

Eaton Diagnose System

Temperature monitoring brings enhanced security to your switchboard



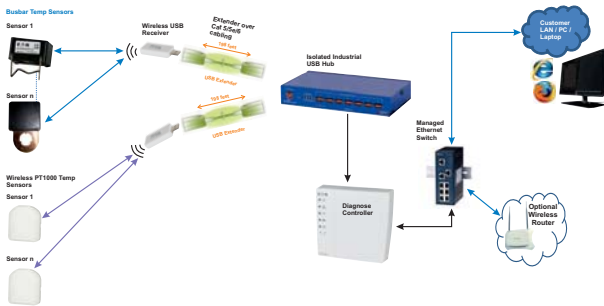
Catalogue 2015



Powering Business Worldwide

EATON Diagnose System

EATON Diagnose System




- Permanent monitoring
- Detection at an early stage
- Warnings
- Diagnostics
- Documentation
- Availability of the system
- Wireless – no wiring of the sensors
- Quick and easy installation
- No batteries in the sensors
- Permanent status transmission
- Log-file recording
- Integration into existing SCADA systems

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Temperature Sensor

- Incl. holding brackets for 10mm flat copper

	Type designation	Article No.	Pack (pcs.)
 vi35115	XNT-DIAG1	178303	1
	XNT-DIAG3	178304	3
	XNT-DIAG12	178305	12


Adapter Plate

- Incl. screws and Allen key

	Type designation	Article No.	Pack (pcs.)
 vi34715	XNT-DIAG-A-3	178306	6
	XNT-DIAG-A-4	178659	8


Holding Brackets

- For 15mm Cu material thickness


	Type designation	Article No.	Pack (pcs.)
 vi34915	XNT-CLAP15	180071	100

Holding Brackets

- For 20mm Cu material thickness

	Type designation	Article No.	Pack (pcs.)
 vi34815	XNT-CLAP20	180072	100


Diagnostics Controller

	Type designation	Article No.	Pack (pcs.)
 vi34215	CHCA-00/03	178650	1

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Diagnostics Temperature Input

- RF module for capturing the ambient temperature
- Incl. fixing bracket
- For 2 sensors maximal


	Type designation	Article No.	Pack (pcs.)
<div><div>vt34415</div></div>	CTEU-02/02	179344	1

Temperature Sensor for Ambient Temperature

- PT1000, attachment hole 4mm, cable length = 1m


	Type designation	Article No.	Pack (pcs.)
<div><div>vt40315</div></div>	XNT-PT1000-4MM	179392	1

Receiver

	Type designation	Article No.	Pack (pcs.)
<div><div>vt34515</div></div>	XNT-REC	178660	1


USB Extender

- Incl. fixing bracket

	Type designation	Article No.	Pack (pcs.)
<div><div>vt34315</div></div>	XNT-USB-EXTENDER	178661	1


USB HUB

- 7 Port USB hub

	Type designation	Article No.	Pack (pcs.)
<div><div>vt34015</div></div>	XNT-USB-HUB-7PORT	178662	1

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Sensor Tester

	Type designation	Article No.	Pack (pcs.)
<div><div>vt34115</div><div></div></div>	XNT-SENSOR-TEST	181584	1

Power supply for HUB

- Rated voltage Input: 100-240V AC, 50/60Hz
- Rated voltage Output: 24V DC, (±3%)
- Rated current: 1.25A

Designation	Type designation	Article No.	Pack (pcs.)
Power supply	EASY400-POW	212319	1

EATON Diagnose System

Technical Data

Introduction

Eaton DIAGNOSE was developed to provide permanent monitoring of our low-voltage main distribution boards. This results in a wide variety of advantages such as early detection, warning messages, diagnostics, documentation, increased system availability, optimized service intervals, reduction of infra-red scans, reduction of mechanical strain, ...

Thanks to permanent monitoring of the distributions boards any potential errors can be detected at a very early stage and be prevented (early detection). Such errors can be identified by a rise in temperature over a longer period of time, which usually would not be detected during a thermo-scan because there is no reference value available for a longer period of time. Another advantage is that sensors can be placed

in areas of the system that are difficult or impossible to access for thermo-scans. As it is no longer necessary to remove covers or planks for thermo-scans, it also results in increased safety for people and increased system availability, because enabling is only necessary when DIAGNOSE reports a pre-existing abnormality. Thanks to wireless signal transmission between sensors and analysis unit there is no need for any additional cables in the main and distribution busbar areas. And the time usually required for service jobs will be significantly shorter. You can immediately start with the usual revision jobs as thermo-scans and disassembly jobs are no longer necessary.

