

DATASHEET 02-17

# DATA-CUBE<sup>3</sup>

SEISMIC DATA RECORDER –  
DEVELOPED FOR REAL FIELD  
APPLICATIONS

The **DATA-CUBE<sup>3</sup>** is a state-of-the-art stand-alone 3-channel seismic data recorder. It was initially developed at GFZ in 2011 and later modified in close cooperation between GFZ and Omnirecs to meet the requirements which have been identified during many years of seismic network operations in the field and various international measurement campaigns in harsh environments. More than 1000 DATA-CUBE<sup>3</sup> recorders have been sold to over 20 countries by the end of 2016.



## KEY FEATURES

- ▶ **extremely low power consumption** (120mW @ 100sps and cycled GPS, internal GPS antenna version)
- ▶ **ultra compact size & weight**
- ▶ **accurate time base (GPS)**
- ▶ **easy handling for field installations**
- ▶ **robust, reliable and well-proven design for unattended field operation**
- ▶ **works with BB seismometers, geophones, infrasound sensors and other DC up to 160Hz signals**
- ▶ **competitive price**

## TYPES

DATA-CUBE <sup>3</sup>	Power supply	GPS antenna	Typical application examples
Type 1	2x D-cell alkaline batteries (compartment) or external power supply	Internal	<b>Outdoor installations</b> for active seismic measurement campaigns of <b>up to two weeks</b> with two D-cell alkaline batteries or long-term deployments with external power supply
Type 1 e/a	2x D-cell alkaline batteries (compartment) or external power supply	External	<b>Vault or indoor installations</b> for noise and acceleration measurement campaigns of <b>up to two weeks</b> with two D-cell alkaline batteries or long-term deployments with external power supply
Type 2	External power supply only	External	<b>Long-term outdoor, vault or indoor installations</b> for <b>passive seismological measurement</b> campaigns

The **DATA-CUBE<sup>3</sup>** is ideally suited for field installations to reliably record seismic data for post-processing. The concept and design of the **DATA-CUBE<sup>3</sup>** is the result of years of expertise by scientists and engineers from seismic installations and handling experience in the field. A great flexibility allows satisfying specific customer requirements by offering the **DATA-CUBE<sup>3</sup>** in different configurations and for sensors like geophones, broadband seismometers and also infrasonic sensors. A constantly high quality of the product is achieved by a well-proven production chain and controlled by regular comprehensive inspections.

### NEW Data streaming extension

The **CCUBE** extends every **DATA-CUBE<sup>3</sup>** with IP communication via WIFI, UMTS and Ethernet. It streams measured data in miniSEED format in real-time directly into your acquisition system. **CCUBE** is an ideal solution for applications which require live and remote seismic data analysis:

- ▶ monitoring of seismic events: earthquakes, vulcanos & tsunami early warning and land slides
- ▶ structural health monitoring for bridges, buildings, geothermal fields and other critical infrastructure
- ▶ remote monitoring of installations with difficult access

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A/D converter	
Type	Delta-Sigma 24 Bit
ADC resolution	24 bit per channel
ADC channels	3
ADC dynamic range	125dB @100sps (128dB @50sps)
Effective resolution	22.4bit @100sps @ gain 1 (typical)
ADC sample rates	50, 100, 200 or 400sps in 3 channel mode 800sps in 1 channel mode
ADC gain selection	1, 2, 4, 8, 16, 32, 64
ADC noise level	10µV/√HZ
Full scale input	4,096Vpp @ gain 1
Input impedance	100kOhm
Signal input voltage	Adjusted by customized breakout box according to sensor specification

Time base	
Type	GPS synchronized free running internal quartz
GPS	GPS receiver built-in
GPS accuracy	1µs
GPS antenna	Internal or external GPS antenna versions available  External version is delivered with 3-5m GPS antenna cable
Free running accuracy	<10ms for 20 days without processing <0.01ms with processing (resampling)

Data storage	
Storage type	SDHC memory card (internal)
Capacity	Up to 32GB (ca. 280 days @100sps)
Recording type	Continuous recording
Recording format	Raw (miniSEED & SEG-Y offline converter software included)

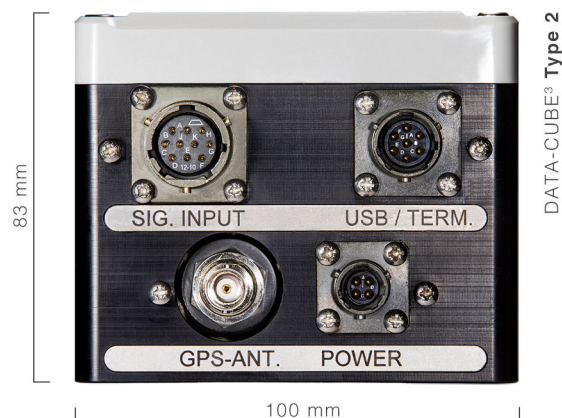
Local user interfaces	
Serial port	Monitoring, additional sensor modules
USB 2.0	Configuration, setup, data download (16MB/s)
LEDs	Indicating status of system, acquisition, GPS timing and data storage

Connectors	
Sensor	MIL-C-2684 A12-10S
Power/Communication	MIL-C-2684 A10-07P
Power	Type 2: MIL-C-2684 A08-04P
GPS antenna	Type 1 e/a: SMA (female) or BNC (female) Type 2: BNC (female)

Power supply	
Input voltage	5-24V DC
Battery	Type 1: internal & external Type 2: external only
Power consumption	120mW with internal GPS antenna 197mW with external GPS antenna for vault installations (rated for 100sps & GPS active 5min per 30min)

Physical	
Size	100 x 100 x 83mm (830ml)
Weight	890g with internal GPS antenna 850g with external GPS antenna
Operating outdoor temperature	-20 - 70°C Lower temperature versions available
Housing	Reinforced plastic
Shock resilience	5g (sinus)
Waterproof	IP67 (1m water depth for 48h)
Transportation	Optional: Rugged aluminium transport box for up to 12 DATA-CUBES for easy handling & deployment in the field.

Specifications are subject to change without notice.



Sens or interface: Maximum flexibility and support for a wide range of seismometers and other sensors are key criteria for the **DATA-CUBE<sup>3</sup>**. We provide sensor-specific breakout boxes (BOBs) which power the seismometer and adjust analogue voltage output from the seismometer to the **DATA-CUBE<sup>3</sup>**. Customized BOBs are built according to customer requirements.