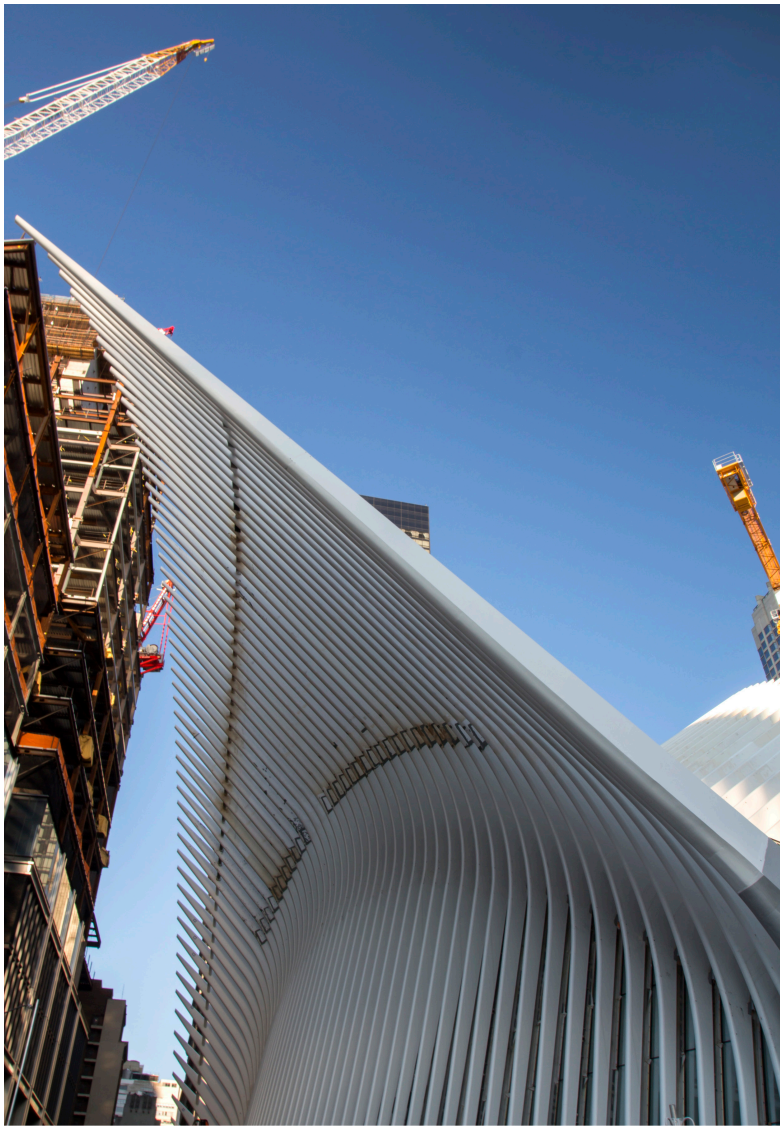




MR3000 motion recorders
Genuine vibration monitoring solutions

Product Line Brochure



VIBRATION MONITORING – SOLUTION PROVIDER



Staying closely connected to the markets and bringing the best products fulfilling our customer needs are key challenges and motivation for BARTEC SYSCOM. From early design stage to product finalization, from data acquisition to information processing and evaluation by the SYSCOM Cloud Software, the highly relevant and easy to use vibration monitoring solutions offered by BARTEC SYSCOM have been designed to bring the most efficient service to our customers.

Market adequacy with specific offerings, latest technologies integration, premium product manufacturing, high-end versatile recorders and state of the art cloud software are the results of a long term strategy to make outstanding vibration monitoring devices finally available.

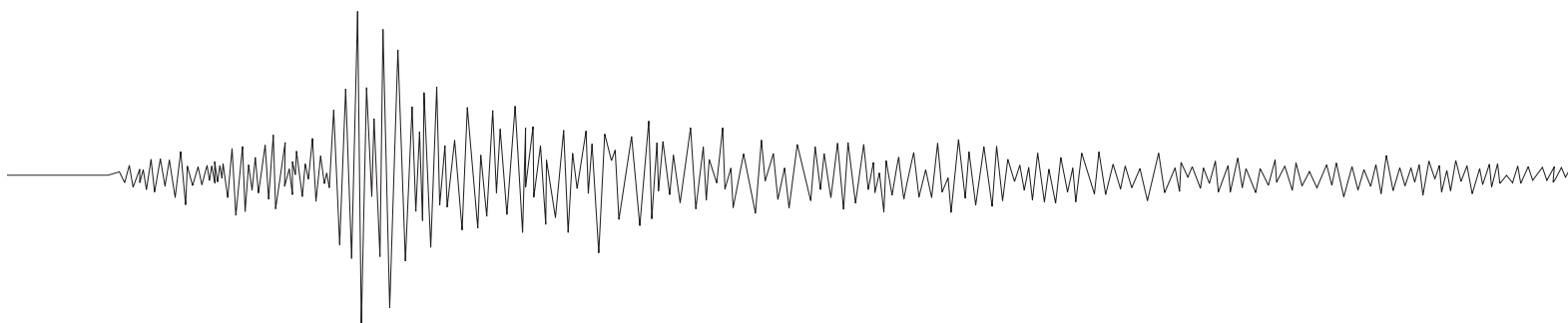
BARTEC SYSCOM product lines include:

MR3000C for Construction site monitoring | MR3000TR for Traffic and Railways monitoring | MR3000BLA for Blasting monitoring | MR3000DMS for Dam Monitoring System | MR3000SB for Structure and Building monitoring.

