

# RiMONITOR

for RIEGL VZ-Line Laser Scanners

- for stand-alone monitoring applications by autonomous operation of RIEGL VZ-400 and VZ-1000 laser scanners
- adaptable configuration of data acquisition in the spatial domain and in time domain
- variety of pre-defined algorithms for data filtering, data processing and data analysis
- remote configuration of data acquisition, on-site pre-processing and data reduction via web interface or telnet interface
- configurable logging of relevant system data and parameters
- user programmable alerts
- interface for offline processing and analysis of the logged scan data

The RIEGL Terrestrial 3D Laser Scanners of the VZ®-Line are excellently suited for topographic and industrial monitoring applications. For reliable and uninterrupted operation under highly demanding environmental conditions, the laser scanner is protected with a climate-controlled housing, e.g. VZ-400-S, VZ-1000-S.

RiMONITOR offers a sound basis for monitoring solutions to be seamlessly integrated into large scale industrial installations or as a stand-alone system connected to a control center.

RiMONITOR operates the scanner with a user-definable set of parameters, e.g. field of view, scan resolution, and time interval or sequences for logging consecutive scans. Additional data of sensors as, e.g. GNSS, Inertial Measurement Unit (IMU), temperature sensors, are acquired for assisting the precise determination of orientation and position for global referencing.

- **Monitoring of endangered areas in open pit mining**
- **Monitoring of rock falls and land slides**
- **Monitoring of snow and ice coverage on glacier and snow-fields**
- **Monitoring of avalanche endangered hillsides**



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Acquired scan data is continuously pre-processed, analyzed and may be compared to a predefined reference scan or reference model. Parameters for processing and analysis can be defined by the user, such as thresholds for firing alarms, in order to adjust RiMonitor to the application in question.

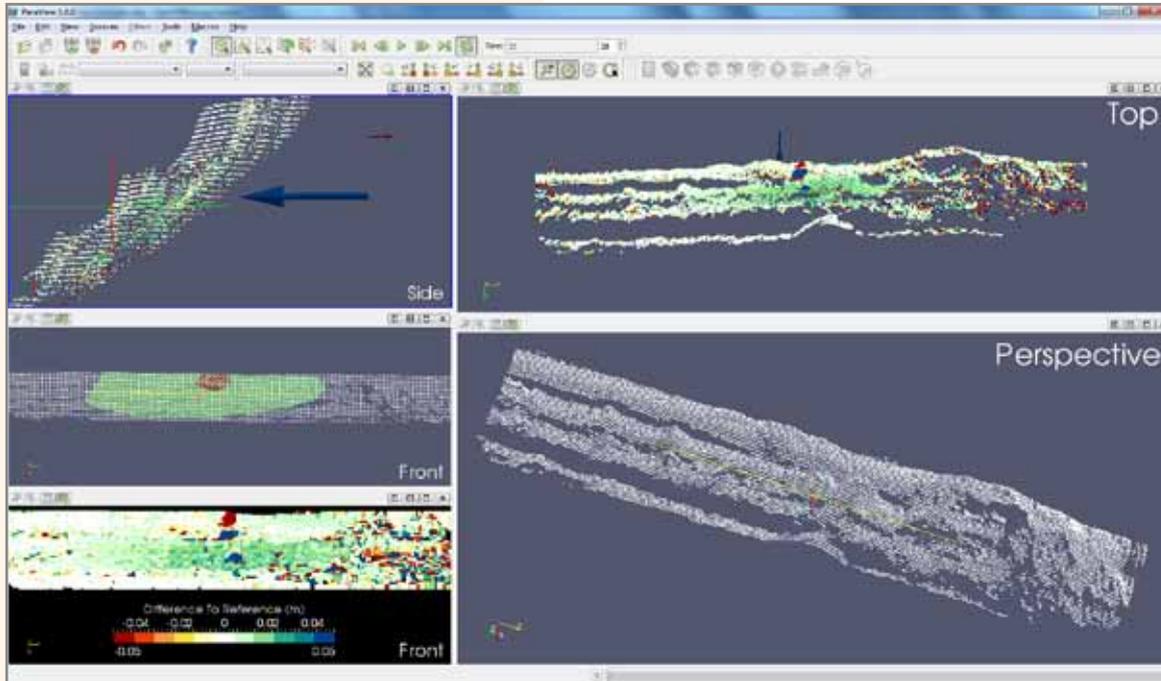
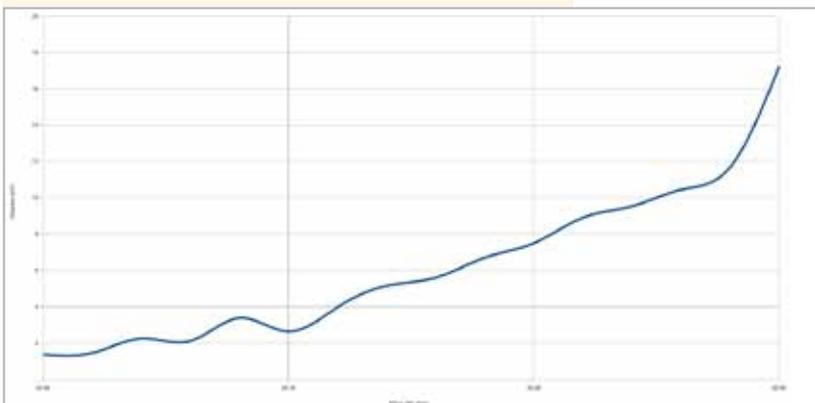


Fig. 1 Example of visualization in open-source, multi-platform data analysis and visualization application ParaView.

