UNDERWATER SHAPE SENSING

The DeepGreen500 European project offers a solution for harvesting energy from tidal and ocean currents, in harmony with marine eco system, with a low average cost of energy (COE). In this collaboration project with Minesto a 500kW tidal power plant in form of a "flying" kite tethered to the sea floor is developed.

Integrated photonics sensing technology is used in the realization of a monitoring system for tracking the kite's movements by means of implementing a shape sensing system inside the tether. Dedicated designed strips can hold up to five optical sensors, four measuring deformation induced wavelength shifts (strain) and one measuring temperature. Using the strain information, the bending radius of the strip is calculated. Interpolation of the bending radius in between multiple strips result in an accurate shape reconstruction of the 26m tether length. Any possible thermal influences can be corrected for using the temperature recordings.

Such application requiring multiple optical fibres the ***SwitchedGator*** is ideal to use. Multiplexing up to 15 channels with data acquisition of >19kHz per channel, allows for easy real time shape reconstruction in combination with a dedicated software.The full system tests have proven the system functionality in lab environment. Therefore the system is currently prepared for a real deep-sea test trial in 2019!

SwitchedGator

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