Cymap Electrical

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Cymap Electrical Overview

Cymap's comprehensive suite of HV/LV electrical software allows engineers to produce designs quickly and easily. The wiring suite offers engineers the full range of calculations associated with high and low voltage design.

Data can be entered in a schematic format or, uniquely, by using a scale drawing. Our wiring calculations link with the lighting package, which uses the radiosity based method of calculating the illumination to 3-Dimensional spaces.

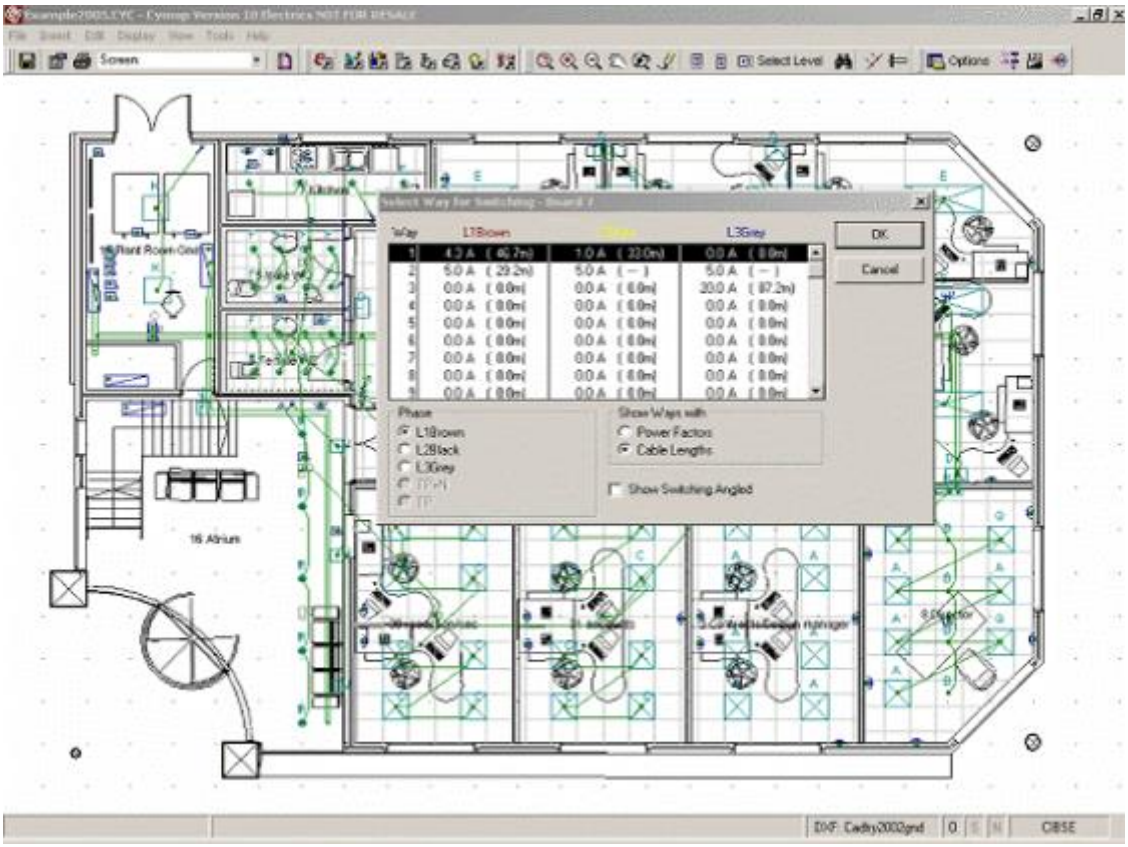
Cymap is renowned for its ease of use, so whether you are a consultant, contractor, or part of a facilities management team, Cymap is the software for you.

Electrics Program

Board schedules can be created with a view to exporting details to Cymap's Wiring program. If the same board references are used in the wiring schematic, the program updates the boards with a constant forward path link from the floorplan based project to the wiring schematic. Once uploaded into the schematic Wiring program all board and final way details are present, thereby saving the engineer time copying details from paper drawings. Cable lengths can be routed electronically utilising the cable containment routing entered on the floor plan. To save time to in producing the Wiring schematic in the Wiring software distribution boards can be associated with each other and linked to enable the schematic to be opened in the Wiring software ready for calculation.

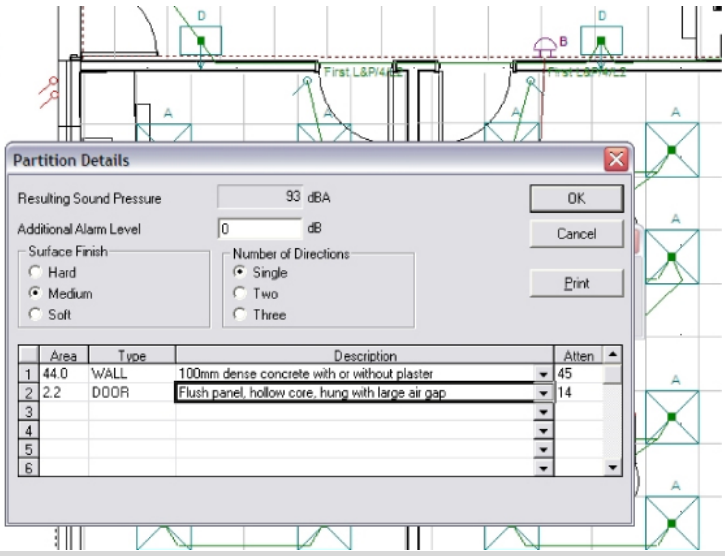
Sub distribution boards can be fed to final boards on the floorplan based schematic.

A detailed symbol library enables the user to place different power, switches, fire alarms, communications and general stationary plant equipment.



The board schedules developed can be imported into the Cymap Wiring package so cable takeoffs and loadings from the floor plan will automatically populate the schematic.

Fire alarm audibility checks based on sounder details and partition composition can ensure compliance.



