

CROSSIG: signal design

CROSSIG includes a number of functions to perform for signal setting design:

- ▷ Definition of signal groups with user-customized signal display sequence to allow for national specialities
- ▷ Calculation of intergreen times either graphically or by pre-specifying intergreen matrices
- ▷ Definition of stages and stage sequences; stages are sets of compatible signal groups
- ▷ Optimization and/or manual editing of fixed time signal plans
- ▷ Assembling of signal plans as a sequence of interstages and stages
- ▷ Definition and editing of vehicle actuated signal plans
- ▷ Graphical display of time-space-diagrams for co-ordinated signals
- ▷ Extensive import/export functions for various control schemes like VS-PLUS; TRENDS etc.
- ▷ Database option

The following slides will give an overview to the graphical interface of CROSSIG



CROSSIG: single intersection signalization

Specification of database (intersections within city)

Properties of signal groups: name, number, MinGreen, MinRed, sequence of signal displays, ...

Definition of stages and stage sequences

Interstage calculation

Traffic volumes

Signal program assembled by stages and interstages

Optimization of signal settings based on signal groups

Capacity Analysis

Deficiencies ?

CROSSIG workflow with test & simulation

CROSSIG design of signal settings

- Intergreen and offset matrices
- stage diagram and interstage timings
- fixed time signal settings
- co-ordination and time space diagram
- capacity analysis (analytical)

VISVAP actuated signal control

- Graphical flow charter
- detector data
- green extension and truncation
- actuated stage sequences
- interface for signal controllers

