

# Structural Monitoring

## DeepData - Sub Sea Instrumentation



### Introduction

The measurement of structural performance of deep sea structural components has until now proved to be a problem for engineers.

The measurement of meaningful data at depth has been extremely difficult due to power and data transmission constraints.

However, as Oil and Gas exploration pushes into the deepwater environment, the quest for data to assist the offshore engineer with construction and operation of sub sea facilities has become ever more important.

As a response to this need Fugro Structural Monitoring has now developed a data acquisition system specifically designed to meet the challenges of the deepwater environment.

The system is called DeepData to reflect the environment and role of this system.

DeepData is the core of highly versatile data acquisition system, which can be specifically configured to meet most sub sea data collection requirements.



### Applications

The range of applications for DeepData is very wide and is restricted only by the practical constraints of deployment and installation. Typical applications include:

#### Foundations

- Conductors
- Risers
- Moorings Lines
- Anchors
- Templates
- BOP Units



*DeepData acquisition unit components*

Measurements are often required at various stages throughout the operating life of a structural element. The data gathered can provide essential information for:

#### Installation Control

- Design Verification
- Performance Verification
- Fatigue Assessment
- Long Term Integrity Monitoring.

The type of data and rate of acquisition will be application specific, however, DeepData offers the versatility necessary to cope with most measurement scenarios.

#### System Performance

The system is modular in nature and can be configured to meet any application.

The design includes the following performance characteristics:

#### Maximum Depth of Operation

- 300m

#### Data Transmission Options

- None (data storage)
- Umbilical
- ROV download
- Serial connection to Hydro-acoustic link

## Sensor Types

- Accelerometers
- Strain Gauges
- Pressure Sensors
- Temperature Sensors
- Current Meters
- 6DoF Motion Monitor
- Inclinometers

## Data Processing

- Powerful data manipulation and analysis software
- Statistics, cycle counts, signal combination etc.

DeepData provides the core of a modular data acquisition system. The specification of the system will continue to evolve as deep water technology develops. For example, alternative ROV mateable connectors can be incorporated as depth ratings improve. Similarly, new, enhanced hydro-acoustic modems can be used as they become available.

## Configurability

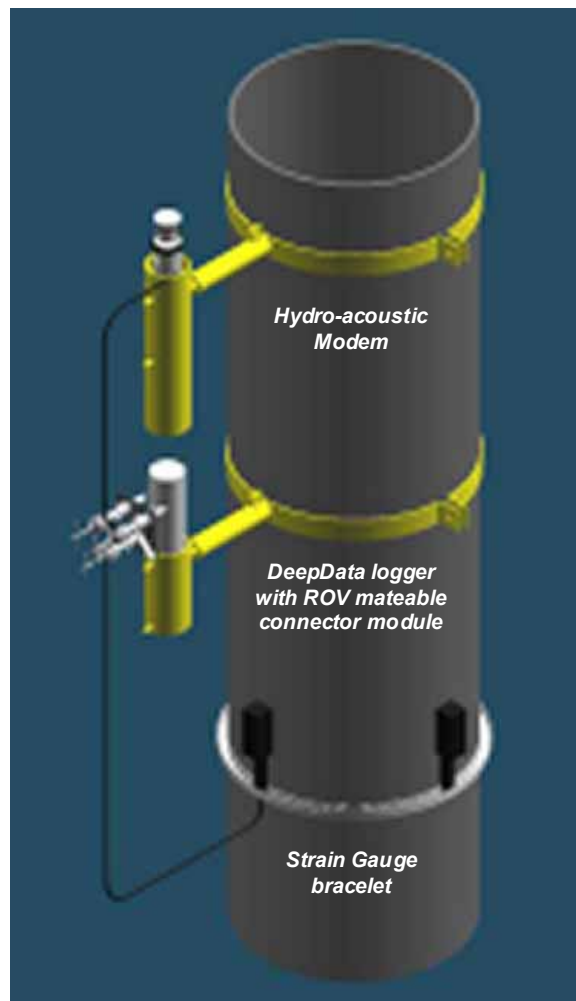
The multi purpose design of DeepData enables a wide range of sensor types and data transmission options to be configured for any particular application. The modular design consists of the following components:

- Data Collection, analysis and internal data storage unit
- Internal batteries, or external battery pack which can be replaced by ROV
- Interface to commercial hydro-acoustic data transmission systems
- Internal sensor options
- Interface to external sensors to permit ROV connection

## Serial Link to Real-Time Display

If a real-time link is chosen, either by an umbilical cable or by hydro-acoustic link, then data can be displayed and stored using the powerful SiMS-NT software package (see separate datasheet).

SiMS-NT has configurable mimic diagrams for the presentation of relevant real-time data to the operator, and sophisticated data archiving and analysis capabilities.



**Measurement of Vortex Induced Vibrations on Riser showing DeepData acquisition system with ROV connector module**

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