

ThermalDIAG Analytics - System Description

Date: 2026-08-13

1. Short Overview

ThermalDIAG Analytics is a Windows application for historical analysis and safe rule validation for ThermalDIAG. It uses stored measurement, signal and event data to make technical behaviour traceable over time.

The application mainly answers these questions:

- What happened before, during and after an incident?
- Which temperature, analog value or digital state changed first?
- Would another rule variant have reacted differently on the same data?
- Is there a slow trend or recurring pattern?
- Which rule idea should be prepared for later review in ThermalDIAG?

ThermalDIAG Analytics is deliberately separated from live plant operation. During analysis, trend calculation and backtest, it does not execute real output switching, Modbus commands, e-mails, snapshots or other external actions.

2. Intended Users

ThermalDIAG Analytics is intended for people who need to understand existing operating data and improve alarm rules in a traceable way.

Typical user groups are:

- maintenance and operation;
- operators and plant owners after an incident;
- technicians during troubleshooting and commissioning;
- process and test engineers;
- users preparing or reviewing alarm strategies;
- JC-Technology and integrators in pilot, diagnostics or improvement projects.

Normal analysis workflows do not require programming skills. Reliable interpretation still requires plant knowledge, process knowledge and safety awareness.

3. Typical Situations

3.1 An Incident Exists, but the Cause Is Unclear

A temperature alarm was created, but the incident alone does not show whether temperature, switching state, analog value or another process state changed first.

ThermalDIAG Analytics shows the selected time range with measurements, digital states, incidents and available action markers. This helps investigate the sequence of changes.

The value is a root cause discussion based on the actual timeline instead of a single snapshot.

3.2 An Alarm Reacts Too Often or Too Late

A rule may be too sensitive, react to short peaks or detect a relevant state too late.

In ThermalDIAG Analytics, a local rule variant can be created and simulated on historical data. The original rule in the running ThermalDIAG system remains unchanged.

The value is safer preparation of thresholds, hold times, hysteresis and filters before a new rule is deliberately released.

3.3 A Rare Fault Cannot Be Reproduced

Some faults occur only under rare load, shift or production conditions. Forcing the fault again may be expensive, time-consuming or inappropriate.

ThermalDIAG Analytics can reload the already recorded period, add other signals to the view and check a rule idea against the same historical situation.

3.4 Slow Trends Need to Be Discussed

Sometimes a value does not exceed a limit, but changes slowly over days, cycles or production states.

Trend views help make such movement visible. They are decision support, not a guaranteed forecast.

4. Main Functions

Connection and Project Selection

Analytics connects to released ThermalDIAG data. Users select the relevant project, time range and measurement context.

Timeline View

The timeline combines temperatures, analog values, digital states, incidents and available markers. This is the central view for understanding what happened in which order.

Measurement Details

Users can compare selected measurement series, inspect value ranges and review how a condition developed around an event.

Trend View

Trend calculation can show a mathematical continuation of a selected curve. It helps discussion, but it does not predict the future with certainty.

Local Rule Workspace

Rules can be copied or created locally. These local variants are separate from the productive ThermalDIAG rule configuration.

Backtest

Backtest applies a selected rule variant to historical data and shows how it would have reacted. This helps compare thresholds, timing and filters.

Safe Rule Handover

When a checked rule idea should be used in ThermalDIAG, Analytics can prepare a handover. The target system creates a new disabled rule. Operational release is done later and deliberately in ThermalDIAG.

5. Safety Principles

ThermalDIAG Analytics follows these principles:

- analysis does not control the plant;
- local rule variants do not overwrite productive rules;
- backtest is a simulation on historical data;
- trends are decision support, not guaranteed forecasts;
- handover creates a disabled rule that must be released intentionally later.

These principles help users investigate and prepare changes without disturbing the running system.

6. Limits of Interpretation

Analytics can only evaluate data that exists and is reliable enough for the question.

Important limits:

- missing historical values reduce the value of a backtest;
- poor measurement quality can lead to misleading conclusions;
- changed plant behaviour may make old data less representative;
- simulated rule behaviour is not proof of former configuration;
- trend models do not replace technical judgement;
- safety decisions remain the responsibility of the operator and specialists.

7. Summary

ThermalDIAG Analytics is the safe analysis workplace for historical ThermalDIAG data. It helps users understand incidents, compare measurements, test rule ideas and prepare improvements without executing live actions during analysis.