EnviMan

Air Quality Management Solutions
During the last 20 years, Opsis has built a team of environmental experts. The comprehensive in-house knowledge has been utilized in the development of the EnviMan software, a state-of-the-art tool for air quality management.

By our in-house knowledge, we can guarantee the quality and continuity of our software solutions for data management and air quality modelling. Our long experience and integrated knowledge in air quality monitoring, meteorology, mathematical modelling, chemistry, QA/QC, communication, data base construction and system integration ensure successful results for the client.

The MS Windows based EnviMan software offers a range of functions for flexible and cost-effective solutions both for urban and industrial applications. The functions can be divided into three main categories:

1. Data management functions such as data acquisition, data validation, data presentation in graphs and tables, statistical analysis, reporting and forecasting.

2. Modelling function such as map handling (GIS), compilation of emission databases, dispersion modelling and simulations of different planning scenarios.

3. Additional functions for processing meteorological information, processing of input and output signals, data dissemination and more.

Each EnviMan installation can easily be adapted to the client needs as the entire software package is modular based. The various modules within the EnviMan suite and their key functions are briefly described in the following pages.

In order to facilitate the coordination of work between different individuals/organisations, an EnviMan application can be run as a client/server solution over the LAN, WAN, Intranet or even over the Internet. By using a thin client (a standard software included in MS Windows) on a local computer (at any location), a user will be able to access all EnviMan functions. This concept adds great value, as modern Air Quality management often is carried out as teamwork where several individuals are involved.

In addition to the EnviMan software, Opsis provides different kinds of services and support related to the software and within the field of Air Quality management in general.
Data Management

Data Acquisition, Validation and Presentation

*EnviMan ComVisioner* provides real-time data management, i.e. accessing monitoring stations according to user defined schedules, extracting data and storing the data in databases. Furthermore, data can be displayed in graphs or tables. Automatic data validation can be set up using scripts and alarms can be generated for certain criteria. Advanced mathematical and logical functions can be used to generate secondary variables (suitable for PEMS (Predictive Emission Monitoring Systems)).

*ComVisioner* is supplied as a client server concept in which the ComServer is dedicated for the data acquisition and the *ComVisioner* clients are used for data presentation.

Advanced Data Presentation and Reporting

*EnviMan Reporter* is a power software for presentation, report generation and advanced statistical analysis of air quality/CEM data. It is designed to be used with Opsis monitoring systems and data loggers but can be used for any other type of monitoring data. *Reporter* can combine data from several monitoring sites, present the data in graphs using various selective conditions and perform multivariate statistical analysis. Data can be displayed in graphs as time series, distribution graphs, scatter plots, period profiles, wind roses and Breuer plots (polar scatter/average diagrams). In addition to the graphs, numerical tables can be viewed.

The *EnviMan Reporter* includes a macro-facility, allowing the user to set up his favourite presentations in a macro – to be used for creating automatic reports. The reports can be set up in various formats such as EXCEL spreadsheets, HTML tables, ASCII files, JPEG, GIF and Bitmaps.

Air Quality Forecasts

The *EnviMan Forecaster* is designed for daily air quality predictions. Projections up to 48 hours can be generated for all types of pollutants. Output could be generated for individual pollutants or as weighed combinations such as PSI or air quality indicators.

The forecast is based on adaptive statistical models utilizing historical AQ monitoring data, meteorological data and a weather forecast.

Internet Presentation

Data presentation on the Internet/Intranet can be carried out in various ways.

The *EnviScheduler* can be utilized to initiate *Reporter* at user-defined occasions to create JPEG graphs and HTML tables that will be transferred via FTP to Web servers for presentation.

*EnviMan Sitebuilder* can be used in a similar way as *EnviScheduler*, but in addition *Sitebuilder* can be used for designing the layout of the HTML page to be presented on the Internet.

*EnviWeb* is designed for displaying weather forecasts on the Internet. The application enables the user to create a map layout including weather symbols such as clouds, rain, fog, wind arrows and various sun symbols. When a weather forecast telegram is received from a weather forecast supplier, the application will automatically compile the data into weather maps showing several forecast projections.

Air Quality Modelling

Processing Map Data (GIS)

*EnviMan Mapper* is a module for preparing suitable maps to be used in all the other EnviMan modules requiring a GIS interface. *EnviMan Mapper* imports and exports raster and vector graphics for the most popular formats such as Arc View shape files (*.shp), Map Info (*.mif) and Windows Bitmap (*.bmp). Different sets of map data can be prepared for optimum use.