VISSIM test and simulation

Traffic flow model for car, truck, bus, tram and train at complex networks

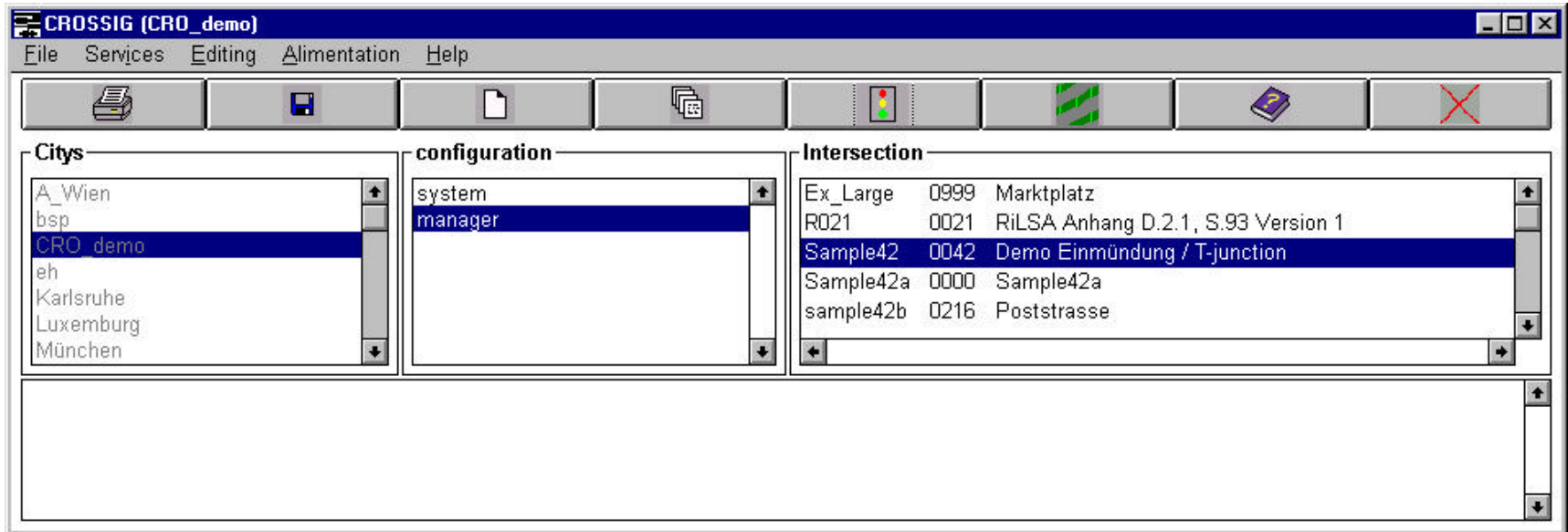
Detector values

Signal settings

VAP vehicle actuated signal control strategy

CROSSIG master

- ▷ *Intersections* of the CROSSIG database are grouped into *citys* also called master control units
- ▷ Each *city* contains a number of *intersections*
- ▷ One database can contain up to hundreds of intersection



CROSSIG definition of signal groups

- ▷ Up to 60 signal groups per intersection
- ▷ Comprehensive properties per signal group
- ▷ Signal sequence (red-amber-green-red/amber) can vary between signal groups; local technical guidelines can be accommodated
