

MR3003SB

Structures & Buildings



The MR3003SB is a dedicated seismic monitoring system for structures and buildings. Its compactness with all must-have features already integrated makes it an ideal motion recorder for any type of structures, tailor-made for buildings.

Up to 32 MR3003SB can be interconnected in a daisy-chain network.

Applications

Strong motion

- Buildings
- Historical Monuments
- Hospitals
- Tunnels
- Skyscrapers
- Arenas
- Airports
- Bridges

MR3003SB Structures & Buildings Monitoring System

The MR3003SB seismic monitoring system is the most advanced, integrated and reliable monitoring system for structures and buildings, able to automatically detect, record and process any strong motion vibrations that might affect the structure. A daisy-chain network (Fiber Optic or Ethernet Copper cable) coupled with latest data retrieval capabilities, make the MR3003SB the easiest to use and most versatile instrument available on the market.

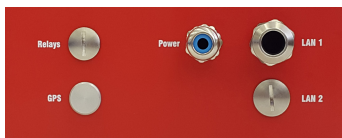
The all-in-one Red Box with internal battery, AC/DC and terminals already integrated provides all the necessary features for easy installation without any additional part. Command & control access through an embedded web server provides self-explanatory interface for system set-up and control.

The optional kit with 3 configurable relay outputs (alarm 1, alarm 2, device error) can be directly connected to any external alarming devices and used as an earthquake early warning system. A common logic system, for a typical 3-station network, will ensure highest reliability and avoid spurious activation of the warning system.

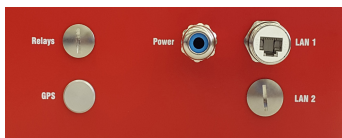
Major features

- Compact unit containing sensor, recorder, battery and communication
- Daisy-chain Fiber Optic or Ethernet Copper type cable
- Internal AC/DC converter
- Embedded Web server for easy configuration and control
- Optional GPS timing
- Industrial cable glands and internal terminals (no additional junction box needed)
- Easy installation and minimal maintenance

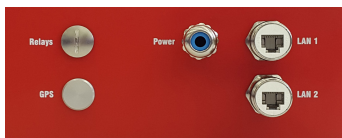
Panel mount possibilities



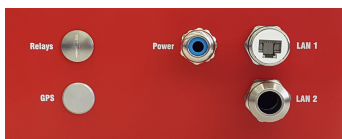
FO stand-alone



LAN RJ45 stand-alone



kit LAN daisy-chain



FO and kit LAN daisy-chain

Technical specifications

Data acquisition

General principle	4 th order delta-sigma ADC per channel
Resolution	24 bits
Sampling-rate	250, 500, 1'000, 2'000, 4'000 sps
Number of channels	3
Channel to channel skew	None, simultaneous sampling on all channels
Data Filter	Anti-aliasing filters
Trigger Filter	Digital IIR filter: 0.5 – 15 Hz band-pass (Strong Motion Applications)

Trigger and de-trigger

Principle	Level trigger or STA/LTA or automatic adjustment of trigger level
Trigger voting logic	Predefined AND or OR combinations, individual channel votes
Trigger level	0.1 mg to 4 g
STA / LTA	STA: 0.1 to 25s, LTA: 1 to 250s, ratio 0.1:25
Smart Trigger / De-Trigger	Automatic adjustment of trigger level

Microprocessor

Recording

Principle	Event recording (time history), continuous time recording or manually triggered
Header	Contains status information at time of trigger and event summary
Pre-event recording	1-99 seconds (@250Hz), others depending on sampling rate
Post-event recording	1-100 seconds
Max. recording time	Unlimited
Memory Removable	SD flash card (4GB)

Timing

System clock	1ppm, could be disciplined by NTP or GPS (optional)
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Data / User Interface

Web interface	Easy to use command & control through embedded web server
Intelligent Alerting	System initiates communications and sends e-mail when an event is recorded
FTP Built-in	Built-in client protocol supporting FTP, SFTP, FTPS able to push to a server
API	Application programming interface REST with extended functions available

Alarm triggers

Principle	Two alarm levels independently settable as threshold levels or user-defined curves, with various notification options (individually settable for each axis)
Alarm level range	0.1 % to 100% full scale
User-defined alarm	Thresholds and frequencies individually settable for each axis
System status	3 LEDs Run, Recording, Warning/Error. Internal LCD with status info and important settings

Network capabilities

Common trigger and common alarm	Configurable with AND/OR logic, for every device within the same network
Sync. in LAN network	Typically 1 ms with NTP protocol
Max. number of MR3003SB	32, in Master/Slave configuration
Remote control	VPN, DDNS

Power Supply

Power supply	100 - 240 V AC, 50 - 60 Hz, internal AC/DC. Optional DC power 10-36 V DC
Internal battery	12 V, 12 Ah
Consumption	4 W (with charged battery), 25 W (AC max. and battery in charge)
Battery autonomy	Typical 60 hours in stand-alone mode

I/O (glands and connectors)

Power	M16 cable gland 4-11mm / Terminals on the AC/DC
Kit Relays (3)	On request, M16 cable gland 7-11mm / Terminals
Kit daisy-chain LAN	On request, RJ45 panel mount
Kit FO	On request, M20 cable gland 6-13mm / ST connectors
Kit GPS	On request, connector and GPS antenna with 5 m cable for time synchronization

LAN cables

Fiber Optic type	Multimode OM2 fiber with wavelength 1300 nm, 50/125 µm, Rx/Tx
Ethernet Copper type	Cat 5e, <100m

Relays kit

Configuration	3 output configurable relays, No/Nc
Current	2 A, 30 V DC

Acceleration sensor

Principle	Micro-machined capacity MEMS accelerometer
Hysteresis	None
Noise (10 to 1000 Hz)	Typ. 7 µg/√Hz
Frequency range	DC to 600 Hz
Dynamic range	Typ. 100 dB @ 200 sps
Measuring range	±4 g
Sensitivity	1.25 V/g differential
Scale factor error	< 1 %
Mounting	Horizontal, vertical or ceiling (horizontally mounted on the ceiling), to be specified when ordering
Self test	Test-pulse, configurable

Housing

Dimensions	330 x 230 x 110 mm
Weight	9.5 Kg
Protection degree	IP67, temporary static immersion in water

Environmental

Shock	30 g/11 ms half-sine
Heat	-20 °C to +50°C
Humidity	up to 100% RH

Regulations

EMC	IEC 61326-1
Electrical safety	IEC 61010
Conformity	CE
Origin	Swiss Made

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Other applications

- Strong-motion monitoring
- Tunnels
- Bridges
- Airports
- Big structures (stadiums, towers, ...)
- Historical monuments
- Malls

Syscom Cloud Software (SCS)

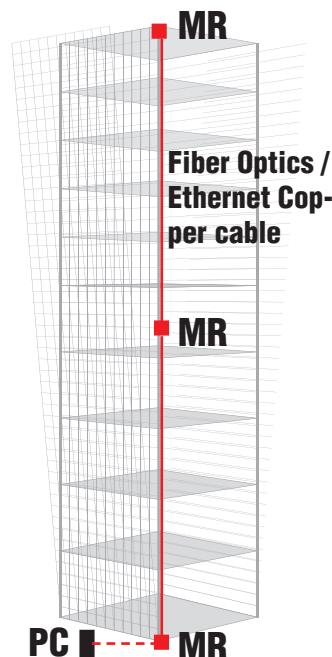
The MR3003SB can be connected to the Syscom Cloud Software (SCS) in order to simply visualize the data recorded and manage different projects.

The main features of the SCS include:

- plug & play M2M communications
- management by projects
- different access levels (administrator, read/write, view only)
- visualization of events/background monitoring
- comparison with reference standards
- automatic reporting

Please visit scs.syscom-instruments.com for more information.

SCS
scs.syscom-instruments.com



Building typical instrumentation

MR: MR3003SB

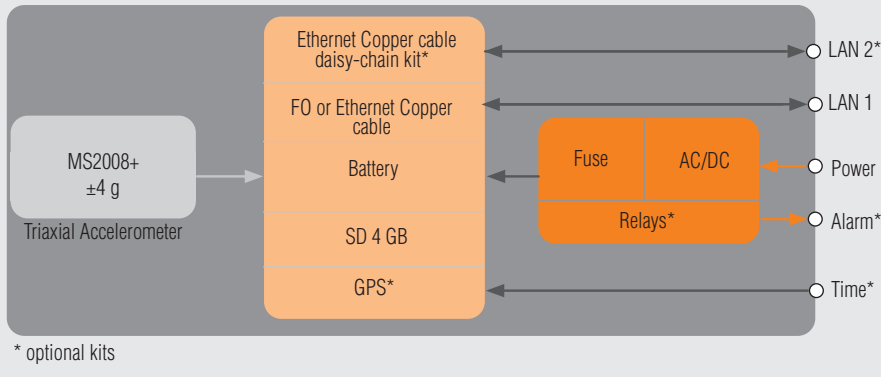
PC: Personal computer or switch with internet access.

Minimal recommended building instrumentation

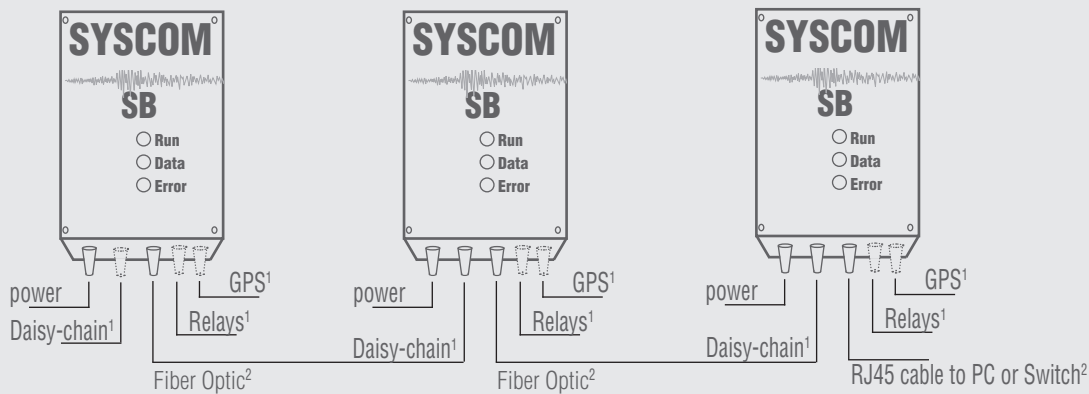
- 1 MR3003SB at the building top-floor
- 1 MR3003SB at the building mid-floor
- 1 MR3003SB at the building basement
- All instrumentation connected through Fiber Optics or Ethernet Copper cable in a daisy-chain network.
- MR3003SB recorder can operate as a stand-alone system if needed.

Contact SYSCOM Instruments SA for a complete review of your installation.

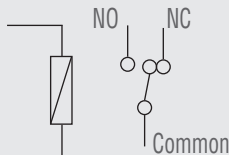
Block diagramm MR3003SB



Wiring diagram



Relays¹



Fiber Optic 1300 nm, 50/125 μm, Rx/Tx, OM2
 Ethernet Cat 5e, <100m
 Relays¹ 3 alarm relays
 Power 100-240 V AC 50-60 Hz

¹ kit on request

² Fiber Optic or Ethernet Copper cables. Only 1 FO per device.

Ordering information

MR3003SB main unit with internal triaxial accelerometer containing: internal battery, internal AC/DC converter, 4 GB Memory, Embedded server for configuration and control with master/slave settings for Ethernet network	Part Number	Fiber Optic configuration	RJ45 Copper configuration	Horizontal mounted	Vertical mounted	Ceiling mounted
MR3003SB ±4g, horizontal mounted, AC 100-240 V AC, 1 LAN and 1 fiber optic	MR3003SB-2008I-H4-LF-AC-X-X	x	x	x		
MR3003SB ±4g, vertical mounted, AC 100-240 V AC, 1 LAN and 1 fiber optic	MR3003SB-2008I-V4-LF-AC-X-X	x	x		x	
MR3003SB ±4g, ceiling mounted, AC 100-240 V AC, 1 LAN and 1 fiber optic	MR3003SB-2008I-C4-LF-AC-X-X	x	x			x
MR3003SB ±4g, horizontal mounted, DC 10-36 V DC, 1 LAN and 1 fiber optic	MR3003SB-2008I-H4-LF-DC-X-X	x	x			
MR3003SB ±4g, horizontal mounted, AC 100-240 V AC, 1 LAN	MR3003SB-2008I-H4-L-AC-X-X		x	x		
MR3003SB ±4g, horizontal mounted, AC 100-240 V AC, 1 fiber optic	MR3003SB-2008I-H4-F-AC-X-X	x		x		
MR3003SB ±4g, horizontal mounted, AC 100-240 V AC, 2 LAN, 3 relays	MR3003SB-2008I-H4-LL-AC-R-X		2 LAN	x		
KIT GPS for one MR3003SB (5m cable, connectors, GPS)	12110201					
MRs network Master/Slave firmware option**	88010003					
Mounting platform in PE-HD black with mounting screws and bolts	13000048					
IP66 plug for KIT LAN with X meter cable. Please specify length in -X meters, in standard 3m.*	81000585-X					

*To be ordered at the time of purchase

**Master MR to be specified at purchase time, 1 MR master per network