AUTOMATIC AND MANUAL DATA MANAGEMENT - WMS

DATA COLLECTION, PROCESSING AND REPRESENTATION

MAIN FEATURES OF DATA MANAGMENT SOFTWARE WMS (WebMonitoringSystem)

✓ Visualization and automatic conversion of data;

✓ Automatic, semi-automatic or manual validation of data;

✓ Analysis and visualization of raw data, elaborated and converted in chart in real time h24/365;

✓ Complete integration with dynamics, hydrometeorological and topographic systems;

✓ Charts generator called "Chart Manager" for the comparison of measures from instruments of different typologies;

✓ Advanced configuration of alarms through SMS/e-mail dispatch or siren in case of alarm thresholds overcoming and all-clears;

✓ Real time monitoring: dashboard to visualize the alarm state of each instrument;

✓ Personalization of the principal parameters of each chart (ranges, colors, thicknesses etc.) with the possibility to save permanently the changes that have been done;

✓ Dynamic zoom;

✓ Configuration and dispatch of automatic and periodic reports;

✓ Georeferencing and "On Demand" function;

✓ Visualization of synoptic interactive tables in CAD, Jpeg or directly in Google Maps and Google Earth;

✓ Configuration of different levels and access privileges through Login (user and password);

✓ Algorithmic-statistic data processing according to the covariant effects as the thermic compensation using SW "FIeldstat2", based on ordinary least squares method;

✓ Integration with EDF algorithm for the predictive statistic of expected data;

✓ Visualization of images and video from CCTV;

✓ Possibility to filter and save printouts in .xlsx format and charts in .jpeg format;

✓ Implementation of manual data directly from .xlsx files, independently from the readout unit in use;

✓ Multilanguage SW (English, French, Spanish, Arabic and Slovak);

- ✓ "Light" functionality with visualization of charts directly from the browser;
- ✓ DB function: in documents section it is possible to upload pictures, relations, schemas, projects etc. concerning the working site. Therefore, they could be shared from different people;
- ✓ In case of projects with TBM (tunnel, underground etc.) it is possible to set up a dedicated synoptic table with the visualization of TBM parameters and of the relative rings;
- ✓ Linear Trend Lines and logarithmic functionalities both in free series graphics (values/distance) and in the standard ones (values/time);
- ✓ Configuration of a personalized home-page at the portal opening, with the possibility to insert pictures and logos according to Client exigencies;
- ✓ Integration with CNR algorithm the calculation cumulative/period in the pluviometric data analysis.

WHAT IS THE WMS?

WMS is a Software Platform for validation, processing, conversion, management and automatic visualization of data from geotechnical-structural, dynamic and hydraulic monitoring system (automatic, semi-automatic and manual).

WMS adapts to the specific necessities of every Client, in order to satisfy the requests and peculiarities of every project.

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HOW DOES THE WMS WORK?

This system is able to acquire, memorize and store automatically the electrical data of instruments. Instruments signals are acquired from Data Acquisition Units that send data to a central server through F/O – LAN – GPRS/3G – Radio – Satellite connections. The central server validates and processes data, that could be integrated in its database as SQL.

Data are subjected to a first automatic validation to delete readings peaks and/or abnormal readings. Later, data are automatically converted in engineering units.

WHAT DO WE OFFER?

Through an application and a web connection, data are made available for Clients, both in graphic and in table format (.xlsx).

In this way, the system is completely automatic and allows to obtain data updated in real time 24h/365d per year.

Charts are completely dynamic and configurable by the user (color, thickness and graphic characteristics of curves), it is possible to download xlsx files and to visualize the instruments state through synoptic and interactive tables (or maps).
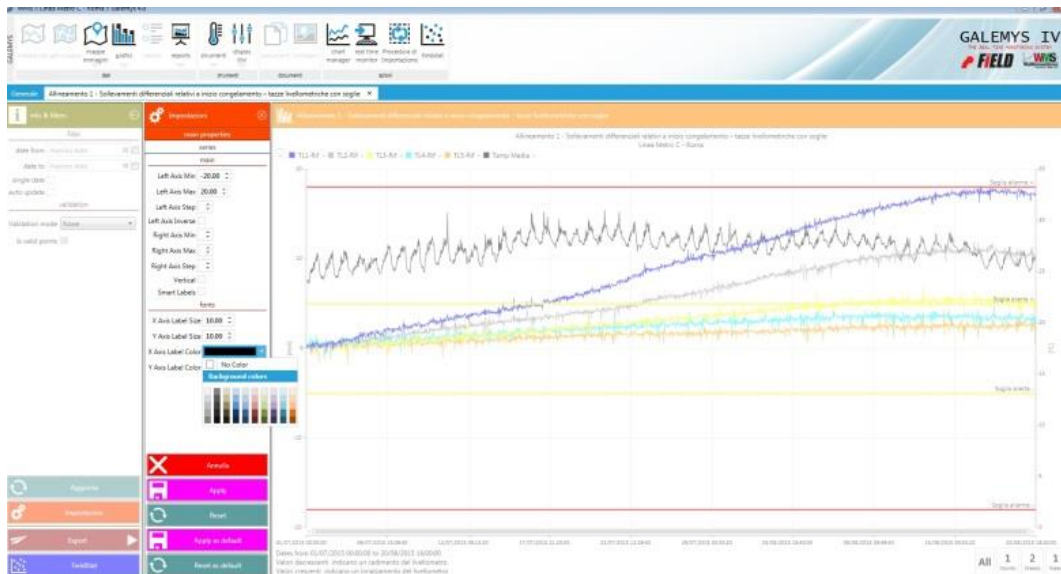

If instruments values exceed the configured alarm thresholds (green, yellow or red), WMS could be set up so that the server sends alarms through SMS and e-mail to the mobile phones of the people whose credentials are registered in the system.
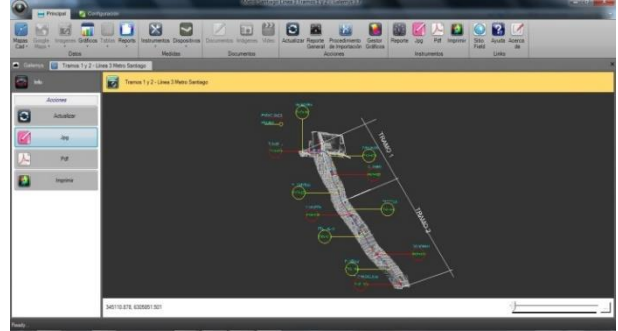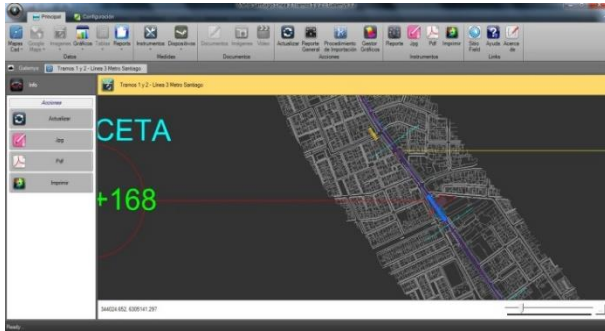
PLATFORM STRUCTURE

The application structure is divided into various sections:

- ✓ Section with project documents (pictures gallery, architecture of the monitoring system, maps with the instruments position, technical reports etc.)
- ✓ Dynamic section, with "flush charts" graphics;
- ✓ Section with "Synoptic tables", where it is possible to see a plan or an interactive section, that includes all the instruments with the dedicated symbols that change color when the alarm state changes.
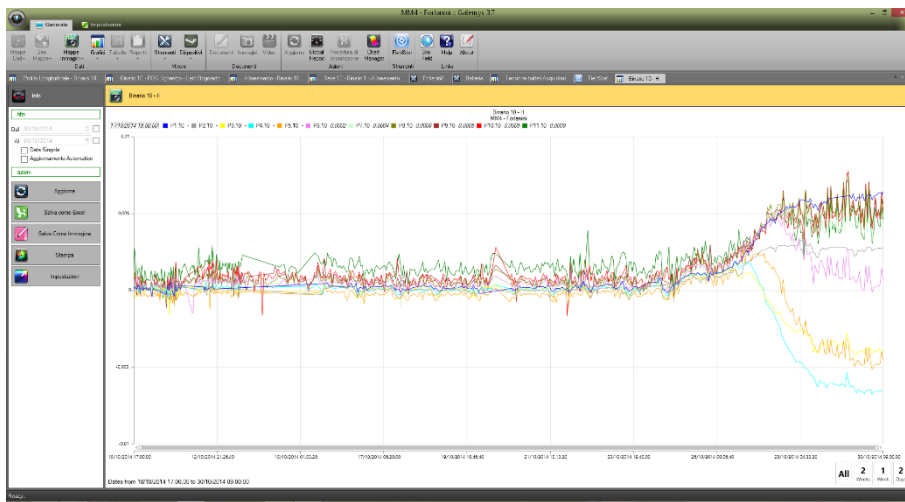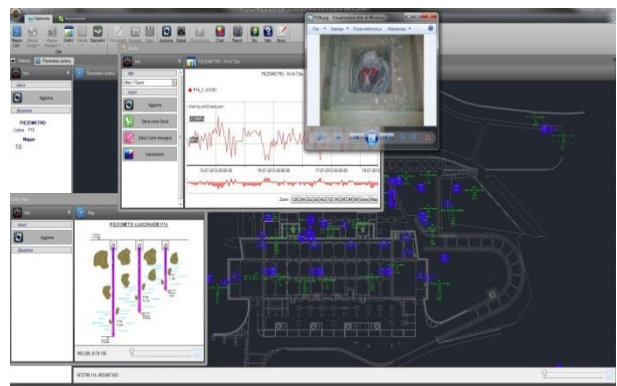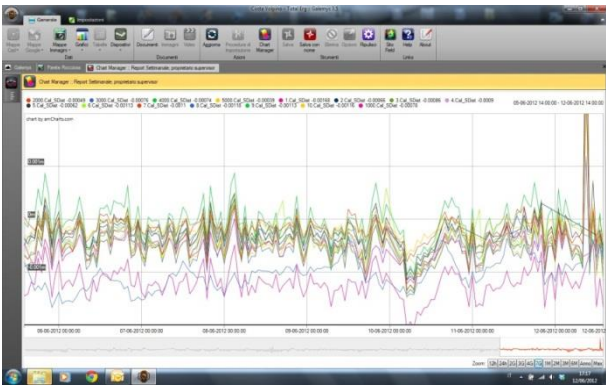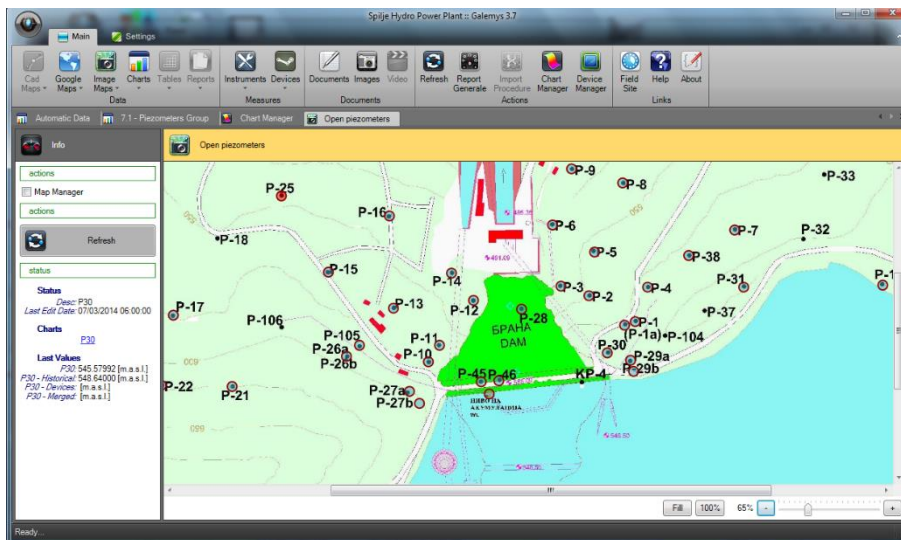

The synoptic table allows the control of all the monitoring system, indicating the sensor state and the last registered value. In addition, clicking on the instrument icon the corresponding display with graphics, documents, pictures and subsections opens.
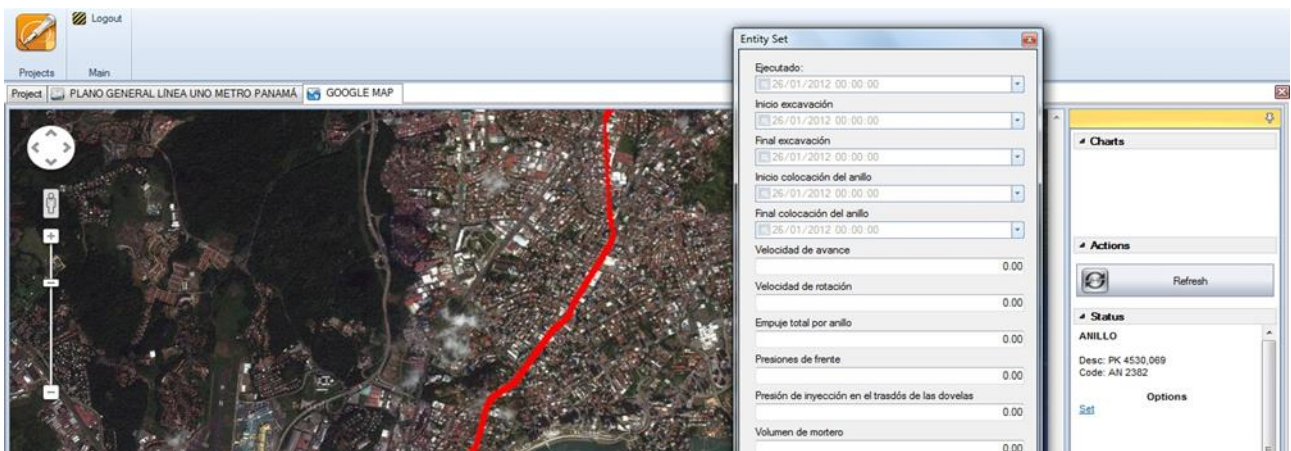
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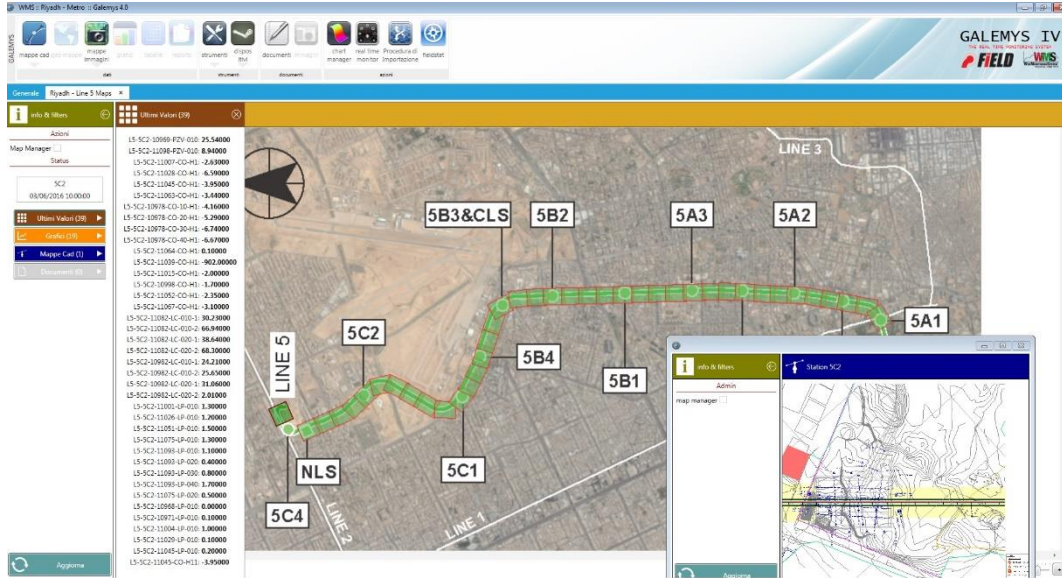
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INTERACTIVE SYNOPTIC MAPS

