

Galleries structural monitoring with optical fiber sensors

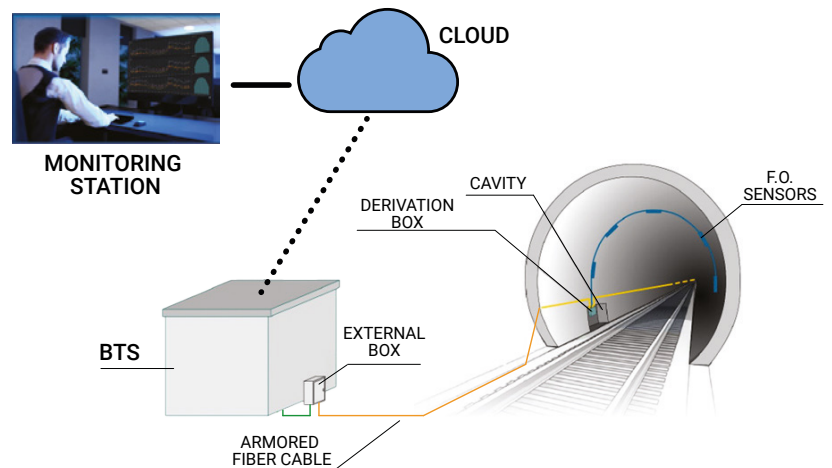
Structural monitoring is vital to ensure safety, reliability and durability of infrastructures as structural monitoring systems allow the collection, transmission and analysis of data, related to a specific structure.

In particular, the following parameters are taken into consideration:

- Convergence of the galleries vault section in specific points;
- Longitudinal deformations of the tunnel between the measuring sections;
- Size of cracks on the inner lining.

All sensors are made of optical fiber and through a single multifiber cable they're linked to an optical interrogator which is installed in an external box and put near the entrance of the gallery. It's also possible to link the external box to a centralized station through an existing optical fiber data network or through an LTE Router.

The centralized station for data visualization and management has an interactive web Dashboard which allows to represent all the parameters and the collected data in real time, but also to set thresholds and to display the history of the detected information.



Advantages of optical fiber sensors system:



Predictive detection of deterioration signs, which lead to a faster and objective evaluation of natural events consequences, in order to speed up the decisional process;



High precision deformation measurement;



High immunity to electromagnetic interferences;



Possibility to allocate the sensors on a single optical fiber, even at a long distance;



High reliability of sensors which have a very long useful life;



Web dashboard to monitor remotely and in real time all the measured parameters.

Marini Impianti Industriali can also support customers through the different steps of the manufacturing process of a monitoring system:

- **Design and engineering** of the system;
- **Planning and installation** on site;
- **Commissioning and validation** of the detected structural parameters and data.