

SAFETY IS OUR PRIORITY

BARTEC SYSCOM

MR3000DMS

Dam Monitoring System



The MR3000DMS is a dedicated strong-motion monitoring system for dams. Up to 32 units can be connected together to have a complete and reliable seismic monitoring system.

Market Segments

Strong motion

- All types of dams
- Dynamic behaviour assessment of large complex structures under seismic constraints

MR3000DMS Dam Monitoring System

The MR3000DMS seismic monitoring system is the most compact, integrated and reliable system for dams, ensuring the highest level of safety and sustainability. Automatic earthquake detection and structural monitoring will ensure the dam full integrity over its lifetime.

The MR3000DMS is extremely versatile and easy to install, thanks to its state of the art Ethernet master-slave connectivity and the command & control access through embedded web server.

3 relays output (alarm 1, alarm 2, device error) can be directly connected to the control room for a centralized overview and an automatic logic response in case of any seismic event.

Major features

- Compact unit containing sensor, recorder, battery and communication
- Fiber optics communication
- Internal AC/DC with Overvoltage protection, type I + II
- Embedded Web server for easy configuration and control
- Optional accurate timing (GPS)
- 3 output relays
- Industrial cable glands and internal terminals (no additional junction box needed)



MR3000DMS



Panel mount RJ45 connector with cap for LAN kit

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, 2000sps

Number of channels

3

Channel to channel skew

None, simultaneous sampling on all channels

Dynamic range

Typ. 130 dB @ 250 sps, 127 dB @ 500 sps

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

1-30 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 GPS or NTP

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

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 MR3000DMS

32, in Master/slave configuration

Remote control

VPN, DDNS

Power Supply

Power supply

100 - 240 V AC, 50 - 60 Hz, OVP protected, type I and II. 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

Typ. 40 hours

I/O (glands and connectors)

Relays (3)	M16 cable gland 7-11mm / Terminals
Power	M16 cable gland 4-11mm / Terminals
Kit LAN	On request, 3 m Ethernet cable
Kit GPS	On request, connector and GPS antenna with 5 m cable for time synchronization
FO	M20 cable gland 6-13 mm / ST connectors

Fiber Optics

FO type	Multimode OM2 fiber with wavelength 1300 nm, 50/125 µm, Rx/Tx
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Relays

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	10 Kg
Protection degree	IP66

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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Syscom Cloud Software (SCS)

The MR3000DMS can be connected to the Syscom Cloud Software (SCS) in order to simply visualize the data recorded and manage different projects.

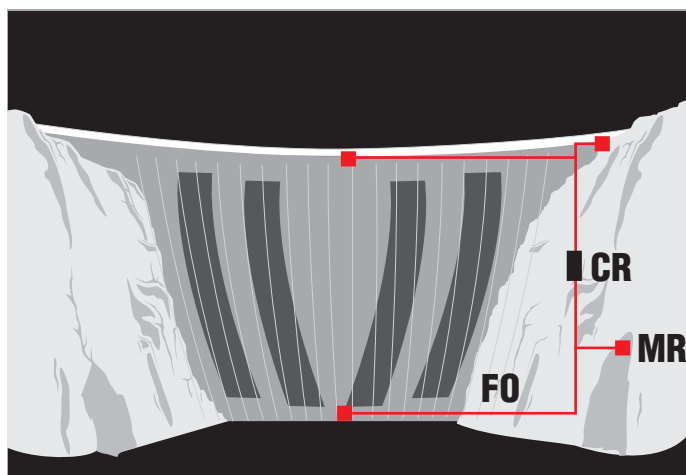
The main features of the SCS include:

- 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.bartec-syscom.com for more information.

SCS
scs.bartec-syscom.com

Arch dam instrumentation



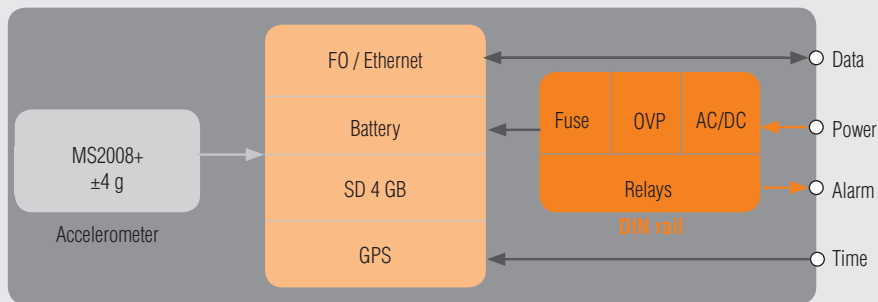
MR : MR3000DMS FO : Fiber Optics
CR : Control Room with FO switch