- ▷ Easy access and editing of each property by table and notebook in asplit window

CROSSIG-junction - editing of signal groups [CRO_demo -- Sample42 -- Version of editing]

SG-name	SG-type	Abstr. SG-Typ	Kanal Nr.	Chn No
1 K1	FV	Kfz (3-b) HR	1	
2 K2	FV	Kfz (3-b) HR	2	
3 K3	FV	Kfz (3-b) HR	3	
4 K4	FV	Kfz (3-b) HR	4	
5 F21	FG	FG (Ro+Gr)	5	
6 F22	FG	FG (Ro+Gr)	6	

Zustand	Symb.display	Duration	Graph.Pict.
g1	-	Var.	Red
f1	=	Var.	Green
a1		Var.	Off

Übergang	Symb.display	Duration	Graph.Pict.	From	after
u1	*	3	Amber	f1	g1
u2	+	1	Red+Amber	g1	f1

cycle

g1

f1

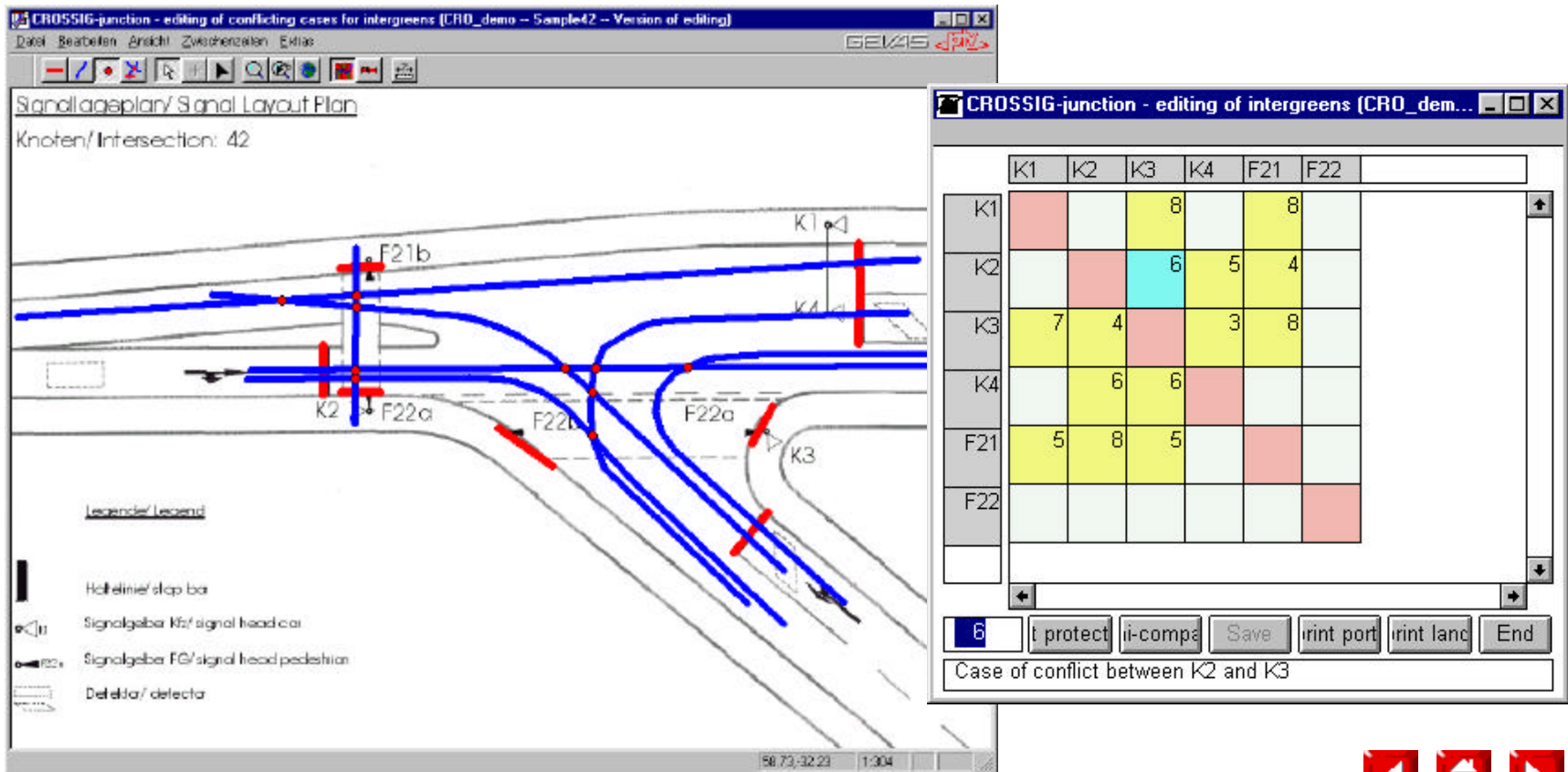
Zuordnungen | ZWZ-Parameter | States/cycle | Controller export