Emission Data Base

*EnviMan AQEmissioner* is state-of-the-art software, designed for compiling emission inventories in urban areas or regions.
Top-down or bottom-up strategies are supported. Direct emission information can be entered as well as activity related information linked to emission factors. Map information can be converted to emission information and data can be compiled as point sources, area sources, line (road traffic, sea traffic, air traffic) or grid sources. Dynamic emission simulation is possible to generate using time variation functions as well as emission factors. AQEmissioner includes emission classes, a useful tool to provide alternative emission scenarios for assessment studies using the dispersion models.

**Dispersion Modelling and Planning**

**EnviMan AQPlanner** can be used for simulation of various air quality scenarios in urban areas or regions. Typical applications include long-term planning in cities and regions, what if... scenarios, air quality mapping, and detection of critical areas. AQPlanner includes different state-of-the-art dispersion models for regional modelling, urban/local area modelling and street canyon calculations. The graphical model output can be exported as ESRI shape files, raster files (jpeg etc.) as well as numerical values in MS Excel format.

**Real-time Dispersion Modelling**

The **EnviMan Nowcaster** is used for real-time dispersion calculations, estimation of the present air quality situation and presentation of historical periods of air quality simulations. Nowcaster can be supplied in two versions:

- Industrial version, using real-time CEM data and meteorological data
- Urban version, using real-time traffic data and meteorological data

**Locating Emission Sources**

The **EnviMan Finder** is a tool to be used to track emission sources. Given information about source release height, weather data and air quality data (measured at two or more monitoring stations), the Finder will track the position from where the emissions are likely to be released. Output will be given as a map showing the likelihood of where the sources are located (isopleths). Selecting one or several points/areas, the Finder will estimate the source emission rates.

**Managing Meteorological Data**

The **EnviMet** module can be used for setting up boundary scaling algorithms as a function of available meteorological data, and display dispersion parameters such as the mixing height, stability class, turbulence parameters etc. In addition, data can be exported/imported via Microsoft® EXCEL 5/7 spreadsheets. Tools are provided to set up automatic import of meteorological data from **EnviMan**.

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The EnviMan software is designed to be used by workgroups. The objectives with the workgroup solution is to provide a user-friendly and cost-effective technical solution that facilitates:

- Coordination of work between different individuals/organisations in a network.
- Remote access to the whole software package for users in a network.
- Easier maintenance and update of large databases such as the emission database and the time series databases (air quality data, traffic data, met data etc.).
- Remote service and support.
- A solution possible to be “on-line” but out of office, using portable lap-tops.

The software will allow the members of a group to utilize all parts of the system via personal computers, without any extra software installation except for the operative system Windows XP/2000. Furthermore, any team member would be able to log in to the EnviMan system using the local area network (LAN), the wide area network (WAN), the Intranet or the Internet, without any substantial loss of performance.

All parts of the system have been developed as fully scalable solutions, i.e. increasing numbers of users can be met by hardware upgrades. The system can easily be set up using different levels of access for different users.

Data acquisition from monitoring stations can be set up in a dedicated data acquisition server (DAS). This concept provides a protected environment when the computer is to be linked to telephone modems.

The AQMS main server hosts all databases and software modules for data management, modelling and GIS.

For modelling purposes, the number of computational servers can be set as to comply with user requirements for processing time limits (especially important when resource demanding dispersion models are used).

The system is recommended to be equipped with an integrated back-up system as RAID 5, if required, also in combination with tape back-up.
Opsis Benefits

- In-house expertise
- Research and development
- Represented worldwide

The EnviMan Software

- State-of-the-art software
- Data management modules
- Air quality modelling software
- Built-in Geographical Information System (GIS)
- Windows based
- User-friendly interface
- Client server solutions for workgroups
- Accessible via the Internet

EnviMan Services

- Project management
- Software and hardware installation
- System integration
- Training programmes
- Technical and application support
- Environmental Impact Assessment studies (EIA:s)

OPSIS AB
Box 244
SE-244 02 Furulund, Sweden
Telephone Int +46 46 72 25 00
Telefax Int +46 46 72 25 01
E-mail info@opsis.se
URL http://www.opsis.se

One Supplier Several Solutions