BARTEC SYSCOM

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Case study - Three typical projects with the ROCK

Three typical vibration monitoring projects with the ROCK in Germany

Abstract

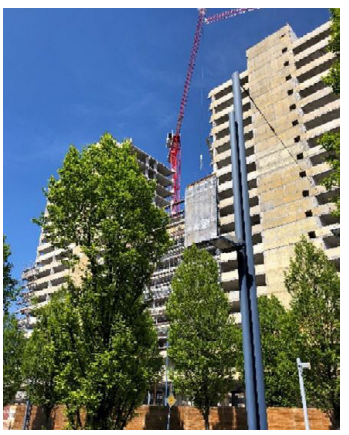
This case study shows three different vibration monitoring projects in Germany, where vibrations are produced respectively by demolition, piling and construction works. In all these applications the ROCK device is selected because of:

- its long autonomy without external power supply
- the ease and speed of the installation, without any cable
- the fully automated solution for data processing and reporting together with the SCS Cloud Software (http://scs.bartec-syscom.com).

In all projects the SCS automatically evaluates the data based on the German norm DIN 4150-3 and sends alarms in case of exceedance.

Project 1: Demolition monitoring

City:	Offenbach am Main (Germany)
Objective:	Determine the effect of vibrations on a vacant building in the direct vicinity of the demolition
Duration:	1 day
Devices:	2 ROCK
Location:	At the 2nd and 5th floor of the vacant building
Output:	Comparison with the DIN 4150-3 norm, with PDF reports made by the SCS cloud software on events and background monitoring.



Project 2: Piling monitoring

City:	Bad Neuenahr-Ahrweiler (Germany)
Objective:	Monitor the vibrations produced by sheet piles inserted into the ground by means of vibration pile drivers, at a distance of about 15 m from two single-family houses
Duration:	1 week
Devices:	2 ROCK
Location:	On the top floor of the surrounding houses
Output:	Document the vibration effects and alert the construction site when the reference values of the DIN 4150-3 are exceeded

Project 3: Construction site monitoring

City:	Mainz (Germany)
Objective:	Monitor the vibrations produced by the construction of a railway overpass on an adjacent underground high-voltage cable and a nearby sleep clinic
Duration:	1 month
Devices:	2 ROCK
Location:	One inside the cable pit and one in the sleep clinic
Output:	Comparison with the German DIN 4150-3 norm

The monitoring

In Figure 1 the map of the Central-Western part of Germany is shown, with the locations of the monitoring sites.

In Figure 2 the ROCK devices installed in the different applications are shown. For the demolition and construction sites (projects 1 and 3) the main power supply was not available, and for the piling monitoring project the power supply cables cannot been installed in the house. The cable-free solution of the ROCK is highly suitable for these kinds of applications.

In Table 1 the main parameters of the ROCK devices are listed. The synchronization ROCK-SCS is fixed to 60 minutes by default, but it was decreased to 5 minutes for two monitoring projects to have a more frequent update of the background data in the SCS. The choice of the synchronization period should be project-based, in order to find a suitable compromise between autonomy and rapidity in having background data. This setting does not affect triggered events recording, pushed to the SCS as fast as possible.

Figure 1. Locations of the different monitoring sites on the German map.

Figure 2. Real installations of the ROCK: a) in the vacant building close to the demolition monitoring; b) at the top of a house close to piling works; c) in the sleep clinic and inside the cable pit, for the monitoring of the construction site.

Table 1. Table of the ROCK parameters used in the different projects.

Features	Project 1 - Demolition	Project 2 - Piling	Project 3 - Construction
Sampling rate	1000 Hz	1000 Hz	1000 Hz
Background mode	Peak + Dominant frequency	Peak + Dominant frequency	Peak + Dominant frequency
Background period	10 s	10 s	10 s
Automatic notifications	E-mail	E-mail, SMS	E-mail
Synchronization ROCK-SCS	Every 60 minutes	Every 5 minutes	Every 5 minutes

