

Seismic Instruments

Developed for real field applications



DATA-CUBE³





The Seismic Data Recorder

The DATA-CUBE³ is the perfect stand-alone 3-channel seismic data logger when it comes to robustness, reliability and handling. The concept and design of the DATA-CUBE³ is the result of years of expertise by scientists and engineers from seismic installations and handling experience under rough field conditions.

Characteristics:

- Extremely low power consumption
- Very small size and weight
- High flexibility
- Compatible with almost all sensors like broadband seismometers from Nanometrics,
 Lennartz or Guralp; different geophones, infrasound sensors and many more
- Best performing analogue-digital-converters (ADC) for ultra-precise and low noise digitalization

DATA-CUBE³



GFZ Helmholtz-Zentrum POTSDAM

The DATA-CUBE³ has already been operated in many various international measurement campaigns in harsh environments.

Examples:

- 100 DATA-CUBE³ together with 4.5 Hz 3-axis geophones were used in the Metaforest Large-N experiment in Mimizan, France
- 300 DATA-CUBE³ were used in three 18 km profiles in the Baza Basin, Spain

The DATA-CUBE³s great flexibility by different configurations allows us to meet the most diverse scientific demands of our customers as the devices are perfectly designed for specific requirements of short and long-term applications.

Type 1 DATA-CUBE³





Short-term Campaigns and Tunnel Installations

KEY FACTS: Internal Power Supply / Internal GPS Antenna / 120 mW Power Consumption

With its internal GPS antenna and internal battery compartment, the DATA-CUBE³ Type 1 is the ideal companion for short term campaigns. The robust and ultra-compact, all-round data recorder can be operated for up to two weeks by the power of only two D-cells and is therefore ideally suited for active seismic measurements.

Furthermore the DATA-CUBE³ Type 1 is optimally equipped for measurements in deep tunnels or caves, due to the possibility of both internal or external power supply.

Easy procedure of tunnel or cave deployment:

- Capture a GPS signal for the time stamp in battery operation outdoors
- Enter the GPS-less area with the device turned on
- Switch to an external long-term power supply during continuous operation
- Reverse the steps at the end of the measurements

DATA-CUBE³ Type 2



GFZ Helmholtz-Zentrum

Long-term Deployments and Building Installations

KEY FACTS: External Power Supply / External GPS Antenna / 169 mW Power Consumption

The DATA-CUBE³ Type 2 has a flexible external GPS antenna which allows to operate the device for long time measurements inside a building with continuous time correction. A recording time of up to 230 days will be achieved when using a standard car battery (80 Ah).

Furthermore the DATA-CUBE³ Type 2 comes along very well equipped for additional live monitoring and streaming. Therefore, it is very well suited for research in isolated and difficult accessible regions.

SPECS TYPE 1 + 2: ADC: 3 channels á 24 bit / ADC sample rates: 50, 100, 200 or 400 sps in 3 channel mode; 800 sps in 1 channel mode / ADC gain selection: 1, 2, 4, 8, 16, 32, 64 / Data storage Capacity up to 64 GB (ca. 320 days @100 sps with 32 GB) / Size 100 x 100 x 83 mm (830 ml)

CCUBE



Live Data Streaming

KEY FACTS: Communication add-on / Various applications / Compact CUBE Design / Ideal device to maintain the DATA-CUBE³ from remote

The CCUBE is designed to reliably transmit seismic data with minimal power consumption via LTE, Wi-Fi or any other IP-based communication method. It is designed to cooperate perfectly together with the DATA-CUBE³ and is ideally for remote DATA-CUBE³ maintaining and data streaming.

It is very well suited for applications like:

- Tsunami or hazard early warning systems which require continuous live sensor data for quick analysis, risk mitigation and fast reactions based on ultra-rapid assessments
- Classical long-term seismology
- Other geophysical installations that benefit from the streamed live data and state-of-health monitoring

SPECS: Operating system: Embedded Debian Linux / Format: miniSEED via seedlink server & Cube plugin / Communication: Wi-Fi (802.11bgn); LTE (4G), Ethernet / Size 100 x 100 x 83 mm (830 ml)

CUBE+



Complete System for Data Acquisition

KEY FACTS: System highly customizable to customer specifications / Streaming possibility / Internal Battery / Possibility for external backup battery / Charge controller for solar panel

The CUBE+ combines the full know-how of our seismic product range into an all-in-one device. The compact, quick to set up all-rounder for permanent field use is housed in a robust polymer case which stands harsh environmental conditions.