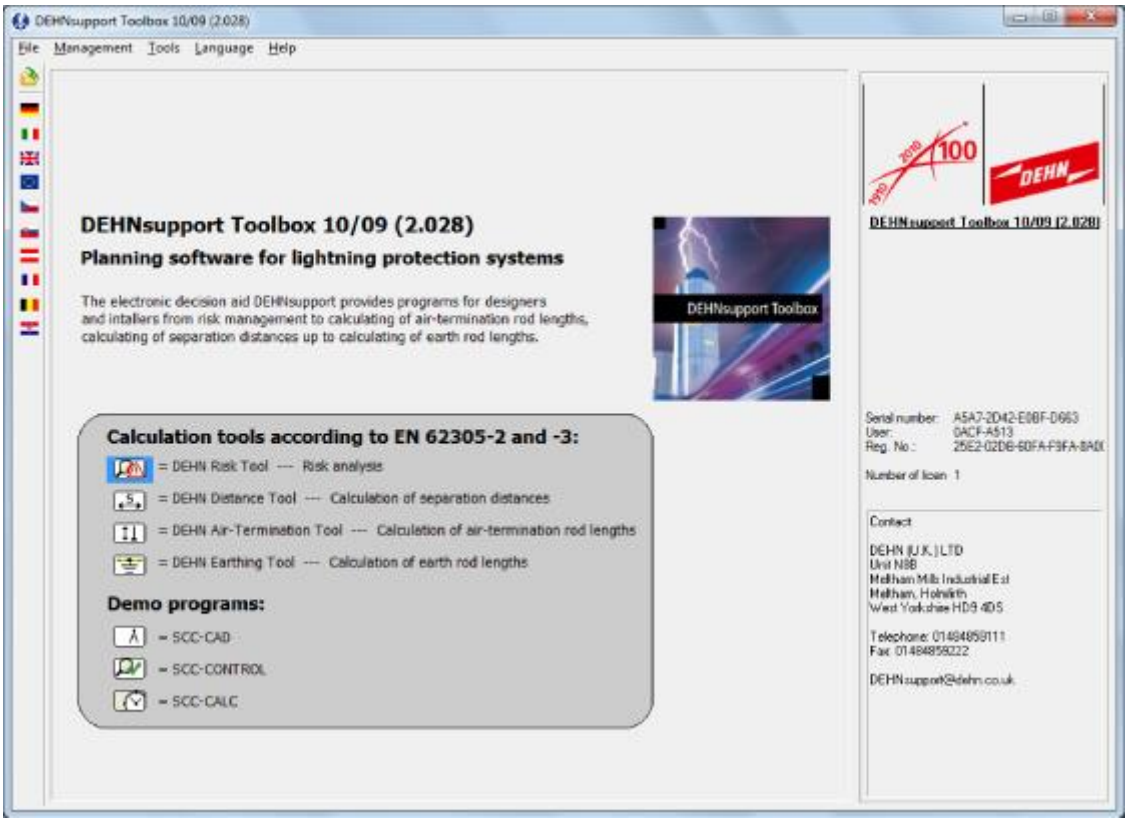
For Part L lighting and switching control, the ability to check which fittings are within the prescribed Part L distance of the switch or movement sensor, enables switching design to be considered when co-ordinating final circuit switching arrangements.

There is also a full current Part L, L.E.N.I and LG7 compliance calculation included.

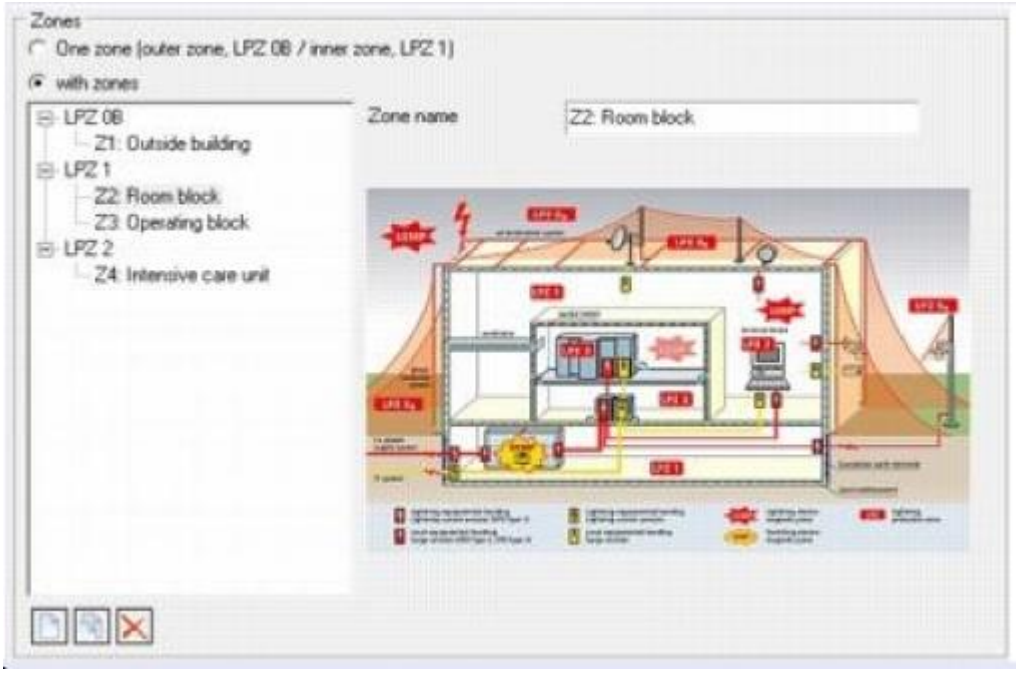
Colour co-ordination of fittings and symbols enables the engineer, at a glance, to check whether lighting and symbols have had their load and cable length completed on the layouts. This is especially useful when importing boards into the Cymap Wiring package to ensure all board data is complete.

BS-EN Lightning Protection

The latest European and BS standards for risk assessments R1-R4 along with down conductor separation distances and down conductor design are now available in collaboration with our colleagues at DEHN.

