

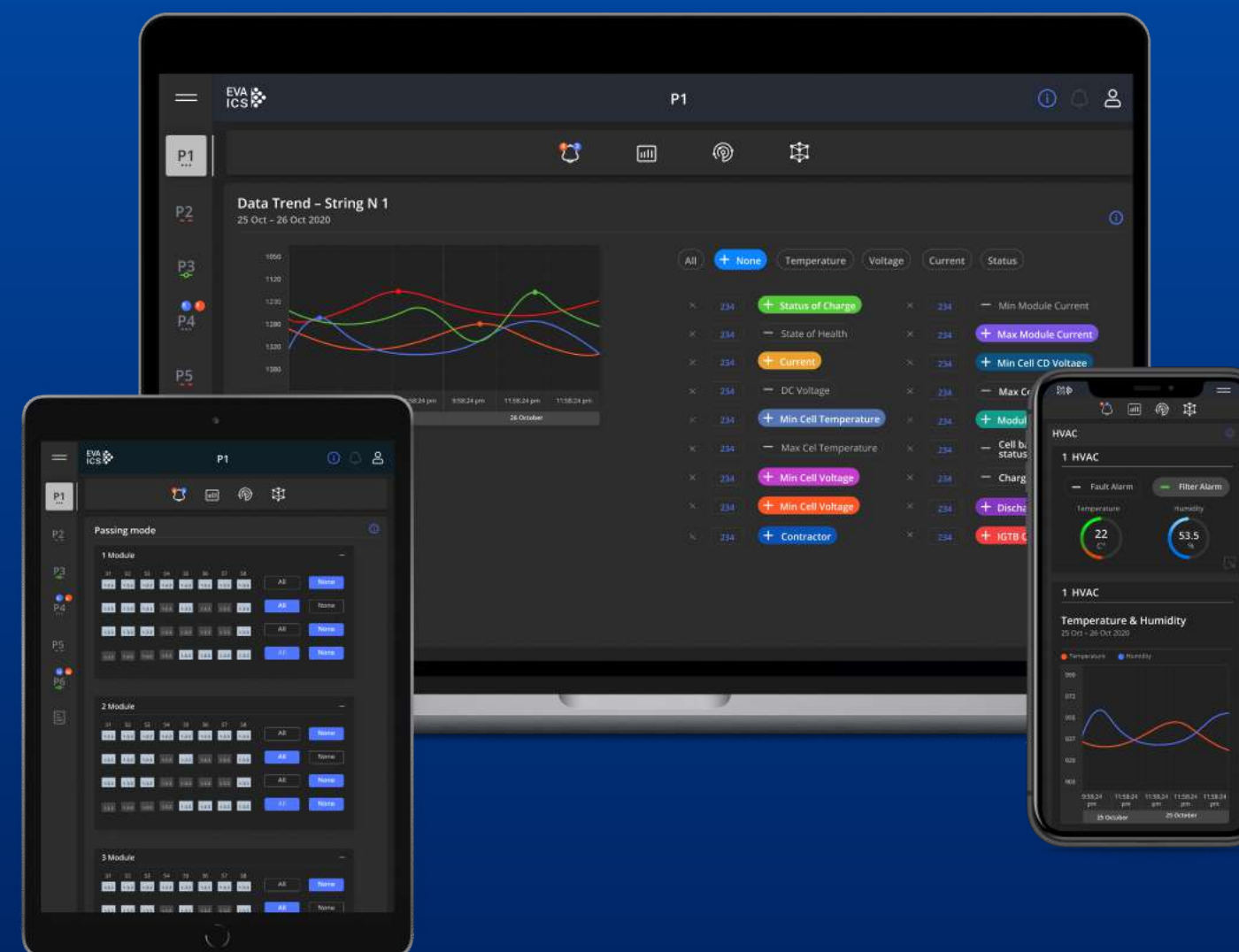
Bohemia Automation

EVA ICS[®] v4

More than just the world's fastest cloud SCADA/Automation platform.

It is a powerful tool for rapidly developing digital transformation and industrial automation solutions across a wide range of IIoT sectors:

- High Energy
- Smart City
- Industry
- Defense
- Smart Farming



Base functionality

Security:

Your Cloud – Your Control.