K1 Copy Insert Delete identification Save print port. print land. End

FV K1: Name of signal group. Any alphanumeric sequence.

CROSSIG intergreen calculation

- Intergreen times are defined as safety times between two non-compatible movements; clearing and entering distances are computed graphically based on the signal layout map
- Distances and velocities according to local guidelines are used to compute clearance and entering times which will result in intergreen times



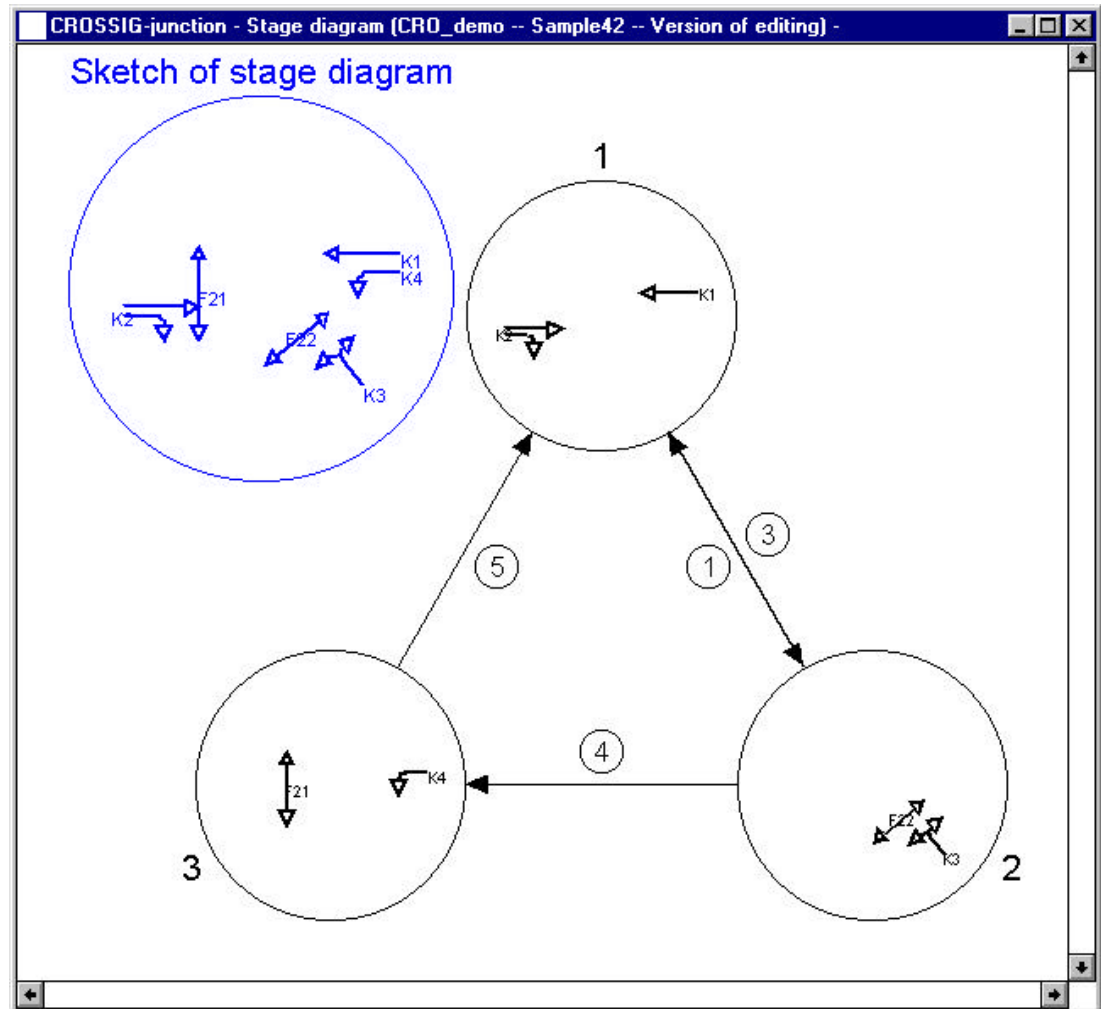
The screenshot shows the CROSSIG software interface. The main window displays a signal layout plan for intersection 42, with various movements labeled (K1, K2, K3, K4, F21, F22) and their corresponding signal heads. A legend identifies symbols for stop bars, signal heads for cars and pedestrians, and detectors. A secondary window shows a conflict matrix for the intersection.

	K1	K2	K3	K4	F21	F22
K1			8		8	
K2			6	5	4	
K3	7	4		3	8	
K4		6	6			
F21	5	8	5			
F22						

Below the matrix, there is a dropdown menu showing '6', and buttons for 't protect', 'ii-compa', 'Save', 'Print port', 'Print land', and 'End'. A text box below the buttons reads 'Case of conflict between K2 and K3'.