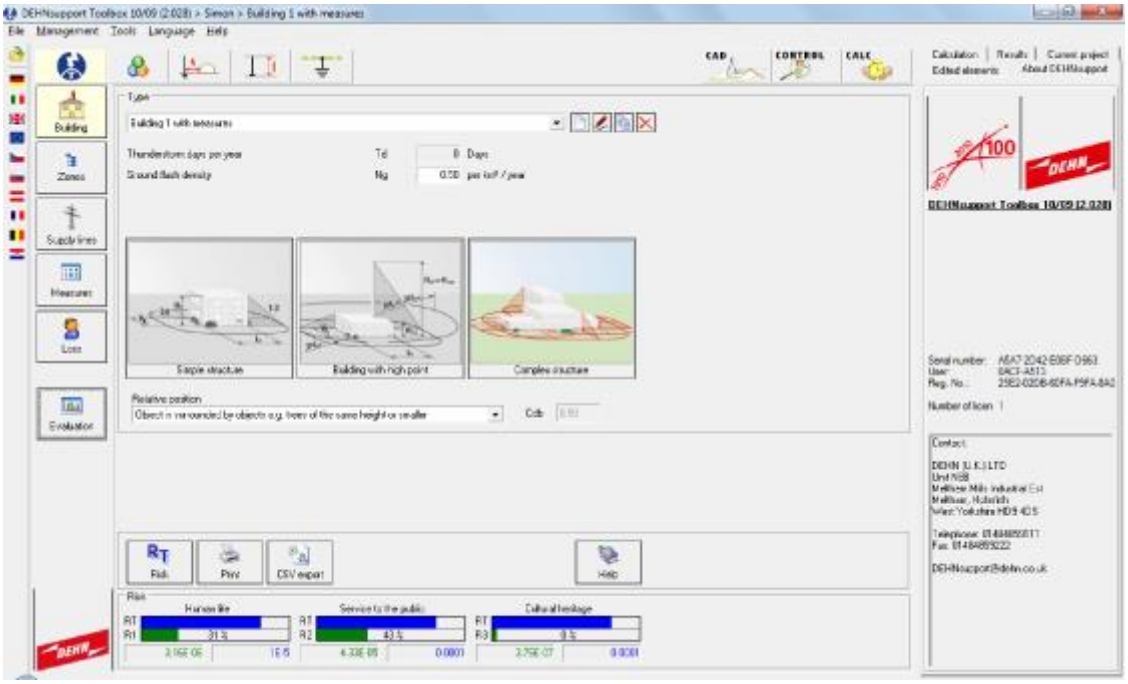


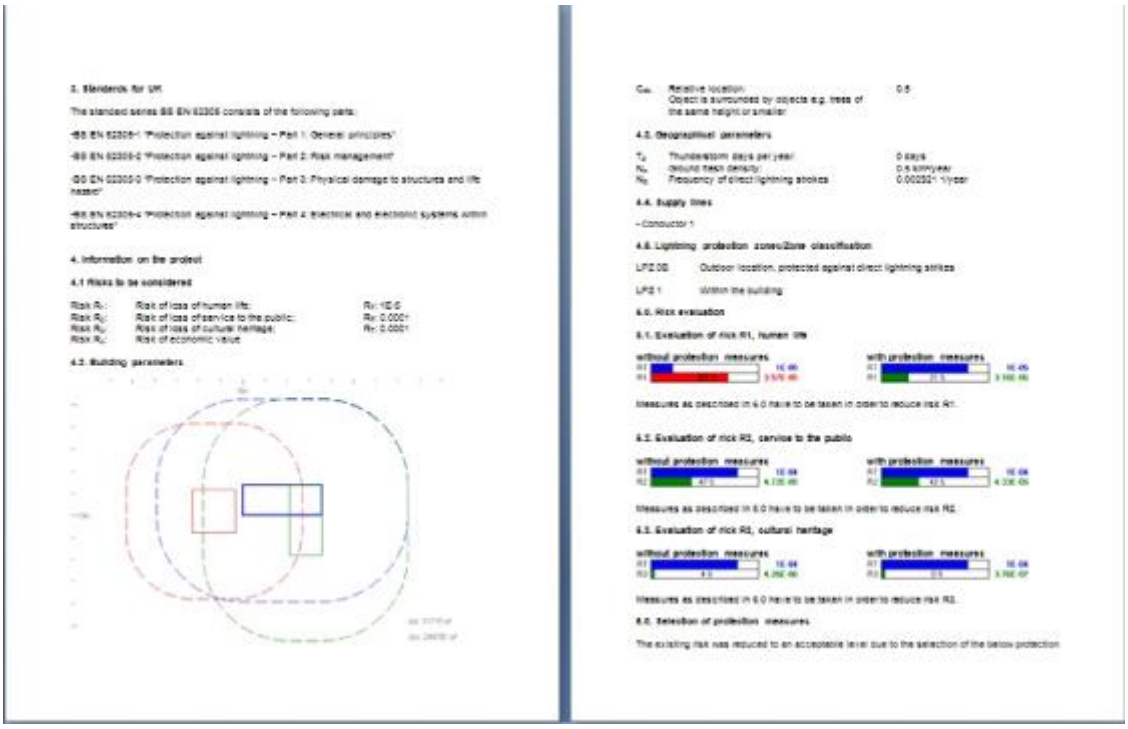
The full risk depending on strike source, whether direct or local with EMP, can be taken into consideration along with all methods of surge protection and fire risk analysis. Separate lightning protection zones can be set up depending on the protection class I-IV which then looks at the “rolling sphere” method of determining protection of obstacles with separate finials.



Full separation distance calculations can be used based on the class of lightning protection required, giving minimum separation distances of the earthing system to prevent flashover into internal services within the building.

The earthing system can be modelled on a 3D building model where the minimum number of down conductors can be calculated with minimum separation distances shown on the 3D model.