No data leaks and lost control. Our solution allows you to fully own your cloud, with the ability to control all communications, host all components on your own hardware, and decide which data to share with 3rd parties. Ensure the security of mission-critical systems by keeping them isolated from the internet on your local hardware without sacrificing functionality.

Zero vendor lock-in:

Unleash the power of flexibility with EVA ICS, the industrial control system that offers zero vendor lock-in. Keep your existing equipment and easily switch between vendors without any compatibility issues. EVA ICS supports multiple fieldbus types and allows for experimentation with new equipment in existing installations, giving you the freedom to choose the best solution for your needs. Say goodbye to vendor lock-in and embrace a fully integrated system with EVA ICS.

Speed:

Transform your industrial control system with EVA ICS - experience lightning-fast performance. Each node is equipped to handle millions of objects and events without the hassle of traditional SCADA applications. Access your data through a simple and user-friendly open web HMI on any device, laptop, or phone, for a seamless and enjoyable experience.

Reliability:

Ensure the reliability of your industrial control system with EVA ICS. Its services are divided into robust processes, ensuring the stability and robustness of each node and node point.

Communication between processes is made super-fast and stable with the use of BUS/RT, an in-house, high-speed IPC bus that outpaces all competitors

Operators' routine automation:

Streamline your operator's routine with EVA ICS. In addition to powerful fieldbus logic, it offers flexible application layer automation to ease the burden of daily tasks and improve overall efficiency.

Flexible management tools:

Simplify your industrial control system management with the flexible tools offered by EVA ICS. Automate typical tasks using the powerful eva-shell console application and manage all resources across all nodes with ease using the EVA ICS Cloud Manager UI, all from a single desktop dashboard.

Scaling:

Expand your industrial control system to meet your evolving needs with EVA ICS. Its cloud formation can be easily extended with additional nodes, installed on the same or different plants, at any time. For heavy-loaded nodes, they can be split into points - clusters of local machines processing different tasks such as fieldbus control, HMI applications, database gateways, and more.

Modern HMIs:

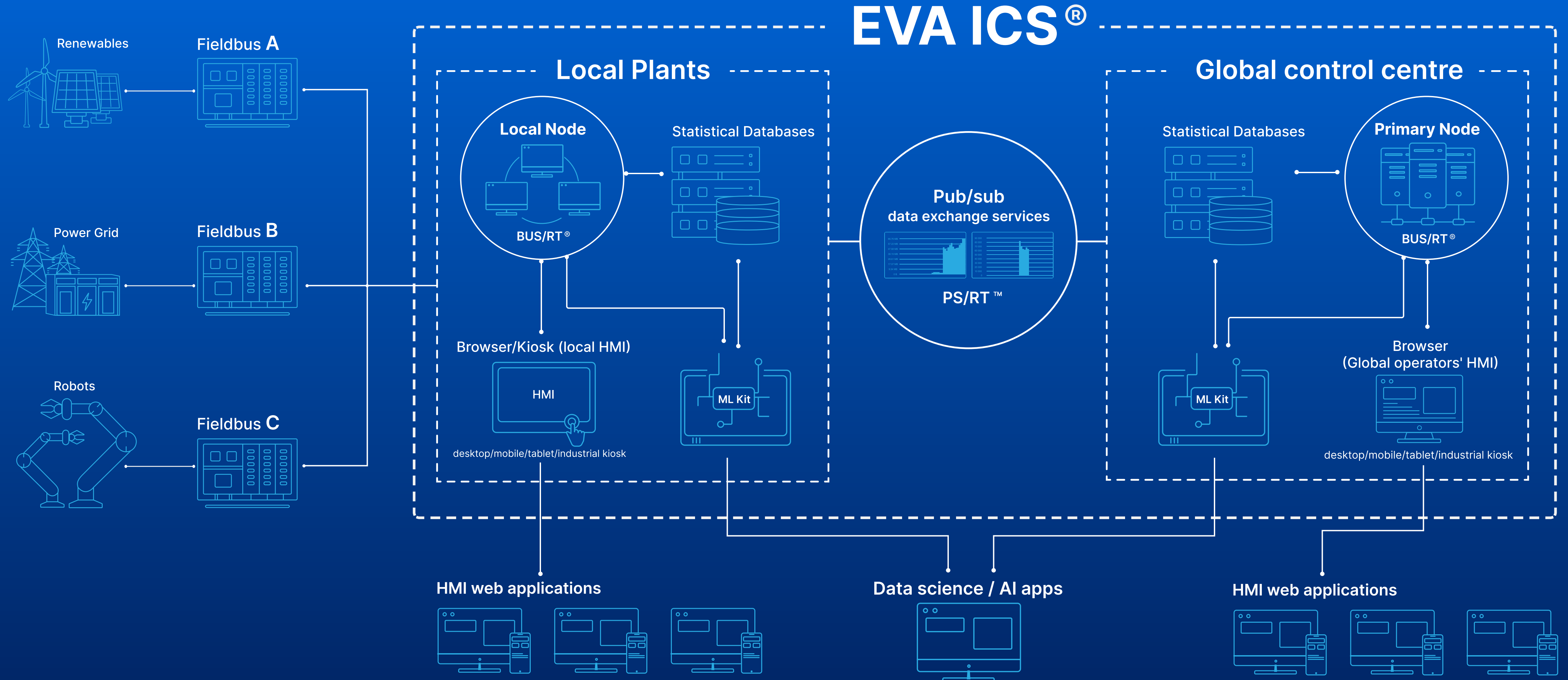
Bring your industrial control system to life with the power of EVA ICS. Its HMI web service and EVA JS Framework ensure that all required data is automatically pushed into the web browser, allowing you to easily design and apply beautiful HTML templates and bind controls for a unique and visually appealing interface.

