SAFETY IS OUR PRIORITY

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MR3000BLA

Blasting Monitoring

The MR3000BLA is a family of instruments dedicated to the monitoring of explosion-induced vibrations. It includes two devices: a portable unit for short-time measurements and a unit dedicated to permanent monitoring. The three channels for vibration and the channel for air overpressure make them perfect for a complete blasting monitoring.

The MR3000BLA devices are equipped with an embedded 4G module for wireless data transfer, and they can be linked with the SCS (Syscom Cloud Software) to offer a near real-time reporting solution with graphical norm comparison and alarming in case of norm exceedance.

Market Applications

- Blasting monitoring
- Mining
- Quarrying

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MR3000BLA Blasting Monitoring

The MR3000BLA is a family of devices developed specifically for the monitoring of vibrations induced by explosions. The MR3000BLA offers 4 acquisition channels: 3 dedicated to vibrations and one to air overpressure. The MR3000BLA family includes two products:

- **MR3000BLA portable unit**, dedicated to short-term measurements, with integrated battery and carrying case;
- **MR3000BLA for permanent monitoring**, with Ethernet connection, GPS compatibility and external extensible antenna.

The trigger-based recording automatically acquires the blast event and the LCD screen displays the most useful related information (peak amplitudes, frequencies). For proper blast documentation, an automatic reporting with norm comparison is immediately generated and sent via e-mail by the Syscom Cloud Software (SCS).

Major features

- Vibration and air pressure acquisition
- Calibration of the velocity sensor according to ISEE Specification for Blasting Seismographs (USA) or to DIN 45669-1 (Germany)
- External triaxial velocity sensor with measuring range ±250 mm/s (±10 in/s) or ±100 mm/s (±4 in/s)
- High pressure microphone with range up to 148 dB(L)
- Wi-fi connectivity
- Embedded 4G module
- Compatibility with Syscom Cloud Software (SCS) for data visualization and automatic blast event reporting

MR3000BLA portable unit

MR3000BLA for permanent monitoring

Technical specifications

Data recording

Resolution	18 bits
Sampling-rate	1'000, 2'000 sps
Number of channels	4
Recording principle	Event recording (time history), continuous time recording, manual trigger
Data memory	Removable Industrial Grade SD Card
Minimum trigger level	0.1 mm/s (0.004 in/s)
Trigger voting logic	Predefined AND or OR combinations, individual channel votes
Pre-event recording	1 - 30 seconds (in 1 sec steps)
Post-event recording	1 - 100 seconds (in 1 sec steps)
Alarm principle	Multiple level triggers with many notification options (settable for each axis)
File event format	XMR/ASCII (if no microphone), ASCII (if microphone is present)

Connectivity

Mobile Network	Internal 4G modem, fallback 3G/2G
Wi-fi access	IEEE 802.11 b/g compliant
LAN connectivity	Available only for MR3000BLA for permanent monitoring

Physical characteristics

MR3000BLA portable unit

Housing	Peli box IP66, 420 x 331 x 170 mm (16.5 x 13.0 x 6.7 in), 6.4 kg
Temperature/humidity	-20° up to 60°C / Up to 100% RH

MR3000BLA for permanent monitoring

Housing	Aluminium IP65, 120 x 180 x 100 mm (4.7 x 7.1 x 3.9 in), 1.5 kg
Temperature/humidity	-20° up to 70°C / Up to 100% RH

External MS2003BLA triaxial velocity sensor

Sensor type	Triaxial geophone with linearized frequency response
Calibration	To be specified at the time of purchase between: • ISEE: calibration according to ISEE Performance Specification for Blasting Seismographs • DIN: calibration according to DIN 45669-1
Measuring range full scale	ISEE: ±250 mm/s (±10 in/s); DIN: ±100 mm/s (±4 in/s)
Frequency range	ISEE: 2-250 Hz; DIN: 1-315 Hz
Dynamic range	> 104 dB
Linearity/Phase	Class 1 (according to DIN 45669)
Cross axis sensitivity	<5% (according to DIN 45669)
Dimensions/weight	100 x 100 x 81 mm (3.9 x 3.9 x 3.2 in) / 1.0 kg
Connector	Cable gland with 1.5 m cable and LEMO 2K push-pull connector
Accessories	Mounting platform for short- or long-term monitoring, soft-soil spike