We are proud to unveil our monitoring solutions in the following pages and very glad to count on your trust in our products.

M. VAN DER REIJDEN

Managing Director



SPECIFIC INSTRUMENTATION FOR TARGETED MARKETS

Civil engineering vibrations - Seismic monitoring vibrations




High quality
best in class DIN45669-
1 velocity sensors
(Geophones)

CIVIL ENGINEERING OFFERING WITH FREE STANDING DEVICES FOR TIME LIMITED MONITORING

These motion recorders are widely used by civil and structural engineers for multiple vibration monitoring applications. Easy to use, highly performing and versatile using the Web User Interface, these devices are must have instruments for competitive edge!





Unrivalled stability and
robustness with
MEMS (Micro Electro
Mechanical System)
acceleration sensors

STRONG MOTION OFFERING WITH ALL-IN-ONE INSTRUMENTATION FOR PERMANENT EARTHQUAKE MONITORING

Fully integrated for easier installation, robustness and reliability are key features of these permanent monitoring stations. Adding automated state of health notifications and alarming capabilities outperforms most and achieves lowest cost of ownership!





<https://scs.bartec-syscom.com>

SYSCOM CLOUD SOFTWARE SOLUTION OFFERING

Dedicated vibration monitoring SaaS (Software as a Service) for straightforward data visualization, project management and automated reporting. Compatible with any MR3000 device.

Structural vibration monitoring technologies - Human exposure evaluation to structural vibration

CONSTRUCTION SITE MONITORING



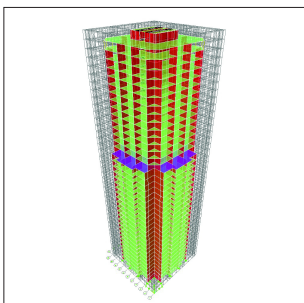
Vibration induced by heavy work on construction sites can have damaging effects on the surrounding buildings. In this regard, a lot of regulations to evaluate vibration effects on structures are enforced, for example: DIN4150-3 (D), SN640312a (CH), ÖNORM9020 (A), UNE22-381 (ES), BS5228 (UK), RI8507 (USA), etc.... Most of these regulations take into consideration transitory or continuous vibrations and specify different threshold levels that must not be exceeded. Another evaluation is usually performed related to human comfort, typically following DIN4150-2 among others. MR3000C devices are tailored for such measurements and provide fully compliant monitoring according to all these regulations.



SHA (STRUCTURAL HEALTH ASSESSMENT) MODAL ANALYSIS



Determination of the dynamic behavior is often used to monitor the state of health of structures over time and to study effects of aging and deterioration due to overstraining. Key parameters to consider are natural frequencies and damping ratios, calculated from recordings of ambient noise or forced vibrations. MR3000C large frequency bandwidth and high dynamic range ensure that even low amplitudes and low natural frequencies are captured with a good resolution.



RAILWAYS MONITORING



Vibration induced by trains, trams, metros are usually monitored in urban areas with potentially wider nuisance range. Such monitoring is needed to record PPV (Peak Particle Velocity) and associated frequency spectra near the tracks and in structures for modeling, prediction of the propagation of vibrations and structure borne noise assessment. These base conditions can be evaluated and potentially damped if needed, however usually involving heavy work. For efficient remote monitoring, the MR3000TR with its relay outputs can typically trigger a camera in order to record trains passing by (Passenger, freight, etc...) for optimum data post-processing. When operating in a master-slave configuration, it is also able to trigger and capture vibrations in the field and in-structure only caused by trains.



BLASTING MONITORING



Working with explosives is always a sensitive matter and when proceeding with shot firing, safety is of utmost concern. Blast evaluation and documentation is therefore part of the process and monitoring devices enable systematic potential hazards assessment. Ground induced vibrations and air over pressure generated by the explosions are recorded by MR3000BLA monitoring devices, for quick blast analysis and proper shot documentation.