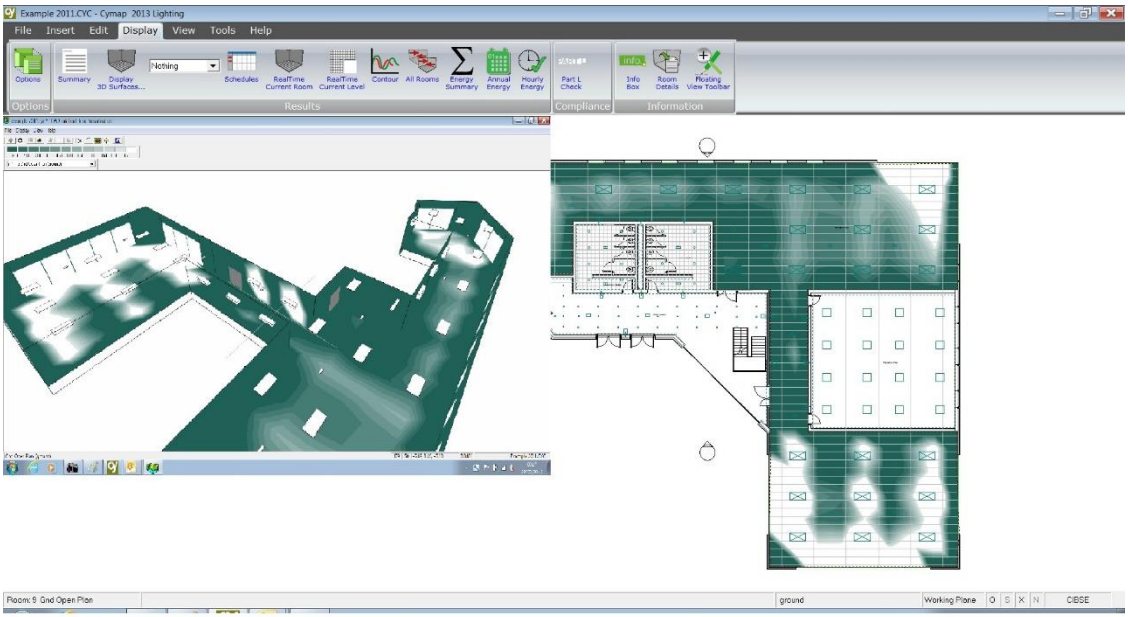


Lighting Program

Lighting design analysis can be undertaken on a single room or floor plan using the building data loaded either by defining the rooms or importing gbXML data from all third party 3D CAD systems. External floodlighting can also be undertaken by the introduction of site plans.

Extensive databases of lighting manufacturers' products are used as well as the ability to upload photometry in either TM14, EUlumdat or IESNA LM63 US standards. This allows the engineer to very quickly upload and add new product data. An extensive list of all major manufacturers website links resides in the manufacturers' lighting database.

The program performs point-to-point analysis as well as space to height calculations, daylighting lux levels and average percentages (particularly useful for Part L daylighting checks) and emergency lighting analysis.



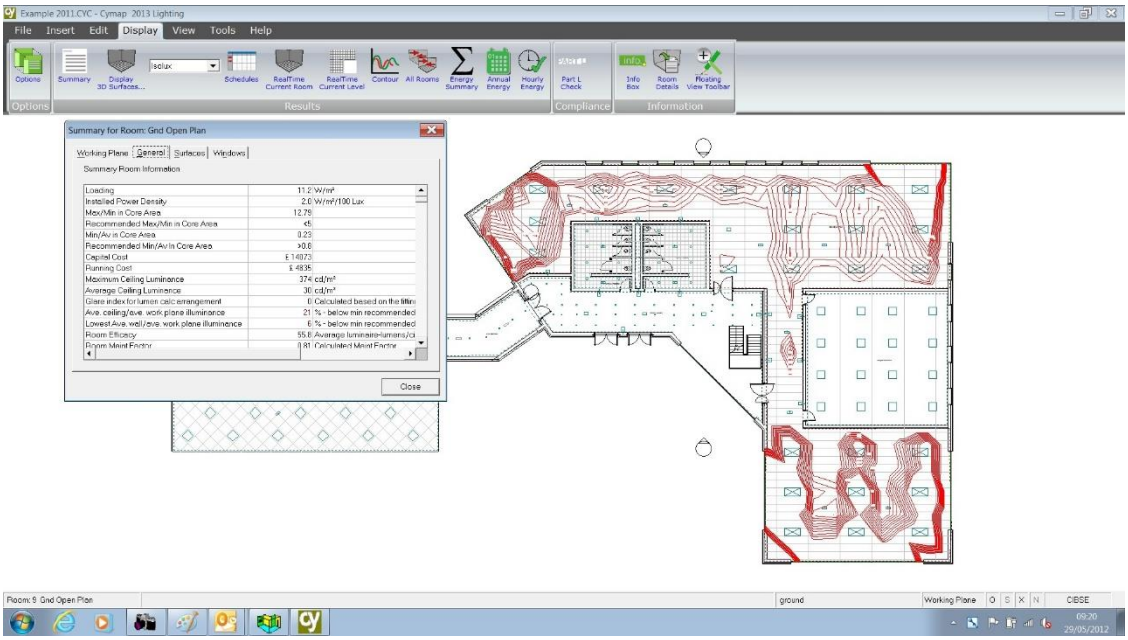
3D rendered images can be created in real time to look at individual rooms or entire floor plans in a 3D format. This allows analysis of lighting on vertical surfaces where feature lighting is employed.

Displays include isolux, intensity and numeric grid plots for daylighting, artificial, emergency as well as daylighting percentages and the combination of day lighting and artificial lighting.

