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LINSIG for Windows – 20 Years On

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LINSIG for Windows will celebrate its 20th birthday later this year, and to celebrate JCT Consultancy will be releasing a new version of the software including many new and improved features.

LINSIG is now in use in the majority of Local Authority and Consultants offices throughout the UK, but for those not familiar with the software it is a computer aided design and modelling package for isolated traffic signal junctions. It is the most widely used software in the UK and is also popular overseas, especially where UK specification signal equipment is widely used. LINSIG is unique in that it allows engineers to model junctions in a way which closely follows the behaviour of real signal control equipment. This means that initial junction designs are realistic and fully include any requirements and constraints imposed by the signal equipment which will eventually operate the junction.
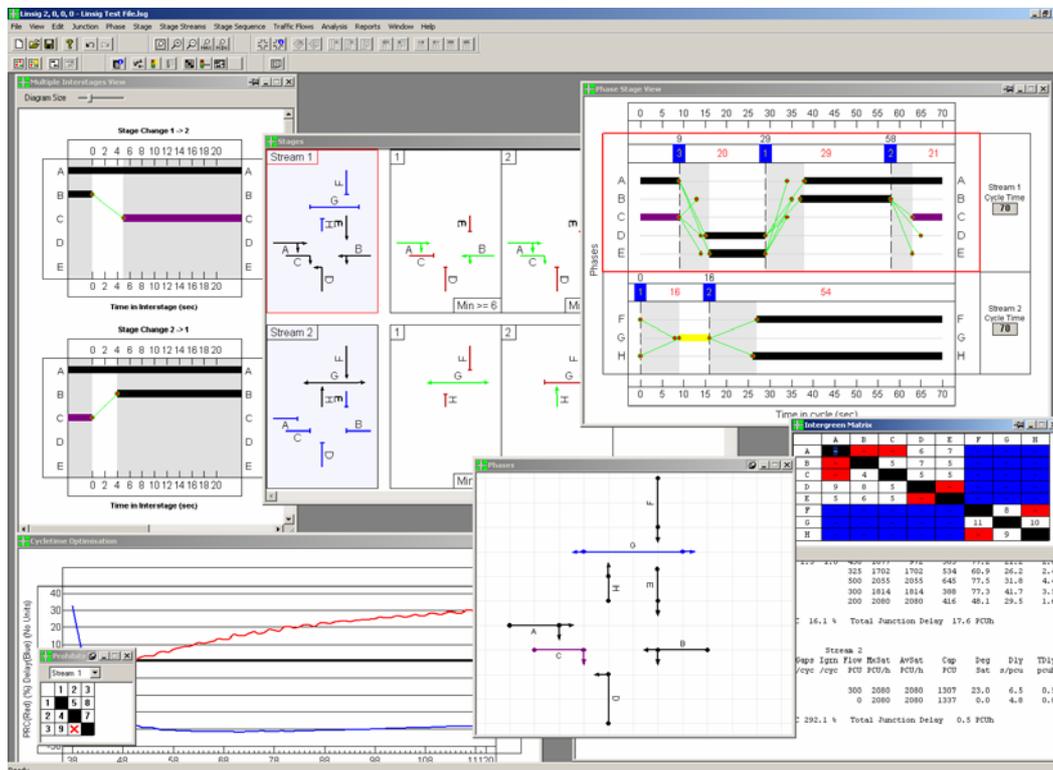
Traffic Signal model improvements

One of LINSIG's unique points has always been its use of a detailed traffic signal controller model similar to a UK TR2210 specification controller. The new version of LINSIG improves on the existing model by adding a number of new features:

Multiple Stage Streams – The use of multiple parallel stage streams is becoming more common in designs for complex signal junctions. LINSIG can now explicitly model multiple independent stage streams on the same traffic signal controller allowing the controller design for the junction to be developed within the LINSIG model. This is particularly useful for junctions such as signal roundabouts which often include a number of stage streams.

