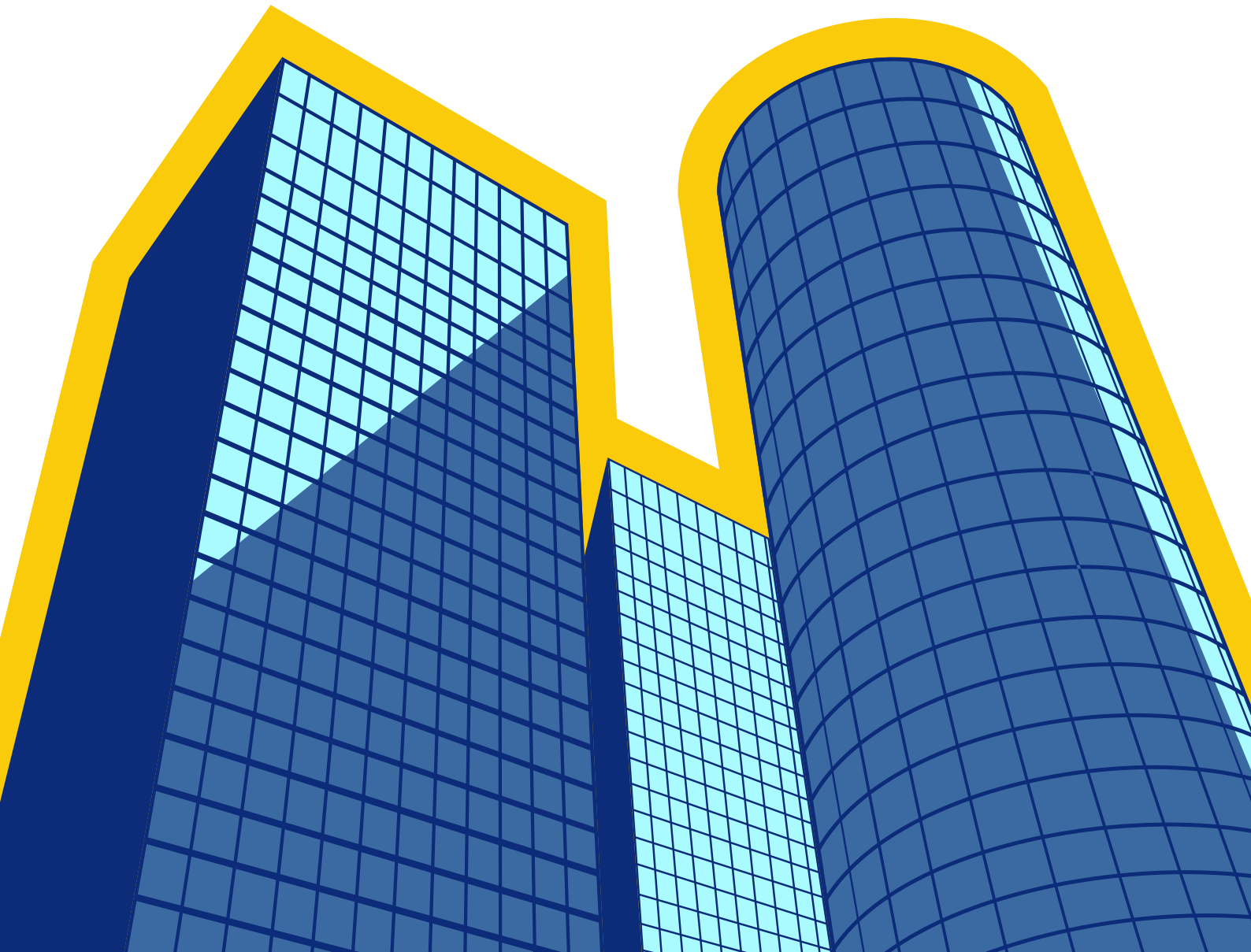
APPLICATION NOTE

Buildings Monitoring

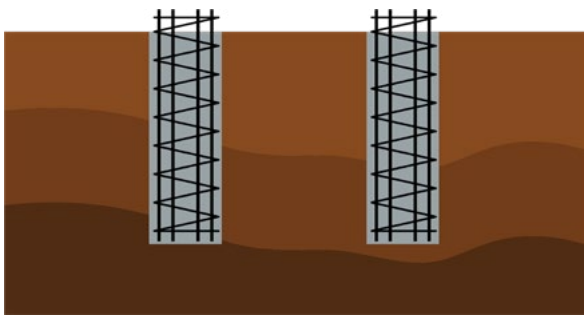


Introduction

A building monitoring is necessary to define its **conditions** and to check its possible **movements overtime**. A monitoring system, which comprehends data acquisition unit and different kinds of sensors, allows to verify, in real time, possible evolutions of the building's structure over time.

