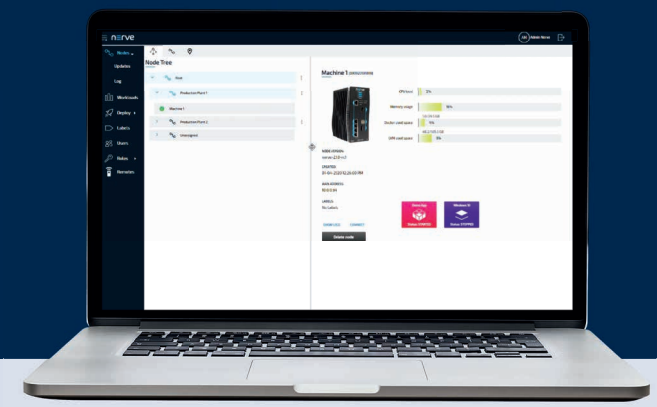
nerve

TTTech industrial

Nerve Blue

The missing link between your business and your machines



Nerve Blue is a radically open edge computing platform that promotes vendor independence and flexibility. Its open architecture allows users to deploy their own software or applications developed by 3rd parties. With Nerve Blue, users can reduce system complexity and cost, improve machine performance, and offer innovative new services to customers.

Collect, store and analyze machine data

- Real-time data access from PLC and IO infrastructure
- Time-series database integrated in device software and in the Management System
- Data Services for manipulating and distributing data between different systems
- Local and web-based user interface for data visualization

Consolidate multiple functions on one device

- Virtualized environment running Windows or Linux virtual machines
- Support for lightweight Docker containers
- Soft PLC (CODESYS®)
- Converge hardware based functions in software

Manage and deploy software

- Central repository for containers, VM and CODESYS® programs
- Simultaneous deployment of workloads to multiple devices and locations
- User management for device and software configuration
- Remote screen and console access to devices and installed software

	Nerve Blue Software	Qualified Nerve Device	Management System
	One-time license per Nerve Device	One-time purchase	Monthly fee per active Nerve Device
Delivery Model	• VM and container hosting • Local UI • Time-Series Database • Local data processing • Real-time data manipulation • Soft PLC	+ • TTTech MFN 100, Kontron A-250/A-150, Siemens Simatic IPC 127E/427E, Vecow SPS 5600 • Qualification of other Nerve Devices available on request	+ • VM and container deployment • Data streaming to the cloud • Cloud interfaces • Global device management • OTA patches and bugfixes

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Base System

Base System	Debian 10 (Linux Kernel 4.19.0) Support for Atom, Core I5 and I7 based COTS hardware (qualifiable as Nerve Devices)
Hardware Support	TTTech MFN 100, Kontron A-250/A-150, Siemens Simatic IPC 127E/427E, Vecow SPS 5600
Hypervisor	Xen 4.11
OS Support	Linux and Windows (as virtual machine)
Soft PLC	CODESYS 3.5 (PROFINET Master/Slave, EtherCAT, Modbus TCP/IP), Cycle time down to 1 ms Hosted in a real-time virtual machine to ensure isolation
Workload Management	Local UI for workload management Resource management to ensure application performance
Extensible Architecture	Open for integration of 3rd party software firewalls (e.g. CISCO vASA)
Updates	Over-the-air updates, security patching and bug fixes for Base System
Communication Security	Encrypted Transport Layer Security (TLS 1.2) based communication Firewall friendly - communication to the Management System uses port 443
Application Sandboxing	Applications are hosted as virtual machines and containers to maintain system separation
Network Segmentation	Configurable networking for separation of workload networks

Data Services

Database	Timescale Time-Series Database (optional InfluxDB)
Data Ingestion	OPC UA with authentication support High speed data ingestion: 100,000 data points per second Time stamp support in data-stream and at ingestion point
Input Protocols	MQTT / JSON, OPC UA Client/Server, OPC UA PubSub
Output Protocols	MQTT / JSON, OPC UA Client/Server, OPC UA PubSub, Timescale DB (SQL), InfluxDB
Data Visualization	Grafana locally on Nerve Device and remotely in Management System
Analytics	Python SDK and toolchain for analytics container creation Analytics support built with Intel MKL and DAAL libraries

Management System

Hosting	Hosted on Azure cloud or on-premises
Management System	Deployable as Linux Docker with browser-based GUI View status of connected Nerve Devices, secure onboarding of new Nerve Devices Supports low bandwidth and intermittent connections to Nerve Devices
Workload Management	Workload management (deployment and updates) remotely via Management System Selective application deployment to mitigate user error Workloads accessible from the external network Support for local repositories (service PC or server)
Database	Timescale Time-Series Database
Data Visualization	Grafana via Data Services
Permission Management	Fine grained role-based access control to Management System LDAP support, OAuth 2.0
Remote Access	Remote service access (VNC, RDP, Shell), remote port tunneling (e.g. for FTP)
Logging and Monitoring	Centralized logging support (Elasticsearch/Kibana)
Alarms	Alarms created through Grafana (RAM, CPU, temp. status & certificate expiry warning)

Material name	Material number
SL-NB2-C-MFN100	13393
Nerve Blue Maintenance	13728

Material name	Material number
SV-NMS2-Hosted-AZ	13675
SL-NMS2-Onprem	13484

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