MR3000C
Vibration & Motion Measurement System

Syscom MR3000
192.168.1.100
tr: 50,50,50
events: 19

Run

Data

Error

SYSCOM

MR3000C

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

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.

Major features

- Compact unit containing sensor, digital recorder and communication
- ARM/DSP Technology
- Internal 4G modem, fallback 3G/2G
- Internal 4GB memory
- Embedded Web Server for easy configuration and control
- Precise timing (GPS)
- Power over Ethernet (PoE)
- Wide dynamic range
- Wireless connectivity

MR3000C with 4G module and mounting plate, lateral view.

Data acquisition

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 (only for accelerometer)

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 (for acceler.)	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)
Data memory	Removable SD card

Alarm triggers

Principle	Two alarm levels independently settable as: threshold levels, curves defined by the main regulations or user-defined curves
Alarm level range	0.1 % to 100% full scale
Alarm based on standards	Different built-in standards: DIN 4150-3 (Germany), SN 640312 (Switzerland), Circulaire du 23/07/1986 (France)
User-defined alarm	Thresholds and frequencies individually settable for each axis
Notifications	Various notification options, individually settable for each axis

Precision timing

System Clock	1 ppm, this clock is disciplined by GPS, NTP

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, event-related information

Wireless Communication

WiFi	IEEE 802.11 b/g compliant
Mobile Network (option)	Internal 4G modem, fallback 3G/2G

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
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%)
Orientation	Horizontal (floor) mounting or vertical (wall mounting)

Triaxial Accelerometer

Principle	The MEMS accelerometer consists in a micro-machined capacitive sensing element (MEMS) and a custom low-power mixed-signal integrated circuit (ASIC) that includes an amplifier and differential output stage.
Hysteresis	None
Dynamic range (100 Hz BW)	typ. 100 dB (±4g)
Noise (10 to 1000 Hz)	typ. 7 $\mu g_{rms}/\sqrt{Hz}$
Frequency response	0 - 600 Hz
Measuring range	±4 g
Orientation	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 set of MR3000C with carrying case, cables and battery pack

Syscom Cloud Software (SCS)

The MR3000C 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
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Ordering information

Description	Part number	4G module	Internal triaxial velocity meter	Internal triaxial accelerometer
MR3000C kits Example: **93106009-A-EU**				
Kits MR3000C with: MR3000C recorder - 4GB Memory - WiFi - Ethernet connectivity - Embedded web server for configuration and control - 3 m Ethernet cable - Battery pack with internal AC/DC & cable to MR - External AC/DC converter - Carrying case				
Basic Vel: MR3000C mounting plate - Internal triaxial velocity sensor MS2003+ - horizontal mounting	93106007		x	
Standard Vel: MR3000C mounting plate - Internal triaxial velocity sensor MS2003+ - horizontal mounting - Internal 4G module	93106009	x	x	
Basic Acc: MR3000C mounting plate - Internal triaxial accelerometer MS2008+	93106026			x
Standard Acc: MR3000C mounting plate - Internal triaxial accelerometer MS2008+, Internal 4G module	93106027	x		x
Basic Ext Vel: Compatibility with external velocity sensor MS2003+	93106008			
Standard Ext Vel: Compatibility with external velocity sensor MS2003+ - Internal 4G module	93106010	x		
Standard Ext Acc: Compatibility with external accelerometer MS2008+ - Internal 4G module	93106041	x		
4G module for Europe, Middle East, Africa and Asia	A			
4G module for North America	B			
4G module for Australia, New Zealand and South America	C			
Without 4G module	X			
Cables to Swiss power grid	CH			
Cables to European power grid	EU			
Cables to US power grid	US			
MR3000C main units Example: **MR3000C-2003I-H-A-X**				
Main unit with: 4GB Memory - WiFi - Ethernet connectivity - Embedded web server for configuration and contro	MR3000C			
External triaxial velocity sensor MS2003+	2003E			
Internal triaxial velocity sensor MS2003+	2003I			
External triaxial acceleration sensor MS2008+	2008E			
Internal triaxial acceleration meter MS2008+	2008I			
Horizontal mounting (only if A = 2003I)	H			
Vertical mounting (only if A = 2003I)	V			
Horizontal mounting, ± 4 g (only if A = 2008I)	H4			
Vertical mounting, ± 4 g (only if A = 2008I)	V4			
External sensor	EX			
4G module for Europe, Middle East, Africa and Asia	A			
4G module for North America	B			
4G module for Australia, New Zealand and South America	C			
Without 4G module	X			
Compatibility with external kit GPS	G			
No compatibility with external kit GPS	X			