

SYLVIA+

Short Description



The Efficient Intersection Control Software
for Coordinated and Traffic Actuated
Controls

SCHLOTHAUER & WAUER 
Ingenieurgesellschaft für Straßenverkehr

Ehrenbergstr. 20, 10245 Berlin
Tel.: ++49 30/ 93 66 72 0 | Fax: ++49 30/ 93 66 72 20

www.schlothauer.de | info@schlothauer.de

SYLVIA+ Intersection Control Software

Effective Planning and Efficient Results

The traffic-actuated intersection control software SYLVIA+ has been in use for over 15 years in several cities in Germany. Since July 2010 it has been available as a separate module of the traffic-planning software package LISA+, making it easy to create controls with the standardized SYLVIA+ software and to test and simulate them in LISA+. Using the LISA+ remote upload interface, it is possible to upload to controllers directly from LISA+; controller software does not need to be modified in any way to implement the control. In Leipzig, the first SYLVIA+ controls have already been uploaded from LISA+ directly to controllers. Using the LISA+ simulation interface to the simulation tool VISSIM (PTV AG), multiple SYLVIA+ controls for single intersections can be simulated at the same time.

SYLVIA+ offers maximum ease of use and transparency: it provides a standard control and a wide selection of parameters, allowing planners to simply import the signal timing plan that the control will be based on and select the relevant parameters. The end result is a traffic-actuated control that optimizes wait time. SYLVIA+ was created with the demands of coordinated intersections in mind and contains an automatic synchronization function. After a new signal timing plan is selected, this function automatically ensures that coordination conditions are met as quickly as possible while also providing optimized wait time distribution. This makes the software particularly suitable for use with modern adaptive controls (e.g. INES+). In order to enable signal preemption for public transit vehicles or to meet unusual demand conditions, modified signal sequences (modifications) can be defined and inserted into the basic signal timing plan.

SYLVIA+ can be used for both simple and complex controls, and does not require any previous knowledge of programming, as it works almost exclusively with predefined parameters.

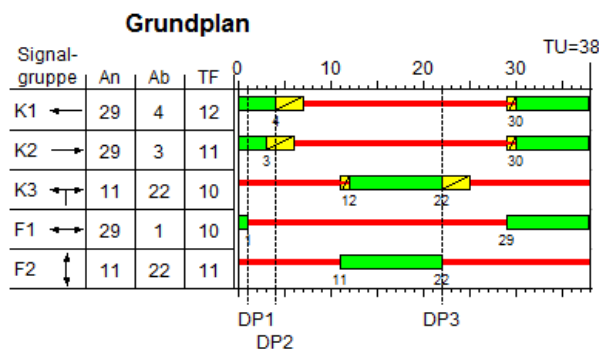
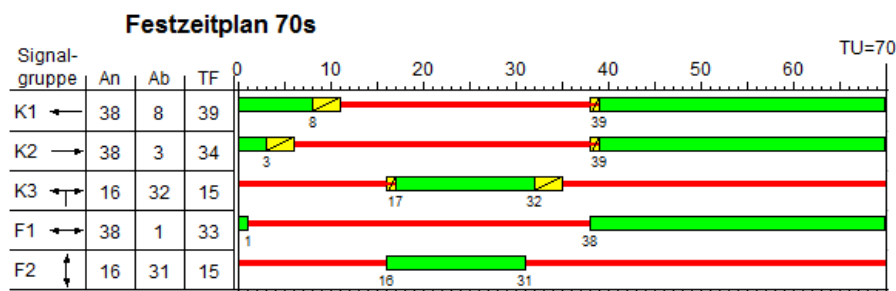
The main features of SYLVIA+ at a glance:

- Traffic-actuated, coordinated and uncoordinated stage length control
- Modifications for special stages (e.g. signal preemption, stage switching, etc.)
- Optimized synchronization after switching signal timing plans
- Freely definable conditions for extending stages and inserting modifications in signal timing plans
- Control of special signals such as flashing pedestrian signals, signals for the blind, etc.
- Controls are created almost entirely with parameters, but can be supplemented by user-created code.

Planning a SYLVIA+ control:

1. Basic signal timing plan with extension points

First, a "compressed" signal timing plan is created based on a pretimed control with minimum green time. In addition to the safety-critical minimum green time that is monitored by the controller, it is possible to create a second minimum green time. Next, the extension points are defined. Extension points are points in the signal timing plan at which the signals are extended. Minimum and maximum extension times are then entered for each extension point in the cycle. Green time can be extended based on detector values and if there is not much traffic, it can be distributed among the other extension points.



