edgeSV
NTEK SYSTEM

USE CASE

Automated Warehouse Cranes & Shuttles

SV500 by NTEK SYSTEM | ESA-based Motor & VFD Predictive Maintenance

OVERVIEW

Stacker cranes and shuttles repeat acceleration and deceleration, and each axis carries a different load. SV500 analyzes drive motor and VFD electrical signals to screen axes that need inspection.

PROBLEM

A stoppage in an automated warehouse spreads across the whole operation.

Key challenges:

- **Warehouse-wide impact** — A crane or shuttle fault affects connected processes, so planned maintenance windows matter.
- **Hard-to-reach drive units** — Location and operating conditions make it easy to miss gradual changes on rounds.

EXPECTED OUTCOMES

Schedule maintenance in low-volume hours and prepare ahead of peak season.

Expected benefits:

- **Inspection priorities** — Compare load and acceleration current by payload to pick units to inspect.
- **Shift to planned maintenance** — Compare trends per unit and schedule checks in quiet hours.
- **Maintenance priorities** — Compare health grades across equipment on one common basis.

TARGET EQUIPMENT

Crane drive motors
Shuttle drive motors
VFD & regen drives

SOLUTION

01 VFD Status Diagnostics

Analyzes the VFD input/output voltage and current waveforms to identify faults in rectifier diodes, DC-link capacitors and switching devices (SCRs or IGBTs). Also monitors power-supply condition and power quality.

02 Motor Status Diagnostics

Analyzes motor voltage and current without additional equipment-mounted sensors. Screens mechanical issues (cavitation, soft foot, bearings and vibration), electrical issues (stator, connections, heat and noise), and load fluctuations.

03 Power Quality Status Diagnostics

Learns normal power-quality patterns and evaluates real-time deviations. Tracks voltage, current, interruptions, sags and harmonics to identify abnormal conditions.

04 Edge AI Server

Performs diagnostic analysis directly on SV500. Built-in storage (8GB eMMC and up to 256GB SD) retains waveforms and diagnostic data. Its web interface shows real-time values, equipment status, power quality, alarms, events and reports.

Operational Impact of edgeSV

Continuous monitoring and early detection support availability, maintenance and energy efficiency.

20–40%	10–25%	5–15%	10–20%
Unplanned downtime	**Maintenance cost**	**Energy savings**	**Equipment life**

Illustrative ranges only; not verified SV500 performance. Actual results depend on equipment, site conditions and corrective actions.