive signal group method

With the decisive signal group method (fixed time) signal programs are automatically calculated. The method takes into consideration that:

- Each signal group is released exactly once during a cycle, unless the user wants permanent red (signal groups without conflicts, e.g. flashing, are set to permanent green, unless bound by offset specifications.)
- -The minimum green time is observed for released signal groups.
- - Green times of the signal groups are dimensioned depending on the given loads, assuming the same degree of saturation,

- and/or that any specified combinations of green start, end, duration and/or signal group relations specified by the user as boundary conditions for calculation (for reasons of road safety, coordination or other) are observed.
- - Cycle times with reference to the available queue areas are based on the equation:
  - tC <= lCongestion * 3600 / rel qCongestion * lveh
  - are checked and when exceeding the upper limit, a corresponding message appears.

If no target cycle time is specified, the method calculates the shortest cycle time possible that meets the above criteria.

The decisive signal group method distributes the time available in accordance with the above-mentioned criteria so that no request times with respect to intergreen times arise.

Non-permissible specifications are rejected with an error message. If for example, the specified cycle time was too short and the minimum green or intergreen times are not met, the method terminates, and a corresponding message is displayed.

The basis of this successful and proven method taken over from the predecessor system SIVIP, is the division of the signal groups into so-called blocking groups. A blocking group is a set of signal groups (at least two) all in conflict with one another.

The method determines the composition of the blocking groups on the basis of intergreen times. The sequence of conflicting signal groups of each blocking group is defined according to the minimum intergreen times total. Intergreen times (ti) and required green times (gt) of the signal groups in the blocking group produce the total time demand of a blocking group. The blocking group with the highest demand, referred to as the main blocking group, thus determines the cycle time.

req tu = $\sum$ rel tGr + $\sum$ req tz

The signal groups of the main blocking group are color highlighted in the signal time plan.

The required green times of each signal group are calculated according to the time demand method from predetermined traffic loads, on the basis of the same degree of saturation:

req. tGr = rel qPS / 3600 * tu * ta

With oversaturated traffic states, the time demand values are reduced proportionately to obtain a valid signal program. This reduction continues to be applied (if no valid solution is obtained by inserting non-conflicting signal groups from subsequent blocking groups) until the minimum green time of the signal groups is reached. Any corresponding capacity deficits based on the observance of identical degrees of saturation for the signal groups of a blocking group are output in the form of negative request times.

The decisive traffic load is likewise calculated automatically by the program from the lanes assigned to the signal group and their permitted directions of travel (lane markings) as well as the volume flows supplied by the user. If no traffic loads are specified, then the method uses the minimum green times of the signal groups.

The release time points calculated by the calculation procedures are displayed in the signal time plan and replaces the present information.

Signal (timing) plan

Traffic signal which prohibits you from driving or entering traffic areas, which in general contains at least one conflict area.

Route

Several subsequent intersections which have precisely defined distances.

City map

Unofficial name for the control of communal networks, with a relatively fixed signalization process. A more or less rigid coordination of adjacent intersections is weighted more than a flexible traffic actuated release time adjustment.

Queue area monitoring

Queue area: Lane surface, which is available for the vehicle while waiting for green or clearance.

Queue area monitoring usually takes place urban via the measuring value assignment.

Control principle

> HG, EPS, SG, SF, Isolated controller

Control

Microscopic control: Signal control (fixed signal program, signal program adjustment and creation) taken into short-term consideration of each traffic state at the intersection.

Macroscopic control: Signal control (schedule and traffic dependent signal program selection) taken into long-term consideration of the traffic state at the intersection or road network.

Time dependent control: Switching the different signal plans on and off depending on the time of day and weekday, with a time switch or similar installation.

Partially traffic actuated control: Intersection control according to specified times in a signal plan with switchover to green or green times of individual, signal groups less dependent on individual incoming road users.

Fully traffic actuated control: Setting all green times on one traffic light at one intersection due to measurements of individual incoming road users.

(Maximum) speed of the route

The route speed is the mean value of a speed profile. The route speed is the mean value of a speed profile. The maximum route speed for public transport vehicles (trams and buses: 30 km/h to 70 km/h is decisive for the duration of the transition signal (4 to 8 s).

