BARTEC SYSCOM

Safety is our priority

MR3000C

Vibration & Motion Measurement System

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

Datasheet : 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.

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 are

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

MR3000C with GPRS

Technical specifications

Data acquisition

Principle	4th 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 or combined
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

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

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 (W/O wireless communication)	2 W (velocitymeter) 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

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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 ±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 (±4g)
Noise (10 to 1000 Hz)	typ. 7 $\mu g_{rms}/\sqrt{Hz}$
Frequency response	0 - 600 Hz
Measuring range	±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 batterypack

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 EU[1]/USA[2]	Battery pack[3] with internal AC/DC & cable[4] to MR	External AC/DC converter	Mounting platform	Carrying case
		93100003[1] 93100005[2]	14100007[3] 81000527[4]	87000268	13000039[5] 13000047[6]	74710101
MR3000C main unit with internal triaxial velocity sensor :						
CE Basic Int Set (velocity)	93106007		x	x	x[5]	x
CE Standard Set (velocity)	93106009	x	x	x	x[5]	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
MR3000C main unit with internal triaxial acceleration sensor :						
CE Basic Int Set (MS type to be specified with PO)	93106026		x	x	x[6]	x
CE Standard Set (MS type to be specified with PO)	93106027	x	x	x	x[6]	x
MR3000C units without accessories :						
MR3000C, with internal velocity sensor	14101007				x[5]	
MR3000C, with internal velocity sensor and GPRS board	14101015	x			x[5]	
MR3000C, config for external velocity sensor, without sensor	14101019					
MR3000C, config for external velocity sensor, with GPRS board, without sensor	14101005	x				
MR3000C, with internal acceleration sensor	14101018				x[6]	
MR3000C, with internal acceleration sensor and GPRS board	14101017	x			x[6]	
MR3000C, network master firmware option, for 1x MR3000C	88010003					

* Refer to MS2002+, MS2003+ datasheet