YOKOGAWA
Co-innovating tomorrow™

Heat monitoring solution for PV Systems

Boost safety and reliability with 24/7 remote monitoring

Distributed Temperature Sensor

DTSX is a temperature monitoring system with optical fiber cable as a temperature sensor.

Challenges

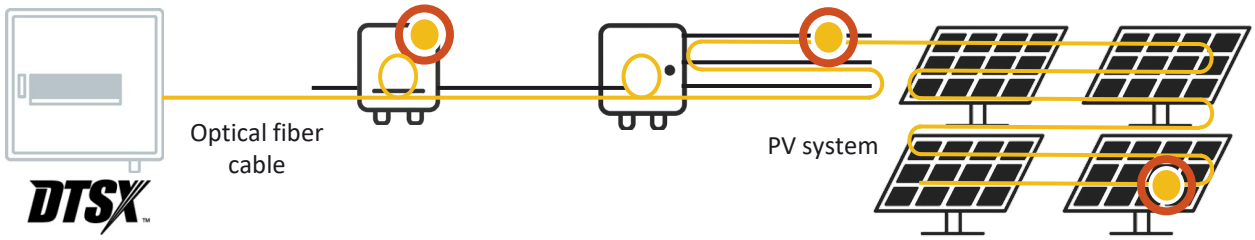
Overheating risks are hard to detect in time

PV (Photovoltaic) systems are built to operate outdoors for decades, exposed to weather, dust, and aging of components. Over time, these factors can cause problems like loose wiring, cable deterioration, and localized heat accumulation known as "hot spots". Such conditions reduce energy output, and if unnoticed, may lead to fire hazards.
Generally, periodical inspections are performed, but if a problem occurs between inspections (which can be months apart), it can delay discovery of the problem.
And, inspections are often done visually or with thermal imaging, which can make it difficult to spot problems at an early stage. Moreover, small PV installations, such as those on the rooftops of buildings or shopping malls, which rarely have dedicated monitoring staff, are at even higher risk of overheating as it is difficult to detect abnormal overheating early.
Therefore, to improve safety and system longevity, PV installations of all sizes require a dependable way to detect heat-related issues early. A solution that allows continuous, automated, and remote monitoring is essential for reliable operation.

Solutions and Benefits

Continuous heat monitoring boosts safety

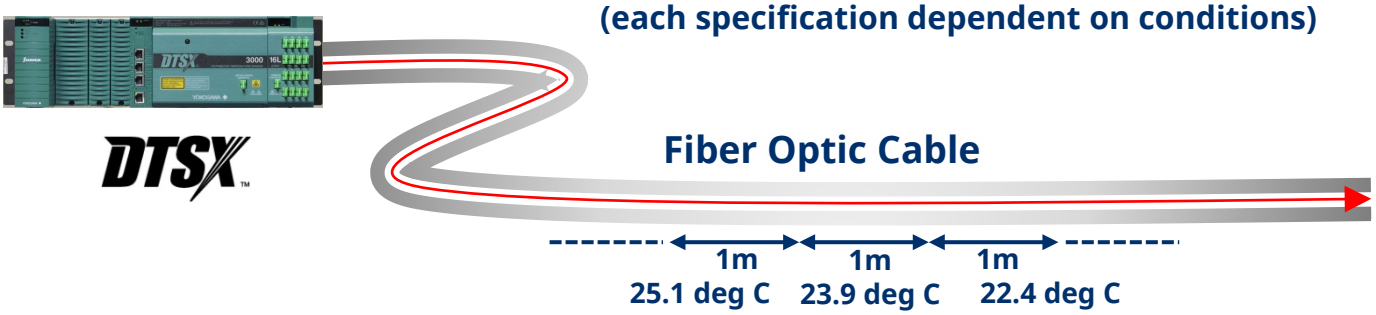
DTSX is a distributed temperature sensing system to monitor temperature across long distances at 1-meter intervals with optical fiber cables . It enables early detection of abnormal heating in panels, cables, and junction boxes - common failure points in PV systems.
DTSX provides 24/7 real-time monitoring with automatic alerts when heat rises above safe thresholds. This allows faster response, reduces fire risk, and helps avoid costly damage. The system continuously records temperature data, providing valuable logs for maintenance planning and reporting.
DTSX is flexible enough to support a range of system sizes - from compact commercial rooftops to sprawling solar farms. It can also be integrated into YOKOGAWA's broader solution, including tools like SCADA, for centralized monitoring, visualization, and control.
DTSX provides more than heat sensing - it's a proactive foundation for safety, operational efficiency, and scalable system management. It enables users to start expand into advanced monitoring as needs grow.



Features of Optical Fiber Sensing in DTSX System

The Fiber Optic Cable Is the Temperature Sensor

- **Monitoring Distance: to 50 km (Model dependent)**
- **Monitoring Temperature: - 200 to 300 deg C**
- **Shortest Monitoring Cycle: Approx. 5 seconds**
- **Temperature Resolution: 0.03 deg C**
  (each specification dependent on conditions)



*** Temperature distribution monitored every 1 m**

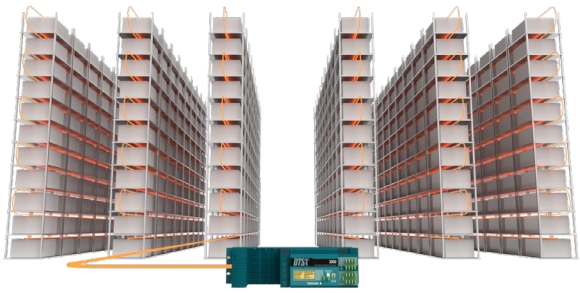
Main Features

- ✓ **24/7 real-time monitoring even in wide areas and ordinarily non-manned areas**
- ✓ **Power supply not required, explosion-proof, not affected by electromagnetic noise**
- ✓ **Flexible installation**
- ✓ **High compatibility with DCS and other host systems (Modbus/TCP)**

Relevant Applications

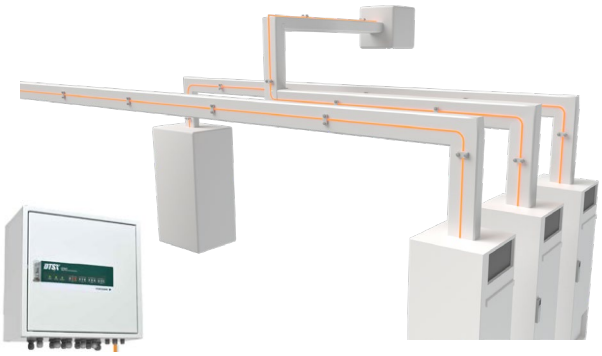
✓ Lithium-ion battery heat monitoring

Thermal runaway of lithium-ion batteries mounted on individual shelves is discovered at an early stage. This enables a quick initial response when an abnormality occurs to limit damage to a minimum.
(For details, refer to Bulletin 39J00Q21-01EN)



✓ Power supply bus duct monitoring

The joints of the power supply bus bar are monitored. Abnormalities are not overlooked as fiber optic cable is built into the bus duct and bus bars extending over long distances in blind areas such as roof space are comprehensively monitored.
(For details, refer to Bulletin 39J00Q23-01EN)



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