Volume flow (w)

Separately designated traffic volumes of a time interval of a network route, according to starting and final point.

Volume flow plan: the progression of traffic flows reproducing graphical display in form of ribbons, marking each traffic volume by the width of the ribbon.

Stream line plan

The flow of traffic flows reproducing graphical display in form of lines, reproducing each traffic volume by numbers.

HG, control principle

The traffic control computer provides a periodic synchronization of controllers but is not involved in the eradication by the second, i.e., it does not operate an "active" signal program.

HGV share

HGV share according to HBS 2001 to calculate the reduction factor fHV for calculating the saturation flow of traffic flows.

Synchronization, synchronization point

Controllers and traffic control computers must be synchronized with each other, e.g. to realize coordination in a green wave. Synchronization commands take care of the current time settings in the controller. The synchronization point is the second in which synchronization takes place in the controller.

Partial intersection

Due to device or traffic engineering reasons, it may be necessary to divide a large intersection into smaller units. These can then be edited with a controller.

For a pedestrian intersection, e.g., this is not included in the main intersection or defined in a partial intersection.

Partial point

Intersection of the central line of two parallel green bands in the time-distance diagram of green waves.

Theoretical intergreen time (th. intergreen t.)

Calculated intergreen after the rounding (according to the specified rounding limits).

Transition time (tPass)

Time between end of green time and start of clearing time. The values are used according to the defaults, but if necessary, can also be overwritten in the IC form.

- Clearing from zero: Default 0s
- Clearing up to 30 km/h: Default 3 s
- Clearing up to 50 km/h: Default 5 s
- Clearing over 50 km/h: Default 7 s

Transition signal

Traffic signal that prepares for a following signal.

Transition time

Time during which the transition signal (amber, red/amber) is output.

Red/amber transition time according to RiLSA 1-2 s

Amber transition time according to RiLSA:

- for v perm = 50 km/h: 3 s
- for v perm = 60 km/h: 4 s
- for v perm = 70 km/h: 5 s

The transition times are defined in the **green-red** and **red-green** transition time lists.

Transition time (tPass)

One-time process of a signal program

Cycle time (cycle time)

Time required by a program for a single cycle.

Switch over point

Selected time for a signal program change, to which the signalization states of two successive signal programs correspond.

Traffic-actuated control

Traffic light control where the signal program is influenced by road users.

Traffic allocation

Spacious or time demanded for a certain route length by vehicles of different lengths at a certain time or in a certain time interval.

Traffic density

Number of vehicles of a traffic flow per route unit at a point in time.

Traffic quality

Summarizing the traffic flow in terms of quality. The criteria are, for example, speed, travel time, the possibility of overtaking, delay times, queue lengths, number of stops, emissions or immissions.

Traffic control computer

Computer which centrally controls the signal systems of a network in several groups in variable ways as desired, usually traffic actuated methods.

Traffic volume

Number of vehicles which pass through a street, a carriageway or a lane in an interval, for example, an hour, at a cross-section in one or both directions.

Offset

1. Time difference of the start of green time successive intersections.

- Time difference by which the signal green times are harmonized with the individual intersections in order to create a coordinated control.

Defaults

General specifications for signal sequences, flow types, etc. These specifications are created once and remain valid for further projects.

Release time

Time required for which the released time for one or several traffic flows starts later than for others, which are released in the same stage traffic flows.

Early cut-off time

Time around which, for coordinated signal controls, the release time for a traffic flow starts earlier, as would be necessary after the time-distance stream.

Waiting line

Broken wide line which indicates that road users who are obliged to give way should wait at this point.

Distance-time-Band

> Time-distance diagram

Repeating signal

The main signal at intersection approaches is on the right, behind the stop line. The repeating signals are positioned at extension poles above the lane or (instead of extension pole transmitters) on the left, next to the lane.

Time demand value

Specifies the time required for the respective traffic flow, to pass the stop line.

The time demand value lies between 1.6 and 2.2 s/car U, a value between 1.8 and 2.0 s/car U is usually assumed.

The value is not differentiated for the different carriers, but always refers to the car unit.