External high pressure microphone

Sensor type	Air pressure microphone - Array microphone
Measuring range	148 dB (L) ± 3 dB
Frequency range	2-250 Hz
Dimensions/weight	60 mm length, 7 mm diameter / 5.5 g
Connection	LEMO coaxial push-pull connector with SMB socket 1.5 m

Power supply

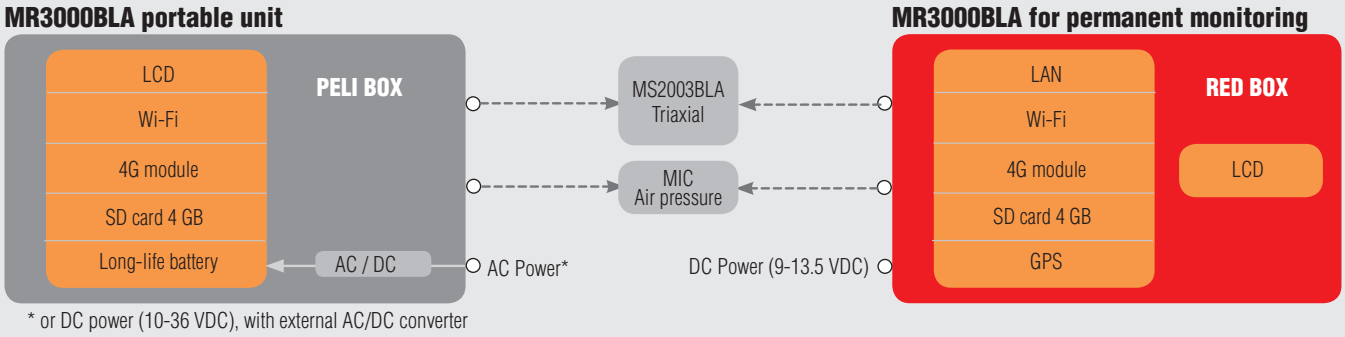
MR3000BLA portable unit

Internal battery	High capacity long life battery (> 3000 charge cycles), 5.3 Ah, 12 VDC
AC power	Internal AC/DC converter, 100-240 VAC, 50-60 Hz, with power LED indicator
DC power	10-36 VDC, with external AC/DC converter and cable to power grid

