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
- Memory
- Embedded Web Server for easy configuration and control
- Precise timing (GPS)
- Power over Ethernet (PoE)
- Wide dynamic range
- Wireless connectivity

**Data acquisition**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>24 bit</td>
</tr>
<tr>
<td>Sampling-rate</td>
<td>50, 100, 200, 400, 500, 800, 1000, 2000 sps, offers on request</td>
</tr>
<tr>
<td>Number of channels</td>
<td>3</td>
</tr>
<tr>
<td>Channel to channel skew</td>
<td>None – simultaneous sampling on all channels</td>
</tr>
<tr>
<td>Dynamic range</td>
<td>Typ. 130dB@250, 127dB@500 sps</td>
</tr>
<tr>
<td>Data Filter</td>
<td>FIR &amp; IIR digital filters</td>
</tr>
<tr>
<td>Trigger Filter</td>
<td>Digital IIR filter: 0.5 - 15 Hz band-pass (Strong Motion Applications)</td>
</tr>
<tr>
<td>Trigger and de-trigger</td>
<td>Level trigger or STA/LTA</td>
</tr>
<tr>
<td>Principle</td>
<td>Predetermined AND or OR combinations, individual channel votes</td>
</tr>
<tr>
<td>Level trigger</td>
<td>0.003 to 100% full scale</td>
</tr>
<tr>
<td>STA / LTA (Strong Motion)</td>
<td>STA: 0.1 to 25s, LTA: 1 to 250s, Ratio: 0.1 to 25.</td>
</tr>
<tr>
<td>Smart Trigger / De-Trigg</td>
<td>Automatic adjustment of trigger level</td>
</tr>
</tbody>
</table>

**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**
- 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
  - Built-in FTP client to push data to an FTP-server
- FTP
- Display
  - Run, Recording, Warning/Error
  - Status information, important settings.

**Wireless Communication**

**WiFi**
- IEEE 802.11 b/g compliant

**Mobile Network (option)**
- Multi-Band UMTS / HSDPA / WCDMA / GSM / GPRS / EDGE

**Power Supply**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Voltage</td>
<td>9 - 13.5VDC or 48V PoE</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>2 W (velocimeter)</td>
</tr>
<tr>
<td>(W/O wireless communication)</td>
<td>2.3 W (accelerometer)</td>
</tr>
</tbody>
</table>

**I/O and Connectors**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Metallic self-latching push-pull connectors with positioning key (LEMO)</td>
</tr>
<tr>
<td>Power</td>
<td>Metallic connector with protective GND</td>
</tr>
<tr>
<td>GPS</td>
<td>Connector for external GPS</td>
</tr>
<tr>
<td>LAN / PoE</td>
<td>Communication with PC or network - Ethernet 100BaseT</td>
</tr>
</tbody>
</table>
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%)

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 µg√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°C 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

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/continuous background monitoring
- automatic reporting

Please visit our website for more information.

SCS
scs.bartec-syscom.com

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F. +41 (0) 24 454 45 60

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info@bartec-syscom.com
## Ordering information

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Part number</th>
<th>GPRS board EU/USA</th>
<th>Battery pack with internal AC/DC &amp; cable to MR</th>
<th>External AC/DC converter</th>
<th>Mounting platform</th>
<th>Carrying case</th>
</tr>
</thead>
<tbody>
<tr>
<td>MR3000C main unit with internal triaxial velocity sensor</td>
<td>93106007</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Basic Int Set (velocity)</td>
<td>93106007</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Standard Set (velocity)</td>
<td>93106009</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MR3000C main unit with connector for external sensors (without sensors)*</td>
<td>93106008</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Basic Ext Set, for external sensor</td>
<td>93106008</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Classic Set, for external sensor</td>
<td>93106010</td>
<td></td>
<td></td>
<td></td>
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<td>x</td>
</tr>
<tr>
<td>MR3000C main unit with internal triaxial acceleration sensor</td>
<td>93106026</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Basic Int Set (acceleration)</td>
<td>93106026</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CE Standard Set (acceleration)</td>
<td>93106027</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MR3000C units without accessories</td>
<td>MR3000C, with internal velocity sensor</td>
<td>MR3000C-2003I-H-XX-X</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR3000C, with internal velocity sensor and GPRS board</td>
<td>MR3000C-2003I-H-EU-X</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR3000C configured for external velocity sensor, without sensor</td>
<td>MR3000C-2003E-EX-XX-X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR3000C configured for external velocity sensor, with GPRS board, without sensor</td>
<td>MR3000C-2003E-EX-EU-X</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR3000C, with internal acceleration sensor</td>
<td>MR3000C-2008I-H-XX-X</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>MR3000C, with internal acceleration sensor and GPRS board</td>
<td>MR3000C-2008I-H-EU-X</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR3000C, network master firmware option, for 1x MR3000C</td>
<td>88010003</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Refer to the datasheets of MS2003+ and MS2008+

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