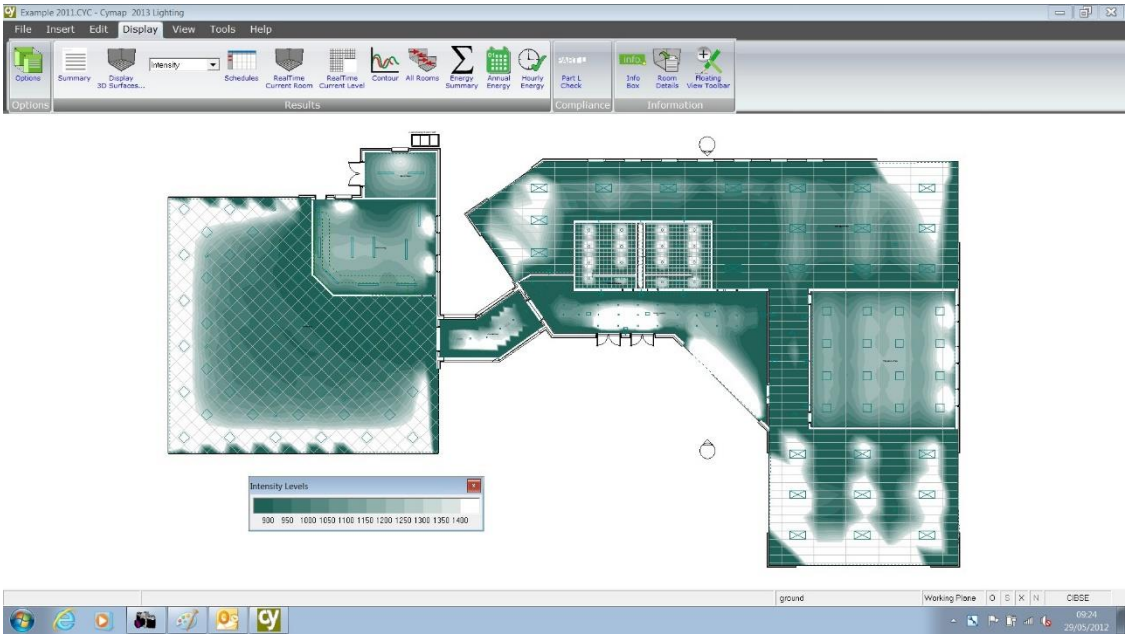
LG7 compliance calculations give the net resulting contrast between working plane, ceilings and floors and the resulting pass/fail.

LENI calculations are also included to give a rounded compliance calculation tool.

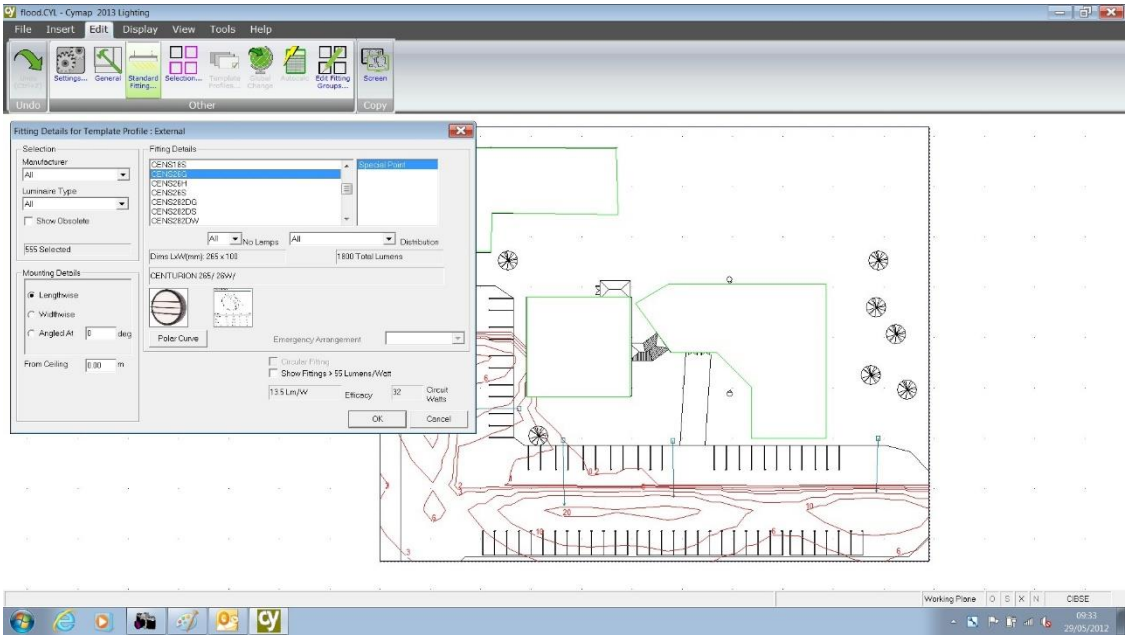
A full Part L compliance check, based on the building type can be used to check compliance based on luminaire fitting efficacy. Values outside the compliance range can be entered into the lighting database to reject less efficient fittings, leaving only newer, more suitable fittings remaining for selection to effect compliance.



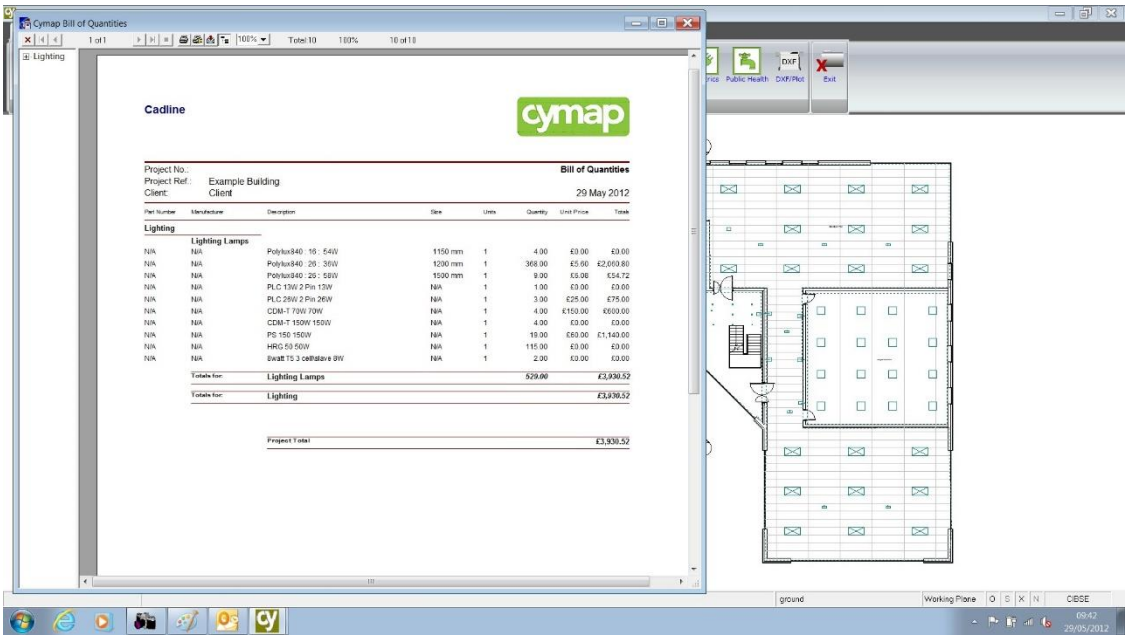
Emergency calculations can be performed by the engineer selecting the fittings to be used. The program then considers only fittings set to “emergency mode” and calculates the lighting levels required. Fittings can either be dedicated emergency or normal and emergency. Task areas can be set to examine lux levels of pre-defined escape routes etc.