Underground route and zoom

Instrument position in dam area

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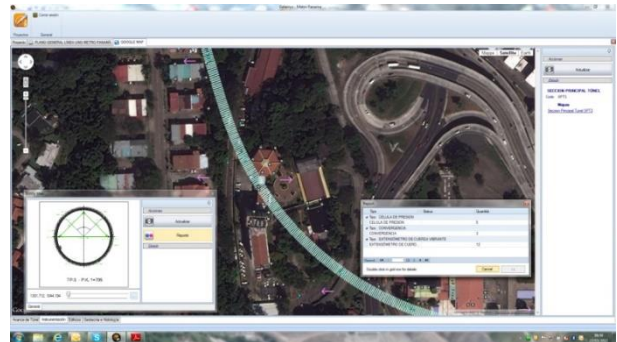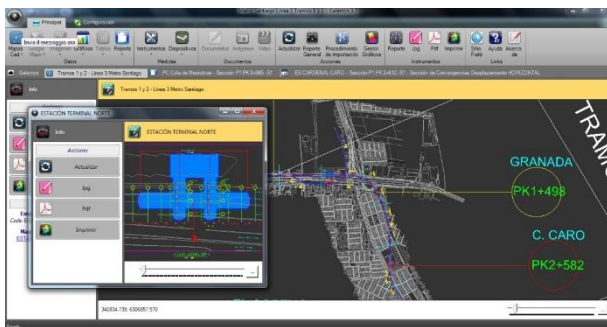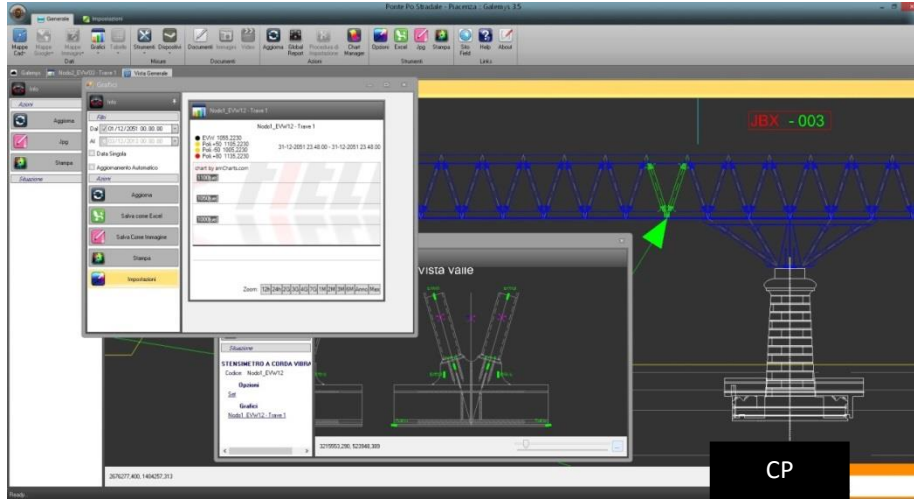e-mail: info@fieldsrl.it - www.fieldsrl.it

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Route visualization in Google Earth and TBM parameters
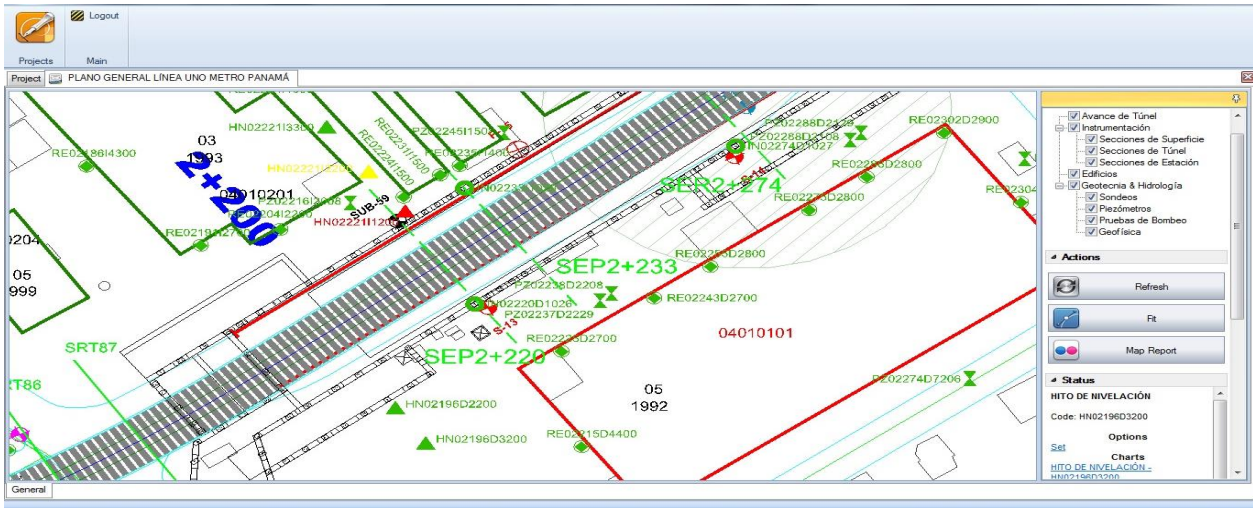
Interactive table with instruments for buildings monitoring and underground route

Map showing section details (Metro)

