

# Eaton Diagnose System

Temperature monitoring brings enhanced security to your switchboard



**EATON**

*Powering Business Worldwide*

## Eaton Diagnose System – Security Management for Low-Voltage Switchgear

Eaton is the leading supplier of safety-related technical solutions that go beyond the standards required by the IEC International Electrotechnical Commission. Eaton sets new standards when it comes to safety for the workforce and the switchgear itself, without limiting efficient operation requirements in the process. The risk of operational failure associated with costs threatening the existence of a company is thus significantly reduced. Eaton has always been among the pioneers in the protection of staff and equipment. Besides the tried and tested circuit-protection devices, additional innovations make the operation of the system even safer for the staff concerned. Whether for tunnel power supply, in the paper industry or data processing centres, an uninterrupted power supply is essential for the protection of men and machines. The result are machines offering a maximum of availability and safety while reducing down times to a minimum. Over-temperatures are very often the reason for massive damage to switchgear. Standards, e.g. IEC 61439, especially take account of this circumstance by making high demands on testing and documenting the “limit temperature” and/or the dimensions of the system. This also manifests itself in that the thermal design requirements increase in proportion to the electric currents of a system (temperature calculation above 1.600 A no longer admissible). In spite of all these measures, we notice time and time again that with respect to the service-life of switchgear and due to various influences like general ageing, temporary overload states, system upgrades, human error etc., the safety-relevant criteria are frequently no longer sufficient.

To eliminate this inconvenience, a periodic inspection of the system is carried out by many responsible



system operators. For this, infrared cameras are generally used to visualise thermal behaviour in specific operating states. However, this analysis only provides a snapshot and is usually not possible in critical system areas because these are thoroughly protected. The removal of covers additionally poses a certain safety risk. Also, the often requested windows that enable thermography from outside are usually a compromise regarding positioning options and the impact on the mechanical stability of the system.

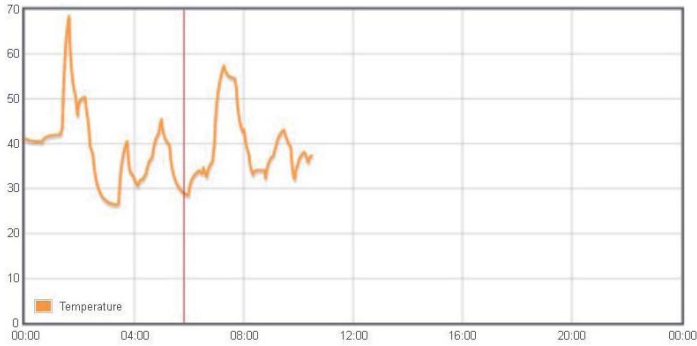
### Increased availability through permanent control

The Eaton Diagnose System makes a permanent thermal monitoring of the low-voltage main distribution boards possible. Thus, any emerging errors can already be detected as they originate and can therefore easily be remedied.

Emerging errors that put staff and the availability of the switchgear at risk are noticeable through a temperature increase over a longer period of time which is normally not yet detected or classified as such during thermography.

Another advantage of the Eaton Diagnose System is that sensors can also be installed in areas of the systems that are otherwise difficult to access or even not accessible at all. As covers or panelling no longer need to be dismantled for thermo scans, personal safety and system availability increase because the system only needs to be disconnected when a dysfunctionality is detected by the Eaton Diagnose System.

## TODAY'S VALUES



Thanks to the wireless signal transmission between sensors and evaluation unit, safety-critical cables in main and distribution busbar compartments are no longer necessary.

Also, the time which is normally needed for service work is significantly reduced. Normal inspection work can be carried out immediately because thermo scans and dismantling no longer need to be done. The sensors themselves are maintenance-free.

The exact sequence can be followed through permanent temperature recording. Emerging errors change the temperature profile.

### Advantages:

- Early detection
- Warning messages
- Diagnosis
- Documentation
- Optimised service intervals
- Reduction of infrared scans
- Reduction of mechanical stress
- 24 hours/7 days permanent monitoring

## How does the Eaton Diagnose System work?

Through permanent monitoring of the system and documentation of the data, errors and trends can be detected and/or optimised. Thus, for instance, absolute load peaks may occur which will normally go unnoticed. This, however, would mean that the entire system is exposed to high stress (mechanical stress), which can very easily be detected and eliminated with the Eaton Diagnose System.