Depending on customer requirements, the CUBE+ can flexibly be expanded by:

- The number of sensor input channels
- The integration of a breakout box (BOB) to support various scientific sensors
- Integrating an additional streaming solution

SPECS: Power supply: internal (12 V, 6.5 Ah), external battery, solar panel / Colors: on customer request / Size: according to system requirements

Geophones



The Short Way to Large Data

KEY FACTS: Frequency: 4.5 Hz / 3-axis / Sensitivity: 28.0 V/m/s / Operating Temperature: -40 to 100 °C / Weight: 880 g

Without a robust and reliable sensor, the best data recorder is useless. Therefore, DiGOS has a passive 4.5 Hz 3-component-geophone in its standard portfolio. The rugged housing is equipped with a 3 m cable and detachable spikes. The installed coils do not require any power, which makes them ideal to use with the extremely energy-saving DATA-CUBE³.

Since DiGOS is known for high flexibility, we also offer other types of geophones on customer request. Other frequencies, number of measured axes and different cable lengths are possible too.

SPECS: 3-channel (x, y, z axis); Frequency: 4,5 Hz / Sensitivity: 28.0 V/(m/s) / Operating temp.: -40 C to 100 °C / Weight: 880 g / Size: body: 115 x 90 x 55 mm, spike length: 75 mm, typical cable length: 3 m (different cable types and lengths are possible on request)

Breakout Box (BOB)



One for all, all for one

KEY FACTS: Very small / Power supply for DATA-CUBE³ and sensor / Possibility of additional functions

Specially designed breakout boxes (BOB) allow to connect almost any sensor to the DATA-CUBE³. The small multi-talents can:

- Supply active sensors with the required power
- Connect each channel of the DATA-CUBE³ to a separate sensor
- Adapt the sensor voltage to the DATA-CUBE³
- Preserve rechargeable batteries with a deep discharge protection
- Provide lock, unlock & centering functions
- Provide the possibility to read out the mass position

So the DATA-CUBE³ (+ BOB) operates with nearly every seismic sensor like:

- Geophones
- Broadband seismometers from Nanometrics, Lennartz, Guralp etc.
- Infrasonic sensors like e.g. Chaparral, Item, etc.
- Tiltmeters like e.g. Jewell

Parallel Cube Downloader (PCD)



Data Collection

KEY FACTS: Simultaneous download of up to 12 DATA-CUBE³ / Fully automated software / Integrated LEDs for processing state for each device

The Parallel Cube Downloader (PCD) is the ideal way to quickly and efficiently prepare a lot of data from large measurement campaigns for post processing. Up to 12 DATA CUBE³s can be connected simultaneously. The automatic download and backup of the recorded data starts immediately after connecting a DATA-CUBE³. Integrated LEDs show the processing state for each DATA-CUBE³.

After download and backup of the measured data, the PCD can setup each DATA-CUBE³ for the next measurement campaign. Additionally, the PCD gives the opportunity to exchange a processed DATA-CUBE³ after its processing by a new one. The rugged design allows operation under field campaign conditions.

Seismic sources



Wave Generation

KEY FACTS SDD 6600: energy of 6600 Nm / penetration depth of 1500 m / up to 600 excitations per day

KEYFACTS SDs 600: up to >120 m distance high frequency SH-stimulation with very low P-wave stimulation adjustable impact force and direction

To complete the services for seismic exploration, DiGOS offers seismic sources for wave generation from own development.

The Seismic Drop Down SDD 6600 is a mobile P-wave source with an energy of 6600 Nm and therefore, a penetration depth up to 1500 m. It is also characterized by its foldaway tower, which allows transportation in a norm sea container.

The SDS 600 is an ultra-mobile SH-wave source which can be easily set up and operated by one person. It is transported in a compact, rugged aluminum box with a total weight of less than 70 kg. It is designed for mounting on standard trailer couplings or on the SDD 6600.

Peripherals



Accessories to Complete your Scientific Equipment

- Aluminum Transport Boxes
- Different sensor cables, built after customer requirements
- Sensor extension cables: to extend the distance between one or all of your sensors to the DATA-CUBE³
- Power cable and Power supply unit
- USB cables for configuration of our devices and data download
- Monitor cables for sensor performance and noise checks in the field during installation
- USB-Monitor-Shift cables to switch between operating modes of the DATA-CUBE³, e.g. used to establish access by Raspberry Pi
- Combi cables built after customer requirements to combine different cables within one plug - for example to combine USB-, Monitor- and LAN-cable in one plug to be used on the CCUBE
- Rugged LTE or Wi-Fi antennas

You would like to get more information about our seismic products?

Then have a look at: **digos.eu**

You have questions about special solutions?

Then contact: info@digos.eu

You have found exactly the seismic equipment you need?

Then do not hesitate to contact us: **sales@digos.eu**

We will be pleased to clarify your specific setup with you, answer your questions and provide you with a detailed offer.

DiGOS Potsdam GmbH

Telegrafenberg 14473 Potsdam Germany Phone: +49 331 288 1133

Managing directors: André Kloth, Jens Steinborn Local court: Potsdam www.digos.eu



Today, more than 1.500 CUBEs are operated by over 30 countries.