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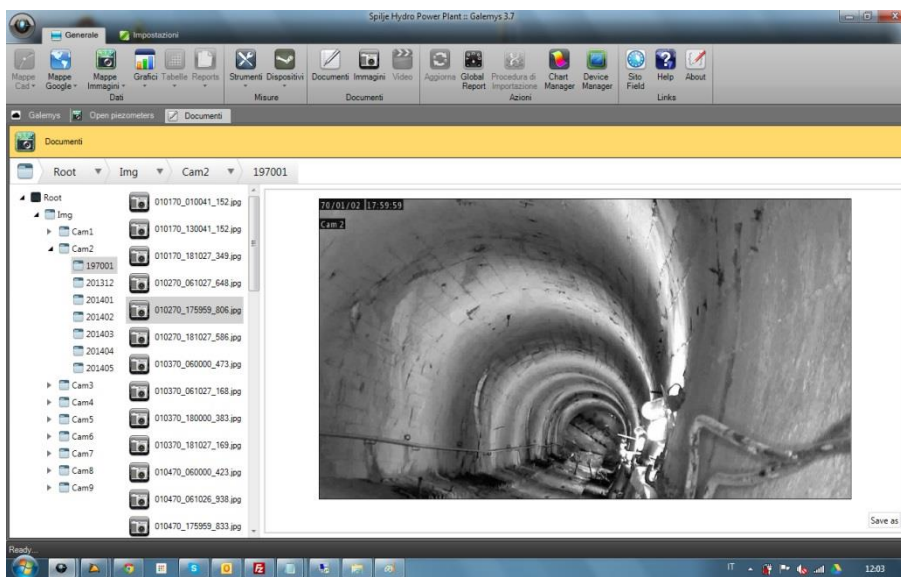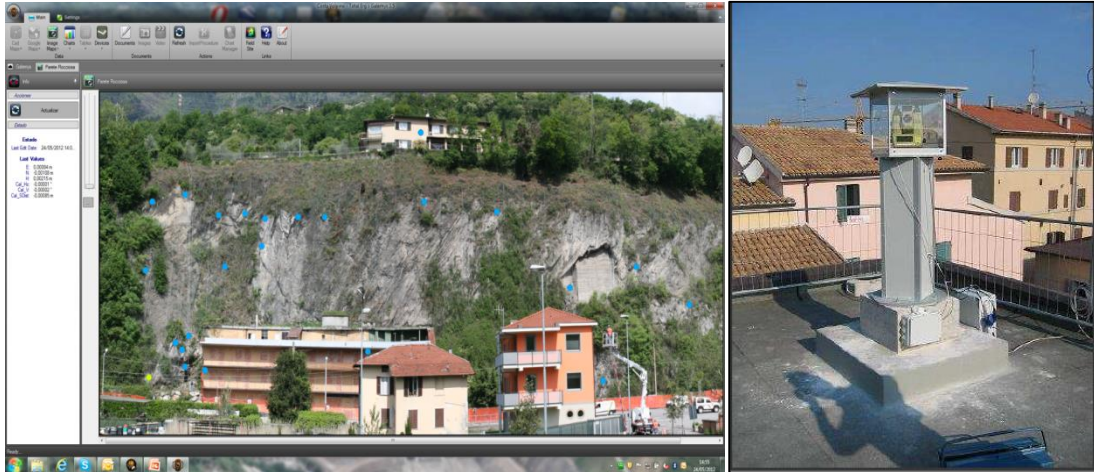
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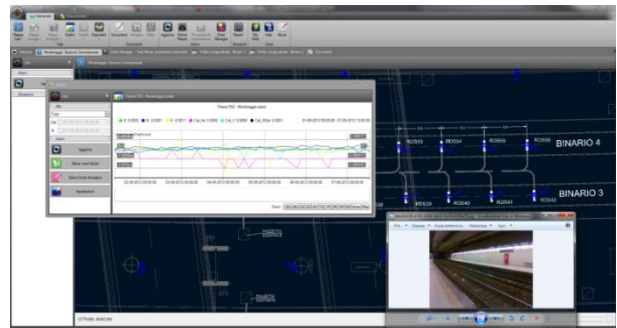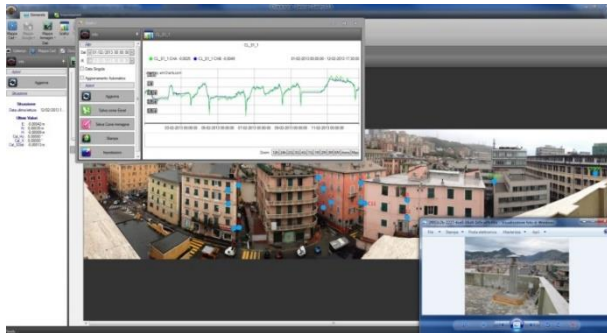**Map showing details of an instrumented bridge section**
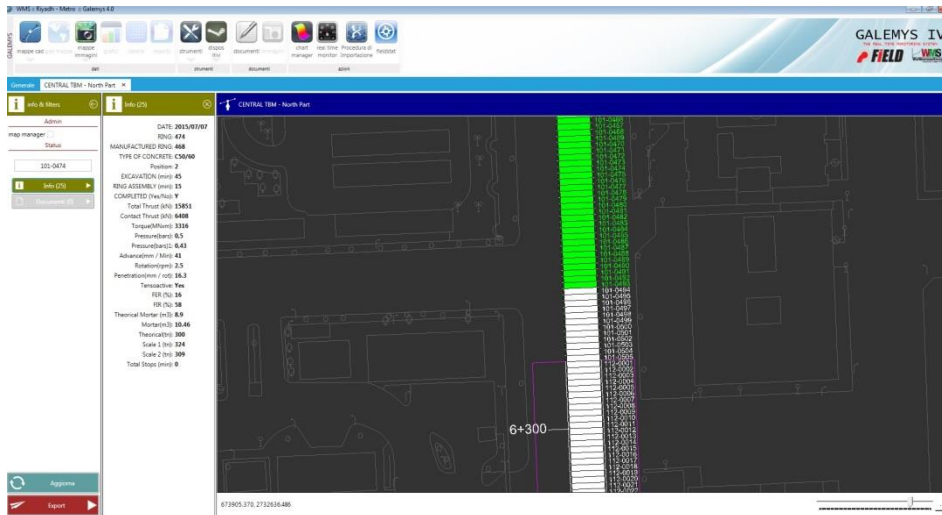
Chart showing TBM progression

Visualization of security picuters of a dam tunnel

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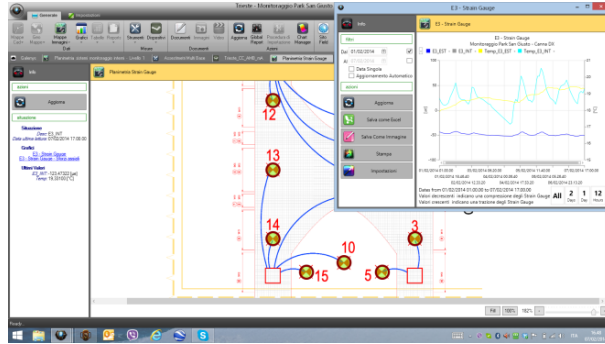e-mail: info@fieldsrl.it - www.fieldsrl.it

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Topographic monitoring with high precision robot-supported station