To adequately analyze the building's instability, it is necessary to have regular and constant measures over time. Moreover, sometimes, it is not sufficient the structural control but it is also necessary to monitor the **environmental conditions** and the **surrounding land**.

Regarding buildings under construction, it is also important to monitor **foundation piles** and **bulkheads** to check the building's structure both during and after the construction: for example the distribution of the weight over all the piles, during and after the completion of the works.

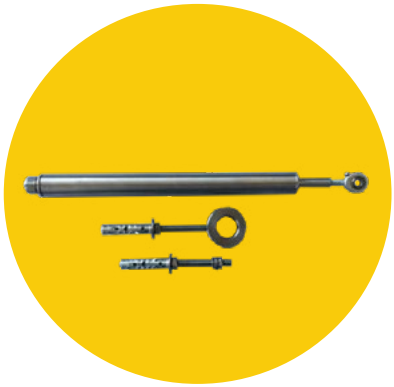


Our solutions

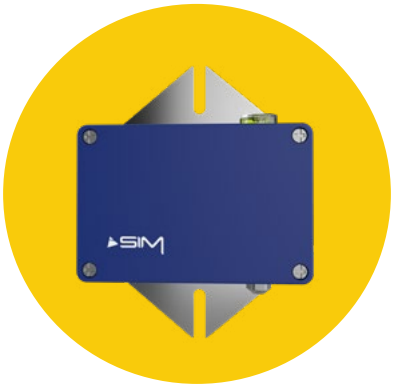
SIM STRUMENTI provides all the necessary facilities for the monitoring (**sensors**, **data acquisition units**, **modem**, **cables**, etc...) as well as **personal assistance on-site or by phone** if needed, during the entire project and monitoring process. In this way, the professional will be able to evaluate the available instrumentation and the data over time.

Monitoring systems can be **manual** or **automatic** and **centralized** or **decentralized**. They can be equipped with **alarm systems** both local and distant. Moreover the acquired data can be sent via **FTP** to a server.

Topic	Instrumentation
Crack	Joint meter **DS810** / **DS811**
Very damaged wall	Wire joint meter **DS820**
Movements control between two horizontal / vertical walls	Wire joint meter **DS820**
Rotation control	Fixed wall inclinometer **IN920**
Settlement control	Settlement multipoint system **ST140**
Settlement control	Beam tilt meter **IN923**
Micro-cracks in reinforced concrete	Embedment strain gauge **LC225**
Temperature/ humidity of the masonry and of the environment	Temperature sensor **WE710** e humidity sensor **WE720**
Settlement control at various depths in the ground	Multipoint borehole extensometer **DS830**
Control of piles and chains	Embedment strain gauge **LC220**
Load in various points of the structure	Pressure cell **PR310**



