

Data Center Infrastructure Monitoring

Distributed Fiber Optic Sensing (DFOS) solutions designed for monitoring data center systems and critical infrastructure

Modern data centers face complex challenges and simultaneously demand 24-7 monitoring of site infrastructure. DFOS offers both preventative and predictive maintenance using a single, affordable system for monitoring multiple assets. The benefits of DFOS include increased efficiency, reduced costs, and prevention of failures which would be detected too late or missed entirely by periodic inspections.



Distributed Temperature Sensing (DTS)

FiberStrike's DTS provides a multitude of benefits:

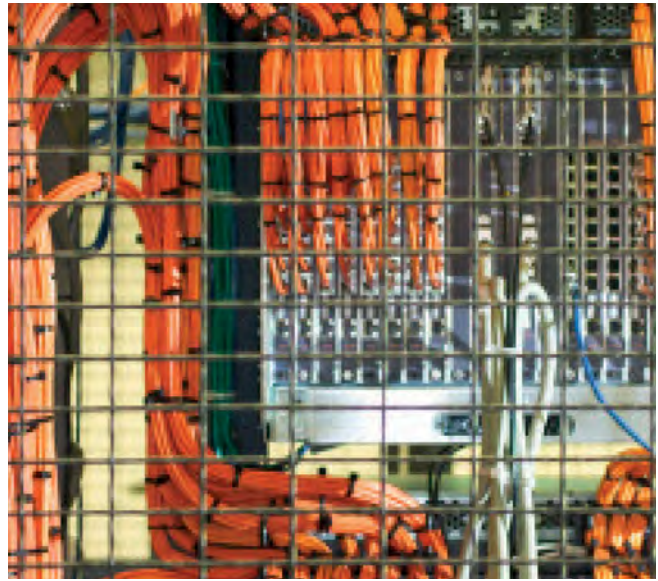
- ✓ 24-7 real time asset monitoring, delivering thousands of measurement points of temperature data
- ✓ Large coverage over several kilometers with only a single, inert and dielectric fiber optic cable
- ✓ Early detection of hotspots, fires or temperature abnormalities indicating faults or other issues
- ✓ Highly reliable systems with a +33 year MTBF



Rack Temperature Monitoring

For modern, high-density data center facilities, temperature is rarely static from rack to rack. Hotspots, resulting from airflow deficiencies and other disruptive conditions, can result in the risk of critical equipment overheating.

Continuous Rack Temperature Monitoring (CRTM) provides real-time temperature monitoring to minimize equipment downtime and prevent costly repairs, as well as to identify early overheating or cooling of the rack structure for proactive maintenance. The location of overheating or a fire can be precisely detected and pinpointed, and the operator is able to reduce or eliminate manpower associated with testing and inspection costs.



Bus Bar Temperature Monitoring

Continuous Bus Temperature Monitoring (CBTM) for Bus Ways, Bus Ducts and Bus Bars provides 24-7 measurement, alarming, reporting and recording of the bus bar temperature. Measurement data is used to predict future performance for safe, long term operation.

This method eliminates the need for using thermography surveying and fully monitors both visible and hidden bus ducts. It provides real time, nonstop monitoring to extend the original manufacturer's certification of IEC 61439-6 and Temperature Rise (TR) testing.

- ✓ Freely configurable alarm parameter sets and zones enabling pre- and main alarms
- ✓ Greater equipment reliability
- ✓ Improved cost effectiveness
- ✓ Immune to EMI/RFI and dust, dirt and corrosion
- ✓ 3D location mapping and location accuracy down to one meter
- ✓ Operates in temperatures up to 750 °C for two hours according to IEC 60331-25
- ✓ Industry's most complete set of tests and certifications (VdS EN 54-22, UL 521/ULC S530, FM 3210, ATEX/IECEX)

SmartVision

SmartVision software can be paired with DTS or DAS to monitor any asset, providing:

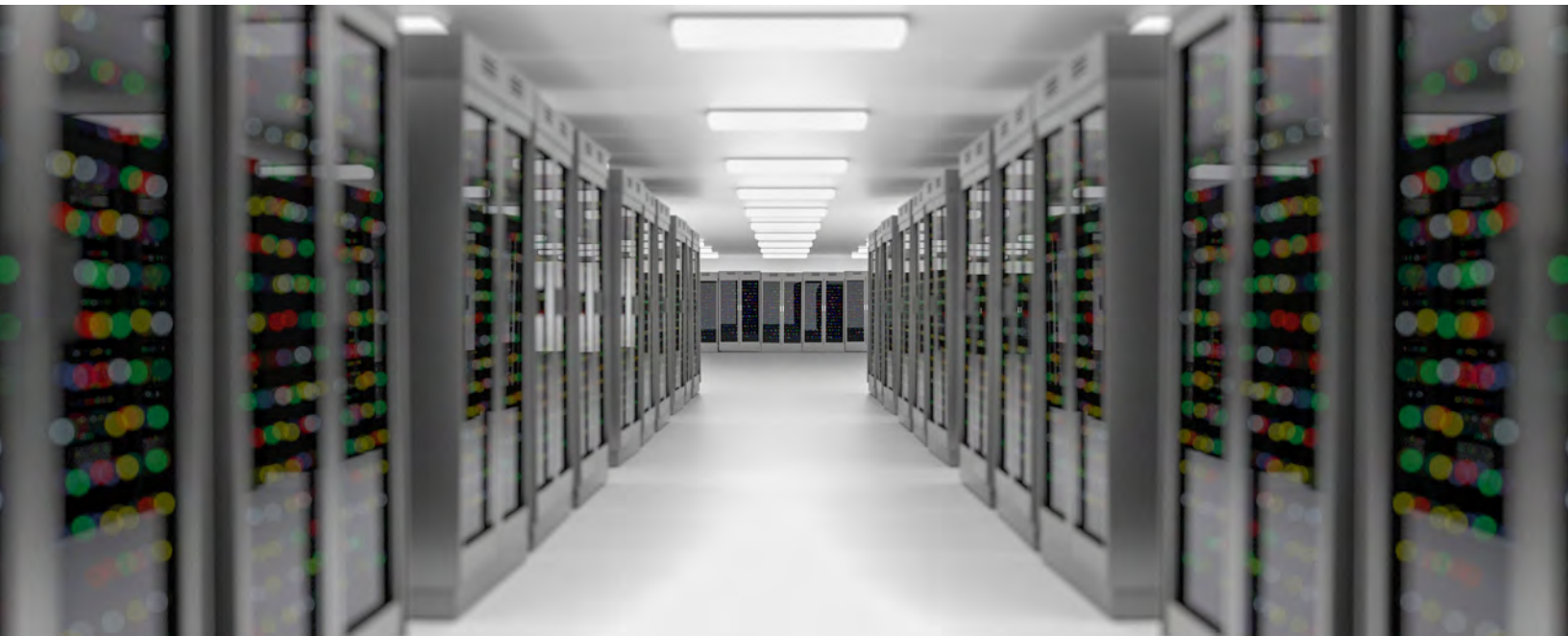
- ✓ Schematic asset visualization for quick orientation and instant status updates
- ✓ Critical zone and alarm status information, which flows directly from system instruments
- ✓ Seamless integration into your existing management platform; direct communication over ethernet (TCP/IP) using standard protocols
- ✓ Various protocol interfaces (Modbus TCP, IEC 60870-5-104, IEC 61850, DNP3) that transmit the results directly to your management system
- ✓ Asset and thermal views

Switch Gear & Power Distribution

Temperatures can rise suddenly in switch gear (SWG) and power distribution (PBD) components, including switchboard (SWB) and motor control (MCC). This often causes thermal run-away, resulting in burning, melting and destruction of components. Overheating caused by circuit overload, load imbalance, or loose and / or damaged connections will shorten equipment life and potentially lead to catastrophic failure. Periodic visual inspections are costly, require special safety considerations and are unlikely to detect these conditions in time.

Continuous Switchgear Temperature Monitoring (CSTM) provides a simple and effective solution for monitoring all switchgear for preventative maintenance and potential component replacement. With a single DFOS system, it enables automated, remote 24-7 temperature monitoring, and reduces or eliminates manpower associated with testing and inspection costs.

- ✓ Easily accessible temperature graphs and recorded data stored in a central databases for analysis, reporting and export
- ✓ Display of even hidden heating issues





Power Generators & Transformers

DFOS data allows safe operation at high loads and critical times, without risking asset failure. Failure results in severe damage to the transformer, generator or back-up battery, unscheduled site downtime, high repair costs, and loss of revenue. Continuous Generator and Transformer Monitoring (CGTM) enables measurement of the system temperature in real time for early detection of hotspots, as well as individual device temperature monitoring for detection and reporting of potential problems. DFOS enables predictive maintenance upon immediate detection of a potential problem before it becomes a big issue.

Cooling Systems & Water Storage Tanks

As a means of reducing energy costs, a data center operator may use thermal storage tanks for cooling. HVAC assets, storage and drainage vessels benefit from 24-7 temperature monitoring, and pipeworks may also be continuously monitored for early leak detection to prevent outages. This solution ensures environmental compliance and operational efficiency, while providing continuous thermal monitoring information and pinpointing hotspots. It can be combined with monitoring other on-site assets using the same system.



Distributed Acoustic Sensing (DAS)

DAS provides benefits such as:

- ✓ 24-7 real time asset monitoring, delivering thousands of measurement points of acoustic data
- ✓ Third Party Intrusion / Interference (TPI) monitoring – preventing damage, system disruptions and theft
- ✓ Long measurement range of up to 70 km
- ✓ Smart algorithms used to classify, locate and alarm intrusion events along the asset while filtering out environmental effects
- ✓ Prevention of clandestine monitoring; ensures security of medical, military and banking information
- ✓ Low visibility system that is unintrusive and does not require a power supply
- ✓ Maintenance-free and immune to RFI and EMI

Telecommunications Cables

Telecom cables are often difficult to locate due to fiber rehoming or imprecise/incorrect build plans. Additionally, damage to fibers between data centers can cause service outages and major disruptions to data flow. DFOS revolutionizes the detection of TPI activities and localization of telecom cables along any infrastructure (streets, railways, tunnels). Using our proprietary Asset Explorer technology, build plans can be easily updated and issues along the cable are rapidly detected and pinpointed. This leads to reduced likelihood of cable cut outages, faster response times and reduced outage periods.

With a single, one-sided DAS unit and a detection toolkit, your technician can spot cables without cutting into the asphalt, even locating nonmetallic and dielectric cables. A mobile app provides a direct feedback loop in the field, eliminating the use of a second technician for observation of the OTDR. After opening the manhole or street for repair work, the cable can be identified with Asset Explorer again. There is no need to bend the cable, triggering a loss on the OTDR. In the case of rail tracks, no track closures are required to locate the cable.



Perimeter

A breach in security may result in campus outage and loss of reputation. Fiber optic sensing technology can be used to protect the perimeter of a data center, including long assets such as campus fencelines and buried telecommunication cables. DAS is used to detect intrusion events or Third Party Interference (TPI); a single device can be used to monitor the perimeter and other data center assets.