MR3000BLA for permanent monitoring

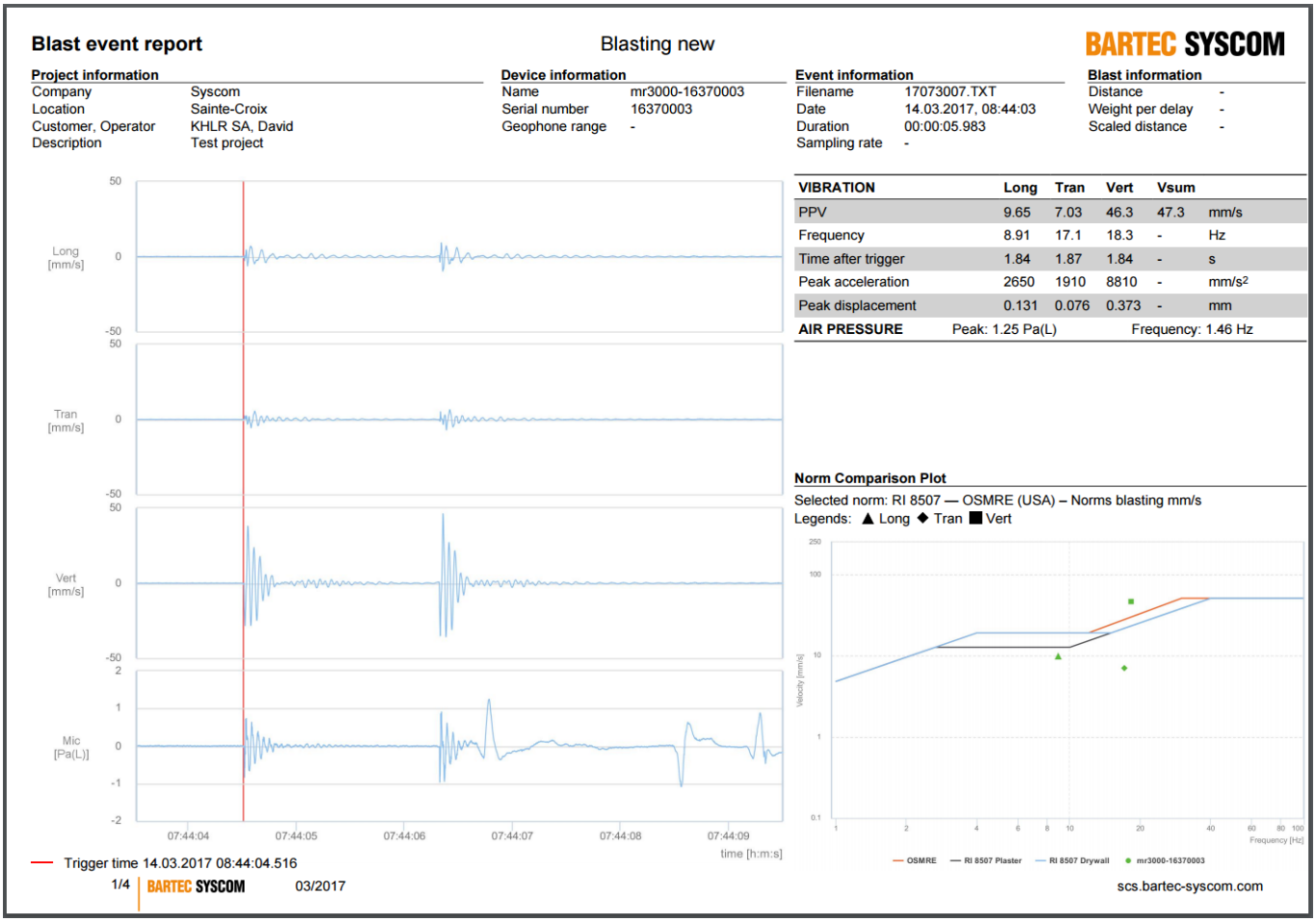
Supply voltage	9 to 13.5 VDC or 48 V PoE

Block diagram MR3000BLA



* or DC power (10-36 VDC), with external AC/DC converter

Blast event report generated by the Syscom Cloud Software



Blast event report

Blasting new

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Project information		Device information		Event information		Blast information	
Company	Syscom	Name	mr3000-16370003	Filename	17073007.TXT	Distance	-
Location	Sainte-Croix	Serial number	16370003	Date	14.03.2017, 08:44:03	Weight per delay	-
Customer, Operator	KHLR SA, David	Geophone range	-	Duration	00:00:05.983	Scaled distance	-
Description	Test project			Sampling rate	-		

VIBRATION	Long	Tran	Vert	Vsum	
PPV	9.65	7.03	46.3	47.3	mm/s
Frequency	8.91	17.1	18.3	-	Hz
Time after trigger	1.84	1.87	1.84	-	s
Peak acceleration	2650	1910	8810	-	mm/s²
Peak displacement	0.131	0.076	0.373	-	mm
AIR PRESSURE	Peak: 1.25 Pa(L)		Frequency: 1.46 Hz		

Long [mm/s] · Tran [mm/s] · Vert [mm/s] · Mic [Pa(L)]

07:44:04 07:44:05 07:44:06 07:44:07 07:44:08 07:44:09 time [h:m:s]

Trigger time 14.03.2017 08:44:04.516

Norm Comparison Plot

Selected norm: RI 8507 — OSMRE (USA) – Norms blasting mm/s

Legends: ▲ Long ◆ Tran ■ Vert

Velocity [mm/s] · Frequency [Hz]

OSMRE · RI 8507 Plaster · RI 8507 Drywall · mr3000-16370003

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Blast report on SCS cloud software

The blast report is automatically created and sent to the user-defined contacts by the SCS Cloud Software. For more information, please refer to the SCS datasheet or to the Bartec Syscom website.