Real Time visualization of measures done with automatic theodolite in urban and rail environment
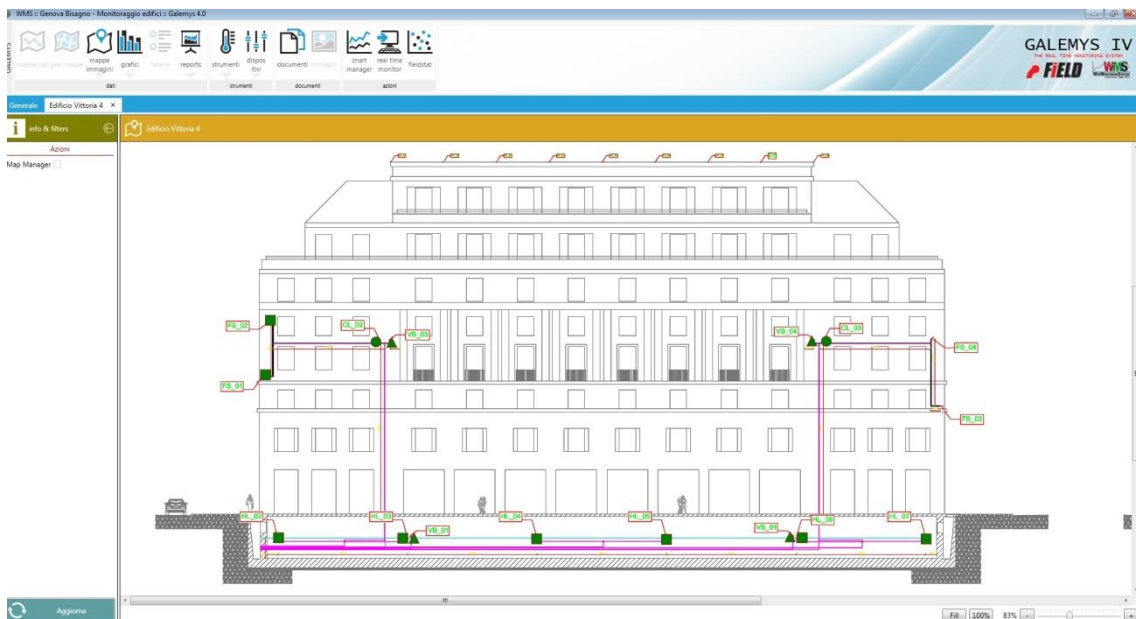
FIELD S.r.l. **Società a Socio Unico soggetta a direzione e coordinamento Sisgeo S**.r.l.
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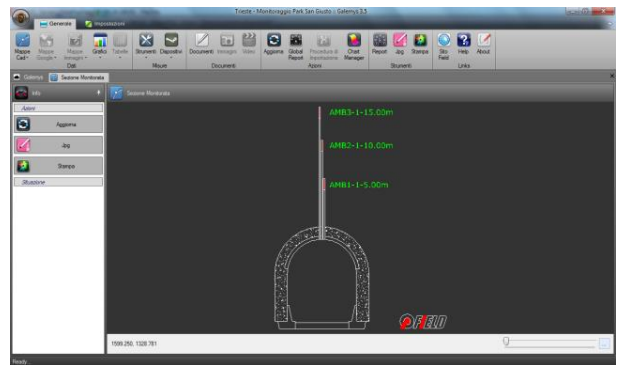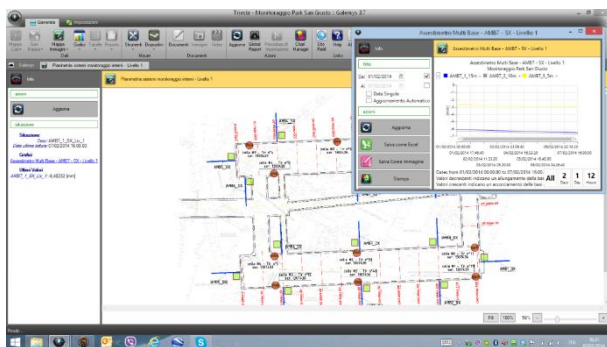
Real Time visualization of measures of a subterranean parking
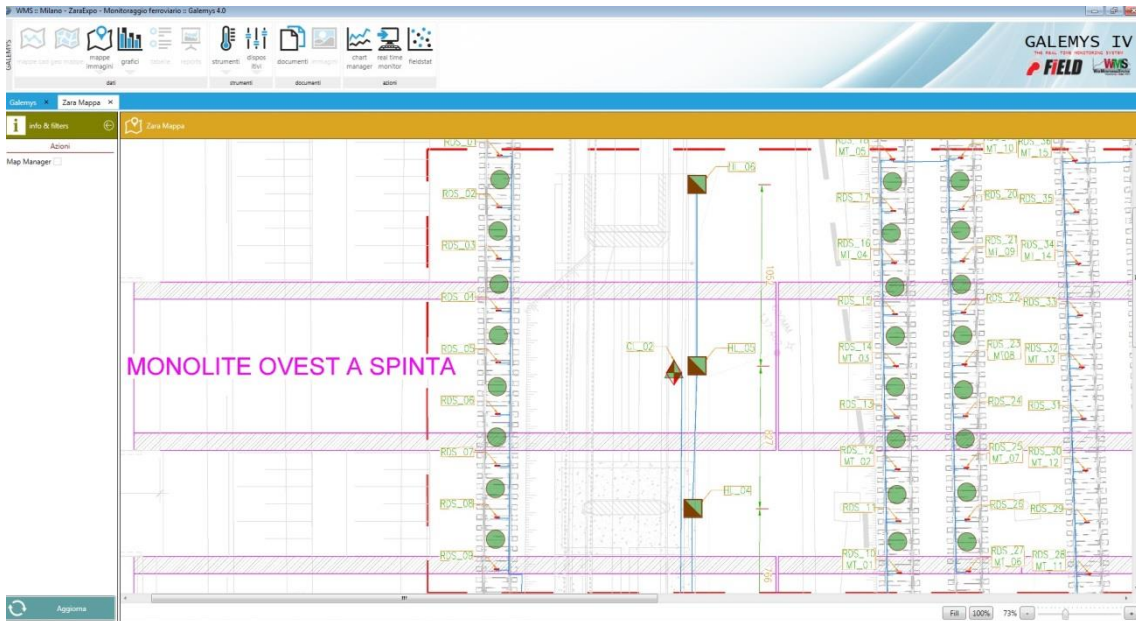
Synoptic table for the monitoring on railway platform with RDS sensors

Synoptic table for the real-time monitoring of a building

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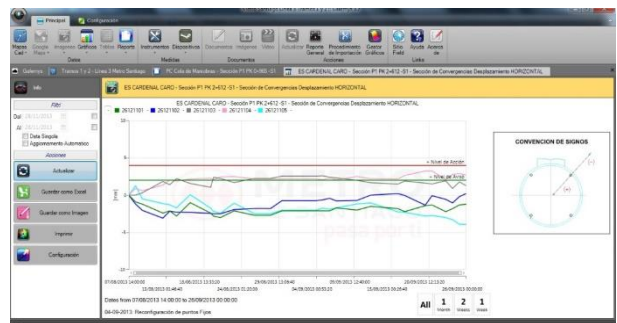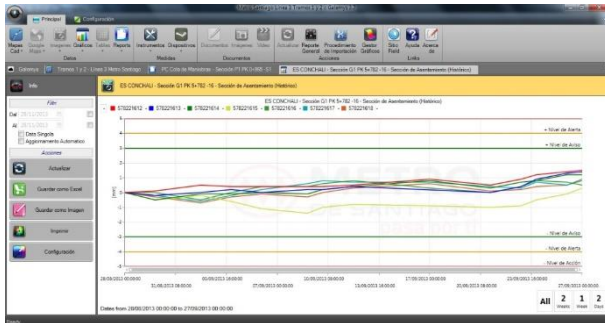e-mail: info@fieldsrl.it - www.fieldsrl.it

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CHARTS

Charts are dynamic with the possibility of visualize the alarm levels, wallpapers with logos and reference pictures. They could be used for any type of instrument:
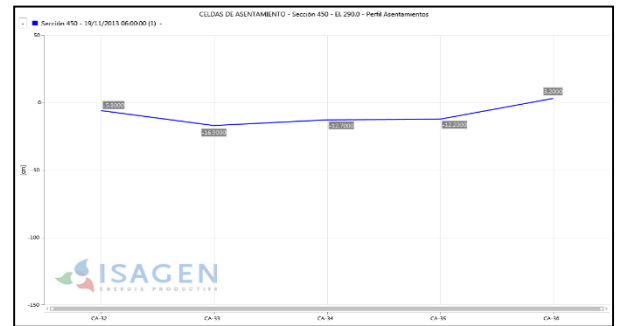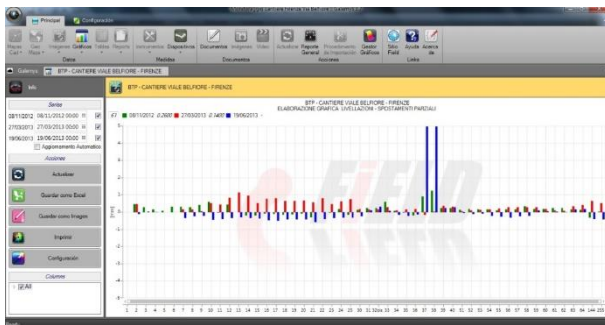
- ✓ Geotechnical;
- ✓ Dynamic;
- ✓ Topographic;
- ✓ Environmental;
- ✓ Other