External floodlighting can be based on a DXF site plan derived from CAD with obstructions entered to give more accurate results.



Detailed bills of quantities can be created based on the design with labour, running and capital costs included.



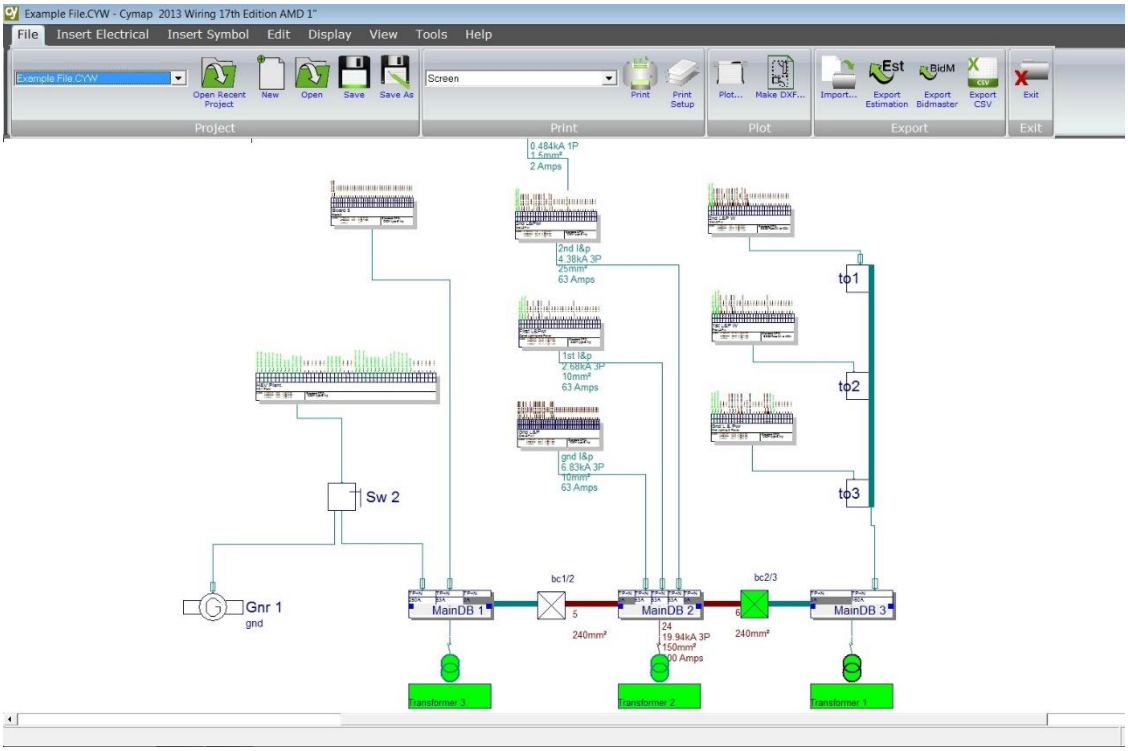
Wiring Program

Clients and regulatory authorities now expect proof that calculations have been carried out to the standards of the **IEE 17th Edition**. Cymap Wiring allows you to provide this evidence and helps ensure you produce a cost-effective and electrically efficient layout. Unlike other vendors there is no limit to the number of boards and loads the engineer can enter.

The distribution system is built up by placing elements representing boards, loads and cables, directly onto the screen. These elements are far more than just symbols as they hold data describing their characteristics entered by you. For example, the cable type and installation method or the load on each way and phase.

The engineer can coordinate the power distribution schematic with the floor plan based Cymap Electrics program. This entails importing the distribution boards set up on the floor plan with all cable lengths and loads determined from manufacturers' luminaires and loads placed. This saves time setting up boards in the Cymap Wiring program.

A full analysis of the system is available as soon as a functioning layout has been described, so within a few minutes of starting the design you can be looking at calculated cable sizes and volt drops, earth loop impedance checks, CPC sizing, discrimination studies and breaker sizing as well as full schedules of rates.



To modify the system simply click on the item to alter and enter the revised values. Recalculation is instant, with cable sizes and other results displayed either directly on the layout or in easy to read schedules.

