



albris - GMS series **Digital Accelerograph**



Overview

Well-established performances of our true electro-mechanical force balance accelerometer AC-7x series and our powerful, low noise GMS series recorder are now merged together as a state-of-the-art instrument: albris, a compact, full-featured digital accelerograph. Highly optimised cost of ownership and user-friendly design make the albris the perfect choice for any application.

Applications

- ▶ Structural health monitoring
- ▶ Damage estimation
- ▶ Disaster management
- ▶ Earthquake early warning (EEW)
- ▶ Earthquake monitoring networks
- ▶ Aftershock studies
- ▶ Ambient vibration monitoring

Industries & usage areas

- ▶ Earthquake and seismological agencies
- ▶ Research institutions
- ▶ Chemical, oil and gas industry
- ▶ Power and manufacturing plants
- ▶ Dams, reservoirs and mines
- ▶ Hospitals and critical structures

Key Features

- ▶ Sensor dynamic range 165 dB
- ▶ Bandwidth from DC to 200 Hz
- ▶ Extraordinary offset stability
- ▶ Temperature and drift compensation
- ▶ Software selectable full scale
- ▶ Integrated bubble level
- ▶ Full remote management
- ▶ Low noise 32-bit digitiser per channel
- ▶ Up to 5000 sps sampling rate
- ▶ Power over Ethernet (PoE)
- ▶ Wired or Wi-Fi¹⁾ communication
- ▶ Built-in time receiver module (GNSS)¹⁾
- ▶ Internal storage up to 128 GB¹⁾
- ▶ Internal LiPo battery¹⁾ up to 2 h autonomy

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Specifications

Sensor

Axis:	Triaxial, Biaxial ¹⁾ or Uniaxial ¹⁾
Full scale range ²⁾ :	± 0.5, 1, 2 or 4 g, user selectable via software
Type:	True Electro-mechanical Force Balance Accelerometer
Dynamic range:	165 dB (per bin rel. full range) 156 dB (per bin rel. full-scale RMS) 134 dB (0.02 - 50 Hz, integrated PSD)
Nonlinearity:	< 0.1 %
Cross-axis sensitivity:	< 0.5 %
Bandwidth:	DC to 200 Hz
Damping:	0.7 ± 0.1 critical
Offset drift:	0.0005 g / °C
Span drift:	200 ppm / °C
Hysteresis:	< 0.001 % of the full scale

Digitiser

Analog-to-Digital converter:	3 individual per channel 32-bit $\Sigma\Delta$ ADC
Sampling rate:	Standard 1000 sps or up to 5000 sps ¹⁾
Dynamic range:	158 dB (per bin rel. full-scale RMS)
Bandwidth ³⁾ :	0 - 1000 Hz

Recording, Streaming, Trigger and Real-time Calculations

Event recording:	Freely user configurable pre/post event time
Continuous recording:	Freely user configurable file duration and channel selection
Data streaming:	Real-time continuous GSBUS, SEEDLink, Earthworm
Trigger types:	Trigger filter and level: Fully independent high-, low-, or bandpass trigger filters. Freely user configurable thresholds.
STA/LTA:	Threshold, STA/LTA, manual, at start-up, at given date/time, over TCP/IP network voting logic.
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STA/LTA:	Freely user configurable with or without clamping

Real-time single/ double integration, differentiation, HP/LP/BP filtering, decimation, peak / average calculations on physical sensor data can be provided as virtual data channels, which can be exploited exactly as, and synchronous to, physical sensor data. All the recording, triggering, and streaming functions can be used on all physical and virtual channels.

Storage Memory

Size:	8 GB, higher capacity up to 128 GB available ¹⁾
Recording format:	Standard miniSEED or Extended miniSEED
Storage management:	Intelligent quota management based on user policy to define reserved space per file type.
Estimated capacity ⁴⁾ :	Sampling rate [sps] x 0.4 [MB/day/ 3 channel]

Time Synchronisation

Internal clock:	Intelligent Adaptive Real Time Clock (IARTC)
Sources:	NTP, GNSS (GPS, GLONASS, BeiDou and Galileo) ¹⁾
Drift rate:	< 0.02 ppm @ constant +25 °C < 0.1 ppm @ -20 to +70 °C
Accuracy:	< 0.5 ms (NTP), < 0.1 μ s (GPS)

A) If installed, the operating temperature range is from 0 to + 50 °C

B) Cable length and wire termination can be customised according to customer's requirements

Communication & Connectivity

Network interface:	10/100BASE-TX, Wi-Fi (b/g/n) ¹⁾
Network protocols:	Fixed or Dynamic IP, OpenVPN support, SSH, FTP/SFTP, HTTP (web interface), GeoDAS, for management and data
Connectors:	Power input and output, Ethernet (PoE), USB console, GNSS antenna ¹⁾ , Wi-Fi antenna ¹⁾

Power

Input voltage:	9 to 48 VDC or POE mode A and B Can provide power to external accessories
Consumption:	< 3.5 W ⁶⁾ excluding external accessories
Protections:	Reverse polarity, Over/Under voltage, self-resettable
Backup battery:	Internal LiPo battery ¹⁾ , 1500 mAh, 2 h autonomy. Higher autonomy is available with external batteries

Physical & Environmental

Type:	Aluminium housing
Size:	205 x 120 x 105 mm ⁷⁾
Weight:	4 kg
Index of protection:	IP67 (NEMA 6)
Mounting:	Single bolt, surface mount, adjustable within $\pm 10^\circ$
Temperature range ⁵⁾ :	-20 to +70 °C (operating)
Humidity:	0 to 100% (non-condensing)
MTBF:	> 500'000 hours (based on AC and GMS series)

1) Optional

2) Full scale customisation available on request

3) Other bandwidth customisations are available on request

4) Average. Since the data is compressed, capacity depends on the context of the data.

5) Use of internal battery degrades this specification, see footnote A below.

6) Average power consumption in steady state with active network communication; min 2.8 W, max 4 W.

7) Recommended installation space: 300 x 120 x 105 mm

Accessories & Optional Products

Orientation, Mounting, Protection and Performance

Optional orientation	Wall mounted (-W); ceiling mounted (-C)
SEN-WALLBRACKET	L Angle for wall mounting, 150x150x10mm
HOU-SEN-SS	Stainless steel protective enclosure
AC-IP67	IP67 (NEMA 6) protection
Performance	Custom bandwidth or full scale

Internal Modules

GMS-TIM	Internal GNSS time receiver, incl. 5 m cable with antenna
GMS-WiFi	Wi-Fi network module, incl. antenna
albris-IB	1500 mAh internal LiPo battery ^{A)}
MEM-MSDXXG	Storage memory sizes, 32, 64 or 128 GB

Cables and Connectors

xxx-WIR--- ^{B)}	Power supply cable for external accessories
xxx-WIR---PoE ^{B)}	Ethernet and PoE cable
xxx-ANT ^{B)}	GNSS antenna with 5 m cable

External Accessories

xxx-PSU	Universal Power Supply, 90 - 260 VAC / 50 - 60 Hz
BAT-Exxx	Batteries from 7 to 100 Ah
GXX-4GMX	4G router
ETH-T1L	Long distance Ethernet module