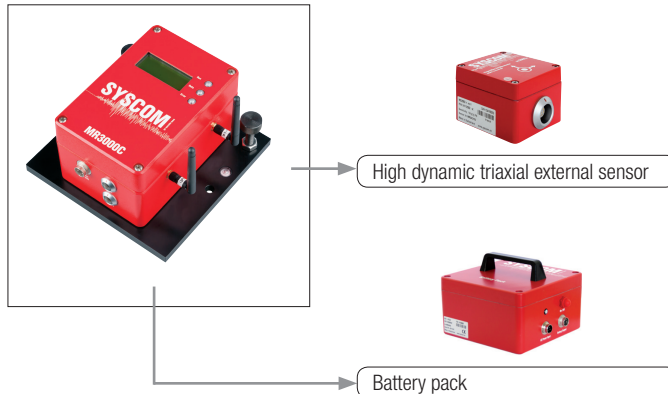
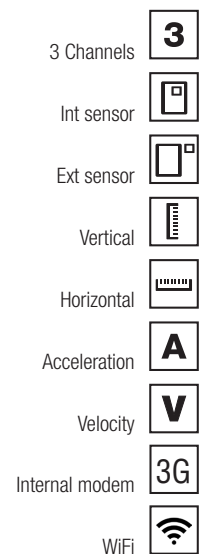


MAIN FEATURES CIVIL ENGINEERING

MR3000C for Construction site monitoring

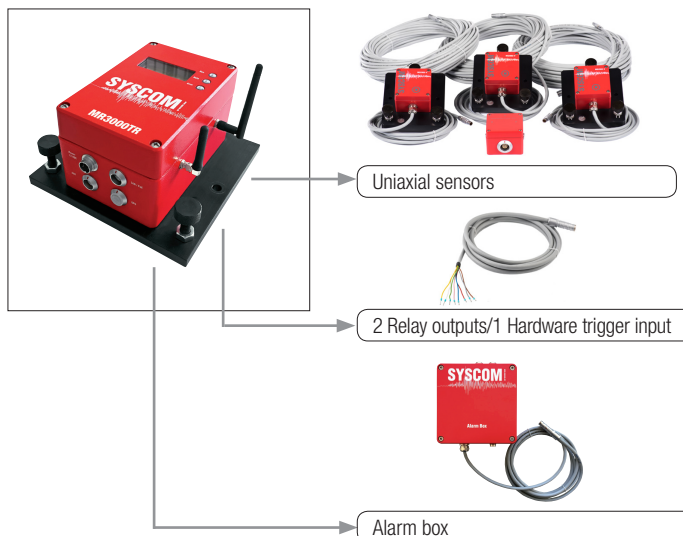
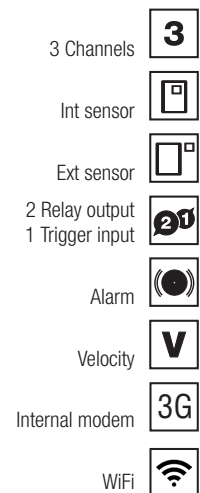
MR3000TR for Traffic and Railways monitoring

MR3000BLA for Blasting monitoring



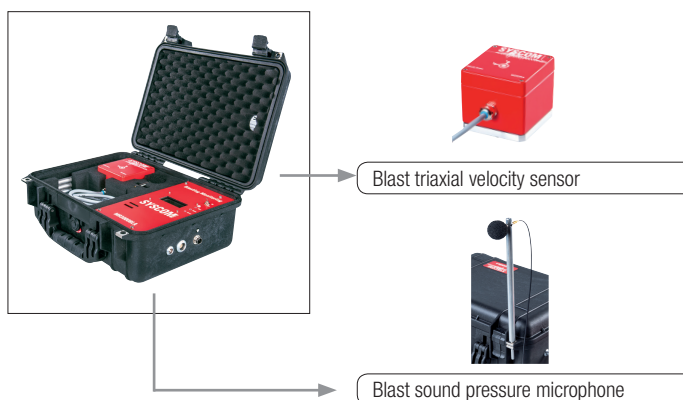
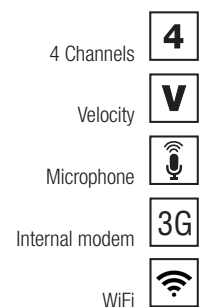
MR3000C

- WebUI quick access and easy parametrization
- Trigger based acquisition
- Non corruptible data with SD card state of health ensuring highest reliability
- Robust and compact aluminum housing for long product lifecycle
- Typical standards or user defined alarming and notifications for versatile usage
- Remote connectivity and full SCS compatibility for painless monitoring solution



MR3000TR

- Same features like the MR3000C above mentioned
- 2 Relay outputs for analog alarming
- 1 trigger input for MR3000TR automated event recording



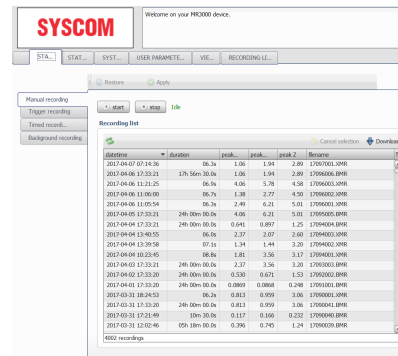
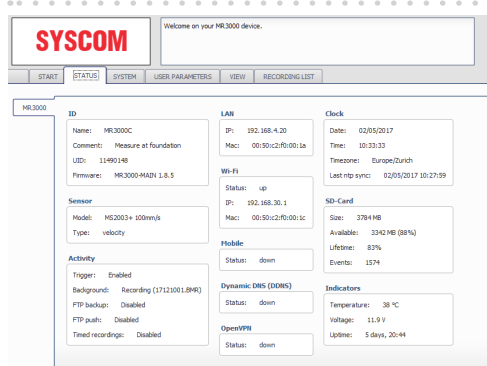
MR3000BLA