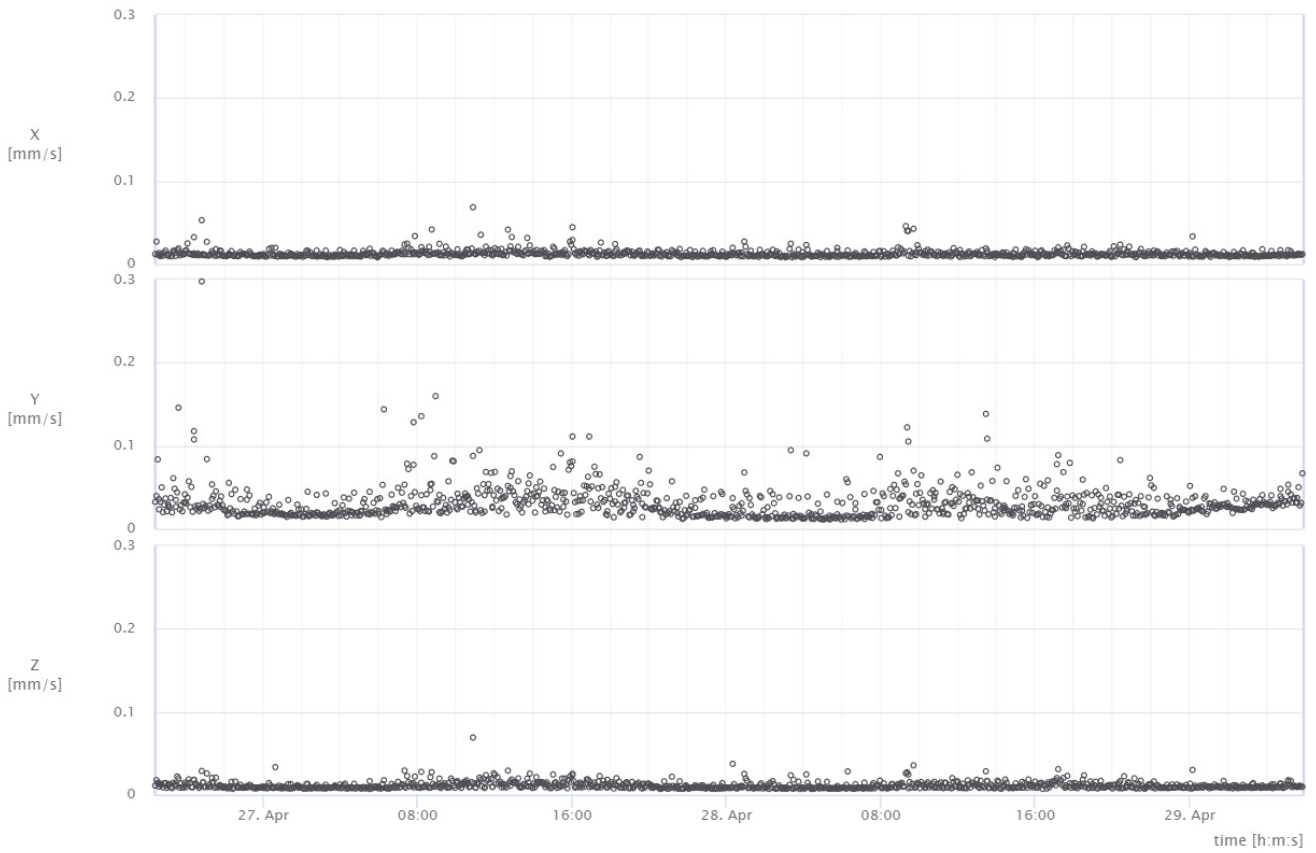


Figure 3. Background recording of 3 consecutive days for the ROCK installed in the sleep clinic close to the construction site in Mainz.

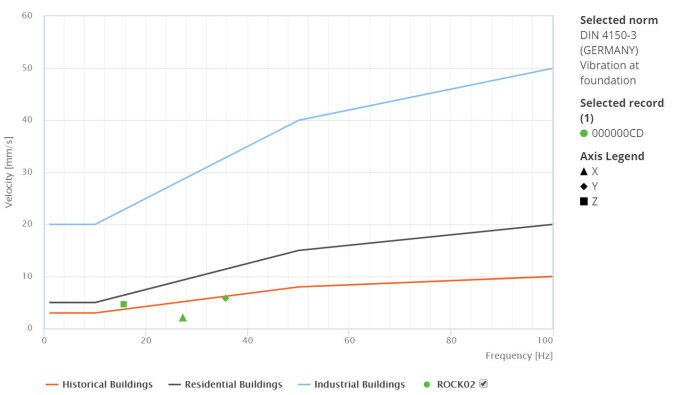


Figure 4. Comparison of an event with the German norm DIN 4150-3.

Results

Figure 3 and Figure 4 refer to the monitoring of the construction site in Mainz, in particular to the ROCK device installed in the sleep clinic.

The background recording shows low values, with a different amplitude between the day and the night periods.

An event recorded during a period of intense works is compared with the DIN 4150-3 norm in Figure 4. The curve relative to residential buildings (black curve) is not exceeded, therefore the ongoing works shall be considered compliant to the norm.

Conclusion

The use of the ROCK and SCS cloud software offers various advantages in many different monitoring projects.

The ROCK is not only easy to install, cable-free and with a very long autonomy, but it is also a complete automated vibration monitoring solution together with the SCS cloud software. The SCS is able to automatically send PDF reports and notifications via SMS/E-mail to the desired contacts for event and background monitoring.

This solution allows people to be informed in near real-time about the vibration levels generated on site with best reliability and efficiency.

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About BARTEC SYSCOM

SYSCOM Instruments SA is a subsidiary of BARTEC GROUP, a multinational manufacturer of industrial safety equipment. SYSCOM Instruments SA is a leading provider of vibration and seismic monitoring equipment for civil engineering and safety related markets, especially for NPP and LNG plants. SYSCOM Instruments SA reputation rests on the reliability of its products, coming from a meticulous control of every design and production aspects.

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