

Atlas Web-Based Data Management Software for Instrumentation

Rick Monroe, Durham Geo Slope Indicator

Atlas - the Project Web Site

Think of Atlas as a web site that is dedicated to a project. The pages of the web site include plan views and photographs of the project and contain links to data, graphs, and reports. Users log into Atlas with their web browsers.

Atlas provides three levels of access. "Administrators" can create new projects, authorize users, and set up sensors, graphs, plan views, alarms, and reports. "Users" can see graphs and plan views, enter manually-collected readings, and add notes and photos to the logbook. "Guests" can see only selected plan views and plots.

Data Collection

Atlas provides web forms to receive manually-collected readings, a logbook to receive notes and photos, and an input folder to receive data files forwarded from data loggers.

Atlas processes incoming data to check for alarm conditions, but it stores only the original, unprocessed readings in its database. Thus readings in the database remain directly traceable to readings collected at the site.

Data Processing

When Atlas generates a graph or serves data, it always processes the original readings on the fly. This makes calculations easy to verify, and it ensures that changes or corrections to

calculations take effect immediately, with no need to purge and rebuild the database with corrected readings.

The core of the Atlas processing engine is the sensor table. It lists every sensor along with its calibration factors, unit conversions and labels, alarm limits, and processing instructions. Processing instructions accept most math functions and can reference earlier readings and other sensors. This makes it possible to calculate changes, correct for temperature and barometric pressure, and perform cumulative calculations for in-place inclinometers and beam sensors.

Data Presentation

Plan views are site drawings or photographs that show the location, current reading, and alarm status of all the sensors at a site. Sensors are represented as icons that change color to indicate their alarm status: green for normal, yellow or red for alarms. Mousing over an icon displays the current reading, and clicking on a reading calls up a trend plot. A quick look at the trend plot can reveal whether the alarm condition is the result of a trend or a transient event.

Plots present data graphically and automatically include the most recent readings. Atlas provides trend plots, profile plots, and correlation plots. Multiple

Y scales allow different types of sensors to be shown on the same plot. Clicking the plot displays a table of the values used in the plot.

Reports present a daily, weekly, or monthly compilation of selected plots, data, log book entries, and photographs. Reports can be distributed automatically by email as PDF attachments.

Alarms and Notifications

When Atlas detects an alarm condition, it records the alarm in a logbook, displays an on-screen warning, and generates an alarm notification. An alarm notification is an email or sms message that identifies a sensor, the time and value of the reading, and the level of the alarm.

Atlas provides filters that help validate alarms, consolidate notifications, and delay or escalate notifications. This filtering improves user confidence in the alarm system and also prevents alarm notifications from flooding email boxes and cell phones.

Data Downloads and Archiving

Readings can be downloaded for analysis in other programs. After the user specifies sensors, a date range, and a data format, Atlas generates a text file that can be saved on a local PC and opened in a spreadsheet.

Data can be archived two ways. Archiving processed readings makes data available for historical investigations after completion of the project. Archiving the original readings provides a way to control the size of the database, though this function is rarely needed.

Software Response Time

The overall response time of a monitoring system is likely to be controlled by the rate of data collection rather than by the responsiveness of the software. That said, Atlas can serve graphs within one or two seconds, refresh plan views every few seconds, and send out alarm notifications seconds after the arrival of new readings.

*Rick Monroe, DGSI,
12123 Harbour Reach Drive,
Mukilteo, WA 98275 USA,
Tel: 425-493-6200,
email:Rmonroe@slope.com*