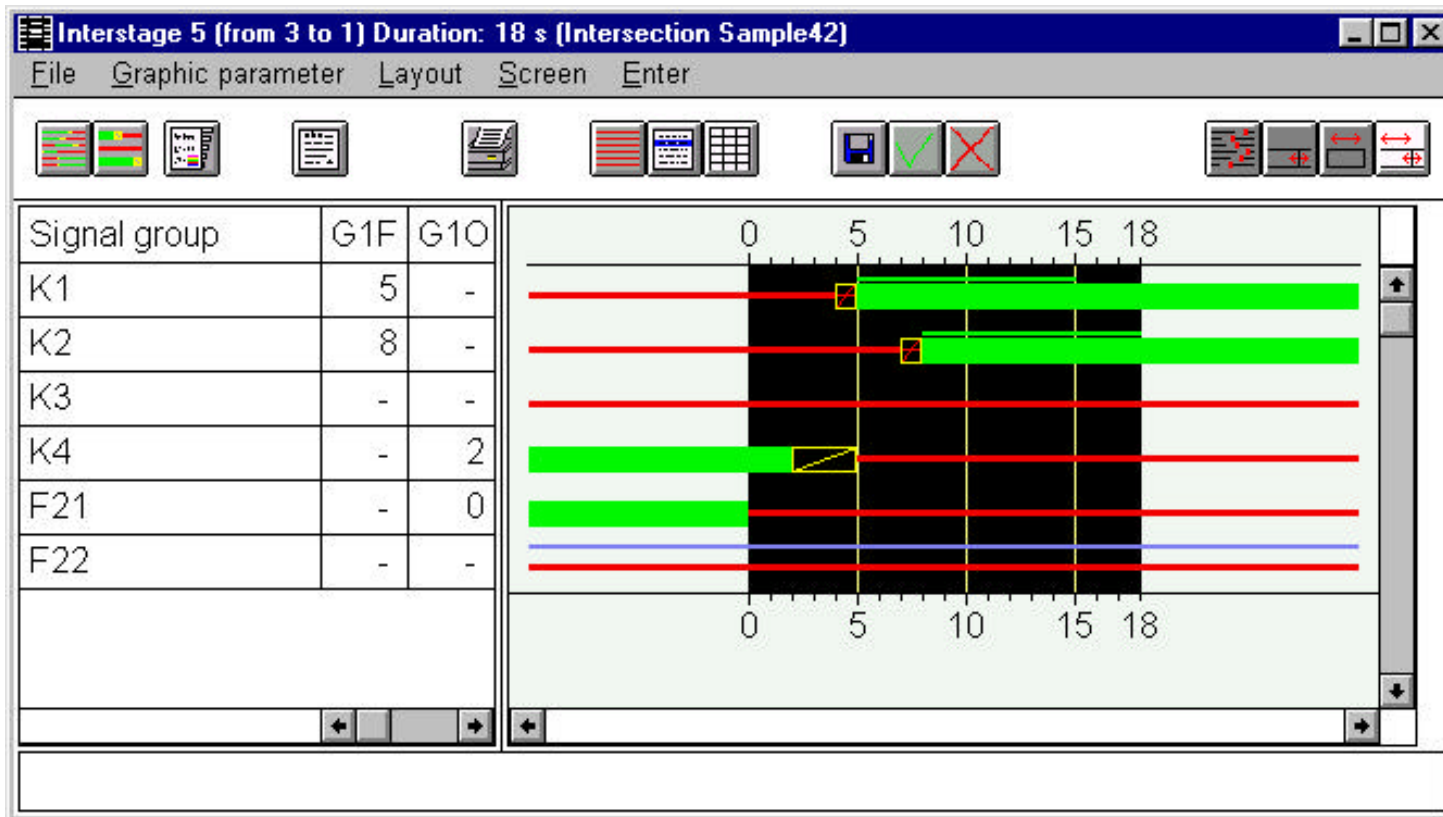
CROSSIG definition of stages

- ▷ Compatible signal groups are grouped in a stage
- ▷ Graphical display of stages
- ▷ Feasible stage sequence indicated by arrows
- ▷ Each arrow represents one interstage stage transition)



