Loccioni at a glance

400 direct employees

45% with University degree

34 years average age

70 Millions Euro (FY 2014)

Installations in more than **40** countries in the world

7% of the personnel cost invested in education

5% of the sales turnover invested in research

Research@Loccioni

Loccioni Research tells a story about passion and future, about the commitment to **improve the quality of our lives and of the world we're living in.** Loccioni Research is an open laboratory for students and young researchers, for costomers and suppliers, for those who want to be on the frontieres of innovation, to gain competitiveness, to collect challenges, to **transform data into value. Science, technology, imagination, courage are the tools to design a possible, human based, sustainable future.**

W²SN

wireless wired sensor network

STRUCTURAL HEALTH MONITORING

One of the new goals of Loccioni Group is to propose a combined experimental and numerical methodology to perform SHM of civil engineering structures lying in seismic hazard zones. A relatively low cost SHM prototype system based on these possible approaches is developed. The system has been tested and calibrated on a three-story prototype model and on several buildings: industrial, residential and public/historical.

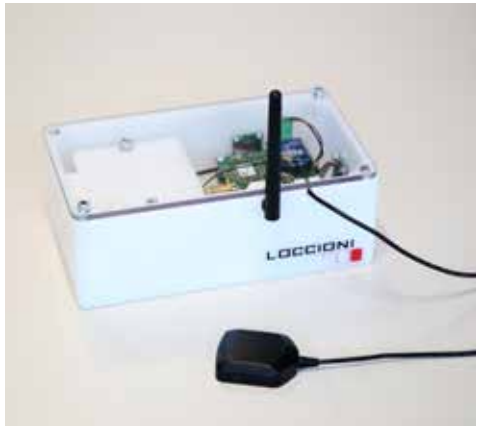
Structural Monitoring

During its life cycle, a structure can be exposed to operational and environmental forces or subjected to earthquakes or to other non ordinary loads.
These events may have a deep impact on the building safety, and thus a periodic or continuous monitoring of the structure health conditions becomes desirable or even necessary to validate or update analytical models of new or existing buildings and to be able to produce post-event scenarios. The system can be wired or wireless or used in a hybrid solution. The flexibility of the monitoring system is fundamental, especially in case of existing buildings, where the use of a considerable quantity of cable could compromise the normal exercise, affect the quality of acquired signal and finally be too expensive.

W²SNBless+ è stato sviluppato in collaborazione con il dipartimento di Ingegneria Civile Edile e Architettura

	PERIODIC MONITORING	ALERT MONITORING
Methodology	> Portable system for periodic survey services	> Permanent system installed in the structure
Technology	> Wireless sensor network	> Wireless or wired sensor network
Power supply Sensors	> Rechargeable Batteries > High-performance sensors	> Primary Batteries or AC Mains >Low-cost sensors

Loccioni Solution

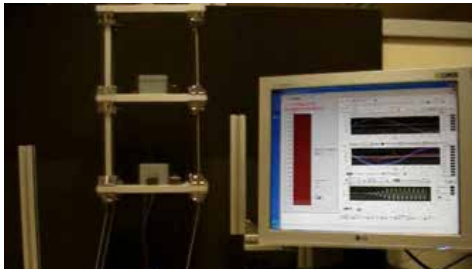


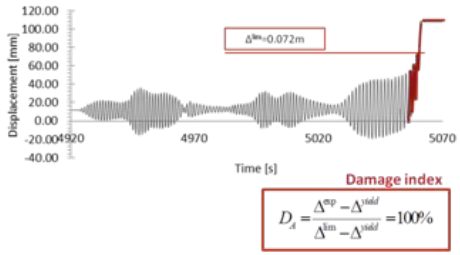
Wireless accelerometer node

The structural health monitoring system has been conceived as a network of “nodes”, each one equipped with 2 accelerometers mounted along orthogonal directions, communicating via wireless or wired. For wireless sensor network synchronization is obtained with a GPS module. Sensors can be chosen according to each application: low-cost MEMS sensors or High-Performance piezoelectric or servo-accelerometers (IEPE standard supported).
Data collected are sent to a database that allows historization, visualization and processing, and if it is necessary, to elaborate them with numerical model in order to obtain damage evaluation.

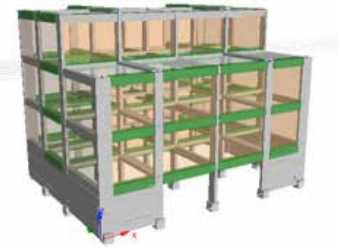
Cases study

Experimental tests on a scale model

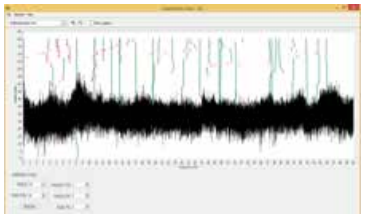




Numerical analysis of residential building



Experimental and numerical analysis of industrial building



Experimental and numerical analysis of Public/Historical building