

Marmon Sensing Solutions provide power cable monitoring based on fiber optic Distributed Temperature Sensing (DTS). A single fiber optic sensing cable provides real-time, performance and design optimization together with asset integrity monitoring.

Applications

- Underground and subsea cables
- Transmission lines, connections and terminations for tunnels
- Cable ducts and tunnels
- Validation of design and installation calculations.

Condition monitoring

The temperature of the power cable is monitored continuously and in real time, along its entire length enabling hotspots and temperature anomalies to be located and analyzed. This distributed temperature information provides insight into the condition of underground MV, HV and EHV power and aerial cables.

For new installations, the passive and EMI immune fiber optic sensing cable can be integrated into the cable, laid alongside it or placed in an adjacent duct.

Existing installations can be monitored either using an unused fiber contained within the power cable, or by deploying a new sensing cable into an adjacent duct.

Marmon Sensing Solutions can provide permanent monitoring or survey power cables on a regular, intermittent basis. Surveys are also ideal for installation design verification pre- and post-cable energization.

Performance optimization

Knowing the actual cable/route temperature profile identifies "as built" installation hot spots that can be mitigated to address temperature "bottlenecks".

Additionally, DCR/RTTR is a software option that continually mines the data relationship between the known cable load and the measured temperature. Using this information, the time to an over-temperature event or the amount of current that can be supplied through the cable before overheating can be predicted. This informs emergency network investment planning as well as maintenance scheduling.



Typical Performance

Notes: Results shown use a multimode fiber interrogator. Measurement parameters are interdependent.

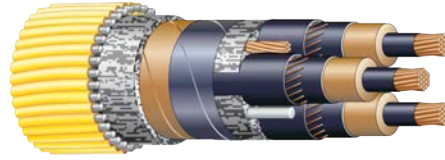
Temperature accuracy: <1.8°F (<1.0°C)
Spatial Resolution: down to 3 ft (1 m)
Measurement Range: 1.2 to 18.6 miles (2 to 30 km) per channel
Measurement Time: 30 sec to 15 min
Unit Operating Temperature: +14°F to +140°F (-10°C to +60°C)

Systems are available to monitor single mode fiber and longer distances up to 43.5 miles (70 km). Please ask for details.

- Optional switch (up to 16 channels) to monitor multiple cables/assets from one instrument
- Maintenance free with outdoor installation capability
- Redundancy options available
- Alarm as well as pre-alarm criteria selectable for each zone
- Over 1000 individually programmable zones per channel (overlapping zones, distinct alarm types)
- User-friendly visualization (GUI) software can be integrated into an existing operations platform allowing data management and asset control.

Features

- Delivers real-time, continuous temperature profile measurements
- Pinpoints hot spots
- Measures many thousands of points through a multimode or single mode fiber optic sensor over long distances
- Acts as a diagnostic and maintenance tool
- Integrated DCR/RTTR software allows for customizing installation parameters for improved monitoring accuracy
- Helps manage overload and emergency conditions
- Utilizes reserves without exceeding permissible conductor temperature
- Allows a quick and dynamic response to transmission requests by monitoring the cable's response to load
- Simulates load predictions using actual data
- Immune to electromagnetic noise (EMI), dirt, dust and humidity
- Intrinsically safe in hazardous environments
- Sensor cable can be integrated into power cable or installed into direct buried, duct bank and other installation type. The sensor cable positions are factored into DCR/RTTR calculations
- Thanks to distributed sensing, all areas are monitored along the asset, not just those at 'higher risk'
- Stand-alone, survey or integrated system operation
- Conforms to international standards: UL 521, ULC S530, VdS, ISO 9001/14001, TÜV, CE.



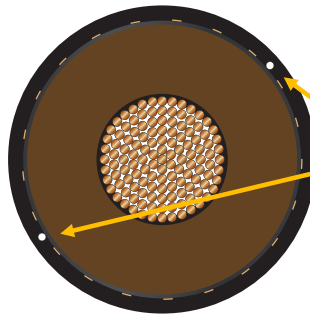
Kerite subsea power cable



Kerite HV power cable

Marmon Utility provides a range of electrical power transmission, subsea, specialty and aerial cables, offering integrated fiber optic cables.

Other manufacturers cables can also be monitored, provided there is fiber optic available.



Example of HV cable with fiber optic cable integrated

A range of cabinet, UPS and battery back-up options exists to suit user requirements.

Marmon Sensing Solutions helps utilities and operators:

Detect intrusion in substations and along cable routes, please see:

Marmon Sensing Solutions Technical Information: Perimeter Intrusion Detection, or contact us.

Detect fire in cable tunnels, substations, duct banks and cable voids, please see:

Marmon Sensing Solutions Technical information: Fire Detection, or contact us.

Our Mission

To provide customer value as an integrator of specialized cable products and services that optimize capital asset management.

Applications of Distributed Temperature Sensing



A Marmon/Berkshire Hathaway Company

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