# BelVis EDM POWER

ENERGY MARKET SYSTEM

# Simple Solutions to Energy Data Management Challenges.

TIME SERIES MANAGEMENT KiTSM INSIDE TIME SERIES MANAGEMENT

NETWORK | SALES



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Since the electrical transmission of energy is a much more economical process than any other we know of, it must necessarily play an important part in the future.

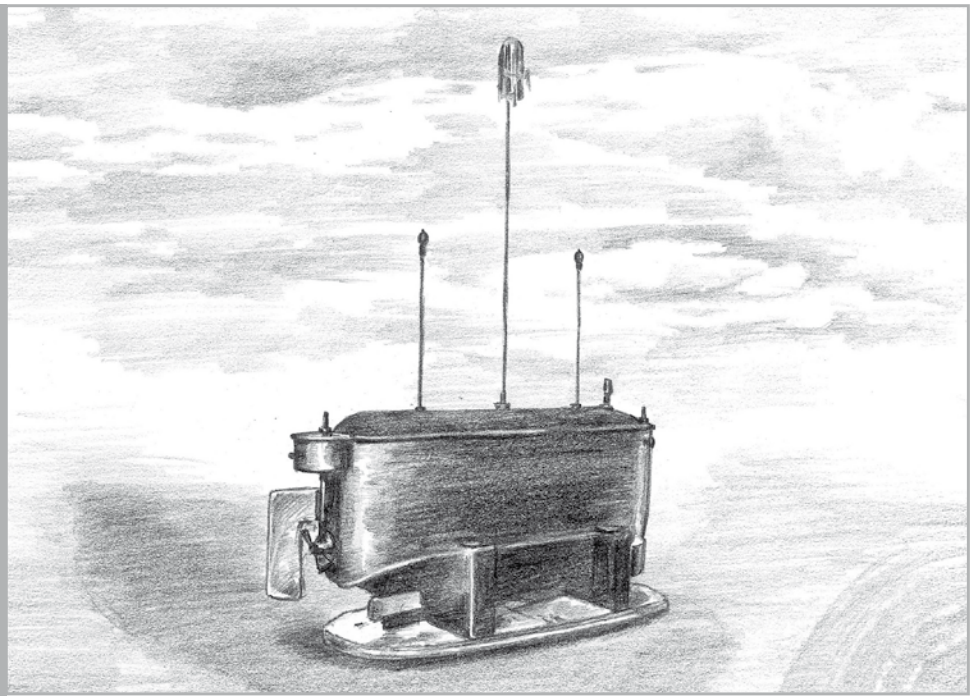
**Nikola Tesla** | Electrical inventor and constructing engineer

KISTERS

Pioneering Technologies.

## The discovery of radio control.

Tesla was not content with having created the first radio link in the world: he went on to develop the first radio control. Tesla demonstrated his discovery using a submarine model, which he controlled directly using Hertz waves, even allowing the boat to dive.
The amazed spectators could hardly guess the implication of Tesla's discovery: It was the birth of space navigation.



# BelVis EDM POWER:
# Energy data management from the market leader.

Mass data capabilities, performance and efficiency of use must be perfectly combined with one another in order to simultaneously guarantee reliability, meet time demands and realize full automation potential: challenges which can only be met from a background of intensive practical experience.
BelVis EDM Power turns our experience into your convincing advantage. Today, BelVis EDM Power is the nucleus of 350 EDM installations in Europe. This high level of BelVis acceptance is a reflection on its particularly high levels of performance. As the core component in meeting all EDM-specific challenges, and critical to system quality, the heart of the data processing system is time series management.

## BelVis: EDM in perspective

BelVis Energy Data Management (BelVis EDM) for the power sector is the basic system for network operators and for the distribution and trading arms of utility companies. BelVis EDM POWER provides all of the most important basic functions for the entire BelVis software family.

"From extraction to billing" is the standard paradigm for the continuity demanded in EDM. BelVis is already in use as the core of an entire system network, which includes:

- Connection to remote meter reading systems
- Integration of all major billing systems, such as SAP, Wilken, SIV, Schleupen, Neutrasoft, etc.
- Connection to other data suppliers for weather data, prices, utilization fees and much more

Having developed BelVis, KISTERS is en route to the next generation of EDM in the form of:

- Data warehouses
- Bridges between realtime data processing and companywide information processing
- Common databases shared by complete business processes

## Versatile enough for any application

BelVis is easy to configure, suits any size of company, and offers a full range of operating versions: the in-house solution, shared energy data management under the umbrella of cooperative deals, or Application Service Providing (ASP) at KISTERS itself. BelVis provides solutions for applications of every size and for every requirement.

**As the basis for all the EDM functions, the time series management system provides access to a range of functions.**

- Full user administration with access security spanning several levels and clients through allocation of user rights, including assignment of roles and rights
- Integrated server for automatic calculation of all time series requiring updating
- Workflow support in all major processes provided by wizards which guide the user through the applications
- Comprehensive standard reports but also individual, freely configurable reports
- Public holiday calendar for all European countries

**The required readouts are imported from various sources.**

- Remote meter reading (e.g. BelVis SODA) and all other standard telemetry systems
- Readouts from mobile data acquisition systems
- Readout lists through interfaces to accounting systems
- Import from external systems
- Automatic import of all relevant standard formats, such as EDIFACT (MSCONS, UTILMD, etc.), ESS, meteorological data and more
- Import from control systems, such as ControlStar or systems offered by other suppliers
- Configurable import facility which can be used to customize import formats

## Turning practical experience into practice

**All market participants (time series data and basic data) may be administered.**

- Customers and their metering points for extraction and feeding points
- User groups including their standard load profiles (SLP, ALP, TLP)
- Suppliers and retailers
- Control areas and balancing groups

**Data is prepared automatically.**

- Plausibility checks and substitute value generation according to all methods defined in MeteringCode2006
- Plausibility checks are either carried out automatically in the background or interactively. The results are shown in a table or a graph. This is ideal for detecting and checking the validity of data.

