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# Continuous subsea cable health monitoring

Real-time insights and decision support  
through fiber optic monitoring



ABOUT MARLINKS

# Market leaders in subsea cable decision support

CABLE INTEGRITY MONITORING

## Your cable health partner

Marlinks guards offshore power cables and empowers you to take monitoring to a whole new level by putting all data, analytics and insights at your team's fingertips. Ultimately enabling your organization to make informed decisions.

By using fiber optic technology, and continuously crunching subsea cable measurements coming from Distributed Temperature Sensing and Distributed Acoustic Sensing devices, Marlinks generates actionable insights.

Understandings customers use to drive timely and informed decisions allowing to develop a predictive maintenance strategy, maximizing energy availability and resulting in a cost, risk and carbon footprint reduction.

MONITORING BENEFITS

## Turning raw data into actionable insights

Empower O&M teams with real-time insights and active decision support services.



### Predictive analytics

Predict potential cable failures based on historical patterns and trends. By staying ahead of potential risks, you can implement preventive measures and ensure the long-term integrity of your subsea cables.



### Proactive maintenance

Detect early signs of degradation or damage to your cables. By addressing issues promptly, you can prevent costly downtime and avoid the need for reactive repairs.



### Risk & cost savings

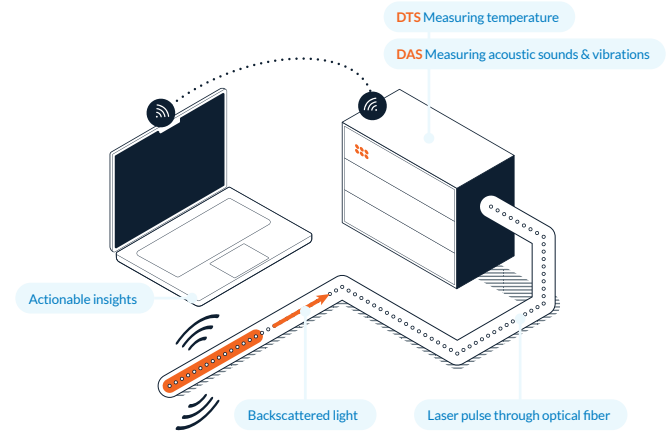
By extending the lifespan of your cables, you can significantly reduce the overall lifecycle costs associated with offshore wind farm operations. Marlinks' solutions help you maximize the return on investment of your assets while minimizing maintenance expenses.

## FIBER OPTIC TECHNOLOGY

### The untapped power of fiber optic technology

The working principle of fiber optic technology for submarine power cables involves the use of optical fibers embedded within or alongside the power cables.

These fibers transmit light signals, which are impacted by changes in environmental conditions or the cables themselves. For instance, variations in temperature, strain, or pressure cause changes in the properties of the light traveling through the fiber.



By analyzing these changes, distributed sensing systems can accurately monitor the condition of the power cables in real-time, allowing to detect potential faults or damages, facilitating timely maintenance and minimizing downtime.

## HARDWARE

### Tailored cable condition monitoring solutions

Marlinks offers a comprehensive solution for cable condition monitoring, covering the entire spectrum from the supply of hardware to installation, commissioning through to monitoring services throughout the operational life of the asset.

#### Hardware agnostic

When supplying hardware, Marlinks prioritizes premium OEM suppliers. Alternatively, Marlinks can seamlessly integrate existing or installed monitoring systems providing a continuous 360° view on your cable's integrity in one single dashboard.

#### Customized cable integrity monitoring system

By collaborating closely with developers, asset owners and operators, a risk-based cable condition monitoring system is designed considering local requirements, risk tolerances, and project-specific demands.



## DASHBOARD

### Get real-time actionable insights

The Marlinks dashboard offers a comprehensive view of all cable monitoring services at once, enabling the monitoring of submarine power cable health for informed risk assessment and cost reduction. Seamlessly integratable into SCADA or through a web browser. Easily download reports for analysis or share them with relevant stakeholders.



# Monitoring services

Marlinks focuses on deriving insights from monitoring devices by combining and translating data from Distributed Temperature Sensing (DTS) and Distributed Acoustic Sensing (DAS) devices. It's not about collecting data; it's about data processing, resulting in actionable insights that are meaningful to the operator.

With **Distributed Temperature Sensing (DTS)**, Marlinks accurately measures temperature variations along the entire length of the cable. By analyzing changes in backscattered light, DTS enables precise temperature monitoring, essential for detecting potential cable exposure.



## DEPTH OF BURIAL

**Continuously monitor the depth of your subsea cables**

Continuously calculate the subsea power cable burial depth taking into account the ampacity, cable design, temperature and soil type. Perform trend analysis, receive alarms on potential risks through SCADA or access the viewer through a web browser.



