

edgeSV

NTEK SYSTEM

USE CASE

Power quality monitoring

SV500 by NTEK SYSTEM | ESA-based condition monitoring & predictive maintenance

OVERVIEW

Data center cooling equipment can stop because of power quality events. In this scenario SV500 measures the three-phase voltage and current of cooling equipment such as chillers, pumps and cooling fans to monitor power quality and motor and VFD condition together.

PROBLEM

Power problems are the largest cause of data center outages.

- **Power is the top outage cause** - In Uptime Institute analysis, 45% of the most impactful outages in 2025 were power-related (54% in 2024).
- **Cooling stopped by a voltage dip** - In August 2023 a grid voltage dip tripped part of the cooling equipment at a data center in the Azure Australia East region, and services such as Azure and Microsoft 365 were affected for more than 24 hours.

EXPECTED OUTCOMES

Power quality and equipment condition of cooling equipment can be understood together so abnormalities can be handled in advance.

- **Early detection of potential failures** - Detects potential failures early to minimize unexpected incidents and risk.
- **Optimized maintenance schedules** - Diagnostic data helps predict and optimize maintenance schedules.
- **Lower cost and downtime** - Higher operating efficiency helps reduce energy consumption, maintenance cost and downtime.

TARGET EQUIPMENT

Chillers | Cooling fans | Chilled and condenser water pumps | VFD

SOLUTION

SV500 analyzes power quality of cooling equipment in real time from voltage and current signals and, with ESA, also diagnoses the condition of motors and drive equipment.

- **Power quality monitoring** - Analyzes voltage sag/swell, total harmonic distortion (THD) and voltage and current imbalance in real time to identify equipment impact and abnormal conditions caused by poor power quality at an early stage.
- **Power and energy measurement** - Measures active, reactive and apparent power, power factor and energy, viewable on the dashboard.
- **Motor and drive diagnosis** - Detects mechanical unbalance, bearing problems, shaft misalignment, winding insulation degradation, ground leakage current and load-related problems.
- **VFD operation diagnosis** - For equipment driven by a VFD, SV500 analyzes voltage, current and frequency signals on the VFD secondary (output) side at 8 kHz to predict and diagnose potential faults.
- **Adaptive thresholds** - Machine learning learns the normal state of each asset and judges condition with thresholds that adapt to load. Criteria matched to each asset and load condition are applied instead of fixed thresholds.
- **Web dashboard and data integration** - The equipment web server dashboard shows status per diagnostic parameter in real time, so condition can be checked without a site visit, and data can be integrated with upper-level systems over Modbus RTU, Modbus TCP, MQTT and RESTful API.

SUMMARY

SV500 monitors and records voltage sag/swell, THD and voltage and current imbalance of cooling equipment in real time from voltage and current signals, and also diagnoses motor and VFD abnormalities with ESA.

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