Reduction of integration costs:

Reduce your integration costs with EVA ICS. Deploy new plants quickly and easily, without tedious setup processes. All configurations can be easily copied, exported, and deployed, and the platform fully supports the Infrastructure-as-Code paradigm, providing you with a streamlined and cost-effective solution.



SCADA / Extended Automation Platform



Special features available in EVA ICS® v4 Enterprise.

Zero-failure replication:

Zero-failure event replication layer addresses the challenge of uncertain data processing in Pub/Sub-based event exchange between two applications, such as two cloud-SCADA nodes. With this layer, EVA ICS ensures that all telemetry events are exchanged with 100% accuracy between all participants, offering a reliable solution to this critical challenge

Active Directory:

Grant SCADA user authorization through your organization's Active Directory domain. Manage access authentication directly from the Active Directory groups manager. This feature offers flexible support for integrating EVA ICS into multiple domains and federations

Kiosk manager:

EVA ICS enables touch panel kiosk interfaces to become a new SCADA standard used by end customers, field engineers, and plant operators. Its flexible and secure orchestration can manage hundreds of touch panels, providing additional security opportunities. Touch panels don't need real login credentials as the interface application is automatically authenticated upon connection to the manager service, using a one-time password and specified access control lists.

EVA JS Framework WASM extensions:

Address the speed limitations of web browsers when handling large amounts of objects and events in Web-HMI applications. With this extension, the object and event processing logic can be offloaded to local, secure browser-built-in web-assembly containers, resulting in an average application speed increase of 20-30 times



EVA ICS[®] Machine Learning kit

Revolutionary Industrial IoT solution from Bohemia Automation designed specifically for data analysts and specialists. The ML kit offers several advantages over traditional methods of querying data directly from databases.

Key features of the ML kit include:

- + Ability to collect data from multiple databases simultaneously, including time series, SQL, or custom services.
- + Data export in Pandas and Polars, Arrow or CSV stream that can be loaded quickly on the client side.
- + Use of the same authentication and authorization mechanism as HMI services, eliminating the need for additional access setup.
- + Delivery of fully prepared data frames as a true Apache.
- + Support for data stream compression during transfer, ensuring faster and more efficient parallel data collection from multiple databases.
- + Full integration with the EVA ICS v4 environment.

In addition to these features, the ML kit includes tutorials for typical IoT data processing with AI, offering incredible opportunities for system modelling and testing.

With a user-friendly web interface, the release version of the ML kit provides quick code generation for Python and R, data chart construction, and data export in Apache Arrow/CSV formats.



EVA ICS[®] v4 Core Components

EVA ICS Cloud Manager UI:

The ultimate solution for remote management.