Warning messages:

If DIAGNOSE detects any abnormality, it will be visually displayed in the software. So there are different colours for messages to indicate the degree of dysfunction.

Green = everything is okay

Yellow = no signal from the sensor, or the battery of the ambient temperature sensor is low

Orange = rail temperatures are getting close to critical values

Red = critical temperature values have been reached or exceeded

DIAGNOSE can be used as a stand-alone solution or it can be interlinked through the Internet, but it can also be incorporated into existing Scada systems in order to be able to react as efficiently and as automatically as possible to any potential errors.

Diagnostics:

Thanks to permanent monitoring of the system and thanks to documentation of the data it is possible to optimize trends and poorly aligned production processes. For example, if there are repeated and extreme load peaks which would normally not be noticed, this may be due to the fact that the entire system is exposed to high strain levels.

Such load peaks can easily be detected and prevented thanks to DIAGNOSE. In most cases all you need to do is optimize timebased processes in the production routine to get this type of problems under control.

Documentation:

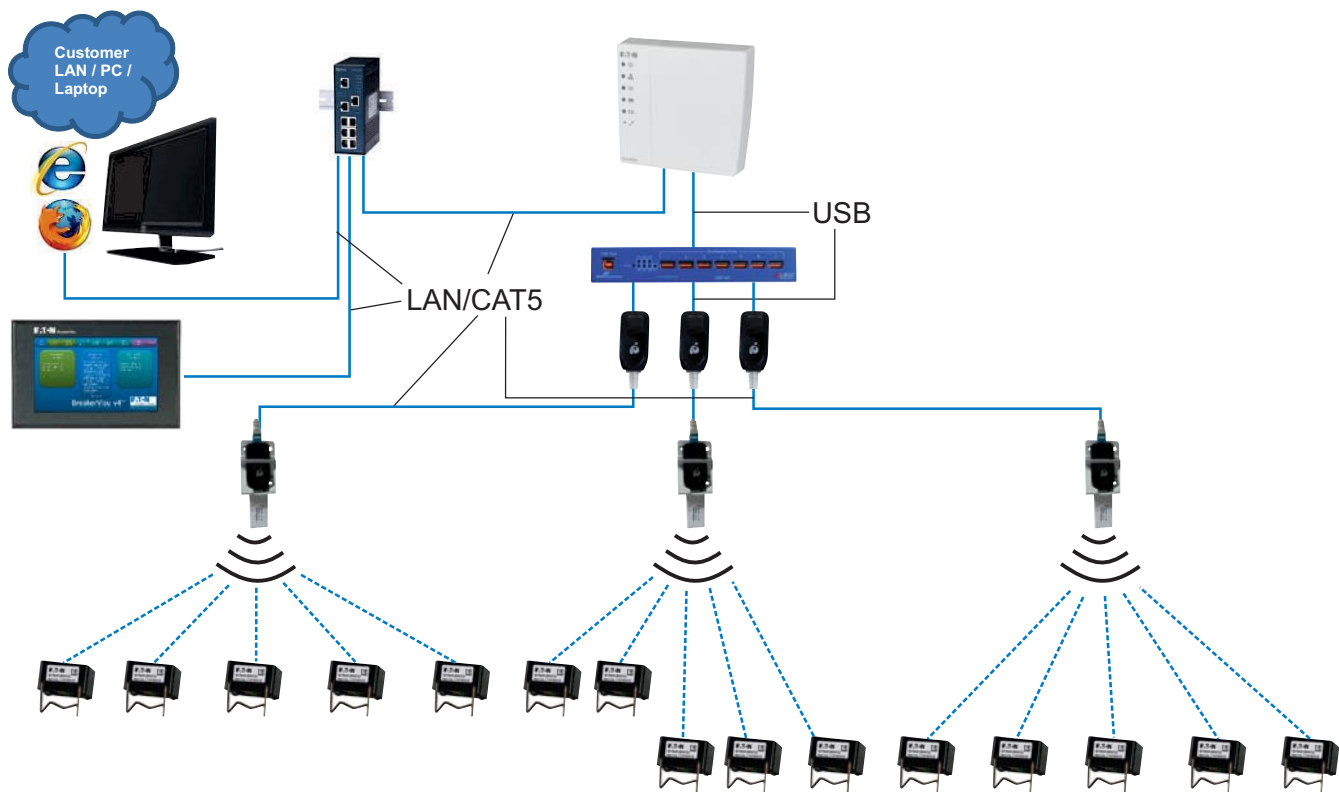
Every 10 minutes the sensors will be checked, their status will be recorded and their data will be saved. The log-file will be saved for one month. After one month, older data will be time-compressed. To prevent any overwriting of data, the DIAGNOSE Controller can be equipped with an additional memory card. Depending on the capacity of the

memory card, you can save log-files over very long periods of time. The log-file will be displayed both as a graph and in an Excel table. These data are the basis for displaying the analysis data in a chart.