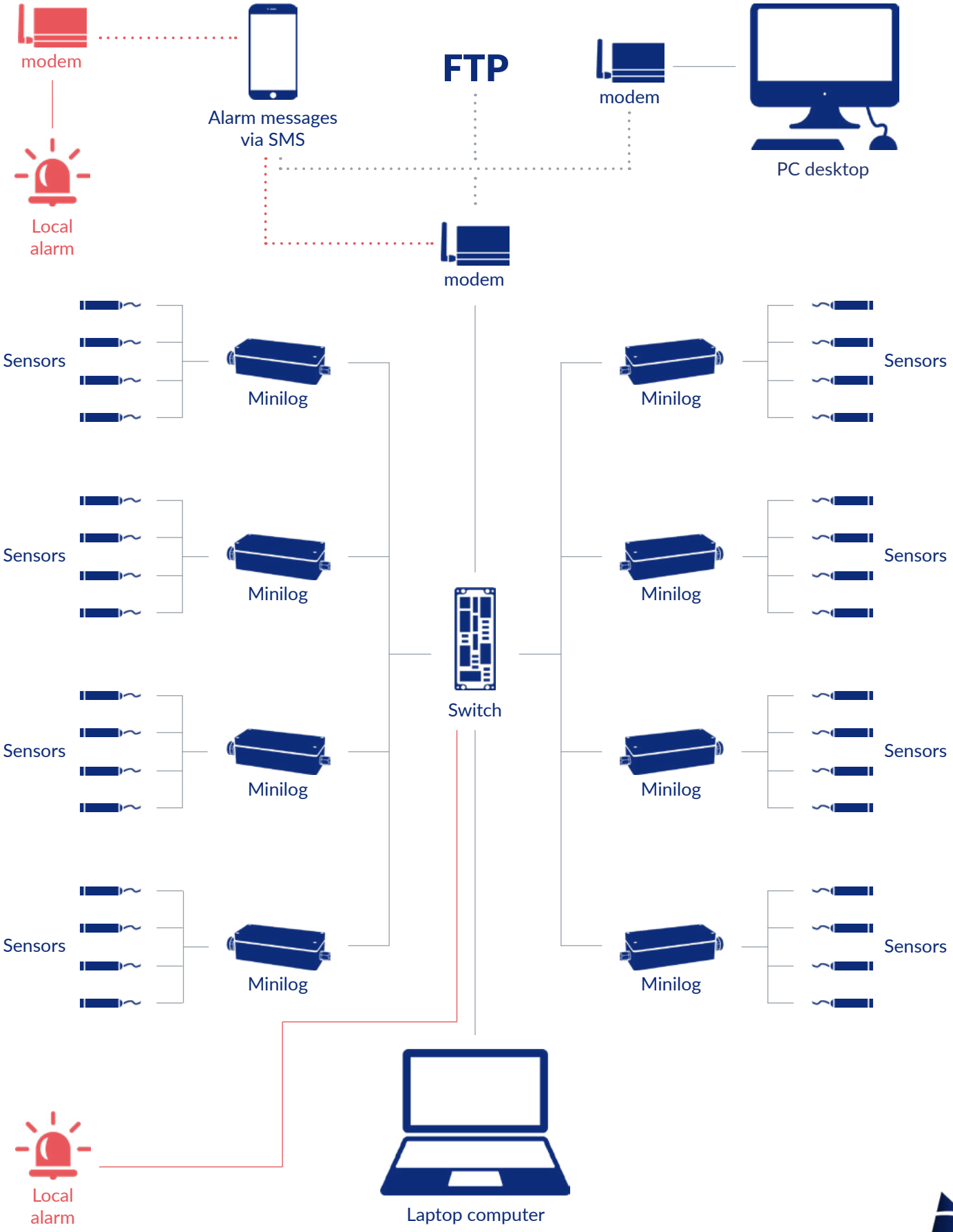
Joint meter
DS811



Fixed wall inclinometer
IN920

Embedment strain gauge
LC220

Monitoring system



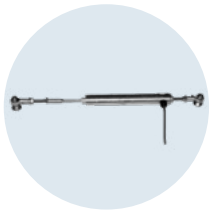
Case study: Palazzo della Minerva

Description

For the Palazzo della Minerva, in Rome, a **complete and continuous monitoring** was chosen in order to control the building in all its components.

The system consists of a **single data acquisition unit**. **Local A/D boards** (to which all the instruments are linked) converge to it through serial cables.

Installed instrumentation



Joint meters - DS810

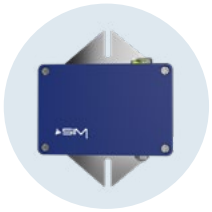
For the control the **cracks** in the old masonry.

Wire joint meters - DS820

For the measure between the two **parallel walls**.

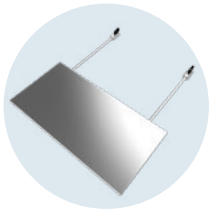
Settlement multipoint system - ST140

For the control of **vertical settlement** (4-unit settlement multipoint system).



Fixed wall inclinometers - IN920

For the control of the possible **rotations** in **external masonry**.

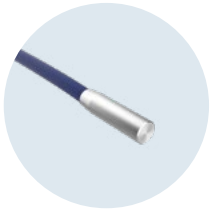


Flat jacks - PR330

For the control of the **tensional state** of the old masonry before and during the works.

Pressure cells - PR310

For the control of the effective **load** of the new masonry.

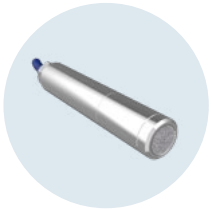


Temperature sensors - WE710

For the **movements** control based on the temperature.

Humidity sensors - WE720

For the **movements** control based on the humidity.

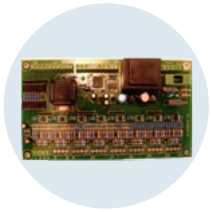


Electric piezometers - LV610

For the control of the level of the **stratum** and of the **interstitial pressure**.

Multipoint borehole extensometers - DS830

For the **settlement** control of the land when the structure is loaded.



Data acquisition system - NATUN

For the **Data** control.
Equipped with **alarm system** (via SMS).
Links:
- via USB cable
- via modem GSM / GPRS

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