Additional time requirement

Optional parameter for taking start and losses into consideration. Is required for the evaluation of signal plans.

Schedule dependent control

> Fixed-time control

Time-distance diagram

Display mode for the traffic flow on one route with several intersections. In the time-distance diagram this is visualized for example by traffic flows and signal program controls.

Late release time

Time required for which the released time for one or several traffic flows ends later than for others, which are released in the same stage traffic flows.

Permitted speed

When calculating the intergreen times, the entering/clearing speeds vE or vC are set according to the pre-set type but not higher than the permitted speed which is permitted here.

Duration of state

Specifies a fixed time for the respective signal state.

If different values for the duration of the state occur in the vehicle environment, e.g. AMBER times with 3, 4 and 5 seconds (for speed limits of 50, 60 or 70 km/h), you must accordingly preset several signal transitions.

Maximum duration of state.

Intergreen

Time between the end and the start of the green time for two successive flows using the same conflict area.

Intergreen time calculation (IC)

Part of the signal program calculation. Intergreen times have to be calculated for all combinations of non-compatible flows.

All road users (vehicles, pedestrians, cyclists, public transport) should be regarded as separate flows even if they may be signalized together.

Intergreen matrix

The (largest) intergreen times which are decisive for each signal group are arranged in a matrix.

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23. Version history

Version	Content
4.5	This version focused on planning intersections and networks (including green waves) as well as on planning and supplying Yutraffic Motion. The manual therefore primarily contains these and adjacent subject areas. Common and central data storage and data modelling are the main objectives of Sitraffic Office. Accordingly. functions for intersection planning e.g. are provided for Motion planning. Configuration of central intersection data is done in Sitraffic Office (previously a component of Yutraffic Control). Configuration of Sitraffic Scala (previously Sitraffic S4) is also done in Sitraffic Office version 4.5.
4.6	This version contains various improvements concerning performance and usability. In addition. it now includes a function for supply and read-out of controllers. For details. please refer to the respective chapter.
4.6.3	The configuration for a sX smart controller is supported via Sitraffic smartCore .
4.6.10	The second base is adjustable, second 0 corresponds with OCIT mindset and second 1 with the "old" Yunex Traffic mindset.
8.0	The configuration for a sX advanced controller is supported and new look and feel is introduced.
8.1	A capacity analysis acc. to HBS 2015 - S4 traffic light intersections is available. A capacity analysis acc. to HBS 2001 is still possible in parallel. A license update (dongle update) is necessary.
8.2	Introduction of new Stage Sequence/Definition editor including calculation of stage transitions and signal programs.
8.3	Besides the introduction of a new editor for matrices, external exporter for Aimsun.Next and for the Map Tool have been integrated. The new stage editor has been improved, i.e. the printout of S-L stage data is now also supported. A license update (dongle update) is necessary.
8.4	The evaluation according to HBS 2015 was expanded to include pedestrians and cyclists (forms 4a and 4b) and public transport (additional lines in form 3f). The planning documentation and the stage editor have been improved as well.
8.5	The stage transition editor has been replaced by a new editor. In this version, you can optionally switch back to the old editor using a feature toggle (see Office options). In addition, the planning documentation was supplemented with the volume flows, the assignments (TA parameter sets to signal programs) and tables with general information on the intersection version. In addition, the workflow status and the date setting to inventory state are available.

8.6	The signal program editor together with the Switch on / off program editor and the Fire brigade and Buestra signal program editor are replaced by a new editor. As usual you can optionally switch back to the old editor using a feature toggle (see Office options) for one version . In the stage definition / stage sequence editor, a stage sequence can now be checked for compliance with intergreen times and minimum times. The system data can now also be printed out within the planning documentation. ….
8.7	The new topology/layout editor not only combines the functions of the old Intersection topology and Layout plan editor, it also includes the functions of the Map, Pedestrian crossings and Stops editors As usual, you can switch back to the old editor for a period of one version using the feature toggle (see Office options). In addition, time values in 100ms cycles were enabled in various editors, which is necessary for the Scandinavian market. The printout of the configuration data within the new (planning) documentation has been improved for the sX device.

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