This desktop dashboard application offers a user-friendly interface to monitor and manage your EVA ICS v4 node and all other connected nodes with ease. With its interactive cloud dashboard, you can stay on top of all your resources and perform management operations with confidence.

PS/RT[™]:

Our in-house pub/sub protocol certified by IANA as one of the standard protocols.

With the ability to handle 100K+ messages on a single node with low latencies, PSRT uses B-tree algorithms to process hundreds of thousands of subscriptions without speed loss. Its data throughput works seamlessly on any type of channel, including low-speed satellites, making it ideal for IIoT setups in remote areas.

BUS/RT[®]:

Our super-fast IPC bus that outperforms all competitors. With a single EVA ICS machine capable of aggregating an unlimited number of objects and processing up to 1,500,000 events per second from local fieldbus, applications, and connected neighbor nodes, BUS/RT is the perfect solution for high-performance data processing needs.

BUS/RT benchmark

Number of objects	unlimited*	~3.5GB RAM per million of objects
Deployment speed	25.000	objects a second
BUS/RT events with HMI enabled, non-repetitive	~ 600 000**	a second
BUS/RT events with HMI disabled, non-repetitive	~ 1 000 000**	a second
BUS/RT events, repetitive	~ 1 500 000**	a second

Footnote

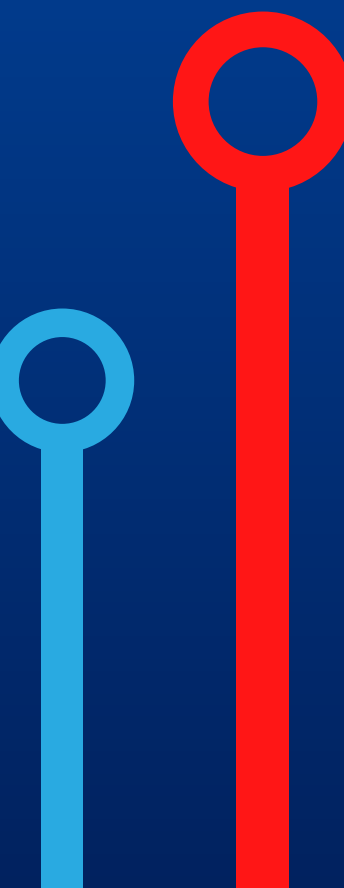
* - as EVA ICS core uses b-tree algorithms to manage inventory, number of objects does not affect the system speed

** - events from field bus services or BUS/RT applications

The system, used for the benchmark:

- CPU: AMD 5950X (4 cores consumed by EVA ICS core process)
- Inventory database: external (SQLite)
- Instant save: off
- BUS/RT core process queue size: 256000

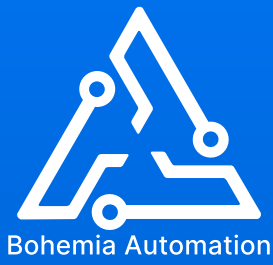
Consider a single EVA ICS machine can aggregate a nearly unlimited number of objects and process up to 1 500 000 events a second from the local fieldbus, applications and connected neighbour nodes.



Key facts for engineers

- EVA ICS is a platform of modern in-house IIoT technologies and protocols designed for Industrial applications.
- EVA ICS v4 is the world's only cloud-SCADA platform fully written in Rust, one of the world's fastest and most reliable modern system programming languages.
- EVA ICS is the only cloud-SCADA platform that completely supports Infrastructure-as-Code (IAC) DevOps technology.
- EVA ICS builds are created with two dedicated build servers, which nearly eliminates any bit-flipping in binaries.
- The platform's quality has been verified in production for years.
- Fieldbuses out-of-the-box: Modbus, OPC-UA, 1-Wire, Ethernet/IP, TwinCAT/ADS
PSRT is the in-house wide-area network pub/sub protocol, developed especially for industrial applications and fully optimized for EVA ICS.
- BUS/RT is an in-house IPC bus that combines the best aspects of IPC approach, starting from Erlang/OTP and ending with modern IPC techniques. It was developed especially for modern, low-latency, heavy-loaded applications.
- ML kit server allows building data frames with billions of cells in a few seconds





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Since 2012, Bohemia Automation (formerly the automation department of Altertech group) has been a pioneering company in the development of new IIoT technologies and cloud-SCADA products.

