

K/MT4230

The founding fathers of K.U.M. had their first encounter with an Ocean Bottom Seismometer (OBS) in 1996. They were immediately fascinated by the combination of high-precision electronics and absolute reliability. A year later, they incorporated as K.U.M. to develop and enhance a range of scientific research equipment for use in the deep sea environment.

In 1999, K.U.M. was part of a scientific expedition that provided the team with first-hand experience of the operation of an OBS, one that was considered to be state-of-the-art at that time. That experience highlighted a number of areas where the team felt improvements could be made. Most notably, they felt the releaser was too big and too heavy, the materials that were used were easily corroded, the quality of the data gathered was poor, and the user interface was completely out of date. With all this in mind, the K.U.M. team decided to address the challenges of building a better system.

In 2001, work began on K.U.M.'s own acoustic releaser designed to eliminate the disadvantages of other models on the market at that time. And, in 2003, K.U.M. launched its first titanium releaser, KUMQuat, which is still considered best in class today.

In the following years, based on interest from several universities, K.U.M. constructed a broadband OBS, which would later be called LOBSTER. This represented the team's first attempt to design a complete OBS system. However, as sophisticated as the LOBSTER was, it was not perfect. So, in 2013, K.U.M. began to develop an OBS that would deliver the team's radical new vision: an OBS that would offer both the highest performance and lowest energy consumption, yet simultaneously be small and safe enough to use on the deck of a vessel in open seas.

The design of this new OBS was so promising that the development work was supported by the German state of Schleswig-Holstein and by the European Union. After two and a half years of development work, K.U.M.

proudly presented a new deep sea OBS concept called NAMMU; this was truly a state-of-the-art instrument that received significant market attention from the moment it was launched.

Since then, NAMMU has proven itself on dozens of missions, with its data quality, reliability and user-friendliness resulting in widespread enthusiasm for the concept.

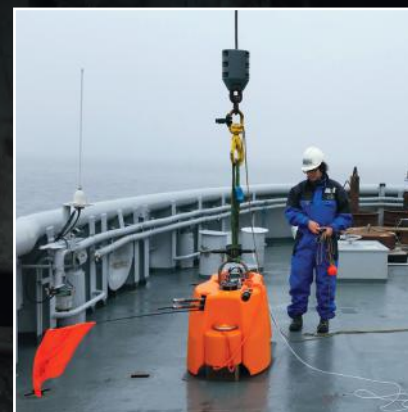
In contrast to earlier models, the buoyancy shell of the NAMMU is designed to simultaneously protect the sensitive sensor system from shocks and accidental impacts during transportation, deployment and recovery. The sensor is located directly at the bottom of the pressure tube and has direct contact with the anchor, which is crucial for good coupling. The anchor itself, like the OBS, is asymmetrical in weight distribution so when the two come together, the complete system has no tilt during descent and lands on the seabed perfectly level.

During recovery, when the anchor is released, the OBS ascends and resurfaces vertically with a flashing beacon and orange flag sticking high up out of the water for clear visibility and speedy recovery. All parts exposed to seawater are made of either polyethylene or titanium; the result is a highly robust, fully saltwater-proof instrument that is perfect for long-term use.

The data logger is continuously enhanced for precision, robustness and low energy consumption. With a signal-to-noise ratio on four channels of over 142 decibel and with only 125mW energy consumption, this is a high-performance piece of kit. Equally impressive is a 120 Sec broadband

seismometer, which works completely autonomously and with a precisely tuned dynamic range. The unit's total energy consumption is less than a third of a watt and thus, despite its small size, data can be recorded continuously for up to 13 months and with a battery backpack extension for up to 36 months.

The memory drive unit is simply plugged in from the outside and the complete instrument is operated via Wi-Fi and the browser. It is all part of what makes NAMMU as user-friendly as the TV in your living room.



“an elegant design throughout”

NAMMU:

An elegant design throughout

THE DEPLOYMENT

Up to 50 units can be transported in one 20-foot shipping container. Easy and intuitive programming is offered over a web interface via Wi-Fi – accessible from your laptop or smartphone. No special software is required. Usually a free-falling system, it can also be deployed by ROV.

THE EXPERIMENT

Deployments of up to three years are possible due to low power consumption with reliable storage of vital instrument data and metadata. Good coupling is facilitated through a compact instrument design and an aquadynamic shape enables industry-leading low levels of external noise.

THE RETRIEVAL

Extremely reliable acoustic release is key for retrieval. Other features include quick location of the instrument with radio beacon and flasher, as well as fast data download via external memory StiK. Easy, fast data conversion to mSEED is possible via our portable open-source software.

TECHNICAL DATA	
Weight with 80 Li-Cells	In air (in salt water)
Weight without anchor	156 kg (-13 kg)
Weight with anchor	205 kg (30 kg)
Weight of pressure tube	45 kg (33.6 kg)
Weight of releaser KUMQuat	11 kg (6.4 kg)
Maximum operation depth	6000 m
Maximum operation time	14.5 months (80 LiThCl D-cells) 36 months with optional battery backpack unit
Size without flag w × h × d	635 mm × 770 mm × 800 mm
Anchor size	800 mm × 600 mm
Seismic Sensors	120 sec broadband seismometer or 4.5 Hz Geophones
Pressure Sensor	100 sec Hydrophon HTI-04-PCA ULF or Differential Pressure Gauge (DPG) or Absolute Pressure Gauge (APG)
Data Logger	K.U.M. 6D6: 4 channels at 32bit at 142db
Releaser	KUMQuat 562



Datalogger 6D6

The Datalogger 6D6 is a flexible data acquisition system with the lowest power consumption on the market and outstanding data quality. It features an easy-programming interface accessible via Wi-Fi and large storage capacities to enable extended deployment of up to three years.

Frame

Made from corrosion-resistant titanium and durable syntactic foam, the frame offers buoyancy in a shock-resistant and robust package that can easily endure the forces of the sea. The unit's small size makes it possible to deploy more systems than ever before.

Sensors

There is a seismometer for every use case ranging from broadband seismometers to high-frequency geophones. A hydrophone complements the seismic data for extended precision.

Acoustic Releaser

The releaser brings the instrument back to the surface in perfect condition. It is the world's smallest, most lightweight titanium release unit – fully reliable in even the most challenging circumstances.