**Particular strengths include the method of displaying results and BelVis graphs.**
Time series, processing results, analyses - the information can be displayed in graph, table or report form:

- as a simple graph for the display, formatting and evaluation of time series data
- as graph templates for the generation of frequently used layouts
- as standard graphs for the generation of specific layouts. Different graphs can even be displayed at the same time. A main graph may be subdivided into up to 16 subgraphs.

BelVis graphs also offer a wide range of individual tools which may be combined in any number of ways for interactive formatting and analysis. A large number of functions can beapplied under administrative control - even simultaneously - to time series approved for interactive processing.

**Simple, interactive time series manipulation with a mouse.**

- Delete and add time series sections or single points
- Vertical or horizontal shifts, flipping, or proportional stretching of time series sections

**Data from comparison metering points can help with complex adjustments.**

- Copy time series sections aligned with the beginning and end of the gap, or with proportional adjustment
- Copy time series sections with energy quantity adjustment
- Gap filling through linear or non-linear regression

**Interpolation methods for gap filling can be used with:**

- a constant
- the last value before the gap
- linear interpolation methods
- spline interpolation methods

**A wide range of data analysis tools are also available.**

- Correlation and regression methods
- Time series calculators that include other mathematical and statistics methods

## For all players in the energy market.

### Calculations

The BelVis calculation server (BelVis CS) calculates all load profile data to be updated and carries out all configured plausibility checks. The update intervals, together with all other system operations, are synchronized in a configuration file. In the default configuration, the calculation server updates the required time series overnight. Computing times in the BelVis Client applications are considerably reduced through the use of a calculation server. The BelVis system features predefined calculation methods (e.g. for accounting in accordance with the standard load profile procedures) and freely definable calculations using formulas. The BelVis formula editor is the ideal tool for this purpose. It has access to an extensive library of functions for time series manage-

ment. Any selected output time series can be analyzed and linked in any standard arithmetic operations. In cases where specific calculation methods have been predefined, the user can still tailor the system to his precise requirements by means of parameter-based calculation.

## Aggregation and accounting

- For normal tariff customers using analytical and synthetic procedures
- Generation of balancing group sums
- Total of analytical and metered customers (tolerance range)
- Calculation of residual load

## Transmission of aggregated data

All standard formats are available for data transmission, including configurable Excel/CSV export formats. These enable the user to transmit all time series to the supplier and balancing groups in formats specified by market partners. Regular tasks, such as data import and data transmission, can be fully automated with the BelVis COM module. As an example, time-controlled data export and dispatch may be sent via FTP or TCP/IP, and the data is then automatically saved to an approved directory on the target system. Alternatively, data can be received and sent by e-mail: all tasks suitable for automated execution with the BelVis Service Controller can be easily customized to specific requirements. BelVis offers predefined standard reports for presentation and evaluation purposes. A number of reports are already supplied with the BelVis system. New standard reports are constantly being added to keep pace with market developments, considerably simplifying the fulfillment of reporting obligations. Reports are output either as simple tables (Excel or CSV) or through Crystal Reports, which facilitates designed reports in a range of formats (e.g. PDF, Excel, Word). Powerful tools to configure the form and content of reports are also available.

## History Management

All data is kept accessible online for ten years. All contractor changes can be traced directly during this period.

## EDM view for the network or sales

Depending on the installation and configuration of the system, BelVis EDM offers functions which allow EDM to be tailored to the special requirements of either the system operator or sales. As such, the specific requirements of any given user may be configured in BelVis.

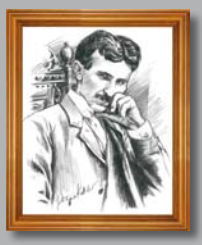
### Special functions for system operators

- Network use fees
- Forecasting based on
  - comparison days method,
  - load profile extrapolation
  - synthetic forecasts
  - reference profile forecasts
  - system load forecasts

### Special functions for sales

- Special methods of customer segmentation
- Sales load forecasts
- Sales-related aggregation methods, such as
  - generation of balancing group sums
  - sum of analytical and metered consumers
  - target/actual analyses
- Control functions for network access invoicing, over-/under-estimate reconciliation and control energy
- Preparation of billing statements
- Compilation of schedules

### The perfecting of the arc lamp.



The brightness of 16 candles! This was the highest light output to be supported by the first electric lights in American cities. The arc lamp, invented by the Russian Paul Jablochkoff, should have saved the situation, but it became unusable once the current flow was interrupted. With simple but decisive modifications, Tesla improved the arc lamp, allowing it to spark itself and automatically replace burnt out carbon pins. For the first time in the history of mankind, public lighting that was user-friendly, reliable, safe and economical became possible.

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