



# Automatic Voltage Regulator retrofits with the EX2100e

For decades, Nexus Controls, a Baker Hughes business, (formerly known as GE Energy Control Solutions) has successfully delivered controls and excitation modernizations for heavy duty and aeroderivative gas, industrial and large steam, and hydro powered turbine-generators. Today, many legacy systems are limited by the technology of their era and require an upgrade to deliver generator operability and availability improvements.

Building upon proven experience, the EX2100e incorporates the enhanced technology found in the Mark\* Vle control platform, making it a highly reliable and adaptable solution.

Its flexible architecture, modern networks, and versatile software suite enhance operations and integration with plant equipment. Advanced algorithms incorporate decades of fleet experience and the latest controls technology to deliver the performance needed in today's power generation industry.

The EX2100e 35A and 120A AVRs support virtually any voltage regulator application, including brushless and rotating DC exciters, as well as SCT/PPT regulator modernizations.

## Benefits

### Increased performance with advanced controls:

Provides industry-leading control, limiter, and protective functions to maximize generator performance and improve protection for a variety of applications.

**Scalable:** Two available power converters (35A and 120A DC max) and redundant channel options allow the EX2100e AVR hardware to be optimized for most applications and budgets.

**Flexible packaging:** Systems can be specified as a freestanding panel configuration, as pre-engineered panel inserts or as parts kits for custom installations optimizing modernization efficiency and cost.

**Advanced software:** Powerful ToolboxST software, with modern drag-and-drop type editors, industry leading trending with video type forward-reverse-freeze capability, and code-compare tools.

- **Improved decision support** – A variety of user-friendly interface options provide real time information, alarm/event management, and trending leading to improved operator recognition and resolution of system events and system status.
- **Maintenance efficiency improvements** – a single, integrated software tool reduces engineering and troubleshooting time, providing diagnostic help support with solution recommendations and real-time data capture with timestamp Sequence of Events (SOE) recording.

**Compliance support:** Simplified testing and reporting features reduce cost and risk associated with regulatory compliance.



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**Expandability:** The EX2100e family of products is designed with the future in mind. The architecture provides a flexible approach to life cycle management. The system is designed to allow incremental upgrades or modernization proving access to new features and protecting the investment from the rapid aging of digital component technology.

**Reliable:** Available in simplex or fully redundant dual configurations to provide cost-effective solutions to meet the needs of any application. Advance dual control technology combines redundant controllers, power supplies, cooling fans and power converters with a sophisticated virtual system model to provide unequalled selectivity and fault tolerance for a dual system.

- **Input redundancy** – Precise generator control from a variety of input sources including a single- or three-phase permanent magnet generator (PMG), a single- or three-phase AC source with power potential transformer or a 125 V DC or 250 V DC battery.

## Cybersecurity

Upgrading to Nexus Controls' suite of security products allows you to take advantage of our comprehensive cybersecurity solutions, helping reduce your risk and ensure maximum uptime. With over 10 years of industrial network protection experience and hundreds of installations worldwide, Nexus Controls' cybersecurity solutions provide defense-in-depth protection and have undergone strict cyber-security best practices, demonstrating to customers that systems are developed and implemented securely. The SecurityST platform and Cyber Asset Protection program are designed to support the plant operation's compliance to cybersecurity standards and guidelines including NERC CIP, NEI 08-09 and ISA99/IEC 62443.

## Life cycle support

Nexus Controls offers System Service Agreements (SSAs) and Multi-Year Agreements (MYAs) designed to reduce the risk and cost of maintaining your system. Subscribers benefit from our expertise and a true partnership in the maintenance and servicing of control systems. Service Agreement costs are predictable, simplifying annual maintenance budgets, and provide a proactive approach to maintenance that reduces the risk of forced outages.

## Dedicated excitation retrofit experts

Nexus Controls provides a full range of services and support capabilities for the EX2100e AVR and static excitation systems:

- Hardware, software and integration engineering
- Application expertise to support custom solutions
- Installation design and documentation packages
- Single point system responsibility – PPT, cable, bus, networks, enclosures
- Comprehensive PSS and excitation model studies, testing and documentation services Project management, installation and commissioning services
- Nuclear grade retrofit packages and DCN support

## We've been here all along

For decades, Nexus Controls, a Baker Hughes business, has successfully delivered turbine and generator control system solutions for power generation customers around the globe. Our team of experienced domain experts leverage a comprehensive portfolio of reliable control platforms to tailor the outcomes to best meet your needs.