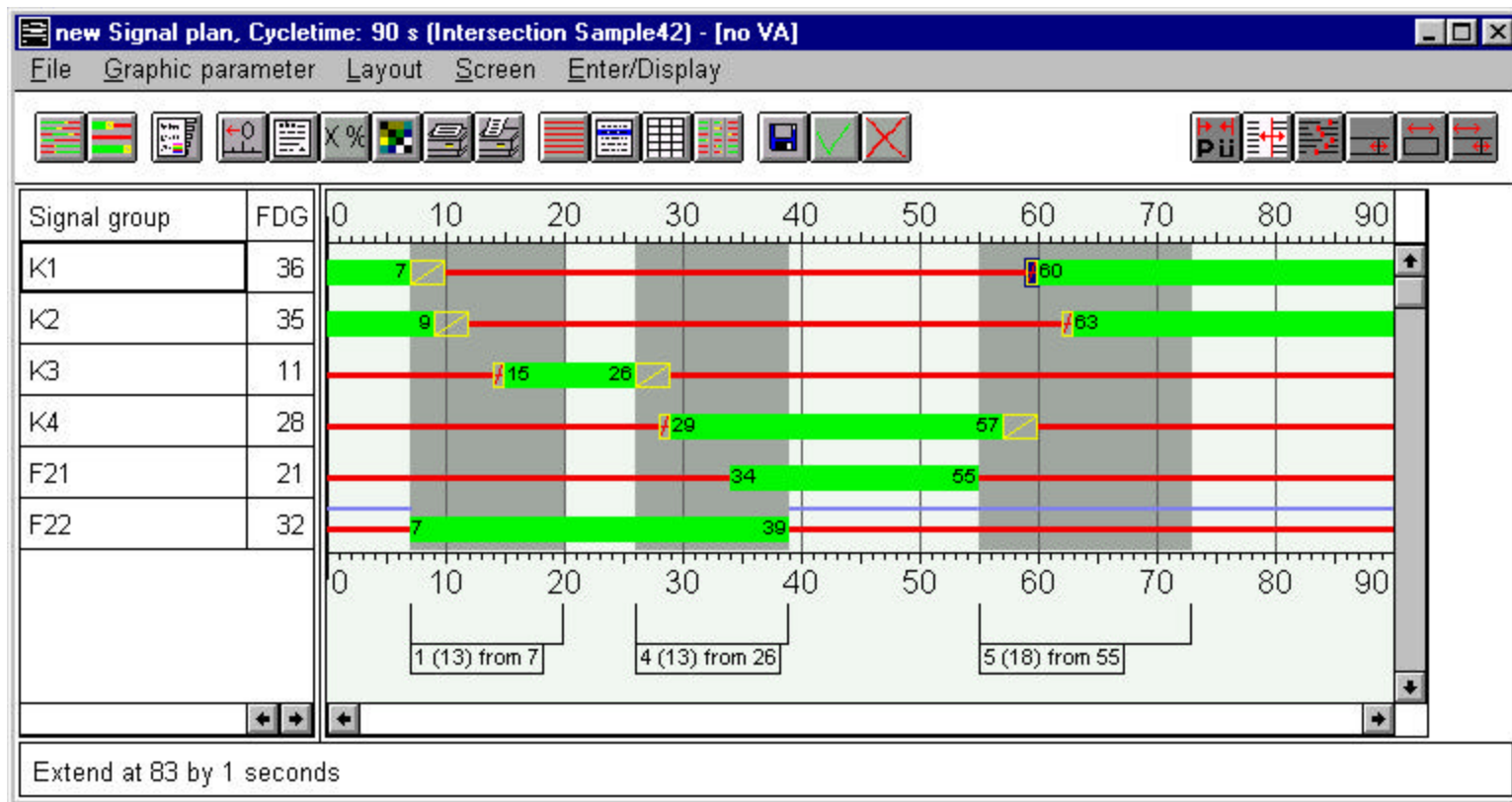
CROSSIG editor for interstages

- ▷ Graphical editor for interstages (similar to editor for fixed time settings)
- ▷ Interstages automatically computed respecting intergreens, offsets and minimum greens
- ▷ Interactive editing of interstages
- ▷ Various user-definable views of the display