- High sensitive triaxial MS2003BLA, DIN45669 class 1
- Premium sound microphone
- All-in-one IP66 and easy to carry housing
- 100-240V AC with power LED indicator or DC power
- High quality LEMO push-pull connectors
- Internal long life battery

VERSATILE WEB USER INTERFACE

Just connect to the MR3000 and automatically load the WebUI with all the available functionalities, bringing ease of use, flexibility and minimum learning time.

Only 1 product needed for versatile applications.
No hidden training costs.



DATA INTEGRITY

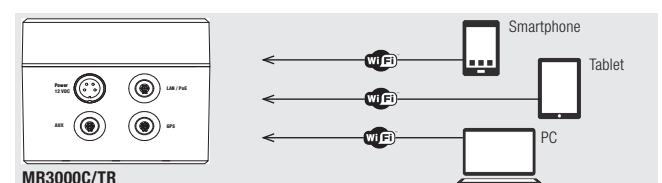
Trigger based acquisition and non-erasable sole event is proof of efficient data analysis and recorded veracity. Data is vital and therefore monitoring SD-card state of health with automatic notifications fully empower that aspect. Even in case of network failure, no data will be lost. MR3000 with their distributed intelligence are absolutely able to operate in a free standing mode.

100% recorded data safety guarantee as it is a primary need!
100% data confidence as it cannot be corrupted!

OUTSTANDING CONNECTIVITY

Ethernet based communication with wired LAN and 3G - WiFi (access point) for wireless connection. Multiple services are already integrated in each MR3000 such as VPN, DDNS, FTP, SMTP, API, SCS (Syscom Cloud Software) for outstanding data processing.

Open system with advanced data processing capabilities or simplicity with Syscom Cloud Software for efficient data recovery.
Data ownership truly remain yours. Focus on your core business and do not waste more time in connectivity management!



EXCEPTIONAL DURABILITY

Housing made of cast aluminum and system built with top quality industrial grade components, achieving best in class DIN45669 class 1 tolerance on the long run.

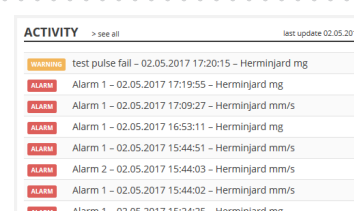
Very low cost of ownership. Made for harsh environment usage.



QUICK ALARM

SMS and Emails notifications are sent automatically in just a few seconds, ensuring very prompt actions in case of vibration level exceedance.

Act quickly for increased safety in case of perilous vibrations.



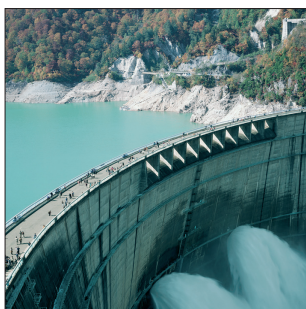
MAIN MARKETS STRONG MOTION

Asset monitoring technologies - Sustainable structural risk assessment

DAM MONITORING



One of the most critical aspects to ensure safety and sustainability of all dams is the ability to measure, evaluate and take prompt actions following an earthquake. Therefore equipping such heavy structures with dedicated instrumentation is highly recommended to fully assess its integrity and to put in place relevant responsive actions. Several MR3000DMS devices are located typically at maximum deflection points, abutments, free-field and in-structures for proper structural monitoring.

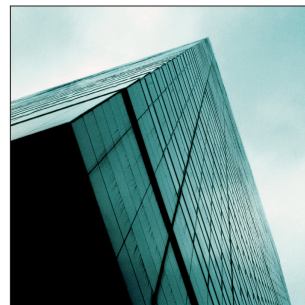


BUILDING MONITORING



All the buildings are subject to vibrations originated from many different sources. Among most energetic vibration affecting buildings are those generally caused by earthquakes. Such strong motions, depending on the intensity, can damage the structure and could lead to a collapse in the most critical cases (harmonic amplifications).

In order to avoid such incidents, structural health monitoring is a must and BARTEC SYSCOM solution with networkable motion recorders MR3000SB will ensure automatic, fast and reliable data acquisition and evaluation.



HISTORICAL BUILDING MONITORING



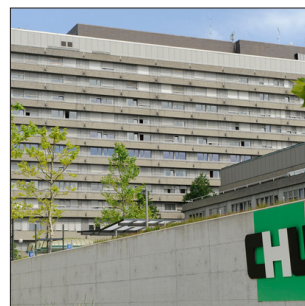
A global challenge is protecting legacy landmark symbols for cultural and generational perspectives and historical buildings are indeed a dominant part of this heritage. As it involves usually very old and special structures that may be delicate, vibration monitoring is a critical preservation aspect that needs to be continuously evaluated with minimum visual and structural impact. BARTEC SYSCOM solution with the all-in-one MR3000SB Red Box is entirely fulfilling this need.



HOSPITAL MONITORING











Critical infrastructures like hospitals are key structures to be monitored in case of potential earthquakes hazards. Utmost care should be taken with structural analysis and reinforcements and therefore permanent seismic monitoring instrumentation should be installed. Quick post-event earthquake evaluation is key factor for shortest building operability down time and achievable with best in class MR3000SB connectivity.



MAIN FEATURES STRONG MOTION

MR3000DMS for Dam Monitoring System







MR3000SB for Structures and Buildings

- Vertical 
- Horizontal 
- Acceleration 
- Over Voltage Protection 
- AC/DC 
- DC/DC 
- Fiber Optics 
- Star network 



MR3000DMS

- All-in-one rugged IP67 housing
- Seismically tested and certified devices
- Fiber Optics for long distance on dams
- LAN networkable devices with trigger and alarming voting logic
- Self-diagnostic features
- Best in class connectivity in a Star network architecture
- Seismic trigger based relay output
- MEMS triaxial sensor
- Internal battery
- Time synchronization using GPS

- Vertical 
- Horizontal 
- Acceleration 
- Fiber Optics 
- RJ45 copper cable 
- Daisy chain network (LAN 1 & LAN 2) 



MR3000SB

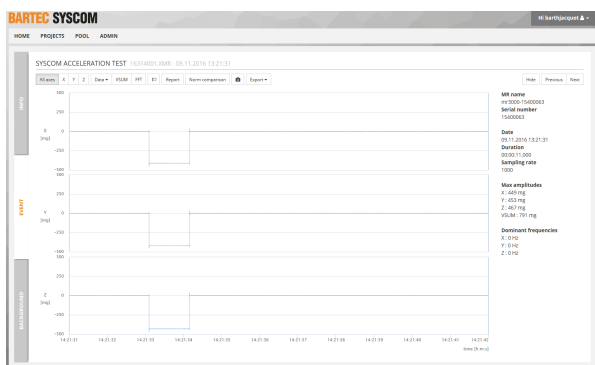
- All-in-one rugged IP67 housing
- Seismically tested and certified devices
- Fiber Optics for long distance or RJ45 copper cable for shorter distance on buildings
- LAN networkable devices with trigger and alarming voting logic
- Self-diagnostic features
- Best in class connectivity in a Daisy chain network architecture
- Seismic trigger based relay output
- MEMS triaxial accelerometer
- Internal battery
- Time synchronization using GPS

MAJOR BENEFITS STRONG MOTION

STRAIGHTFORWARD INSTALLATION

Everything needed is already integrated in a unique Red Box, such as cable glands and terminals for cabling, battery, sensor, recorder and industrial SD-card. The connection between the devices is simple and it can be realized with fiber optics or ethernet cables.

All-in-one product for a quick installation.



AUTOMATED SELF-DIAGNOSTICS FEATURES

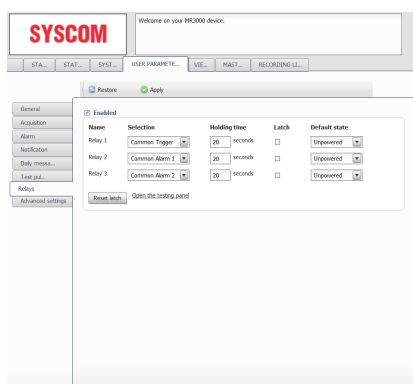
Periodic test-pulse notifications and recorder permanent state of health, typically for battery and SD-card status procure confidence in the whole system integrity. MEMS based built-in sensors also provide best stability over time with no recalibration needs.

Monitoring system condition permanently diagnosed ensuring lowest down time and maintenance costs.

LOCAL WARNING SYSTEM

MR3000 strong motion devices are able to detect, record and automatically raise alarms and activate relays in case of earthquakes. For better reliability and in order to avoid spurious activation of the system, a trigger and alarm voting logic (typically 2oo3, 2 out of 3 monitoring devices needed to detect an earthquake to activate the relays for example) can be easily programmed in the Web User Interface.

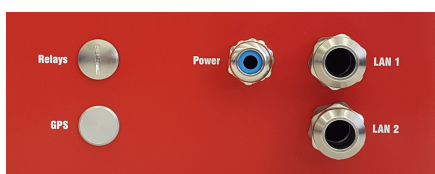
Automated safe process without spurious activation of the system with increased local safety.



OUTSTANDING DURABILITY

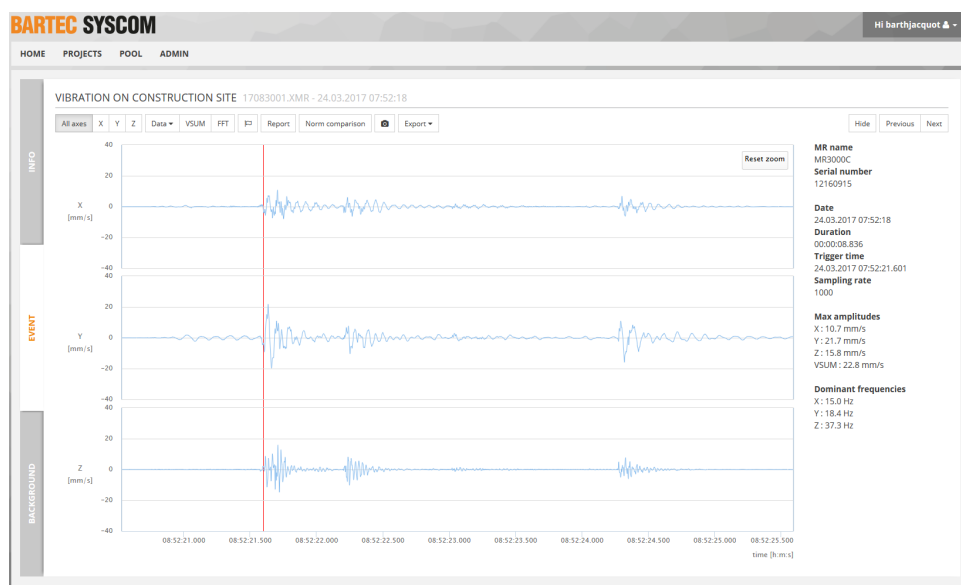
Housing made of cast aluminum IP67 protected and system built with ruggedized industrial grade components, achieving exceptional stability and reliability on the long run.

Very low cost of ownership. Made for harsh environment usage.



Compatibility with:

MR3000C – MR3000TR – MR3000BLA – MR3000DMS – MR3000SB

SOFTWARE **SCS** <https://scs.bartec-syscom.com>Quick & Easy
to connect

Automated reporting



Management by projects



Data classification



SOH & Alarming



Remote MR setup

SYSCOM CLOUD SOFTWARE (SCS)

is compatible with all MR3000 product lines. It is fully designed by BARTEC SYSCOM and dedicated to vibration monitoring. The SCS operates like a Software as a Service (SaaS) platform, providing all the benefits of such model. Its main features include plug & play M2M communications, management by projects, automatic reporting and post-processing capabilities such as data categorization, data filtering, Fast Fourier Transform (FFT), signal integration & differentiation, data visualization and graphical comparison with widely spread standards (DIN4150, SN640312, BS5228, BS7385-2, French regulation, RI8507, AS 2187-2 and NP2074 among others).

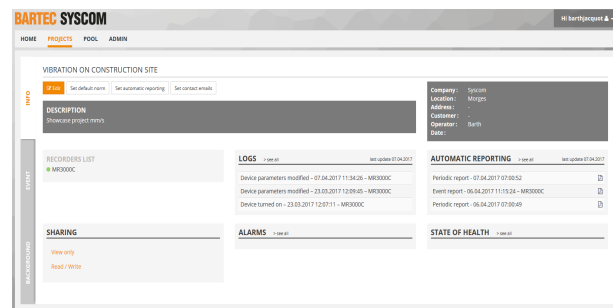
This software solution remains open and therefore data ownership truly remain yours. In order to empower that, SCS includes easy data sharing features with automatic reporting, specific project access with reader or viewer rights and data export capabilities.

MAJOR BENEFITS SYSCOM CLOUD SOFTWARE

FLAWLESS CONNECTIVITY

Simply create a secure link between the MR3000 and the SCS to have an efficient remote data acquisition solution. Nothing else is needed to have access to your data automatically uploaded to the software. It requires no specific IT skills, it is very straightforward and all the servers and maintenance are professionally & securely managed by BARTEC SYSCOM.

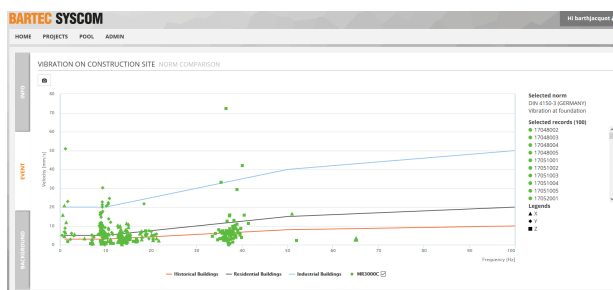
Focus on your core business.
Remote data acquisition made efficient and accessible to everyone.



VALUABLE INFORMATION

Uploaded events can be classified and compared to widely used standards. Manage data coming from multiple MR3000 in a specific project, apply some filters and select relevant files to be compared with the applicable regulation. This can be entirely done online with the SCS.

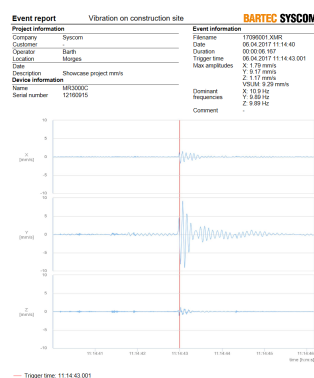
Simply trustful information painlessly !



DECISION MAKER

What is data without being able to communicate, access and share them easily? SCS allows you to visualize, share, export and automatically generate PDF reports in near real time.

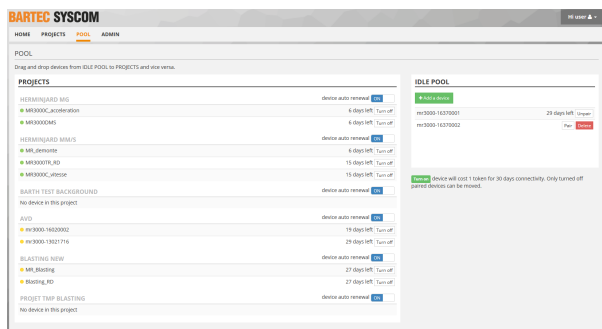
Take relevant actions quickly. Share your data with customers in one click.
Automatize standard periodic reporting with no human interference.



COMPETITIVE ADVANTAGE

Account creation is the only step to have access to these features, ensuring rapid deployment, painless upgrades, very low risk and low cost. Remote MR3000 setup of key parameters is also possible with the SCS, therefore no more visits to monitoring sites are required.

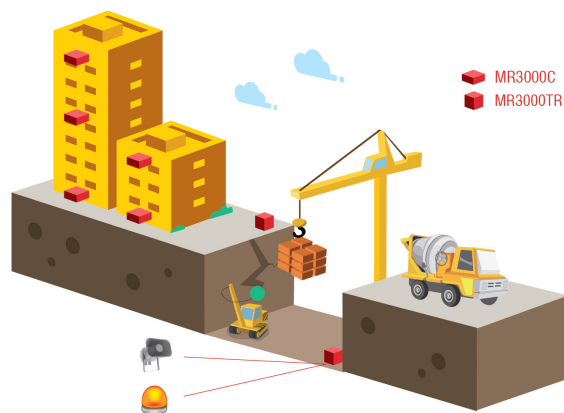
Fully integrated monitoring solution. Quick return on investment.



Typical setup for civil engineering and strong motion applications

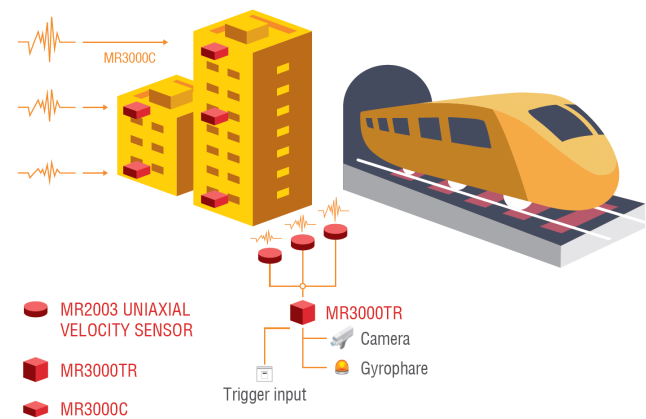
CONSTRUCTION SITES

Monitoring vibrations on a construction site and close by buildings using geo-phone sensors for human comfort evaluation and structural health monitoring.



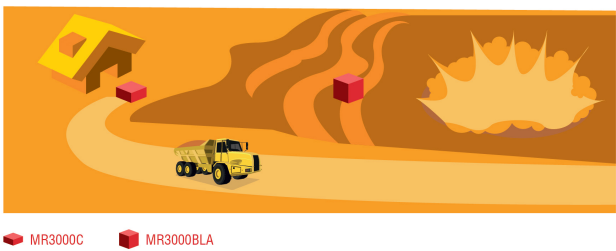
EXCAVATION & RAILWAYS

Monitoring of rail induced vibrations or when using a tunnel boring machine (TBM) for new tubes with instrumentation on structures located above the path.



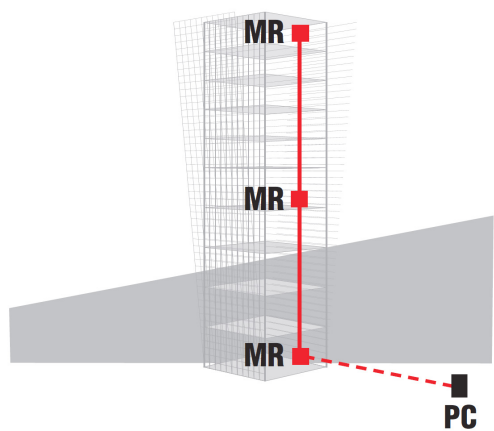
EXPLOSION MONITORING

Monitoring blasts on quarries or mines and in the surrounding structures for safety assessment following a shot.



