



+ Forecast

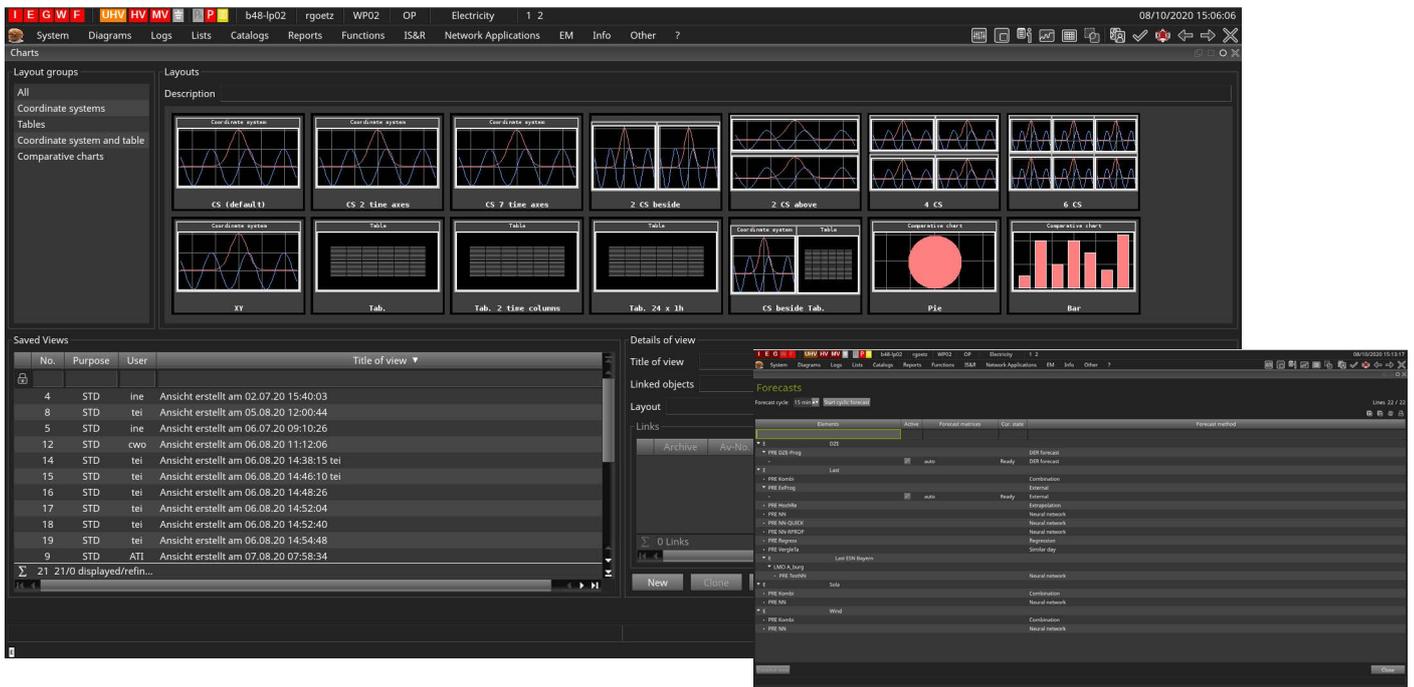
PSI forecast for loads and renewable infeeds

PSIforecast



PSI provides a comprehensive software package for forecasting of infeeds and loads. It can be integrated in PSIcontrol, operate as a stand-alone system, or be accessed by other systems via interfaces. PSI also uses PSIforecast as the base product for providing forecasts as part of service contracts.

Based on weather forecasts and historic data of the decentralized infeeds (including wind and solar plants) installed in a certain area as well as the connected consumers, PSIforecast provides overall and partial load forecasts for electricity, gas, water, and district heating.



PSIforecast includes several forecast methods which can be used in parallel, complementary, or alternatively.

The following methods are provided by PSIforecast:

- Neural networks
The supplied and fully integrated editor can be used for adaptations as well as creation of own network structures which are optimized to the specific customer requirements.
- Linear regression
This method uses relationships which can be linearized in segments for the forecast.
- Extrapolation
This method is used to consistently determine the average power demands for each forecast interval from the overall energy forecasts.

- Comparison day search

Experience shows that for the same initial conditions (weather, time of year, history, etc.), the time-dependent loads are identical so that there is a well-defined correlation. In order to make use of this correlation, comparison days are searched based on defined input variables which match these criteria.

An overall forecast can consist of several individual forecasts. For this purpose, methods can be combined to achieve the optimal solution for a forecast area such as a geographic region. It is also possible to generate competing forecasts which may be based on different methods and models. The automatically updated error statistic makes it simple to select the best forecast for each case.

The forecast results are made available as time series. If the forecast module is integrated in a PSIcontrol system, the archive tables are used for storage.

If separate forecasts are generated for each day, the load curves are usually not continuous at the transitions between the forecast periods and must be adapted. PSIforecast assigns the adaptation required for continuity at the change of day in equal parts to the previous and the next day.

The forecast time series can be displayed both as tables and as graphics.

The forecasts are general and must be adapted to the actual conditions.

PSIforecast supports the following time periods:

- Short-term adaptation

The forecast is automatically corrected by the deviation of the previous period. The adaptation can be defined as constant offset (shift of the entire forecast) or as decreasing adaptation.

- Long-term adaptation

This covers long-term behavior changes in the network area. For forecasts based on neural networks, a retraining is performed. This can be done automatically and periodically or spontaneously by the user. The forecast model accounts for the changing dependencies for regression and extrapolation by using a Kalman filter.

The retraining decision is facilitated by an ongoing error statistic. The error statistic is calculated for a defined time period and facilitates selection of the forecast with the proven smallest forecast error. If the error rate increases, the forecast models can be subjected to retraining. Here the training can also be performed automatically or started by the user.



Your benefits



The innovative and comprehensive solution

- + Self-learning algorithms support maximum precision
- + Automatic adaptation to changing demand and generation behavior
- + Forecast of the loads and the renewable energy infeeds
- + Flexibly expandable and adaptable to specific requirements
- + Optimal scalability
- + Stand-alone operation or integration in PSIcontrol





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