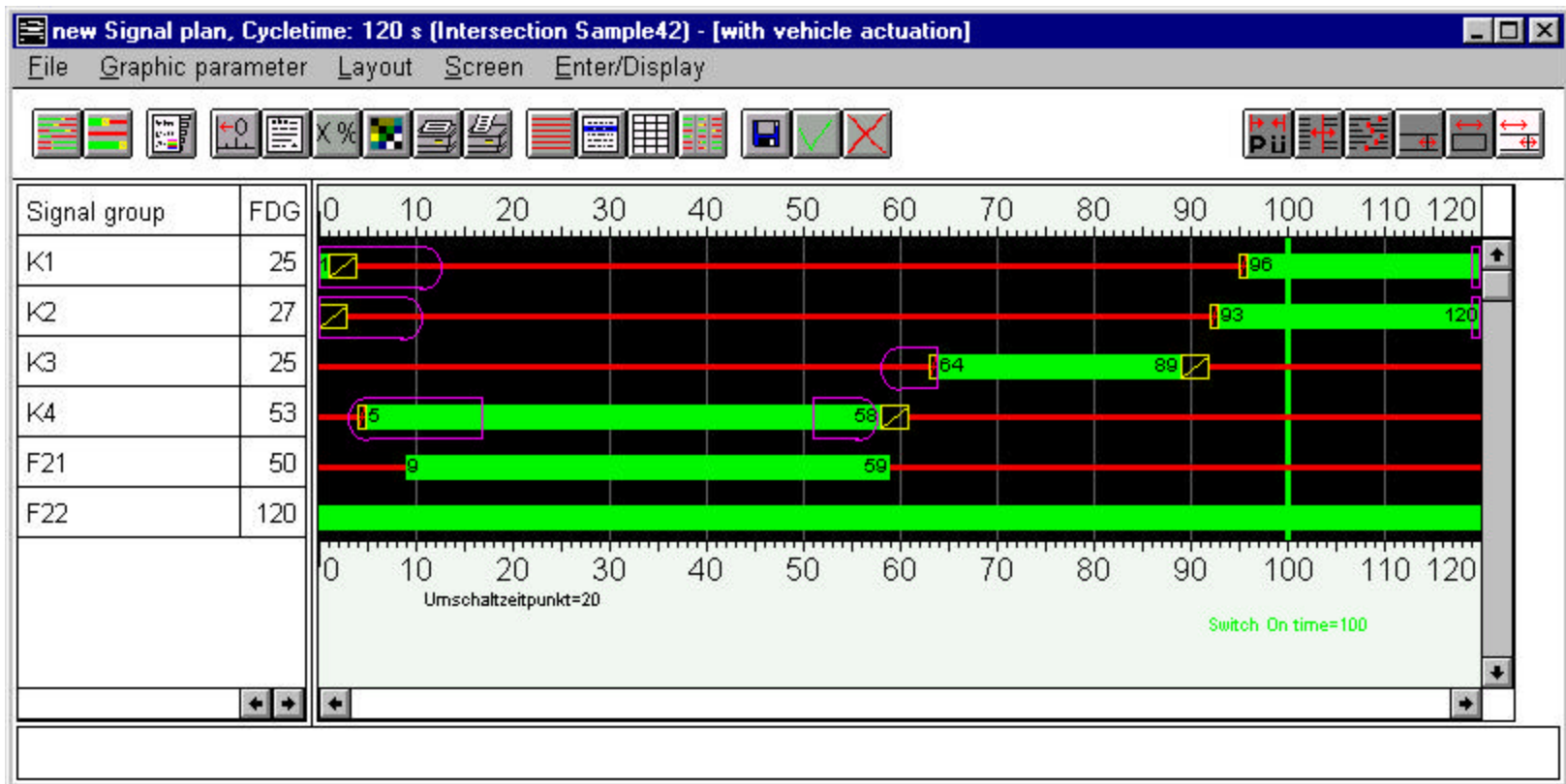
CROSSIG signal settings by interstages

- ▶ Circular sequence of interstages and stages define one signal plan
- ▶ Stage duration computed or manually changed by graphically shifting stages and interstages
- ▶ Continuous supervision of intergreens, offsets and minimum greens
- ▶ Various user-definable views of the display