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Technical Data

Functional overview



systemuebersicht1

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Technical Data

System overview

Version 1:

No network connection, max. number of sections to be monitored = 5

As there is only 1 receiver installed in this configuration, the maximum size of the system is limited to 5 sections (regarding the transmission power it is a max. of 2 sections to the left and 2 sections to the right).

The data received and saved can be loaded from the Eaton Diagnostics Controller to a PC at any time and then be analyzed.

Busbar Temp Sensors

Sensor 1



Wireless PT1000 Temp Sensors

Sensor 1



Sensor n



Wireless USB Receiver

Managed Ethernet Switch



diagnose2

Version 2:

With network connection, max. number of sections to be monitored = 5

As there is only 1 receiver installed in this configuration, the maximum size of the system is limited to 5 sections (regarding the transmission power it is a max. of 2 sections to the left and 2 sections to the right).

The data received will be saved directly at the Diagnostics Controller and at the same time all data will also be transmitted to the connected network.

Busbar Temp Sensors

Sensor 1



Wireless PT1000 Temp Sensors

Sensor 1



Sensor n



Wireless USB Receiver

Managed Ethernet Switch



diagnose3

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Technical Data

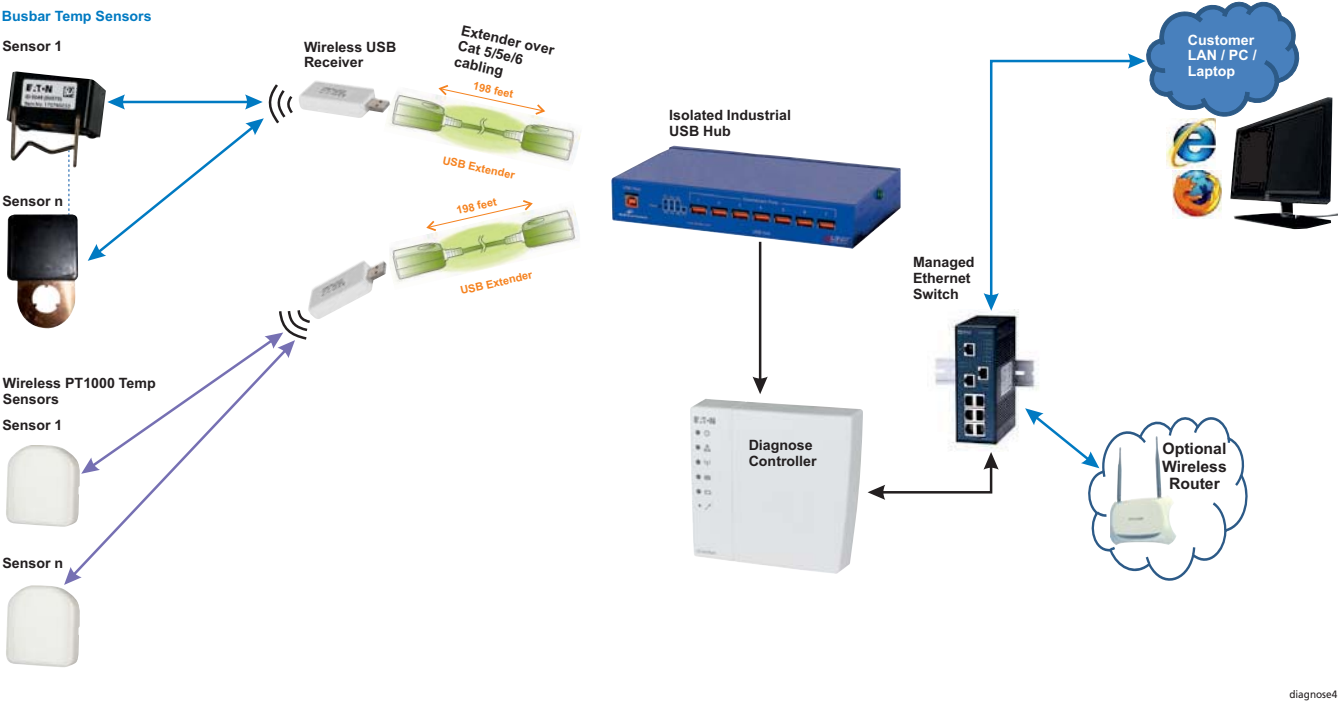
System overview

Version 3:

