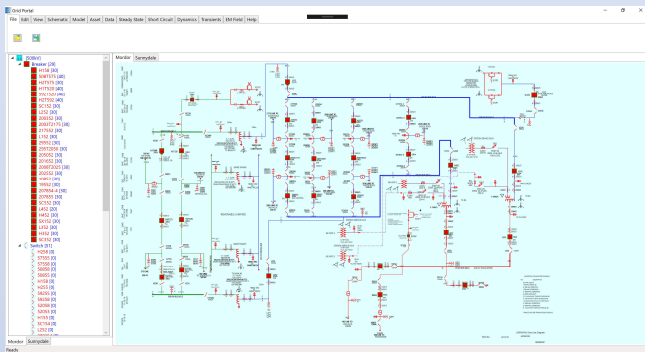# GirdPortal - Liven Up Grid Data from CAD to EMS

IPE GridPortal is a big data visualization, management and analysis tool and a grid information presentation framework for electric utilities. It provides a platform for planners, operators, technicians, engineering, managers, and executives in the power grids all around the world to visualize, analyze and synchronize the grid data to design and operate the grid in a more efficient, more reliable and greener manner. IPE GridPortal is aiming at uniting the prevalent technologies in different departments and organizations in the electric utility industry to will weave the frequently used features in those major software systems of those technologies into an overarching and cross-referencing data driven platform to meet the challenges at the present in the electric power industry and offer the data oriented applications of the future for the power grids.
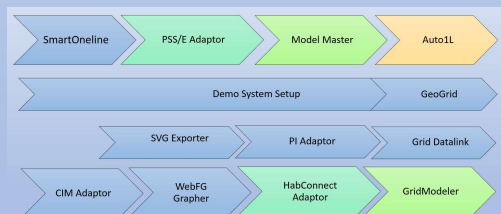

Substation CAD Display   IPE GridPortal Display

The in-memory electric network model with diagram information can be exported to a number of industry common formats, such as PSS/E (V33 and V34), OSISoft PI, TARA, CIM, EMS, and ASPEN. The following video isa screenshot of exported PI Vision diplay for the Mordor substation

PI Vision display

GridPortal UI for diagram viewing

The above is a screenshot of a general GridPortal UI. GridPoratl is currently a desktop application that is designed to perform the following functions for power grid engineering:
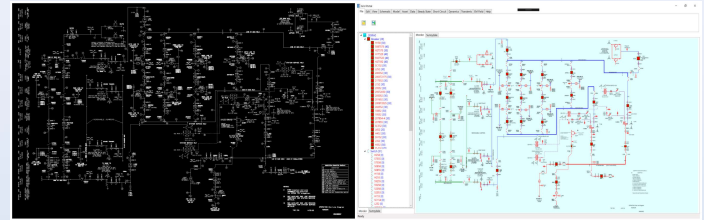
- *Central Network Model Management*
- *Models Sync Up and Reporting*
- *Grid One-line Diagrams Conversions*
- *Automatic One-line Generations*
- *Data Visualization*
- *Advanced Grid Simulations*

The following chart shows the major components of GridPortal to fulfill the aforementioned engineering features :

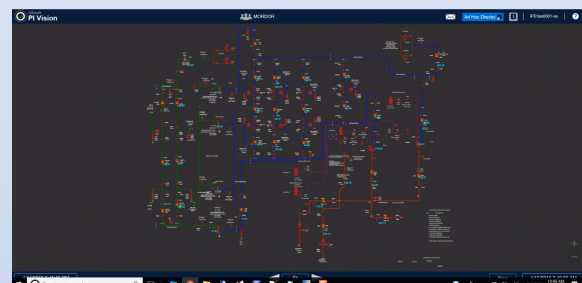

GridPortal Components Structure

One key compoent of GridPortal is the SmartOneline that can read raw substation and transmission line CAD files (AutoCAD, Microstion, pdf formats) that have only basic line/arc/texts information and use GridPortal's advanced artificial intelligence to analyze the file and generate an in-memory electric network model. The in-memory model then displays in GridPortal UI and allows users to visualize and control. The following is a side-by-side comparison of a raw CAD file and an GridPortal livened display.

The in-memory electric network model with diagram information can be exported to a number of industry common formats, such as PSS/E (V33 and V34), OSISoft PI, TARA, CIM, EMS, and ASPEN. The following video isa screenshot of exported PI Vision diplay for the Mordor substation

Another innovative and highly-demanded GridPortal feature is the Model Master, the IPE network model management tool. Model Master uses APIs of CAD software, transmission line engineering tools, common ERP databases and so on to 1) retrieve the equipment electric parameters and ratings, the network topology and transmission line configurations, 2) calculate transmission line impedances, 3) generate in-memory network node-breaker model, 4) do topology analysis to produce bus-branch model, 5) export the in-memory model into requested operations, planning and protection network model formats, 6) maintain and version control the models. Advanced artificial intelligence in heavily used in this feature and the following is an illustration of the Model Master feaure in GridPortal.
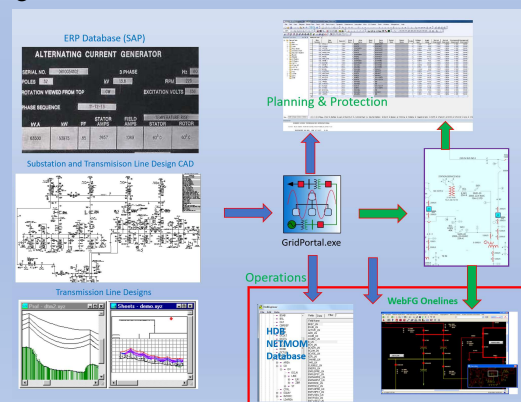
GridPortal Model Master Illustration