Signal Plan Library – With the advent of multiple stage streams the staging designs which can be created in LINSIG have the potential to be much more complex than previously. To help manage different staging designs LINSIG now includes a signal plan library which can be used to build and store complex signal plans for the junction. Each signal plan includes detailed stage sequences and timings for the junction, or for each stage stream where multiple streams are used. This makes it very easy to store away different signal plan options, for example morning and evening peak, and to quickly switch between them.

Phase Based Design Editor – The new phase based design editor implements an alternative design methodology for designing traffic signal staging and sequences. The technique often allows a much more efficient staging arrangement to be designed but is quite detailed and complex to implement by hand and so is not commonly used except in particularly important junction designs. The new version of LINSIG introduces a graphical signal sequence editor which removes a lot of the legwork previously necessary when using this methodology, but still allows the design decisions to be made by the engineer. The editor allows the desired phase design of the junction to be defined freeform without regard to stages. LINSIG will then analyse the phase structure determining what stages are required to implement the design.

SCOOT Configuration Data Calculator – LINSIG models are often used as part of the process of designing a junction which will be run under the SCOOT UTC system. The new SCOOT Configuration Data Calculator provides additional help with this process by using the LINSIG controller model to calculate a range of data needed when configuring the SCOOT database. This allows junction design changes to be quickly incorporated into SCOOT.

User Interface Improvements

The new update incorporates many user interface improvements into LINSIG. These include detailed graphical views, the ability to easily zoom and pan views, toolbars, customisable colours and text sizes, a wider range of text display options, and customisable junction layout grids with snap-to-grid facilities. Although many of these changes are minor in their selves, together they significantly improve the ease with which junctions can be edited.

Two more major editing improvements are the new Error View and multi-step undo. The Error View constantly checks the LINSIG model for errors or warnings, reporting any found to the user. It acts as a central 'To Do checklist' listing any parts of the model which are incomplete or may require further checking. The Undo facility allows any action taken in LINSIG to be reversed. Up to 100 previous steps can be stepped through allowing 'experiments' with the model to be easily rolled back.

Reporting Improvements

Report Generator - LINSIG now includes a completely new report generator which produces detailed reports in a format compatible with most modern word processors. The report generator allows any number of custom report templates to be defined allowing reports to be as detailed as desired. The reports can contain tables and also graphics based on LINSIG's graphical views. Reports can be quickly rerun for different design scenarios allowing design changes to be quickly incorporated.

Graphics Export Facilities – Often the graphical components of a LINSIG report may need to be enhanced and added to before being used for presentation. LINSIG now allows graphical views to be exported to a number of formats, including DXF CAD format, for import into graphics and CAD software for further editing. Graphics can also be cut and pasted via the clipboard for easy insertion into other software.

Traffic Model Improvements

Traffic Model Flexibility Improvements – A number of improvements have been made to the LINSIG traffic model to provide more flexibility in modelling different scenarios and also to allow assumptions built into the traffic model to be changed to provide easier comparison of results with other modelling packages.

Calculated Traffic Flow Groups – LINSIG uses traffic flow groups to represent different time periods or development scenarios. Often a flow group is calculated as a combination of several other flow groups, for example, Base Traffic plus Development traffic. Previously in LINSIG flow group combinations had to be calculated manually which could lead to substantial recalculation if a flow group on which many others are dependent changes. To assist with this process automatically calculated flow groups have been introduced. A new flow group can be defined using a mathematical equation to combine other flow groups. When a base flow group is changed all dependent flow groups are then automatically recalculated.

Conclusions

The new version of LINSIG for Windows will contain a large number of new features including both improvements to the way junctions are modelled and improvements to the user interface and reporting facilities. The software attempts to include a range of sophisticated modelling options whilst still being easy to use. As with all good engineering software it does not attempt to be a 'black box' and do the engineers job, but aims to provide tools which reduce the engineers manual workload allowing them to evaluate a wider range of designs in a shorter time scale.

We envisage the new version of LINSIG being available around Christmas 2005 or Spring 2006. Pricing and any changes to licensing structures will be published nearer the release of the software.