The Eaton Diagnose System is a wireless and maintenance-free temperature monitoring system for busbar systems and ambient temperatures which can be adjusted and expanded according to the respective system size. The sensors are installed directly at the critical points in the system. Every 10 minutes, each of the decentralised sensors sends its respective status which is received by receivers and forwarded up to the central diagnosis controller via cable connection.

The diagnosis controller processes the data it receives, compares them with the stored threshold values and issues the respective status. If a temperature draws near its maximum admissible limit temperature, a pre-warning stage is triggered. Thus, a continuous long-term transparency is ensured which makes evaluations considerably easier. This way, for example, slight temperature increases of individual connection points can be detected very early. These are generally a sign of contact loss which can normally be eliminated in a few simple steps.

### Internet or SCADA connection:

The Internet or also SCADA connection can be established via a network connection. Depending on the equipment available, a UMTS-capable router, a standard network router or also a fibre optic converter system may be used. The system per se is based on an HTML interface that can be called via a standard Internet browser at any time and thus can be integrated into every network. The current values can be called via a display directly on the switchgear.

### Busbar Temp Sensors

Sensor 1



Sensor n

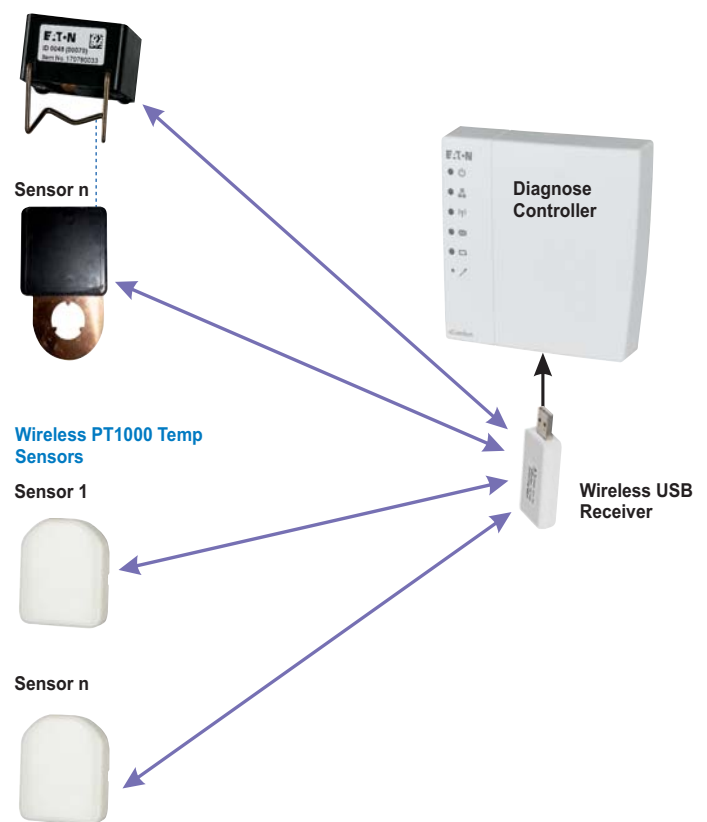


### Wireless PT1000 Temp Sensors

Sensor 1



Sensor n



If the controller is connected to the Internet, it is also possible to install any updates available from a server automatically.

Eaton is a power management company with 2014 sales of \$22.6 billion. Eaton provides energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton has approximately 102,000 employees and sells products to customers in more than 175 countries.

For more information, visit [www.eaton.com](http://www.eaton.com).



To contact an Eaton salesperson  
or local distributor/agent, please visit  
[www.eaton.eu/electrical/customersupport](http://www.eaton.eu/electrical/customersupport)

**Eaton Industries (Austria) GmbH**  
Scheydgasse 42  
1215 Wien  
Austria

**Eaton Industries Manufacturing GmbH**  
**EMEA Headquarters**  
Route de la Longeraie  
1110 Morges  
Switzerland

© 2015 Eaton Industries (Austria) GmbH  
Subject to technical modifications. No  
responsibility is taken for misprints or errata.  
Printed in Austria (05/15)  
Publication number BR014022EN

Graphics: SRA  
DigiPics, Lithos:  
Print: