SAFETY IS OUR PRIORITY

BARTEC SYSCOM

MR3000SB
Structures & Buildings

The MR3000SB 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 MR3000SB can be interconnected in a daisy-chain network.

Applications

Strong motion

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

MR3000SB Structures & Buildings Monitoring System

The MR3000SB 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 MR3000SB the easiest to use and most versatile instrument available on the market.
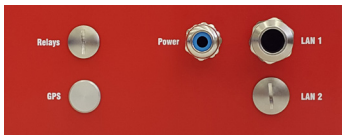
The all-in-one Red Box with internal battery, AC/DC and terminals already integrated provides all the necessary features for easy installation without any additionnal part. Command & control access through an embedded web server provides self-explanatory interface for system set-up and control.

The optional kit with three 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.
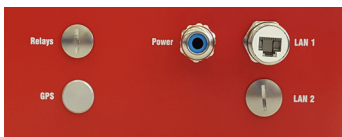
Major features

- 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)
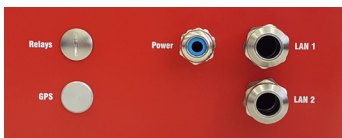
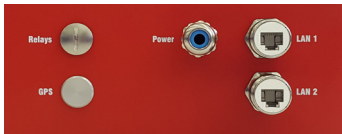- Easy installation and minimal maintenance

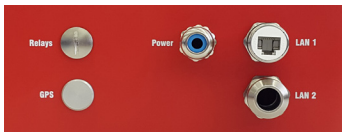## Panel mount possibilities

FO stand-alone

LAN RJ45 stand-alone

kit FO daisy-chain

kit LAN daisy-chain

FO and kit LAN daisy-chain

Technical specifications

Data acquisition

General principle	4th order delta-sigma ADC per channel
Resolution	24 bits
Sampling-rate	50, 100, 200, 400, 500, 800, 1000, 2000 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
Level trigger	0.1 to 100% full scale
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	1-30 s (in 1 second steps)
Post-event recording	1-100 s (in 1 second steps)
Max. recording time	Unlimited
Memory Removable	SD flash card (4GB)

Timing

System clock	1ppm, could be disciplined by NTP or GPS (optional)

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	FTP client to push data to an FTP-server
API	Application programming interface REST with extended functions available

Alarm triggers

Principle	Multiple level triggers with various notification options (individually settable for each axis)
Range	0.1 % to 100% full scale
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 MR3000SB	32, in Master/Slave configuration
Remote control	VPN, DDNS

Power Supply

Power supply	100 - 240 V AC, 50 - 60 Hz, internal AC/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 daisy-chain 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 fiber with wavelength 1300 nm, 50/125 µm, Rx/Tx, OM2
Ethernet Copper type	Cat5e, <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 %
Orientation	Horizontal or vertical mounting, 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 & Vibration	30 g/11 ms half-sine , seismically tested
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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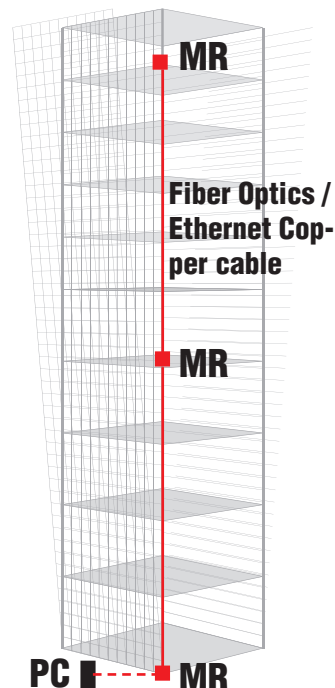🖥 www.syscom.ch
✉ info@syscom.ch

Other applications

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

Building typical instrumentation

MR: MR3000SB

PC: Personal computer or switch with internet access.