With network connection, max. number of sections to be monitored = 35

In this configuration the Diagnostics Controller is connected to the USB hub. The hub has 7 outputs and can therefore connect up to 7 receivers. Each receiver can monitor up to 5 sections. All of the data

received by the receivers installed are transmitted to the Diagnostics Controller and saved. At the same time all the data are also transmitted via the connected network.

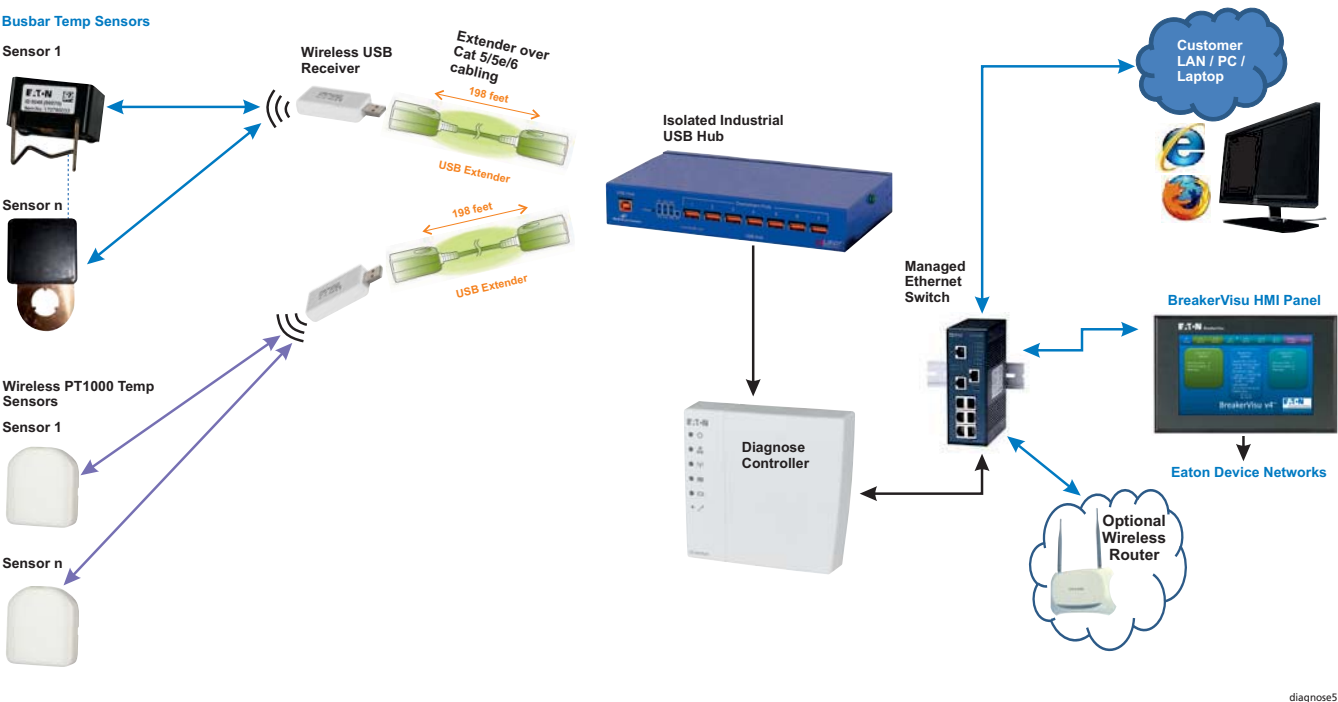


Version 4:

With network connection and Breaker Visu Integration, max. number of sections to be monitored = 35

Same configuration as in version 3. In addition, there is a connection to the Breaker Visu Touch Panel which makes it possible to immediately read the current values measured

and the status requests. Via the Multi-Breaker-Display, the system displays all operating data of your low-voltage switchgear system in a centralized and clearly structured way.