The Calculation Process

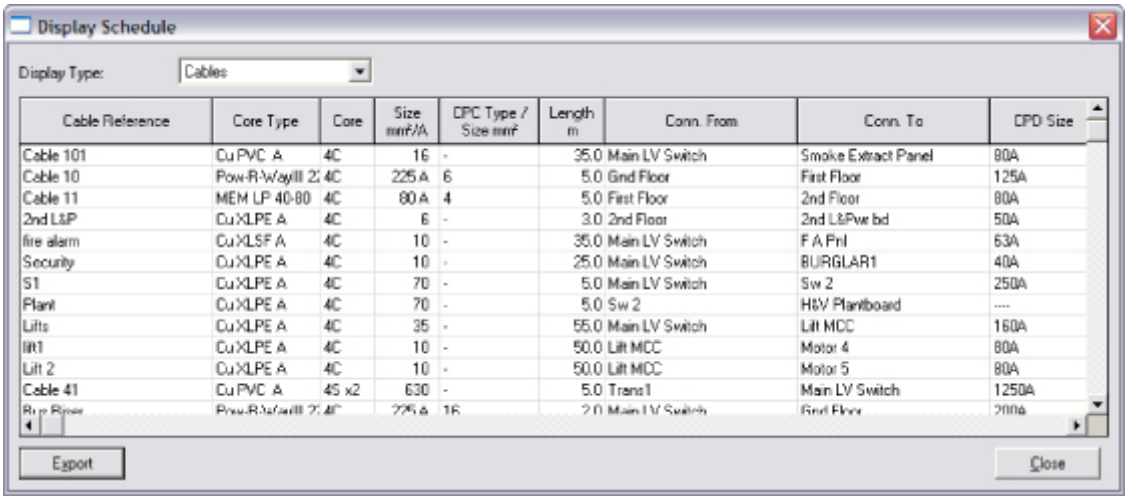
Cables can be controlled in various ways:

The size may be fixed. They can be set in parallel and various de-rating factors can be determined. Over 285 types of cable are available in the database provided, including IEE 17th Edition cables and those based on ERA installation methods.

CPCs can take various forms including core in cable, using the armouring or the conduit. Alternatively, you can choose to run a separate earth.

Protection devices, including HV devices, MCBs, MCCBs, air circuit breakers and electronic devices are available from many manufacturers and can be modified or added to by the user. RCDs can be included and either fixed in size or sized automatically by the program to ensure discrimination. Diversity can be entered at any point in the system.

Loads, cable sizes, protection device sizes, volt drops, short circuit fault levels and earth loop impedances are calculated for every point in the system. In addition, disconnection times are calculated, adiabatic and other checks are made to help ensure compliance with the IEE 17th Edition. Full de-rating and single cable sizing form part of the minor suite of programs included.



Final Circuit Analysis

The description of final circuits is an integral part of the Cymap Wiring package. As each element of the final circuit is entered the total load on the way is updated, the protection device size is calculated and the numerous checks required by the IEE regulations are carried out. Six types of final circuit are identified to cover the full range of possibilities; lighting, standard sockets, special sockets, cooking, stationary equipment and spare capacity. Loads may be either single phase or three phase.

Where there are a number of similar boards in a building for example, the lighting on identical floors of an office block, the complete contents of one board can be copied to another. This is in addition to being able to copy, move and swap individual ways within a board. The ability to select whole sections of one project and paste them into another is also a useful feature.

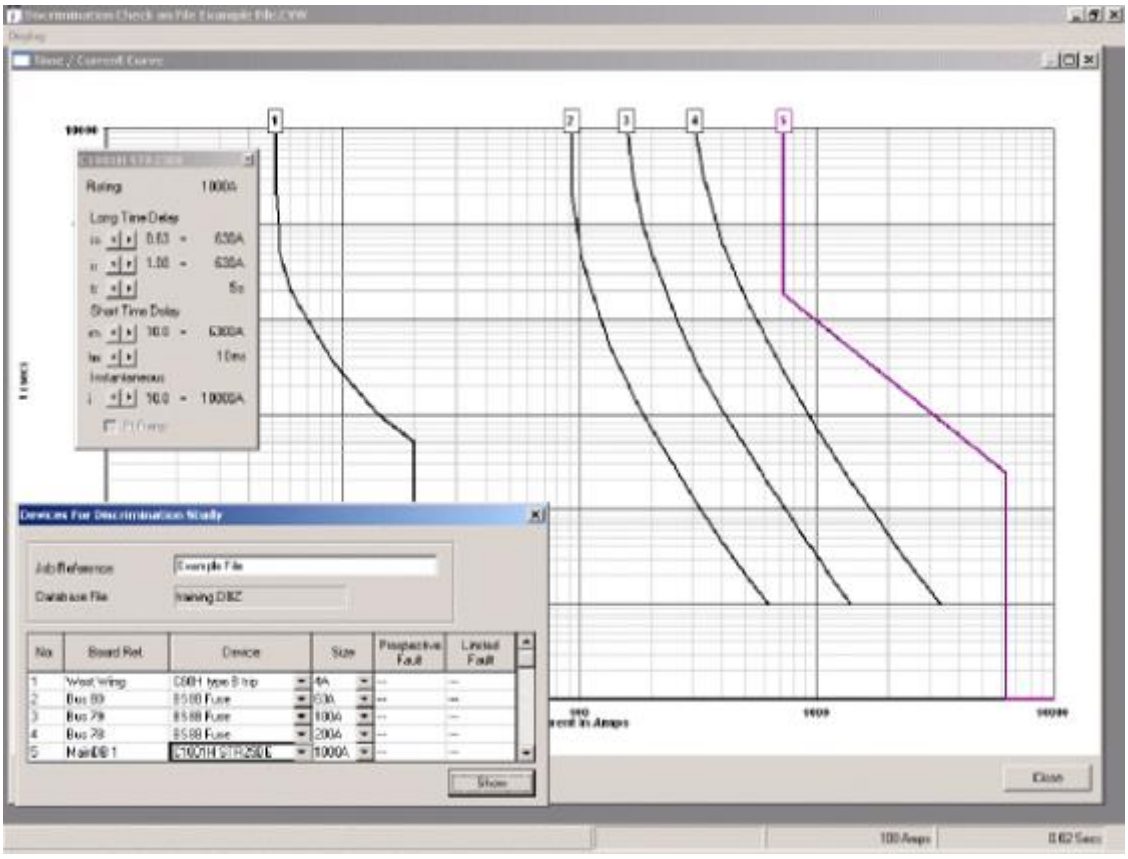
Device Co-ordination

Discrimination between protective devices is automatically checked each time a calculation is performed and any problems reported. A full coordination study can also be carried out, taking into account the tolerances of the device and enabling you to alter the settings of adjustable devices, while viewing their fault/time curves on screen. HV devices can be included on the upstream HV side of the power distribution network. Full adjustment of all devices is possible by selecting the appropriate device curve and changing the device settings.