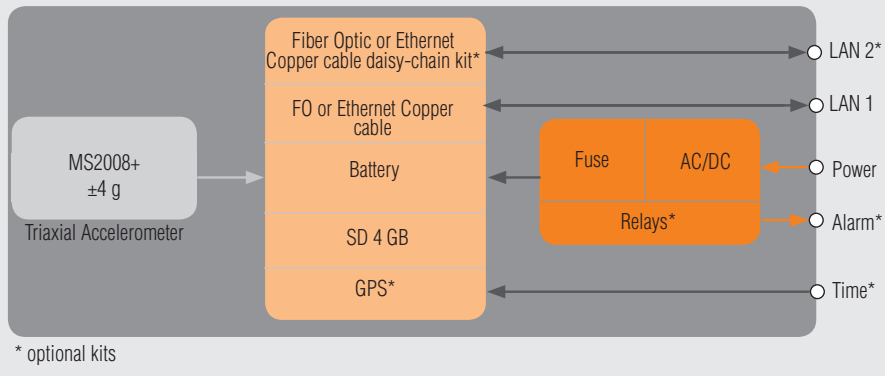**Fiber Optics / Ethernet Copper cable**
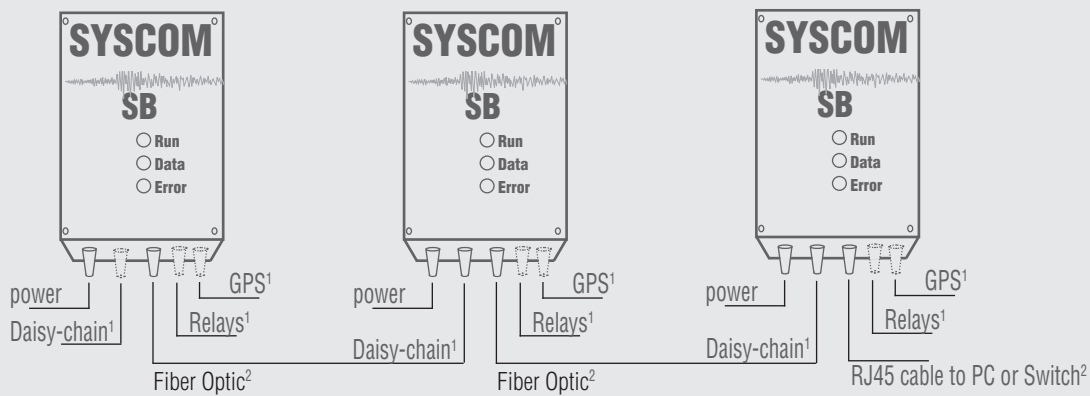
Minimal recommended building instrumentation

- 1 MR3000SB at the building top-floor
- 1 MR3000SB at the building mid-floor
- 1 MR3000SB at the building basement
- All instrumentation connected through Fiber Optics or Ethernet Copper cable in a daisy-chain network.
- MR3000SB recorder can operate as a stand-alone system if needed.

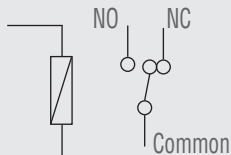Contact SYSCOM Instruments SA for a complete review of your installation.

MR3000SB_e//10.2015

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Block diagramm MR3000SB

Fiber Optic or Ethernet Copper cable daisy-chain kit* ←→ ○ LAN 2*

FO or Ethernet Copper cable ←→ ○ LAN 1

MS2008+ ±4 g
Triaxial Accelerometer →

Battery

Fuse | AC/DC → ○ Power

Relays* → ○ Alarm*

SD 4 GB

GPS* ←→ ○ Time*

* optional kits

Wiring diagram

SYSCOM SB
○ Run
○ Data
○ Error

power
Daisy-chain[1]
Relays[1]
GPS[1]
Fiber Optic[2]

SYSCOM SB
○ Run
○ Data
○ Error

power
Daisy-chain[1]
Relays[1]
GPS[1]
Fiber Optic[2]

SYSCOM SB
○ Run
○ Data
○ Error

power
Daisy-chain[1]
Relays[1]
GPS[1]
RJ45 cable to PC or Switch[2]

Relays[1]

NO   NC

Common

Fiber Optic	1300 nm, 50/125 µm, Rx/Tx, OM2
Ethernet	Cat7, <100m
Relays[1]	3 alarm relays
Power	100-240 V AC 50-60 Hz

[1] kit on request
[2] Fiber Optic or Ethernet Copper cables

Ordering information

Sets descriptions:

	Part Number	Fiber Optic configuration	RJ45 Copper configuration	Horizontal mounted	Vertical mounted
MR3000SB main unit with internal acceleration sensor containing: 4 GB Memory - Embedded server for configuration and control with master/slave settings for Ethernet network - internal triaxial accelerometer - AC/DC - battery					
MR3000SB ±4g, horizontal mounted	14101200			x	
MR3000SB ±4g, vertical mounted	14101201				x
KIT 1 FO for one MR3000SB (Internal ST connector, cable gland)*	93101103	x			
KIT 1 LAN for one MR3000SB (RJ45 connector with cap, panel mount)*	93101104		x		
KIT 2 FO daisy-chain for one MR3000SB (Internal ST connectors, cable glands)*	93101105	2FO			
KIT 2 LAN daisy-chain for one MR3000SB (RJ45 connectors with cap, panel mount)*	93101106		2LAN		
KIT FO/LAN daisy-chain for one MR3000SB (Internal ST connector, cable gland, RJ45 panel mount)*	93101107	x	x		
KIT RELAYS for one MR3000SB (3x relays output)*	93101108				
KIT GPS for one MR3000SB (5m cable, connectors, GPS)*	93101109				
MRs network Master/Slave firmware option (1 MR master per network, master must be specified at purchase time)**	88010003				
Mounting platform in PE-HD black with mounting screws and bolts	13000048				

*To be ordered at the time of purchase   **Master MR to be specified at purchase time, 1 MR master per network.