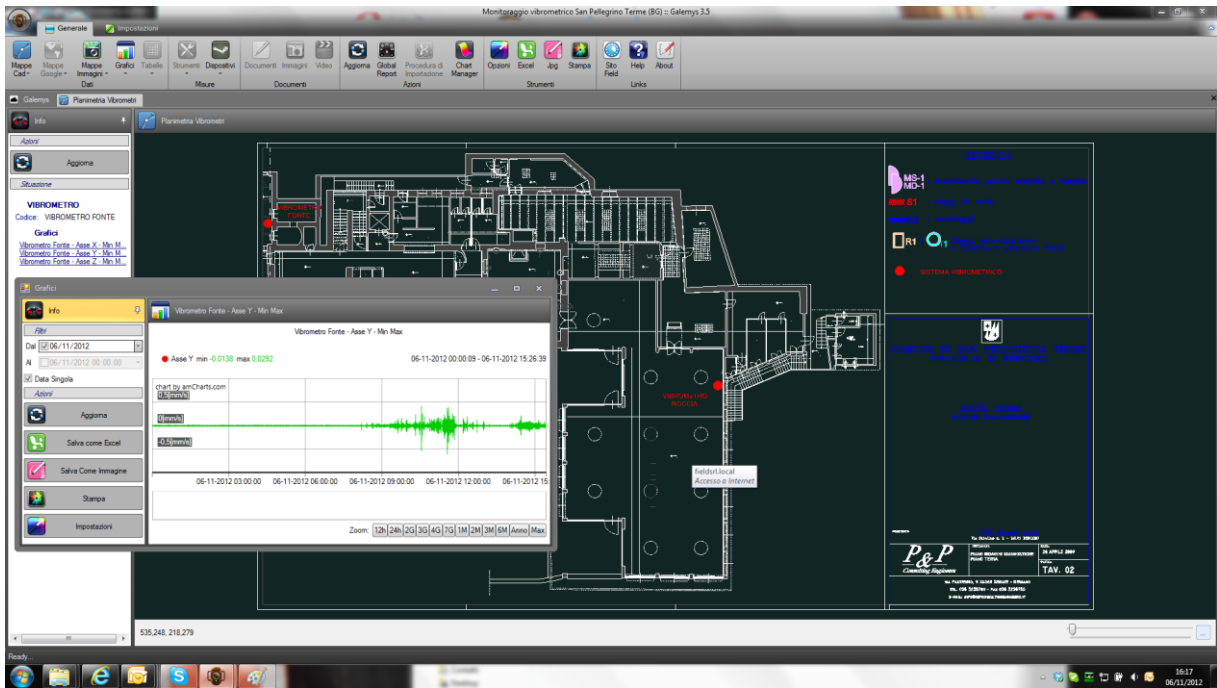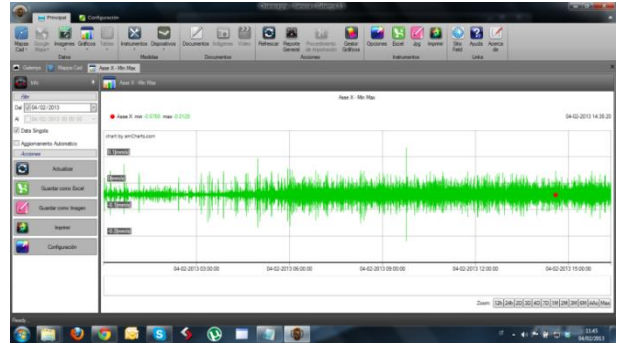Type of charts:

- ✓ Values Vs. Time
- ✓ Values Vs. Instrument

Measures Vs. Time with reference picture

Values vs instrument and corresponding histogram

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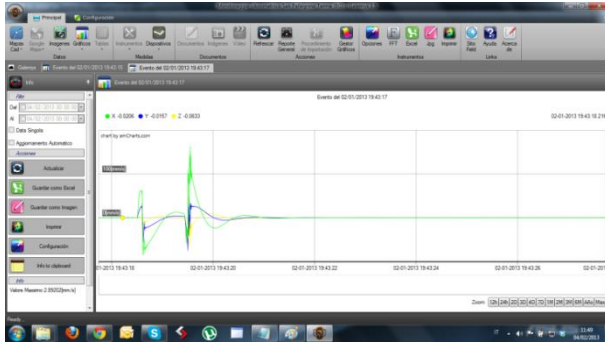
Charts regarding dynamic instrumentation
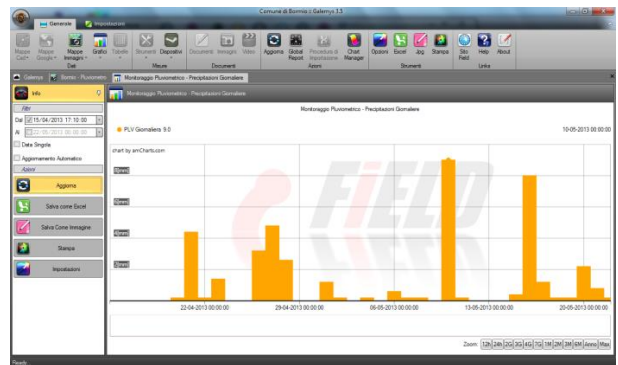
Charts regarding hydro- meteorological instrumentation

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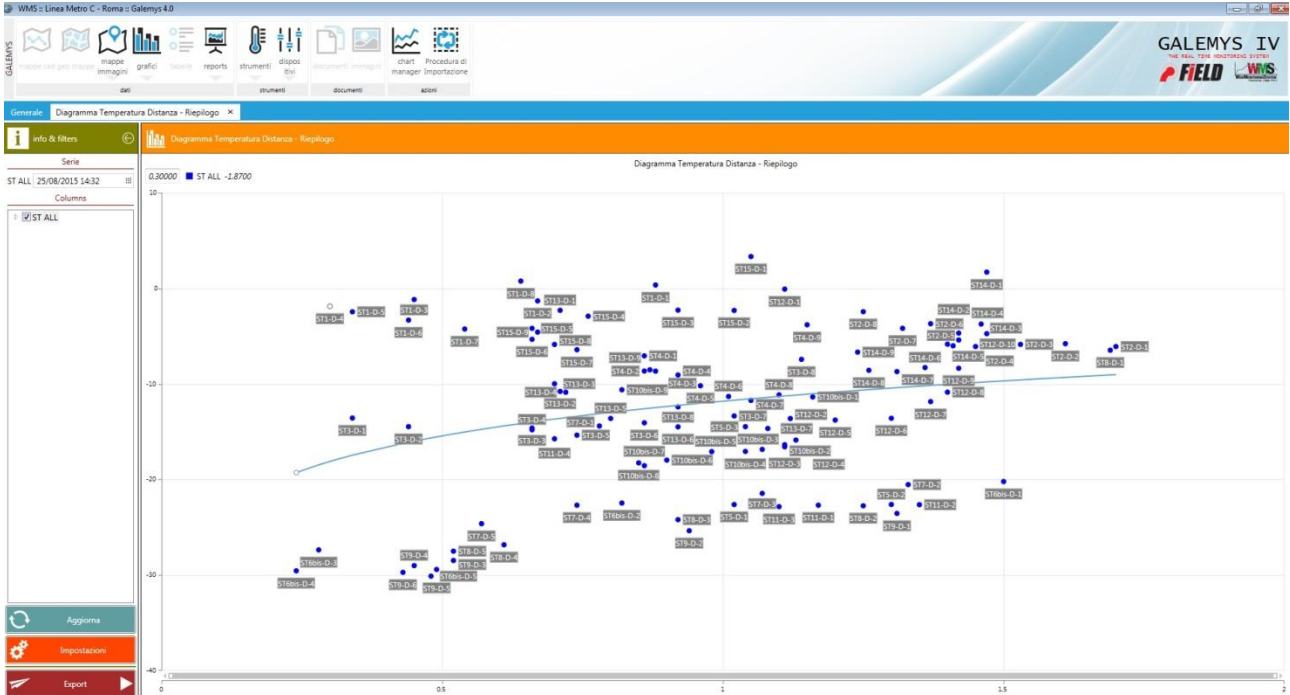
Charts for points with logarithmic interpolation
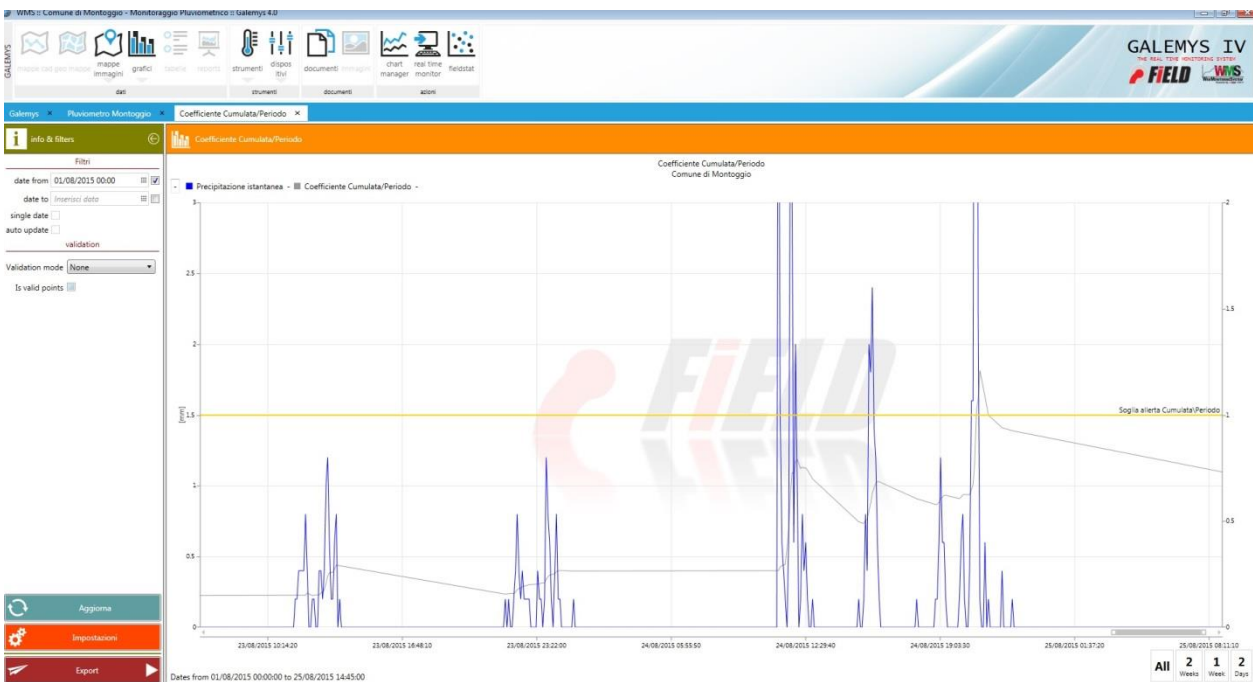
Pluviometric chart accumulated/period