Dam Strong-motion, minimal instrumentation

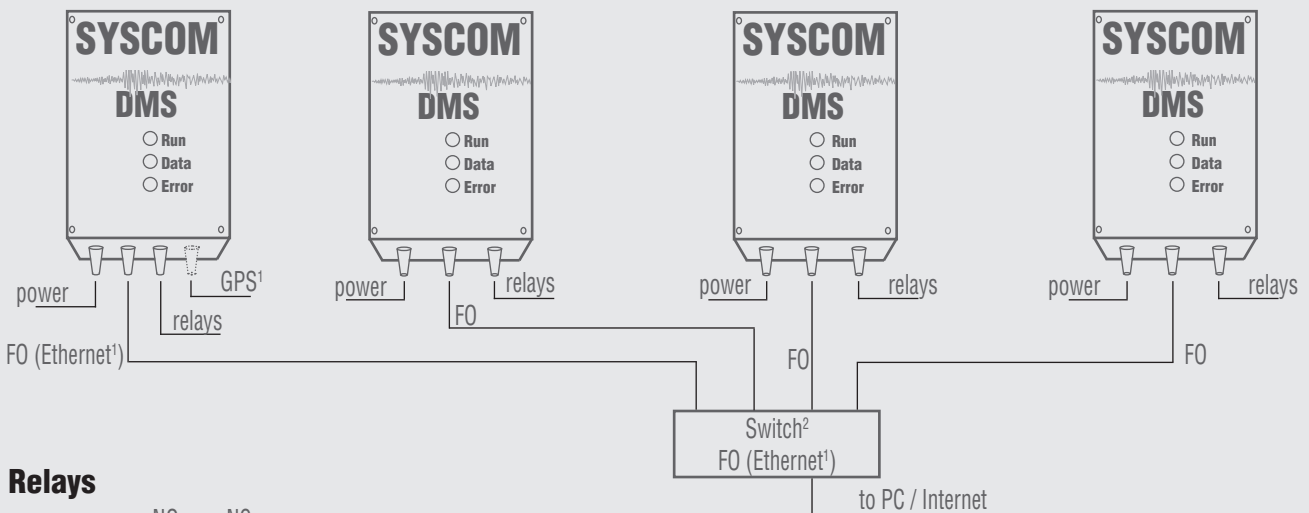
- 2 MR3000DMS at the dam top (middle and embankment)
- 1 MR3000DMS at the dam base
- 1 MR3000DMS at the free field
- Connections with fiber optics to reach the Control Room

Contact SYSCOM Instruments SA for complete dam monitoring guidelines

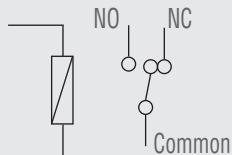
Block diagramm MR3000DMS



Wiring diagram



Relays



FO 1300 nm, 50/125 µm, Rx/Tx, OM2
 Relays 3 alarm relays
 Power 100-240 V AC 50-60 Hz, DC on request

¹ kit on request

² the switch is not supplied by SYSCOM

Ordering information

Sets descriptions:

MR3000DMS main unit with internal triaxial accelerometer containing: internal battery, internal AC/DC converter, Over Voltage Protection, 3 relays, 4 GB Memory, Embedded server for configuration and control with master/slave settings for Ethernet network	Part Number	AC Power supply & OVP	DC Power supply	Horizontal mounted	Vertical mounted
MR3000DMS ±4g, horizontal mounted, AC 100-240 V AC, fiber optic communication	MR3000DMS-2008I-H4-F-AC-X	x		x	
MR3000DMS ±4g, vertical mounted, AC 100-240 V AC, fiber optic communication	MR3000DMS-2008I-V4-F-AC-X	x			x
MR3000DMS ±4g, horizontal mounted, DC 10-36 V DC, fiber optic communication	MR3000DMS-2008I-H4-F-DC-X		x	x	
MR3000DMS ±4g, vertical mounted, DC 10-36 V DC, fiber optic communication	MR3000DMS-2008I-V4-F-DC-X		x		x
MR3000DMS ±4g, horizontal mounted, AC 100-240 V AC, LAN communication	MR3000DMS-2008I-H4-L-AC-X	x		x	
MR3000DMS ±4g, horizontal mounted, AC 100-240 V AC, LAN communication, GPS compatibility*	MR3000DMS-2008I-H4-L-AC-G	x		x	
KIT GPS for MR3000DMS complete (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 purchase time

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