SCS

scs.bartec-syscom.com

Measurement information

All the details about the project and the measurement are shown on the top left part. If the user adds a comment in the SCS, this is automatically shown in the blast event report.

Time histories

Visualization of 4 components:

- 3 for vibration
- 1 for air overpressure

Summary table

Table with peaks and frequencies related to vibration and airpressure measurements. Additional information like vector sum and user comments is shown.

Comparison with the standard curve

The velocity peaks calculated on the 3 axes are compared with the curve selected by the user (OSMRE, RI 8507, DIN 4150-3 and others).

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Ordering information

Description	Part number	Triaxial velocity meter	Overpressure microphone	AC power	DC power
MR3000BLA portable unit					
Example: **93106036-C-US-ISEE**					
Kits MR3000BLA portable unit with: MR3000BLA recorder - integrated carrying case - internal battery - 4GB Memory - WiFi - Internal 4G module - Embedded web server for configuration and control - Triaxial velocity sensor MS2003BLA for horizontal mounting - Kit with mounting plate and spikes for velocity sensor					
AC power (internal AC/DC converter), with microphone amd accessories	93106036	x	x	x	
AC power (internal AC/DC converter), without microphone	93106038	x		x	
DC power, with microphone and accessories	93106042	x	x		x
DC power, without microphone	93106043	x			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				
Cables to Swiss power grid	CH				
Cables to European power grid	EU				
Cables to US power grid	US				
Full range ±100 mm/s - DIN 45669-1 compliant	DIN				
Full range ±250 mm/s - ISEE Guidelines compliant	ISEE				

Description	Part number	Triaxial velocity meter	Overpressure microphone	AC power	DC power
MR3000BLA for permanent monitoring					
Example: **93106047-A-EU-DIN**					
Kits MR3000BLA for permanent monitoring with: MR3000BLA recorder - 4GB Memory - WiFi - Internal 4G module - Compatibility with external kit GPS - Embedded web server for configuration and control - 3m Ethernet cable - DC input - AC/DC converter - Mounting plate for MR3000BLA - Triaxial velocity sensor MS2003BLA horizontal mounting - Mounting plate for MS2003BLA for fixed installation - Overpressure microphone and accessories					
With battery pack and related cables	93106047	x	x		x
Without battery pack	93106048	x	x		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				
Cables to Swiss power grid	CH				
Cables to European power grid	EU				
Cables to US power grid	US				
Full range ±100 mm/s - DIN 45669-1 compliant	DIN				
Full range ±250 mm/s - ISEE Guidelines compliant	ISEE				

Accessories	
Triaxial velocity sensor, full range ±100 mm/s	MS2003BLA-H-TRIA-100
Triaxial velocity sensor, full range ±250 mm/s (10 in/s)	MS2003BLA-H-TRIA-250
Microphone for air pressure 2-2000 Hz, 148 dB (L)	87000568
1.5m cable from MR to microphone	81000608
Windshield for microphone	87000569
Set of 3 mounting rods for microphone	13100013
Kit with mounting plate and set of spikes for velocity sensor	13100010
Power and other accessories	Refer to MR3000C

SYSCOM Instruments SA
Rue de l'Industrie 21
1450 Sainte-Croix
SWITZERLAND

T. +41 (0) 24 455 44 11
F. +41 (0) 24 454 45 60

www.bartec-syscom.com
scs.bartec-syscom.com
info@bartec-syscom.com

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