

PRODUCT SPECIFICATION

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Overview

The AL.VIS/Timeseries application is a network-based, multi-user information system for managing measurement networks and measured data in the form of time series data.

AL.VIS/Timeseries component allows to carry out import, intuitive search, graphical analysis and export of stored time series.

The AL.VIS/Timeseries software consists of five basic components:

1. **AL.VIS/TS-Web** multilingual, web-based software solution for searching and managing time series and measurement point data as well as for administration of the complete system
2. **AL.VIS/TS-Vali** client programme for manual import and validation of time series data
3. **AL.VIS/TS-Jobserver** for automatic import of time series data from external SQL-databases with subsequent automatic validation
4. **AL.VIS/TS-Sensorweb** for automatic import of sensor data
5. **AL.VIS/Timeseries-Mobile** Android app for mobile searching for time series and measurement data

The design is based on a reliable technology, delivering high-performance, and stable applications. This includes the use of Microsoft .NET technology, an efficient database system, and the IIS web server. The interface is also based on Ext.NET and Sencha Ext JS, ensuring that a modern interface with extensive functions is installed.

AL.VIS/Timeseries can be used in conjunction with other AL.VIS-Software products, e.g. with an object cadastre based on AL.VIS/Objects.

Database Technology

AL.VIS/Timeseries can be used with the following database systems:

- ORACLE 11g
- PostgreSQL 9.3 / PostGIS 2.1

The database model used is flexible and can be expanded in a simple manner. The monitoring sites, time series, and organisations can be structured hierarchically and assigned with metadata according to individual specifications.

The following properties are stored for each data set:

- Measurement time
- The original value
- A corrected value resulting from validation
- Configurable flags for measurement identification and classification
- Remarks

Coordinate specifications, e.g. for object locations, are stored in the used database system as special geometry objects (e.g. SDO in ORACLE). This allows the user to analyse the spatial relationships using SQL statements.

Individual coordinate transformations can be made by submitting the appropriate transformation instructions in the database.



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Functions Overview

Function of AL.VIS/Timeseries	TS-Web	TS-Vali	TS-Jobserver	TS-Sensorweb	TS-Mobile
Creation of time series	✓				
Management of system parameters (units, measurement parameters, validation parameters, import routines)	✓				
Search for master data	✓				✓
Search and analysis of measured values (dynamic chart components, presentation of data individually or as pivot table)	✓				✓ limited
Data export (master data, measured values, analyses)	✓				
Use of Web-GIS for selecting time series and show position on a map	✓				✓
Manual data import		✓			
Manual data validation		✓			
Manual data correction		✓			
Automatic data import from SQL databases incl. automatic validation			✓		
Automatic data import from SensoMaster for periodical measurement data from data loggers				✓	
Sensor Observation Service (SOS) for transfer of stored time series to third parties (optional)	✓				
Automatic analysis of time series for critical values using software detectors (optional), alarm index display	✓				



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AL.VIS / Timeseries-Web

Administration

- Creation of new measurement parameters
- Management and conversion of measurement units
- Organisations management
- Flag definition for identification of measured values
- Meta data management for defining custom properties for time series, organisations, and measuring points
- Easy creation of new measuring points and time series
- Positioning of measuring points using Web-GIS

Search

- Form-based web interface to search for time series data and measuring points using different filters
- Tree view with measuring points and time series based on an individually defined organisational structure
- Access to the submenus: reminder, administration, chart, help and reports
- List view and detailed view of measuring points and time series data
- Chart preview
- Easy browsing through search results

Chart Components

- EDynamic display of several time series in one chart
- Automatic and manual axis scaling and annotation
- Up to four different axes
- Intuitive navigation within the chart using in/out zoom and scrolling
- Customisable layout

- Use of different chart types (point, line, bars), colours, and annotations
- Use of different dynamic analysis functions
- “My Charts“ - storing and downloading of personalised chart settings
- Export of charts as image file

Data Analysis

- Creation of aggregated time series for a selected time interval
- Definition of upper and lower limits
- Definition of ascending and descending slope limits
- Creation of scheduled values
- Thinning out of time series (with or without nodes, with or without edge correction)
- Linear interpolation for closing “gaps“ in time series data
- Creation of moving averages
- Time series statistics

Data Export

- Export of master data for selected time series to Excel
- Export of the stored measurement values or results of analyses to Excel
- Export of pivot table to Excel

Software Security and User Permission Management

- Interfaces for easy management of user access permissions

Web GIS Integration

- Presentation of measuring points on a map
- Map-based selection of measuring points for subsequent analysis



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Reminder (“My Time Series”)

- Storage and management of private and public sets of time series data
- Display of individualised data sets in the hierarchy tree

Interfaces

- Interface for AL.VIS/Objects for linking a time series with objects (e.g. dam)
- Configurable database-based application interfaces
- Support of Cardo interfaces (software product from IDU mbH Zittau for constructing a geo data infrastructure (GDI))

Alert Value Management using Software Detectors (Optional)

- Support of five different software detectors for identifying critical values
- Alarm index design (weighting of effects of individual detectors)
- Web form for configuring detectors

Reports

- Creation of on-the-fly reports
- Integration of Jasper Reports (Open Source Version) for generating reports



AL.VIS / Timeseries-Vali

Data Import

- Use of predefined import formats (Excel and CSV files)
- Single parameter import (import of individual time series)
- Multi parameter import (import of measured values with various parameters at different measuring points)
- Import from SQL databases (e.g. from process control systems)

Validation

- Time series validation during manual import
- Setting of defined flags for quality assurance
- Post-validation of previously imported time series
- Check-up of upper and lower limits as well as ascending and descending slope limits
- Use of a chart component for validation
- Validation of a group of time series

AL.VIS / Timeseries-Sensorweb

- Solution for automatic data transfer of measurement data taken in the field
- Form-based registration of measuring stations (hosts), (integrated into AL.VIS/TS-Web)
- Management of registered stations in AL.VIS/TS Web (display of status and state of data transfer)

AL.VIS / Timeseries-Jobserver

- Automatic, periodic import of time series
- Automatic validation during import process
- Possible data sources: SQL databases (e.g. process control systems)

AL.VIS / Timeseries-Mobile

- Search for time series or measuring points using different filters
- List view
- Display of time series in (line-)chart
- Intuitive navigation within the chart using in/out zoom and scrolling
- Map-based display of measuring points
- Display of time series nearby the position of the user (local search)

Technology and System Requirements

- Microsoft .NET Framework 4.5.1
- Ext.NET-based web interfaces
- IIS web server
- Support of current browsers
- Database system for managing data – Oracle 11g or PostgreSQL/PostGIS