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Technical Data

System description

DIAGNOSE is a wireless and maintenance-free temperature monitoring system for busbar systems and ambient temperatures. It can be adapted to any system size and can be expanded to meet any requirements. The sensors can directly be fixed at the critical points in a system. These points are precisely defined in the installation instructions of each system; they are arranged according to field (section) types. Every 10 minutes every sensor transmits its current status, receivers will receive the status and forward it to the DIAGNOSE Controller through a cable-based connection. In addition, the ambient temperature of the individual fields (sections) can be measured and captured. For this purpose, we provide PT1000 sensors with a cable length of one meter. This type of sensor can be connected to a temperature input. Every temperature input can be connected to 2 sensors. Via RF the data will be transmitted from the temperature input to the receiver.

One receiver covers an RF range of a maximum of 5 fields (sections). If the system configuration includes more than 5 fields (sections), a second receiver needs to be installed. In large system configurations one receiver is installed for 5 fields (sections) to ensure a safe reception of the data from the sensors. Therefore it is necessary to install a hub (distributor). Our hubs are equipped with 7 ports. So a maximum system size of 35 fields (sections) can be realized with one DIAGNOSE Controller. If the system size is bigger than that, a second DIAGNOSE Controller needs to be installed. It will again be connected to a hub (up to 35 additional fields/sections).

Internet or SCADA connection:

The Internet or SCADA connection can be realized through a network connection. Depending on the respective situation you can use a UMTS compatible router, a standard network router or a fibre-optic converter system. The system as such is based on an HTML interface

The receiver sends the data it receives from the sensor to the Controller where they are processed/compared. The Diagnostics Controller processes the data it receives, compares them with the threshold limit values saved in the system and then shows the respective status. In the DIAGNOSE Controller all data will be collected and compared with the respective threshold limit values. If a temperature gets close to a maximum permitted threshold limit, a pre-warning level will be triggered. This will be displayed in orange in the Diagnostics software. In the overview, the respective sensor will change its colour. If a temperature value exceeds the respective threshold limit, the sensor will turn red. If a sensor does not send any information (no current on the busbar), it will be indicated in yellow.

All the data collected will be displayed graphically and can be exported as an Excel table. Further processing of the data, e.g. in charts, can be done at any time. This ensures continuous long-time transparency which can make an analysis so much easier. A slight increase in temperature of individual connection points for example can be detected at a very early stage. This is usually a sign of contact loss which can usually be fixed with just a few touches (by tightening the screws for example).

which can be opened any time through a standard Internet browser and can therefore be integrated into any network. If the Controller is connected with the Internet, it also offers the opportunity to automatically install any updates available from a server.

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Detailed explanation of the individual components

Maintenance of ambient temperature sensors:

The sensor as such is maintenance-free. Only the temperature input is equipped with a coin cell which needs to be replaced every 5 years approximately.

Receiver:

The receiver serves as a receiver of data from the sensors and temperature inputs of ambient temperature sensors. The maximum number of sensors each receiver can receive data from is limited to 200. The receiver can directly be plugged into the USB port at the DIAGNOSE

receiver. However, if you need several receivers for a system, you need to use a USB hub in between. Usually you will need to install one receiver for four fields/sections. If a system includes more than 4 fields/sections, you will need to install several receivers.

Receiver holder:

To install the receiver in a safe and stable way in the cabinet, Eaton provides a mounting device which can easily be fixed at any point easy to access in the system. All you need to fix that holder is 2 screws.

USB extenders:

They are necessary to establish a connection between the USB hub and the receiver (1 extender for each receiver). For the connecting lines you can use standard LAN cables CAT5 or higher. The length of

the LAN cables can vary depending on the distance between the receiver and the hub.

USB hub:

To monitor large systems in a safe and reliable way you will need to install several receivers. You will need one receiver for 5 fields/sections. But because each Eaton DIAGNOSE comes with one USB port only, you will need to install an additional distributor (USB hub). We

provide a 7-port USB hub equipped with rotary fixing brackets on the side. Therefore it is possible to fix it in different positions.

Gateway/Switch:

A gateway or switch establish a connection to LAN/WLAN networks.

Breaker Visu:

A Breaker Visu touch panel makes it possible to immediately read the current measurement values/status queries directly and on the spot. Each sensor can be scanned section by section. Alarm messages will be visually shown at the display.

Via a Multi Breaker Display the system will show all operating data of your low-voltage switchgear system in a centralized and clearly structured way.

- Log-files including operating data, energy and incidents
- Service-life indicator for NZM circuit breakers
- Password protection for important settings
- User-defined labelling of switches

Wireless router:

The wireless router cannot be specified by Eaton because it can be designed differently according to each network. Please consult your local IT specialist to get the support you need (Security Policy).

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.



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