A full database of manufacturers' devices is included along with impulse voltages which can be used for analysis of protection of atmospheric or otherwise over voltages which require surge protection. A separate discrimination coordination package forms part of the extensive range of circuit protective devices enabling engineers to create a simple discrimination study by selecting devices on a tabular format and viewing the results. This is particularly suitable for existing networks where obsolete breakers need replacing without resorting to a complete modelling of the power distribution network.

Harmonic analysis is a feature that can be applied if necessary to analyse tripleN harmonics created in today's electrical environment at a distribution board level.

There are no limits to the number of boards and loads added to the schematic system, so the software can be used to cover the vast majority of projects from domestic to commercial.


Rating 1000A
Long Time Delay
Short Time Delay
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Devices For Discrimination Study
Job Reference
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No
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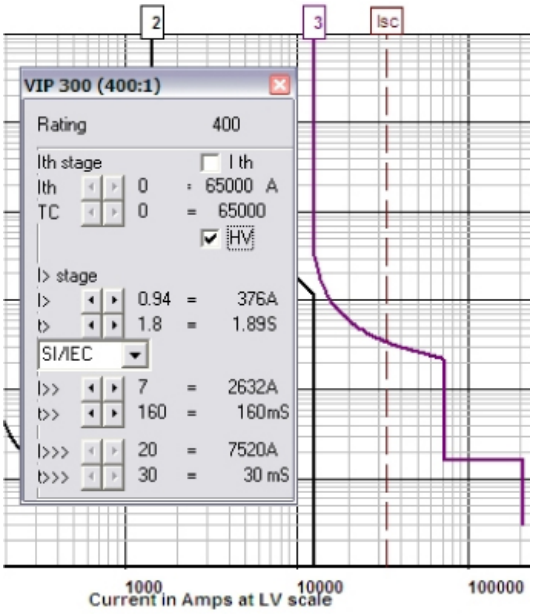
2
3
Isc
VIP 300 (400:1)
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SI/IEC
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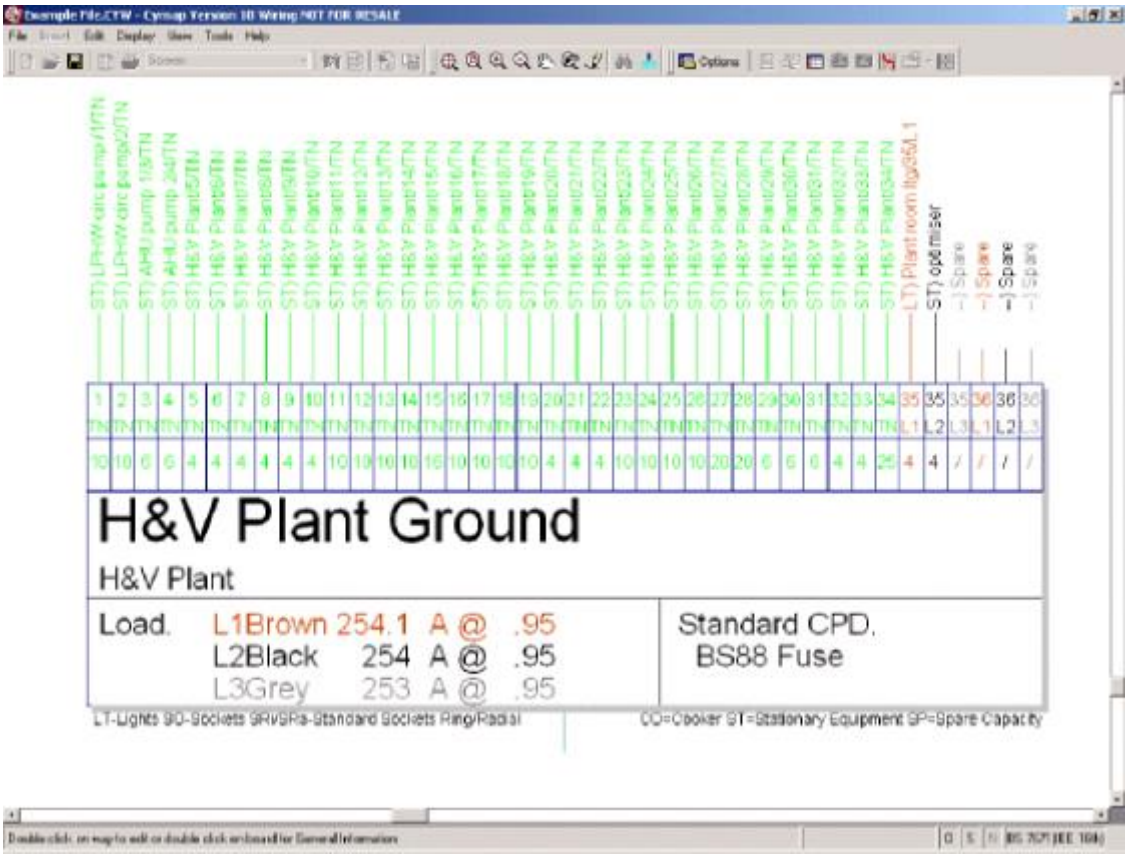
t>> 160 = 160mS
I>>> 20 = 7520A
t>>> 30 = 30 mS
1000
10000
100000
Current in Amps at LV scale



Reports and Drawings

A wide range of customisable reports can be printed, including all aspects of design and schematics, final board diagrams, a bill of quantities and commissioning test sheets. As an accredited supplier, appropriate BS5750 and BS7671 output documentation is provided.

Diagrams can be printed, plotted directly or exported to a draughting system such as AutoCAD for further enhancement. System details can be exported in a format suitable for spreadsheets, word processors and estimating systems.

Cymap Wiring is user friendly and enables the engineer to copy and paste individual boards, groups of boards or even whole sections of one project into another making it easier for the engineer to add projects together.