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CURVES IN MAPS

It is possible to visualize the curves inside maps. With this application it is possible to visualize:

✓ phreatrimetric levels directly in project plans, with the possibility to visualized maximum and minimum values from a whatever temporal window;

✓ settlements;

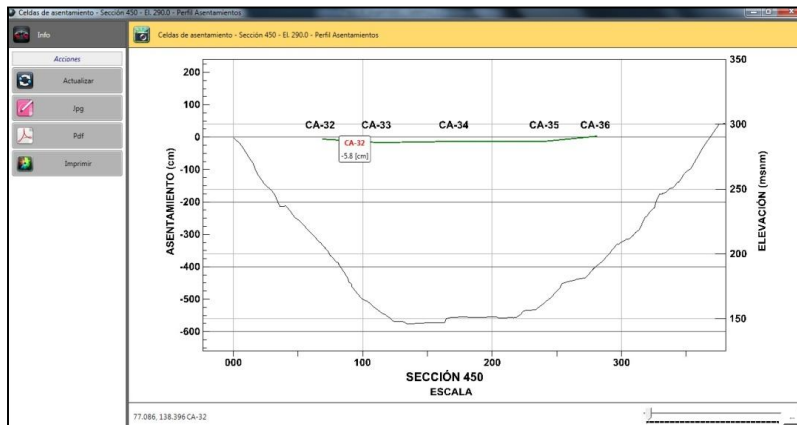✓ declivities;

Curves and map values visualization
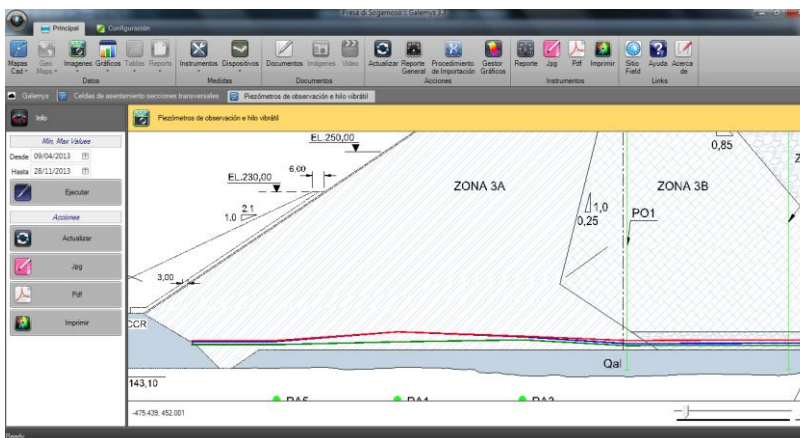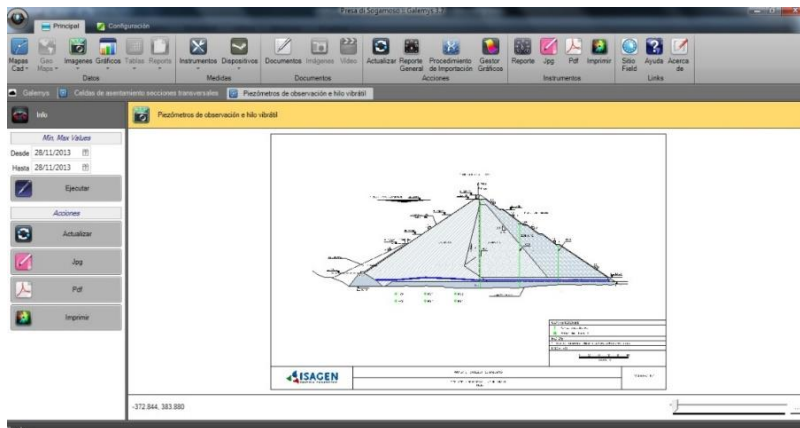
Phreatrimetric level on plan visualization (current, maximum and minimum)

