

MR3000C

Vibration & Motion Measurement System



The MR3000C in SYSCOM's rugged RED BOX is a compact vibration/motion measurement system. As such it meets all user expectation in a state-of-the-art device and thus is a highly reliable and efficient tool for many applications.

Applications

- **Civil Engineering**
Industrial Vibrations - Construction Site Monitoring - Tunneling
- Truck and Rail Traffic - Blasting Monitoring - Model Verification
- **Earthquake Engineering**
Building Monitoring - Monitoring of Structures (Dams, Bridges..)
- **Geology**
Soil Characterization
- **Earth Science**
Earthquake Monitoring (seismic Intensity)
Continuous data stream in MiniSeed/SeedLink format

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Major features

- Compact unit containing sensor, digital recorder and communication
- ARM/DSP Technology
- Memory
- Embedded Web Server for easy configuration and control
- Precise timing (GPS)
- Power over Ethernet (PoE)
- Wide dynamic range
- Wireless connectivity



MR3000C with GPRS

Data acquisition

Principle	4 th order delta-sigma ADC per channel
Resolution	24 bit
Sampling-rate	50, 100, 200, 400, 500, 800, 1'000, 2'000 sps, others on request
Number of channels	3
Channel to channel skew	None – simultaneous sampling on all channels
Dynamic range	Typ. 130dB@250, 127dB@500 sps
Data Filter	FIR & IIR digital filters
Trigger Filter	Digital IIR filter: 0.5 - 15 Hz band-pass (Strong Motion Applications) Others on request

Trigger and de-trigger

Principle	Level trigger or STA/LTA
Trigger voting logic	Predefined AND or OR combinations, individual channel votes
Level trigger	0.003 to 100% full scale
STA / LTA (Strong Motion)	STA: 0,1 to 25s, LTA: 1 to 250s, Ratio: 0,1 to 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 seconds (in 1 sec steps)
Post-event recording	1 - 100 seconds (in 1 sec steps)
Max. recording time	Event recording: unlimited
Non volatile Memory	Internal and flash and removable SD card

Alarm triggers

Principle	Multiple level triggers with various notification options (individually settable for each axis)
Range	0.1 % to 100% full scale

Precision timing

System Clock	1 ppm, this clock is disciplined by GPS, NTP
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Data/user interface

Intelligent Alerting	System initiates communications or sends text message (SMS) or e-mail when an event is detected
Web Interface	Easy to use command & control through embedded web server
FTP	Built-in FTP client to push data to an FTP-server

Display

3 LED	Run, Recording, Warning/Error
LCD-Display	Status information, important settings.

Wireless Communication

WiFi	IEEE 802.11b/g/n compliant
Mobile Network (option)	Multi-Band UMTS / HSDPA / WCDMA / GSM / GPRS / EDGE

Power Supply

Supply Voltage	9 - 13.5VDC or 48V PoE
Power Consumption	2 W (velocitymeter)
(W/O wireless communication)	2.3 W (accelerometer)

I/O and Connectors

Type	Metallic self-latching push-pull connectors with positioning key (LEMO)
Power	Metallic connector with protective GND
GPS	Connector for external GPS
LAN / PoE	Communication with PC or network - Ethernet 100BaseT

Sensors (Internal)

Triaxial Velocitymeter

Type

Velocity sensor with linearized frequency response
A3HV 315/1 (triaxial) (according to DIN 45669)

Principle

Geophone

Measuring range full scale

± 100 mm/s

Frequency range

1 - 350 Hz (linear $\pm 10\%$ frequency response)

Case-to-coil motion

4 mm p-p

Dynamic range

> 130 dB

Linearity/Phase

According to DIN 45669 (class 1)

Cross axis sensitivity

According to DIN 45669 (<5%)

Triaxial Accelerometer

Principle

The sensing element is an analog force feedback accelerometer featuring a variable capacitance, silicon bulk-micro machined acceleration sensor (MEMS) and a custom low-power mixed-signal integrated circuit (ASIC). The MEMS/ASIC custom design forms a DC coupled analog servo accelerometer.

Hysteresis

None

Dynamic range (100 Hz BW)

typ. 100 dB ($\pm 4g$)

Noise (10 to 1000 Hz)

typ. $7 \mu g_{rms}/\sqrt{Hz}$

Frequency response

0 - 600 Hz

Measuring range

$\pm 4 g$

Orientation

Triaxial, horizontal (floor) mounting or vertical (wall mounting)

Self test

Test-pulse

Dimensions

Housing

Aluminum, 120 x 180 x 100 mm

Weight

1.5 kg

Protection degree

IP 65 (splash-proof)

Regulation

Electrical Safety

In compliance with IEC 61010

EMI/RFI

In compliance with EN 61000

Environmental

Shock: 30 g/11 ms half-sine

Heat: -20° up to +70°C

Humidity: up to 100% RH

Vibration: up to 5 g (operating)

Conformity

CE

Ordering Information (please refer to last page)

Measurement System

MR3000C with internal Velocitymeter

MR3000C with internal Accelerometer

Power supply

External battery package with integrated AC/DC converter/charger

External AC/DC converter

Mounting Platform

Mounting platform for MR3000C with levelling bubble

GPS timing

GPS receiver and antenna

Carrying case

For MR3000C and battery package



Standard carrying case with cables, MR3000C and battery pack



MR3000C with GPRS and mounting plate

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Ordering information

MR3000C - 4GB Memory - 3 channels - WiFi - Ethernet connectivity - Embedded web server for configuration and control - 3m Ethernet cable

Description	Part number	GPRS board EU¹/USA²	Battery pack³ with internal AC/DC & cable⁴ to MR	External AC/DC converter	Mounting platform	Carrying case
		93100003¹ 93100005²	14100007³ 81000527⁴	87000268	13000039	74710101

MR3000C main unit with internal triaxial velocity sensor

CE Basic Int Set (velocity)	93106007		X	X	X	X
CE Standard Set (velocity)	93106009	X	X	X	X	X

MR3000C main unit with connector for external sensors (without sensors)*

CE Basic Ext Set, for external sensor	93106008		X	X		X
CE Classic Set, for external sensor	93106010	X	X	X		X

* Refer to the datasheets of MS2003+ and MS2008+

MR3000C main unit with internal triaxial acceleration sensor

CE Basic Int Set (acceleration)	93106026		X	X	X	X
CE Standard Set (acceleration)	93106027	X	X	X	X	X

MR3000C units without accessories

MR3000C, with internal velocity sensor	14101007				X	
MR3000C, with internal velocity sensor and GPRS board	14101015	X			X	
MR3000C, configured for external velocity sensor, without sensor	14101019					
MR3000C, configured for external velocity sensor, with GPRS board, without sensor	14101005	X				
MR3000C, with internal acceleration sensor	14101018				X	
MR3000C, with internal acceleration sensor and GPRS board	14101017	X			X	
MR3000C, network master firmware option, for 1x MR3000C	88010003					