



EcoStruxure™ Power

Continuous Thermal Monitoring eGuide



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EcoStruxure Power digitizes electrical distribution

EcoStruxure Power helps facility teams improve operations

Digitization of the electrical distribution unlocks opportunities to gain better insight into the state of the electrical distribution.

Reduce the risk of electrical fires

While thermal surveys on electrical equipment has been commonplace for decades, often it is a manual, periodic procedure that can prove costly over time. EcoStruxure Power leverages digitization to improve this process with **Continuous Thermal Monitoring**.



Digitizing Electrical
Distribution

Challenges and
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What is at stake when it comes to electrical fires?

The major cause of fire in medium and low voltage installations is faulty power connections. Loose connections from improper tightening or vibration, or damaged contact surfaces due to corrosion or excessive pressure can cause cable, bus bar, and circuit breaker connections to deteriorate over time.

This deterioration can be accelerated by electrical contact resistance increases, which further induces temperature increases. Higher temperature deteriorates connection surfaces even more, in turn increasing its contact resistance.

The result is thermal runaway and ultimately complete connection failure. Fire, flash over, or explosion can occur, leading to switchgear destruction or even operator injury.

Some insurance companies request annual surveys to reduce this risk. The National Fire Protection Administration, NFPA70B, also recommends an annual thermal survey.

[Read the white paper](#)

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One major insurance carrier estimates that approximately 25 percent of all electrical failures occur due to loose connections.



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Relevance of thermal surveys

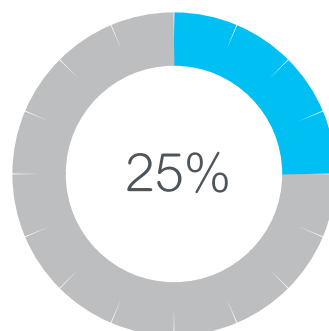
In most cases, early detection of abnormal bus bar temperature rises will prevent electrical failures and fire. In fact, today periodic thermographic surveys of MV and LV connections have become general practice to mitigate the risk of faulty connections.

However, these periodic inspections can be complicated due to:

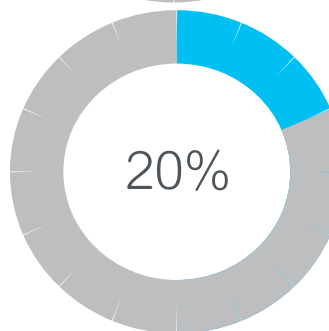
- Restricted access to electrical rooms (safety regulations)
- Operator safety (opening a door to check connections)
- Limited accessibility / visibility of contacts (example busbar)

Periodic thermographic inspection is also costly and does not always alert early enough when there is fast deterioration.

Top failure statistics leading to electrical failure/fires:



Loose or faulty connections



Environmental conditions

Source : NETA

<https://www.netaworld.org/sites/default/files/public/neta-journals/NWsu10-NoOutage-Genutis.pdf>

Monitoring on a continuous basis

Critical connections can be equipped with wireless, continually transmitting temperature sensors. Optional environmental sensors can also monitor ambient conditions. An algorithm computes:

- Temperature differences between phases exceeding a threshold
- Absolute temperatures exceeding a threshold with status indicators ● ● ●

This eliminates the need for periodic thermography, reduces monitoring costs, and improves network performance. Other benefits include:

- Detection of thermal runaway occurring between annual surveys
- Increased MTBF of the main electrical switchboard
- Automatic alarming and notification
- Long-term trending to detect slow deterioration
- Optional environmental data for more accurate analysis



IoT Enabled applications for continuous thermal monitoring

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Continuous thermal monitoring

How can you help prevent electrical fires and ensure protection of equipment and people?

Continuous Thermal Monitoring

“I want to prevent electrical fires in my facility and have a solution to detect abnormal temperature rises in my conductors. This is important at both the MV and LV level.

- Monitor temperature with wireless sensors installed on busbar via central data concentrator
- Avoid the cost of periodic and manual 3rd party IR scan audits
- Pre-alarm in edge control software as early detection of conditions that could cause fire
- Reduce total cost of ownership by 60% throughout the lifecycle compared to traditional methods
- With optional expert advisor services, optimize maintenance through more streamlined maintenance planning and scheduling

With thermal monitoring



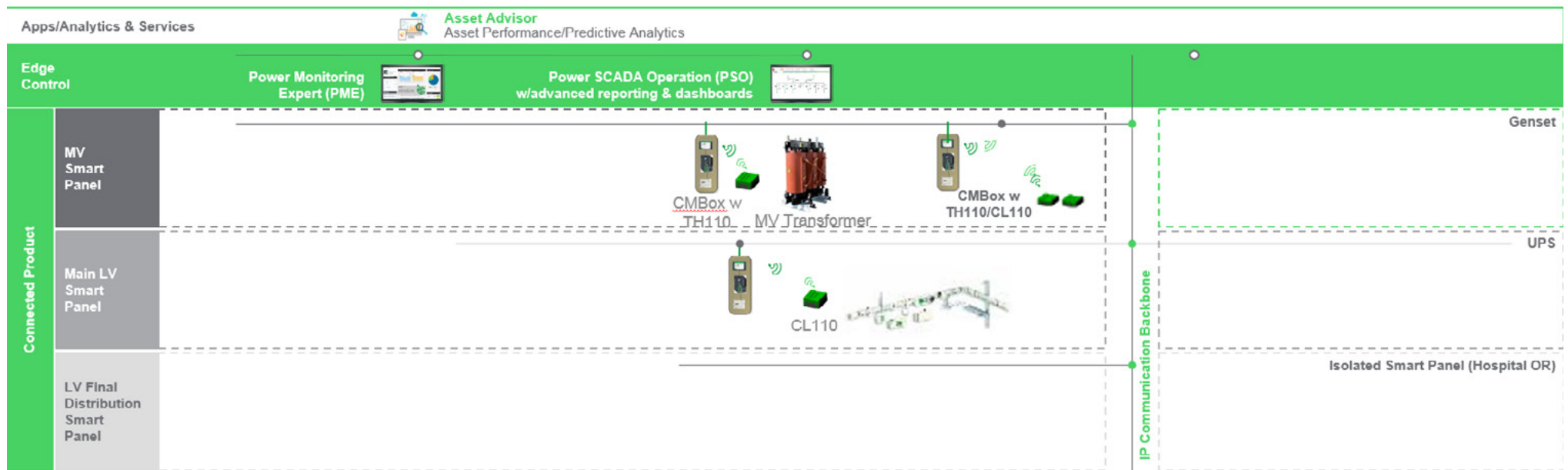
Without thermal monitoring



Digital architectures

Architecture 1

Continuous thermal monitoring eliminates the need for periodic, manual thermal scanning with continuous monitoring using IoT sensors.



Learn more



Tuprag Mine ensures reliable power



White paper: Mitigating Risks in Mission Critical Facilities

This document presents general, non-binding information regarding the potential value that digitized power distribution products and solutions can bring to the user. Due to varying user situations and goals, Schneider Electric does not warranty or guarantee that the same or similar results represented in this document can be achieved. Please refer to Schneider Electric product and solution catalogs for actual specifications and performance.

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