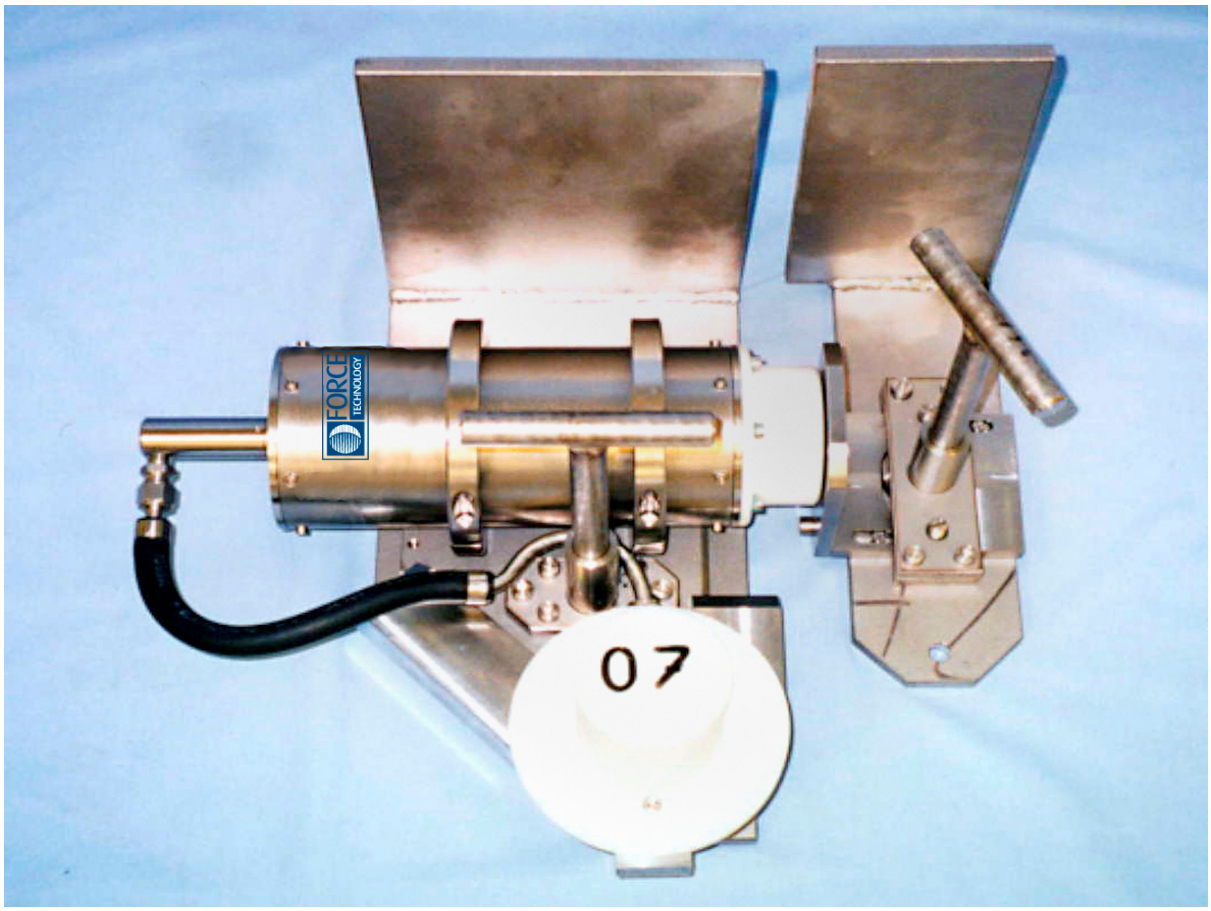
Detection and Quantification of Structural Response

FORCE Concrete Crack Monitor



FORCE Concrete Crack Monitoring system, total size 276 x 545 x 363 mm (11 x 21 x 14 inches) - sensor to the left, target unit to the right

Features and Advantages

- Monitors concrete crack opening
- Measures long term relative crack development
- Built for subsea applications
- Reduces inspection costs through continuous monitoring.

The FORCE Concrete Crack Monitoring System detects development in existing concrete structures. It consists of a sensor and a target unit placed on opposite sides of the crack to be monitored. A dedicated data logger measures the distance between the sensor and the target unit either frequently for dynamic measurements, or periodically for long term monitoring (more than 5 years). A facility for magnetic read-out is available, which is particularly suitable for ROV operations.

The FORCE Concrete Crack Monitoring system:

- Provides a quantitative measure of the development of concrete cracks
- Gives reliable readings through a dedicated data logger and an accurate sensor
- Has a measurement range of 0 to 25 mm with a resolution of 0.1 mm
- Is small, handy and easy to install.

Equipment and operation

The FORCE Concrete Crack Monitoring System features:

- A crack monitoring sensor system containing a sensor and a separate target unit. The target unit is adjusted to an optimum position relative to the sensor. The sensor is mounted on one side of the crack to be monitored, while the target unit is mounted on the opposite side.
- A dedicated low-power data logger with interface to the inductive proximity sensor that measures the distance to the target unit.
- A power consumption that allows approx. 8 measurements per day for at least 5 years.
- A data read-out that has an inductive (non-contact) coupling technology with a conical transmit coil arrangement attached to the data logger and a receiver coil placed outside the transmitter by an ROV.
- The sensor, the data logger and communication unit are all mounted on a frame that slots into a separate base plate which in turn is bolted to the structure by expansion bolts. The system is covered to protect it from falling objects. While a diver must install the base plate, the sensor, data logger and communication unit can be installed and retrieved by a ROV.
- The system offers continuos monitoring of a crack and measures the relative crack width from the exact same position every time. This makes it possible to take any remedial action before a serious fault or problem arises. The highly accurate sensor and reliable data logger provide clear information regarding the structure's condition at the monitoring location at any time.

Specifications of the FORCE Concrete Crack Monitoring System

Instrumented footprint	545 mm x 363 mm (21 x 14 inches)
Instrument height	276 mm (11 inches), including ROV handle and protective plates
Material	6 Mo steel or Titanium
Depth rating	Standard version: 150 m water depth
Connectors	Inductive (non-conductive) coupling to read out unit
Communication	Digital current loop, 4800 baud read out
Measurement range	25 mm
Measurement resolution	0.1 mm
Repeat accuracy	0.5 mm under stable temperature
Power supply capacity	5 years with measurement and logging every 3 hour
Data storage capacity	10 years with measurement and logging every 3 hour
Attachment	Expansion bolt provided with delivery

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