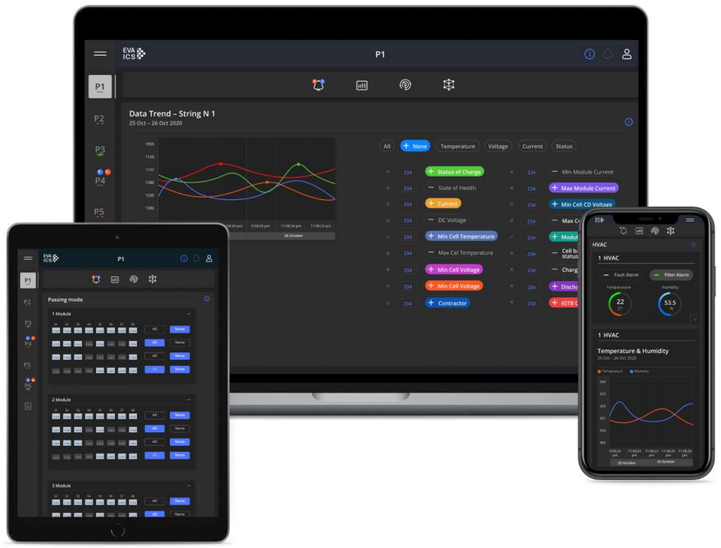
Bohemia Automation presents

EVA ICS® v4

World-fastest cloud-SCADA and complete automation system for rapid digital transformation in:

- High Energy
- Smart City
- Heavy Manufacturing
- Smart Farming
- Defence
- Other IIoT sectors

which opens up previously unimagined possibilities.



Base functionality

Zero vendor lock-in

EVA ICS allows to keep existing equipment when switching vendors, coupling different fieldbus types together. Feel free to experiment with new equipment in existing installations. EVA ICS combines them all.

Speed

EVA ICS is super-fast. Each node can control and monitor millions of objects and process millions of events. And there are no heavy SCADA applications to access them - open web HMI on a laptop, on a phone and enjoy.

Reliability

EVA ICS services are split into different processes, which makes nodes and node points completely robust. To make inter-process communication stable and fast, EVA ICS uses BUS/RT - an in-house super-fast IPC bus, which is far ahead of all known competitors.

Operators' routine automation

In addition to existing fieldbus logic, EVA ICS provides flexible application layer automation, which helps with daily tasks.

Flexible management tools

Typical tasks can be automated with eva-shell - the powerful console application. Additionally, EVA ICS Cloud Manager UI allows managing all resources on all nodes from a single desktop dashboard.

Security

EVA ICS is not yet-another-IoT cloud solution. Our goal is simple - customers fully own their cloud. The customers can control all communications, host all cloud components on their own hardware and decide which parts of data should be moved to 3rd parties. Forget about data leaks and host sensitive information in fully isolated offline private clouds on their own equipment.
Any EVA ICS mission-critical setup can be completely isolated from the Internet on a customer's local hardware without any functionality loss.

Scaling

The cloud formation can be extended with additional nodes installed on the same or different plants at any time. Heavy-loaded nodes can be additionally split into points - clusters of local machines, which process different tasks, such as fieldbus control, HMI applications, database gateways etc.

Modern HMIs

With EVA ICS HMI web service and EVA JS Framework, all required data is automatically pushed into the web browser.
All is needed is to design and apply a good-looking HTML template and bind controls to elements. This makes all integrations or product interfaces beautiful and unique.

Reduction of integration costs

With EVA ICS new plants can be deployed quickly and easily. Forget about boring plant setups - all configurations can be copied, exported and deployed. The platform fully supports the Infrastructure-as-Code paradigm.

Special features available in EVA ICS ® v4 Enterprise

Zero-failure replication

When two applications exchange events via Pub/Sub (e.g. two cloud-SCADA nodes), the sender never knows is the data processed by the receiver correctly.
EVA ICS brings an additional zero-failure event replication layer, which 100% guarantees that the telemetry events are always exchanged correctly between all participants.

Kiosk manager

Touch panel kiosk interfaces become a new SCADA standard and are used both by end-customers, field engineers and plant operators. EVA ICS provides flexible and secure orchestration, which allows it to manage hundreds of touch panels connected. This also brings additional security opportunities, as touch panels do not need any real login credentials - as soon as a panel is connected to the manager service, its interface application is automatically authenticated, using a one-time password and gets specified access control lists.

EVA JS Framework WASM extensions

Web-HMI applications become more and more popular, however, due to JavaScript speed limitations in web browsers, such applications are slow to deal with large amounts of objects and events. With EVA JS WASM extension, object and event processing logic can be offloaded to the local secure browser-built-in web-assembly containers, which increases the average application speed by 20-30 times.

EVA ICS® v4 core + BUS/RT® benchmark

Results

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.

PS/RT

In addition to the traditional MQTT protocol, widely used in IIoT setups, we provide our own in-house pub/sub protocol, called PSRT.

**The protocol is IANA-certified as one of the pub/sub standard protocols.
w-speed satellites (around 33600 bps) and perfectly handles any channel problems, quickly automatically restoring any dropped connections.**

**The server with PSRT protocol can process 100K+ messages on a single node with very low latencies (<1ms).
Speeds are reasonable (1K+ ops/sec) even with enormous (1MB+) payloads.**

**Topic subscriptions in PSRT are processed with B-tree algorithms, which allows the server to handle hundred thousands subscriptions without any speed loss.
Another key feature of PSRT is data throughput on any type of channel. Industrial facilities are often located far from urban areas and have limited speed and stability communication channels. PSRT allows customers to deal with plants even on the far north, connected with low-speed satellites (around 33600 bps) and perfectly handles any channel problems, quickly automatically restoring any dropped connections.**

Key facts for engineers

- EVA ICS is a set of modern in-house IIoT technologies and protocols, developed for heavy industry applications.
- EVA ICS v4 is the only cloud-SCADA, fully written in Rust - one of the world-fastest and reliable modern system programming languages.
- EVA ICS is the only cloud-SCADA, which completely supports Infrastructure-as-Code (IAC) DevOps technology.
- EVA ICS is the platform, whose quality is verified in production for years.
- EVA ICS builds are created with two dedicated build-servers, which nearly eliminates any bit-flipping in binaries.
- 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 the in-house IPC bus, developed especially for modern low-latency heavy-loaded applications and combines the best sides of IPC approach, starting from Erlang/OTP and ending with modern IPC techniques.
- Bohemia Automation (formerly the automation department of Altertech) is the cloud-SCADA-pioneer company, which develops new IIoT technologies and cloud-SCADA products since the year 2012.
- ML kit server allows building data frames with billions of cells in a few seconds

Contact us

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