## CABLE EXPOSURE

**Monitor the risk of cable exposure**

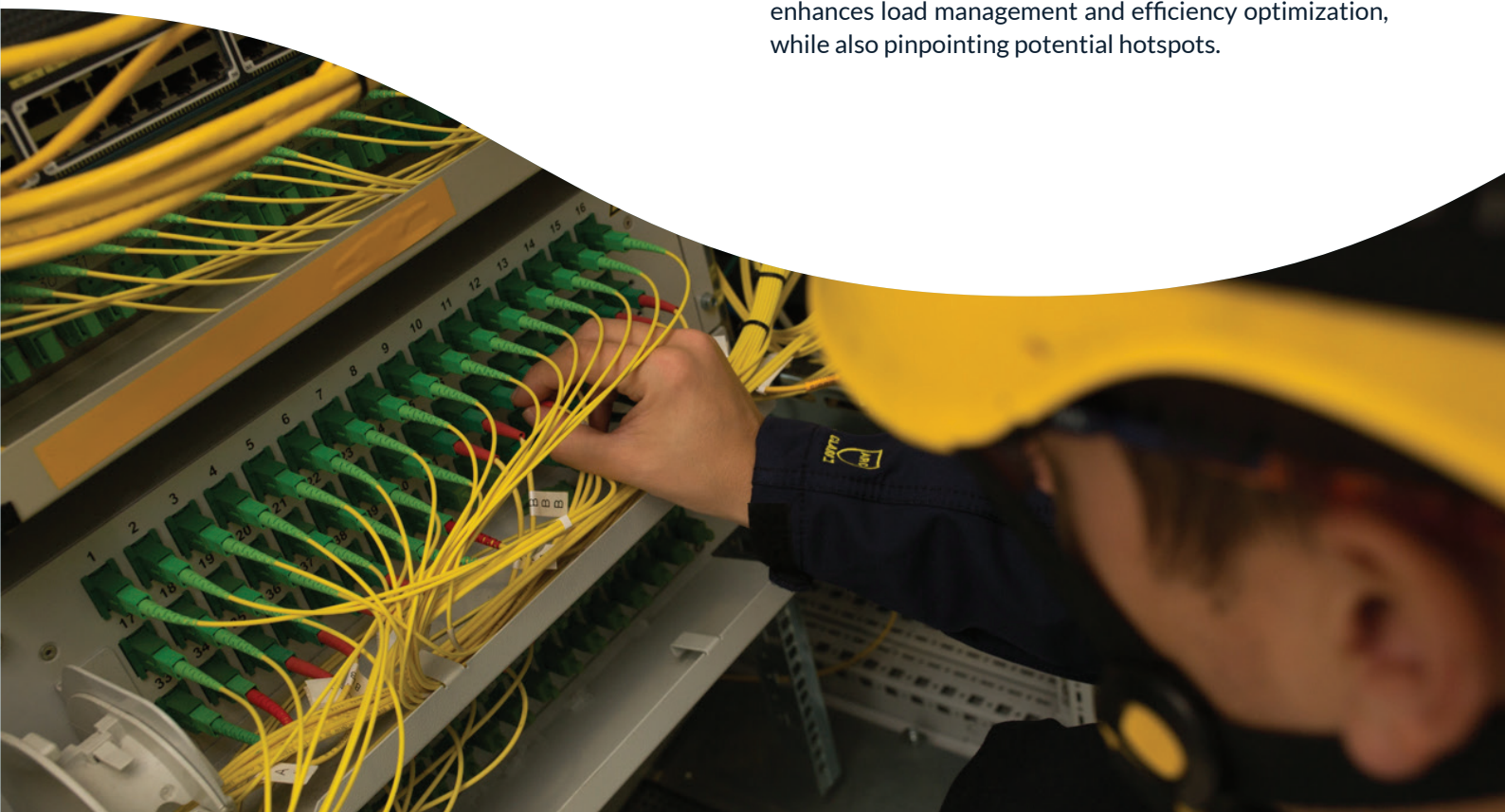
Cable Exposure detects and locates submarine power cable exposures in offshore wind farms. Target interventions to mitigate issues, preventing energy loss, cable damage, and unwanted contact.



## RTTR

**Extend the lifetime of subsea power cables**

Real-Time Thermal Rating (RTTR) enables real-time monitoring of the core temperature of subsea cables, facilitating exact calculations of the time required to reach maximum thermal capacity. This capability enhances load management and efficiency optimization, while also pinpointing potential hotspots.



**Distributed Acoustic Sensing (DAS)** leverages the unique capability of fiber optic cables to function as continuous sensors, detecting acoustic signals along their length. By analyzing the scattered light patterns within the fiber, DAS systems can precisely identify the location and characteristics of disturbances,

transforming them into actionable data. Marlinks has leveraged this technology to develop a suite of monitoring services, by processing large volumes of DAS data—up to terabytes per day—to provide comprehensive insights for various applications.



#### CPS HEALTH MONITORING

##### **Abrasion monitoring through DAS**

Distributed Acoustic Sensing provides continuous measurements of Cable Protection Systems (CPS) on offshore wind turbines. Detecting scraping or swinging sounds, signaling potential CPS destabilization. Relevant information which alerts users to the intensity of abrasion, facilitating prompt mitigation actions.



#### DYNAMIC CABLES

##### **Safeguarding operational efficiency**

Monitoring the behaviour of dynamic cables is crucial for ensuring operational efficiency and preventing potential failures.



#### ELECTRICAL FAULT

##### **Detect and pinpoint electrical cable faults with precision**

Continuously monitoring your cable assets through DAS can enable quick and targeted interventions with real-time detection and localization of emerging cable sheath faults and short-circuit faults along the cable route.



#### IMPACT DETECTION

##### **Efficiently locate external impact events**

Monitor for immediate impact to efficiently identify and pinpoint cable faults caused by anchor strikes or fishing gear entanglement. Real-time monitoring facilitates swift responses, minimizing downtime, enhancing efficiency, and reducing costs for offshore wind farms.



#### ENVIRONMENTAL

##### **Earthquake & marine monitoring**

Distributed Acoustic Sensing (DAS) technology has the power to detect various environmental events such as endangered mammal sounds, earthquakes, and vessel movements. Collecting relevant environmental data and safeguarding marine life at the same time.

# Some global projects

Proud to work with clients on renewable projects all around the globe.



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