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CHART MANAGER

Chart Manager allows the visualization of various instruments in one single chart. The user could decide which instrument to visualize, selecting them in the list of all the installed instrumentation. It is also possible to compare different instruments with different measures units, using the 2 available axes.
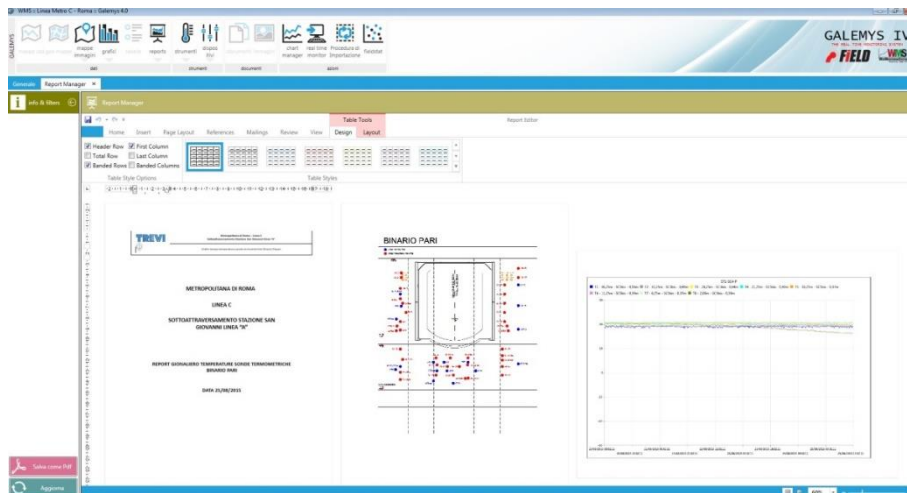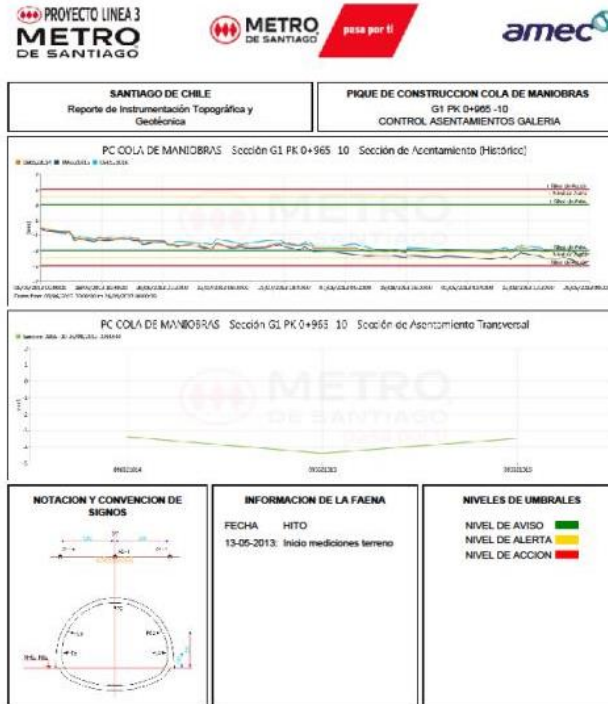

Example of plot in Chart Manager

AUTOMATIC REPORT

It is possible to configure automatic reports in PDF which contain charts of a monitoring site, sections or synoptic tables, pictures etc. with the possibility to choose a temporal window from 1 day to various years. These reports are typically used in undergrounds and dams projects for daily, weekly or monthly reports sent automatically to the distribution lists.

In addition, it is possible to add in complete autonomy a section of the report completely editable and customizable, according to the "word" standards, where to add comments or notes to the charts.

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Example of an automatic report automatically generated and sent to the distribution list
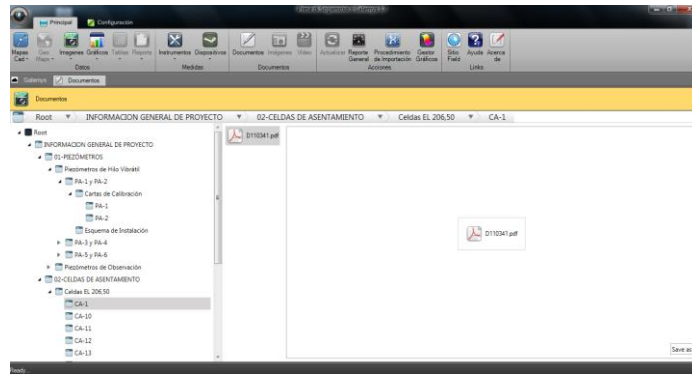
DATA DOWNLOAD

In any moment, it is possible to download raw and processed data in .xlsx format through applications such as "Devices" and "Instruments".
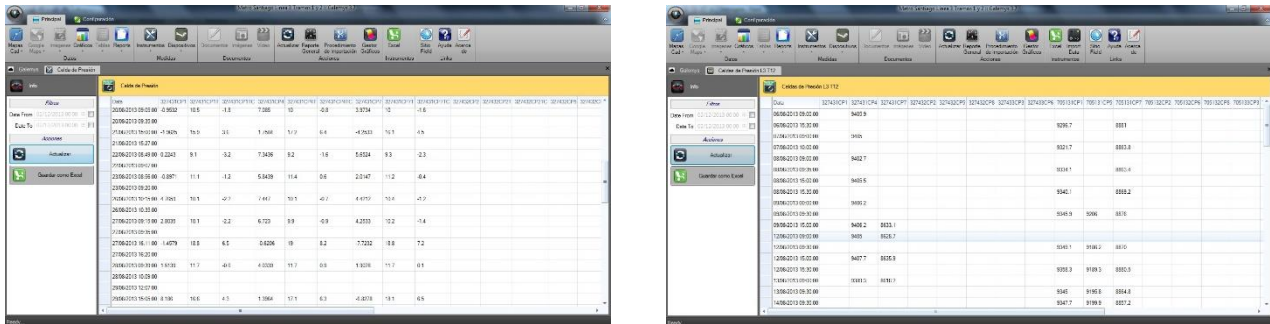
Example of "Devices" and "Instruments"

DATA BASE DOCUMENTS, PICTURES, REPORTS, VIDEOS…etc.

All project documents as: calibration certificates, datasheets, plans, pictures, schemas, geological reports, stratigraphy etc. could be inserted in section "Documents" so that the users with the necessary permissions could download the requested information.

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Example of tree visualization of documents downloadable from the portal

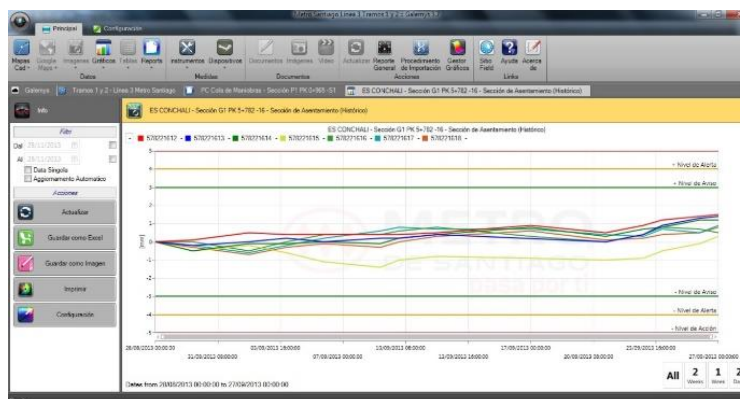## ALLARMS AND REPORTS ON INSTRUMENTATION STATE

The alarms management includes:

✓ Change of instrument state in plan (colour change etc.);

✓ Visualization of alarm levels in charts;

✓ Report showing the instrumentation in alarm;

✓ E-mail and/or SMS dispatch.
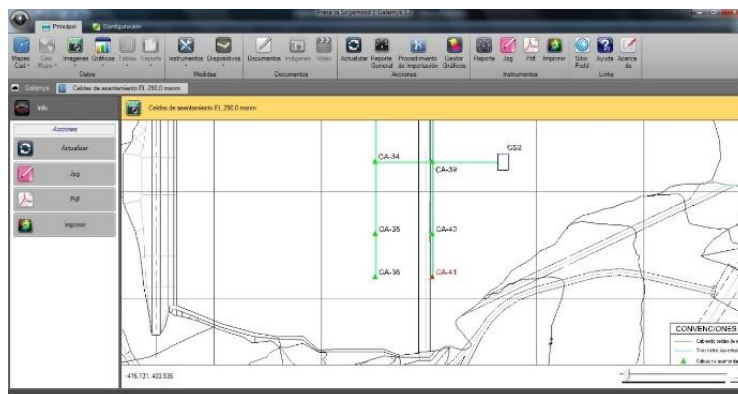
AUTOMATIC instruments state change

Different alarm levels in charts

Examples of projects managed using WMS
(both in local and cloud version)

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RIYADH METRO - PACKAGE 3 (LINES 4, 5 & 6)

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ROMA - METRO C