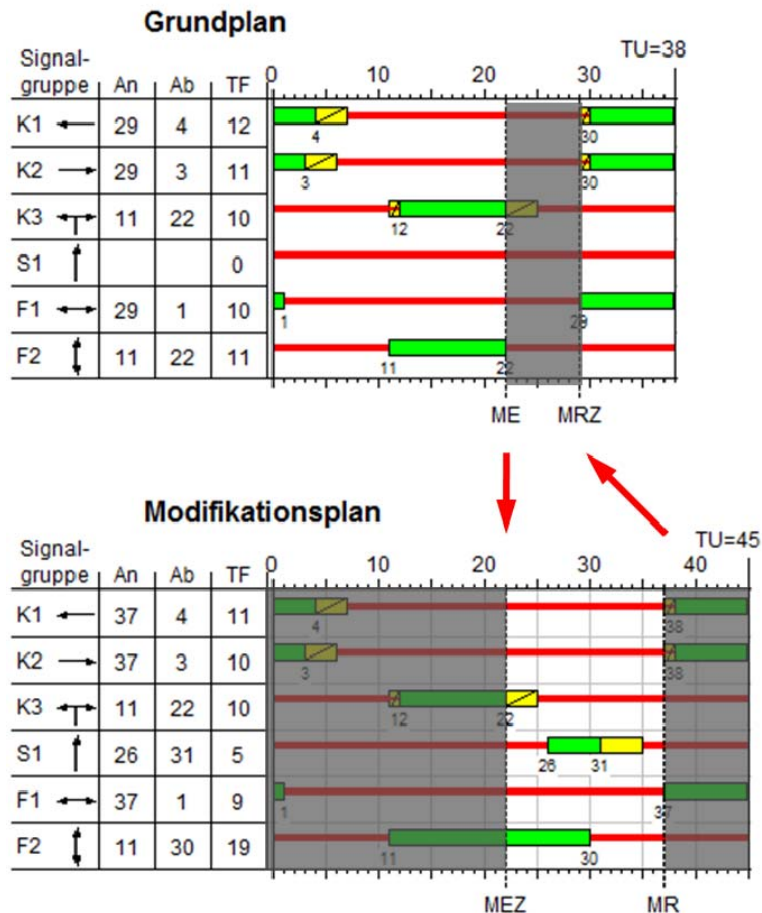
2. Definition of coordination conditions

SYLVIA+ works on the basis of so-called coordination conditions. A coordination condition might specify, for example, that the main direction at a given intersection gets green at cycle second 30. Coordination conditions are always correlated with a point (cycle second) in the signal timing plan. Multiple conditions (in most cases one is sufficient) can be defined in the basic signal timing plan and must be maintained by the SYLVIA+ control. They can be changed at any time and enable coordination point offsets to be easily defined at the intersection. A coordination offset essentially allows the location (cycle second) of a coordination point to be changed without necessitating changes in the documentation. In order to maintain the coordination conditions, a compulsory extension is defined for a certain extension point which will be used in full or in part, depending on how much extension time was used by previous extension points.

3. Modifications

Modified signal sequences can be defined in LISA+ for public transit prioritization or for signal demand (e.g. pedestrian calls). The starting point for the modification as well as the return point can

be set anywhere in the basic signal timing plan by the user. It is possible to activate multiple modifications. If the use of modifications causes the cycle time to be exceeded, time is automatically "borrowed" from the subsequent cycle so that the coordination's cycle time is maintained. Although formulating trigger conditions for modifications is easy thanks to the predefined functions available in LISA+, users can add their own functions as well. Modifications are tested automatically in LISA+, ruling out intergreen time violations in advance.



4. Special signals

LISA+ provides two parameter tables that make it easy to enter basic conditions for the control of flashing pedestrian lights and signals for the blind.

SYLVIA+ makes the planning of traffic-actuated controls much simpler and thereby more cost-effective. The operator is provided with clear, comprehensible planning documentation. The control parameters can be readily understood by any planner and can be changed at any time. Subsequent changes to the basic control conditions are very easy to make.

In addition to the SYLVIA+ control module, LISA+ continues to provide a logic editor in which users are free to formulate their own rule-based or model-based traffic-actuated controls. Controls created using SYLVIA+ can be supplemented by any amount of user-created code and can thus be easily adapted for special situations. It is therefore not necessary to decide in advance for or against a parameter-based method of creating controls.