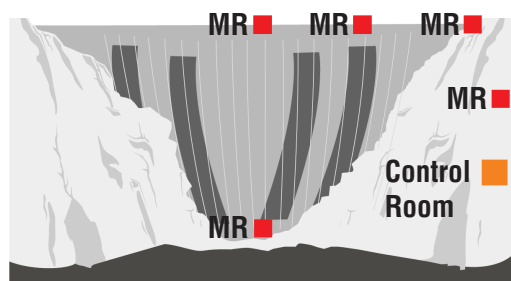
BUILDINGS MONITORING

Permanent installation of strong motion recorders MR3000SB in a typical daisy-chain configuration setup for high rise buildings.



DAMS MONITORING

Minimum configuration of MR3000DMS in a fiber optic star network setup connected to the control room, for arch dams strong motion monitoring.



BARTEC SYSCOM SERVICES

BARTEC SYSCOM has a very low vibration noise laboratory equipped with a calibration bench and shakers. 100% of the production is calibrated and inspected with comparison to fully certified and traceable reference sensors.



Calibration

Every MR3000 instrument is repairable at the factory. BARTEC SYSCOM ensures high spare parts availability over time.



Repair

Web based remote training sessions or local trainings are organized and any of BARTEC SYSCOM customers can attend.



Training

Before & after sales technical support given by well-trained engineers is available at BARTEC SYSCOM.

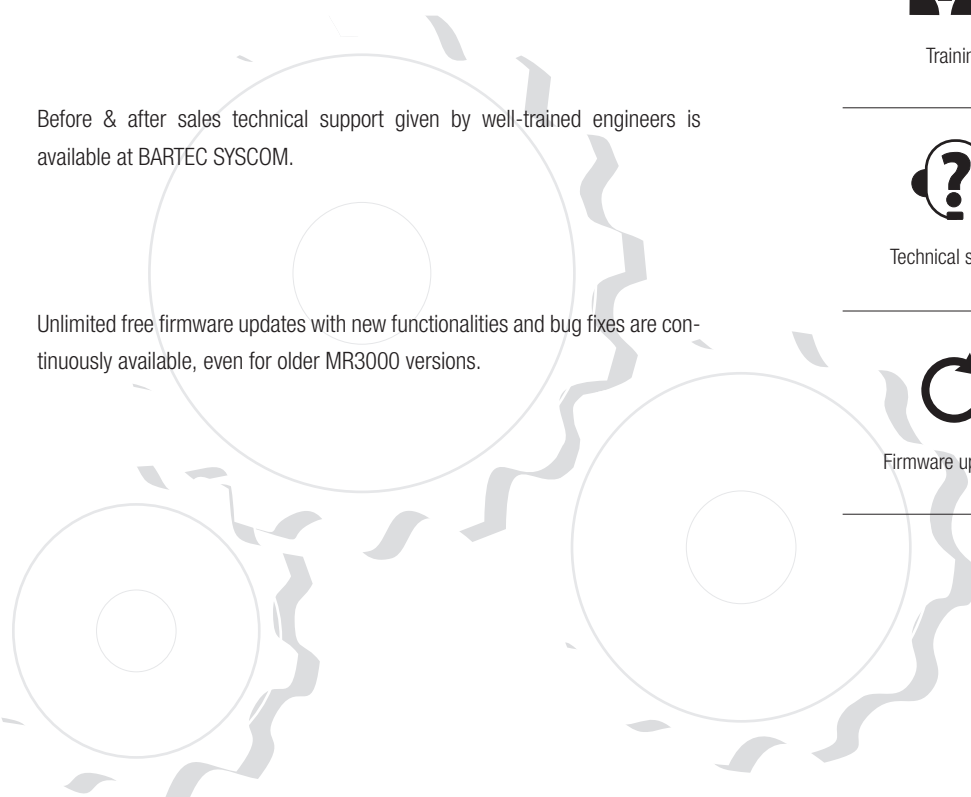


Technical support

Unlimited free firmware updates with new functionalities and bug fixes are continuously available, even for older MR3000 versions.



Firmware upgrades



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, strong-motion monitoring and safety related markets, especially for NPP and LNG plants. SYSCOM Instruments reputation rests on the reliability of its products, coming from a meticulous control of every design and production aspects. SYSCOM Swiss facility, fully ISO9001 certified, utilizes modern, automated production and test equipment to assure cost-competitiveness and high quality products.

www.bartec-syscom.com

BARTEC GROUP

BARTEC is a world leading provider of industrial safety technology for use in hazardous areas. Wherever substances such as flammable gases, vapors, mists or dust can occur the components and system solutions developed by BARTEC prevent explosions and ensure the safety of both people and the environment. The main customers of the global corporate group include the oil and gas industry as well as chemical, petrochemical and pharmaceutical companies from all around the world.

www.bartec.de

SALES NETWORK

BARTEC SYSCOM relies on a very well trained and specialized distribution network worldwide. Please contact them freely to get the best advice about MR3000 product lines and premium local support. Refer to BARTEC SYSCOM website for a complete list of representatives.

www.syscom.ch/representatives



UK-D-SIS13042017-04/2017-Marketing & Communications-410991



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