



ONE DIGITAL TWIN SUBSTATION: AN IMMERSIVE VR EXPERIENCE

From design to operation. In a single digital twin.

Discover how a substation evolves from engineering design to a living digital replica that supports construction, operation and maintenance.

Through an immersive Digital Twin experience, visitors can enter a fully immersive VR environment and walk through a substation before it is built. Every asset, connection and piece of equipment is represented in an intelligent 3D model, creating a single source of truth throughout the project lifecycle.



SUBSTATIONS SOLUTIONS

IMMERSIVE VR EXPERIENCE

Explore the digital substation in VR to:

- Validate equipment layout, clearances, and maintenance access before construction.
- Support operator training and multidisciplinary design reviews.
- Enable remote stakeholder collaboration and approvals.

DIGITAL TWIN & BIM ENGINEERING

Built with primtech 3D, the model integrates:

- Equipment, structures, cables, and civil works.
- Automated drawings, BOMs, and a centralized engineering database.

The model evolves into a live Digital Twin, connected to asset management, GIS, and SCADA systems via CIM standards.



KEY BENEFITS

- Faster engineering and project delivery
- Reduced site rework through early clash detection
- Accurate as-built documentation using LiDAR surveys
- Integrated compliance calculations (IEC 60865-1, IEC 62305, IEEE 998)
- Real-time asset visibility and support for predictive maintenance analytics

A Digital Twin transforms engineering data into actionable insight, enabling safer, smarter and more efficient substations throughout their lifecycle.



FROM PHYSICAL ASSETS TO OPERATIONAL
INTELLIGENCE



GRID ACCESS SIMULATION & MULTI-PLANT VOLTAGE REGULATION

From grid connection to real-time network control.

Successful renewable integration requires more than a connection study. It requires understanding how assets interact with the power system and how voltage and power flows are managed in real time. Our solution combines advanced Grid Access Studies with intelligent Multi-Plant Voltage Regulation, ensuring compliance, stability and maximum network capacity.



SUBSTATIONS SOLUTIONS

GRID ACCESS SIMULATION

Over the past five years, Energobit* Control Systems has delivered:

- 200+ **Grid Connection Studies**
- 25,000+ **MW assessed capacity**
- PSS®E **industry-standard simulations**

STUDY CAPABILITIES

- Grid connection and reinforcement assessments
- Load-flow, contingency (N-1/N-2), and congestion analysis
- Short-circuit, stability, and FRT/LVRT studies
- SCADA and dispatch integration evaluation
- Grid connection cost assessment

These studies provide the technical basis required by TSOs, DSOs and project developers to secure network access.

MULTI-PLANT VOLTAGE REGULATION VIA JVC (JOINT VOLTAGE CONTROL)

When several renewable plants or BESS installations share the same connection point, voltage regulation must be coordinated across the entire portfolio.

JVC automatically distributes reactive power between assets to maintain voltage within grid-code requirements while optimizing overall plant performance.



KEY BENEFITS

- Coordinated voltage control across plants and BESS
- Improved PCC voltage stability and reduced reactive power conflicts
- Increased renewable hosting capacity
- Faster compliance with TSO requirements
- Seamless integration with SCADA, PPC, EMS, and RTUs
- Scalable architecture for future expansion

OMEXOM

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