IP COMMUNICATION –
LIVE STREAMING FOR
GEOPHYSICAL INSTRUMENTS

DATASHEET 03-20
CCUBE

The **CCUBE** (Communication Cube) is a modular communication device for real-time data transmission recorded by the DATA-CUBE³. It was developed in collaboration between the seismology group of University of Potsdam, Omnirecs UG, GFZ Potsdam and Gempa GmbH to extend the possible application range of the field-proven DATA-CUBE³. The **CCUBE** is designed for low power operation and to reliably transmit seismic data via LTE, WiFi or other IP-based communication method.
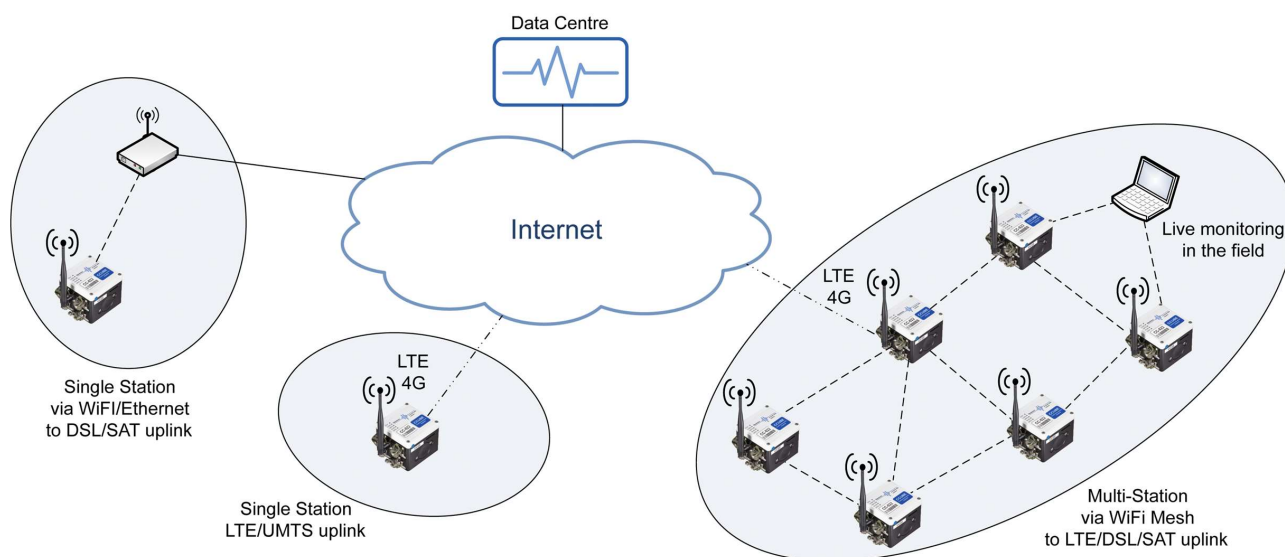
KEY FEATURES

▶ **real-time IP communication extension for DATA-CUBE³ recorders and other geophysical data loggers**
▶ **streams seismic measurements via seedlink server**
▶ **integrated WiFi 802.11bgn** (including Meshing)**, LTE/UMTS/EDGE** (optional) **and Ethernet**
▶ **live state-of-health monitoring**
▶ **very low power consumption of typically <1W**
▶ **ultra compact size & weight**
▶ **easy handling for field installations**

The **CCUBE** is the optimal **DATA-CUBE³** extension to meet today's needs for real-time seismic data streaming. New applications like tsunami or hazard early warning as well as monitoring infrastructure or geothermal fields require continuous live sensor data for quick analysis, risk mitigation and fast reactions based on ultra-rapid assessments. The **CCUBE** provides a robust and reliable solution for transmitting seismic and other sensor data. Moreover, classical long-term seismological and geophysical installations benefit from live data streaming and state-of-health monitoring via **CCUBE**.

INSTALLATION EXAMPLES

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TECHNICAL SPECIFICATION

System performance	
System architecture	ARM9
Operating frequency	400MHz
System RAM	256MB
Operating system	Embedded Debian Linux
Recovery	64MB (buffering up to 1 day @100sps)

Data streaming	
Format	miniSEED via seedlink server & Cube plugin
Live streaming	Yes
Data buffering	Yes, up to one day in case of communication outages (@100sps, STEIM2 compression)

Time synchronization	
NTP	NTP synchronization via Internet

Communication	
WiFi	802.11bgn
WiFi configurations	Client in managed network, ad-hoc or meshing
WiFi meshing	Supported via B.A.T.M.A.N. (see http://open-mesh.org)
WiFi meshing distance	800m between CCUBEs with free line-of-sight & omni-directional antennas at 2m height
WiFi meshing bandwidth	4MBit/s for 800m distance between CCUBEs (see WiFi distance)
Mobile broadband (cellular network)	LTE (4G) Securely tightened SIM card slot with screwed and sealed cap.
Ethernet	100MBit/s
VSAT & BGAN	Supported via Ethernet interface

Remote operation	
VPN access	Yes (OpenVPN)
Remote login	Yes (SSH)
Monitoring	Yes (system voltage, temperature, communication status & performance)

Local operation	
RS-232 / USB	Terminal access
LEDs	Indicating status of Ethernet connection, system load, UMTS (if option is available), WiFi/WLAN and seismic data acquisition

Connectors	
Data out	MIL-C-26482 12-10P (Ethernet, USB, RS-232)
WiFi antenna	RP-SMA (female)
Mobile broadband antenna	FME (male)
DATA-CUBE3 input	MIL-C-26482 10-07S
Power	MIL-C-26482 08-04P

Power Supply	
Input voltage	10.5-24V
Battery	External battery or power supply required
Power consumption	Idle: 360mW Streaming via Ethernet: 700mW Streaming via WLAN: 820mW Streaming via UMTS (typical): <1W Power consumption rated for CCUBE only. DATA-CUBE³ must be added (~300mW running in continuous GPS acquisition mode).

Physical	
Size	100 x 100 x 83mm (830ml)
Weight	730g
Operating outdoor temperature	-10 - 60°C (other possible on request)
Housing	Reinforced plastic
Waterproof	in accordance with IP67 (1m water depth for 48h)
Transportation	Optional: Rugged aluminium transport box for up to 12 CCUBE units for easy handling & deployment in the field.

Specifications are subject to change without notice.

CCUBE

83 mm

Data out   WLAN   CUBE

UMTS/LTE   POWER

100 mm

DiGOS

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