Fast analysis of scan data is realized by parallel computing. In order to further adjust RiMonitor to the specific needs of new applications, the software architecture is modular with well-defined and well-documented internal interfaces. Additional modules can be added on an as-needed-basis with affordable time and effort.

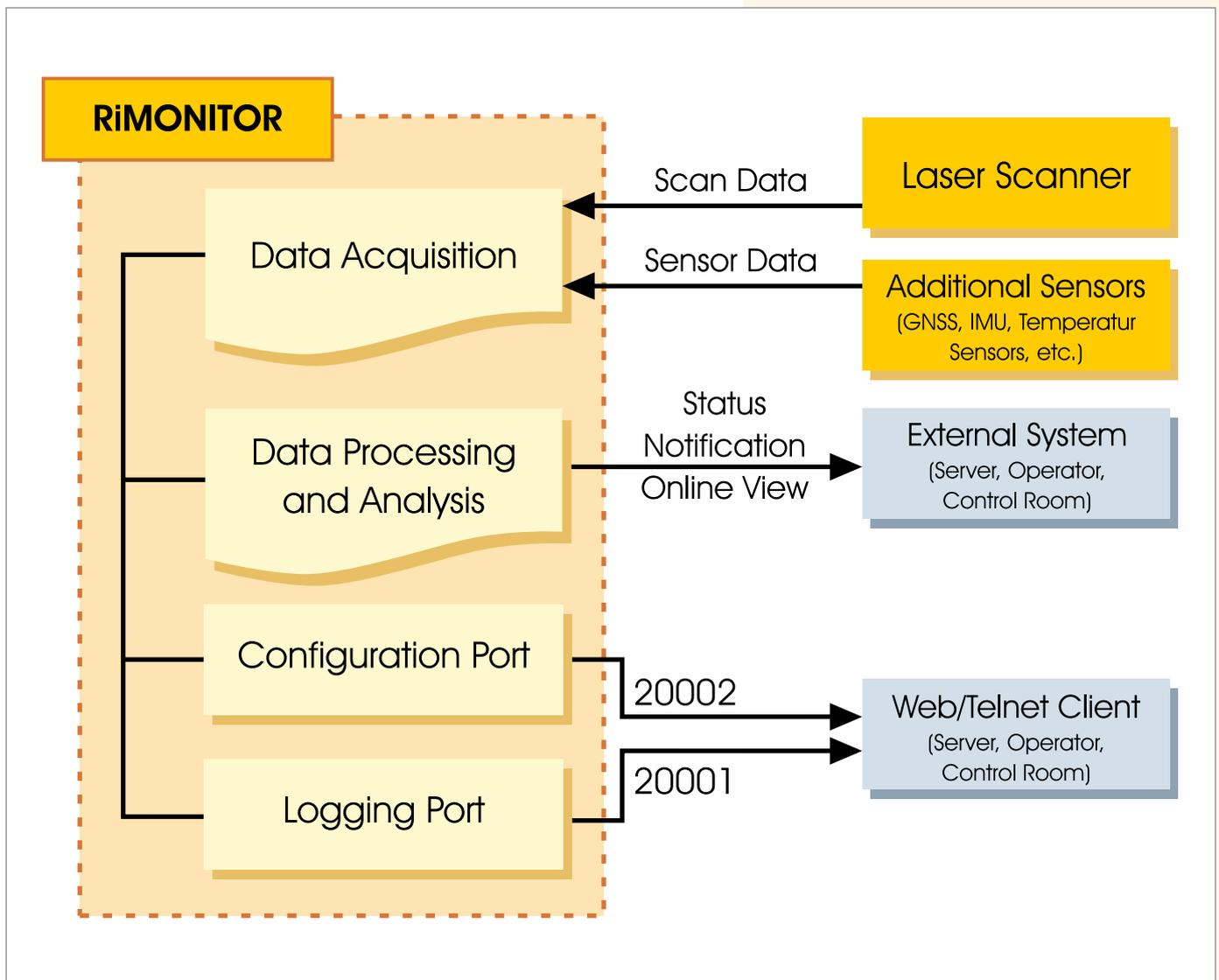
Fig. 2 Example plot of change in volume over time of surface under surveillance. Changes can be viewed in near real time over web interface.

One of the current core modules derives changes in hillsides by rasterizing the point cloud data and thus obtaining a compact surface model which is further analyzed to determine changes in volumes. Quick and easy determination of tendencies in volume is derived and is the basis for raising early alarms.



RiMONITOR can raise alarms in various forms, e.g. sending short messages or e-mails, activating electronic warning alarms, a horn, warning lights, etc.

RiMonitor requires only a moderate computer hardware configuration, thus it can be run on nearly every state-of-the-art PC or industrial embedded computer.



## RiMONITOR Key Features

- **Supported laser scanners: RIEGL VZ-400, RIEGL VZ-1000**
- **Modular software architecture**
- **Well-documented open data formats**
- **Pre-defined modules for data acquisition, data filter for outlier rejection, data modeling, robust volume estimation**
- **Configurable alert (SMTP notification, web service integration)**
- **Straight forward processing and visualization with third party software packages**
- **web and telnet interface for configuration**
- **Recommended minimum hardware configuration: single-core CPU @ 1.2 GHz, 1 GB RAM**



**RIEGL**®  
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