

## Alterrex\* Excitation Retrofits with the EX2100\* Product Family

## product overview

Upgrade your plant's existing Alterrex\* excitation control system in less time and at a lower cost than you may have thought possible. GE Energy offers customized products and services to modernize the Alterrex family of analog excitation systems.

### EX2100AR Alterrex Regulator Retrofit

GE Energy's EX2100\*AR Alterrex Regulator Retrofit enables a modular migration path, replacing the aging analog voltage regulator with a new, digital control system, while retaining the rotating Alterrex and the water-cooled diode bridges. The new regulator delivers all the benefits of a new exciter platform, including robust self-diagnostics, online repair of redundant control, flexible operator and plant-wide system interfaces, powerful configuration and troubleshooting software, and improved system reliability, all of which are essential for today's power environment.

### EX2100 Static System Retrofit

GE Energy also offers an EX2100 static system retrofit, which provides the expanded functionality of an Alterrex regulator upgrade, but with minimized repair and maintenance costs. By replacing the rotating Alterrex and the liquid-cooled diodes with GE Energy's state-of-the-art EX2100 static system, the maintenance issues associated with the rotating Alterrex are eliminated. The EX2100 also delivers improved system performance and fault tolerance, including on-line repair of controls, cooling fans, and power conversion bridges.

GE Energy custom-engineers each retrofit solution, ensuring that the turbine generator train, collector, and lube or stator water systems all continue to perform as designed after the removal of the Alterrex.

Increase the reliability and functionality of your excitation control system – contact GE Energy today.

### System Highlights

- Voltage regulators and static systems featuring triple modular redundant controls
- Voltage regulator or full multi-bridge static excitation system with PPT
- Advanced software features, such as Power System Stabilizer (PSS)
- Data available through multiple operator stations
- Microsoft® Windows®-based software tools for configuration, diagnostics, trending, recording, and export
- Flexible system interface to plant-wide control systems
- Online repair of controllers and fans in redundant systems
- Engineered retrofit services including civil, mechanical and electrical design packages
- Complete turnkey packages including equipment, engineering, installation, and commissioning
- Regulator packages can be bundled with water-cooled diode refurbishment services



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## Functionality & Reliability of a Modern Control System

The EX2100 excitation control system is GE Energy's latest control offering for steam, gas, and hydro exciters. A flexible system to meet today's excitation challenges, the EX2100 can be customized with simplex or triplex modular redundant controls, simplex or redundant power conversion bridges (from 20 to 8000 amps), and advanced software features, such as self diagnostics, active system graphics/plots, and a Power System Stabilizer.

Upgrade benefits include: eliminated thermal drift and analog control alignments; enhanced operational modes, alarm management, and advanced protective functions; and, increased availability of spare parts. Existing operator controls can be retained, replaced, or augmented with a variety of color touch-screen HMIs, or integrated into an existing turbine control or plant-wide control platform.

Set-up and troubleshooting are simplified with the user-friendly, Windows-based, ToolboxST\* maintenance and configuration tool. Advanced features, including self-diagnostics, active system graphics and schematics, programmable trend recorders, and high-resolution oscillography deliver a broad range of excitation and generator data at your fingertips. Additionally, flexible communication architectures enable connectivity to other plant controls systems through standard protocols and connections.

Increase the reliability and stability of your generator with GE Energy's EX2100, while minimizing cost and installation time. Contact GE Energy today to learn about the full range of Alterrex retrofit products and services.

## Architectural Highlights

- Regulators up to 600Vac, 450Adv
- Static excitation systems up to 1300Vac, 7,700Adc
- 10/100 Ethernet networks
- Standard 1ms Sequence of Events (SOE)

## Typical Software Functions

- Automatic and manual voltage regulators, reference adjusters, and reference followers
- Volts per hertz limiter
- Online and offline over and under excitation limits
- Reactive current compensation
- PT fuse failure detection
- Generator field temperature calculation
- Operator control simulation
- Power System Stabilizer
- Protective functions
- Automated testing functions



GE Energy  
3800 North Wilson Avenue  
Loveland, CO 80538  
800-835-5182  
+1-970-461-5201

[www.gepower.com/controlsystems](http://www.gepower.com/controlsystems)

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