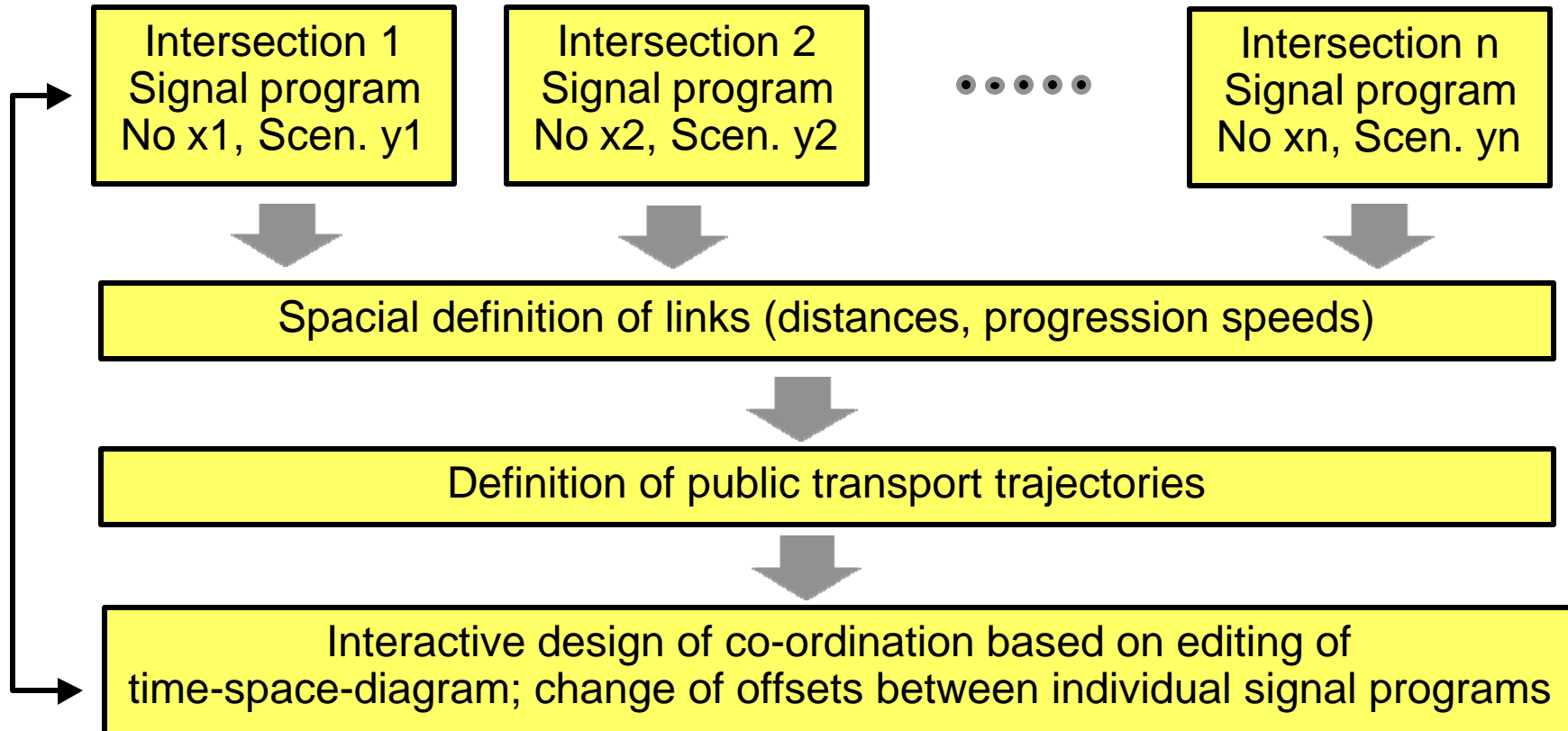


CROSSIG signal settings by interstages

- ▷ Fixed time signal settings edited by graphical editor
- ▷ Flexible timings superimposed on fixed time settings
- ▷ Basic description of vehicle actuation at the time scale



CROSSIG co-ordination



CROSSIG co-ordination

- ▷ Time-space diagram
- ▷ trajectories for buses, trams and other vehicles including stops and acceleration rates
- ▷ direct access to the signal settings of each intersection
- ▷ editing of green times and offsets at each intersection and/or time-space diagram

