



### Introduction

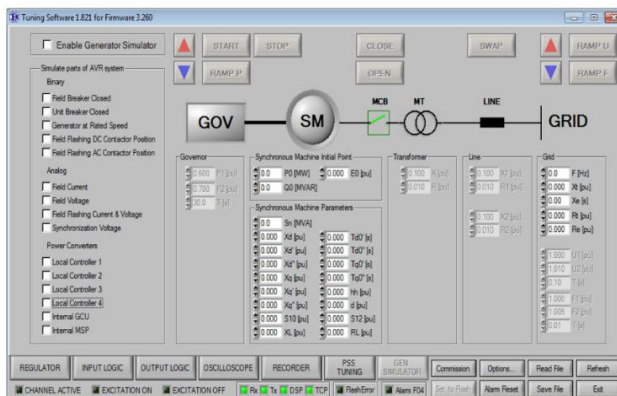
Building on a sound knowledge of turbine control and power generation philosophy, Dynamic Controls Canada Inc. has developed a series of AVR retrofit packages designed to meet the specific needs of customers struggling with the high costs of control system retrofits.

We believe that smarter, simplified systems can allow the industry to meet operational requirements while contributing towards lowering the financial impact of control and excitation system replacements.

With almost 80 years of industry experience, our professional group of engineers will ensure that clients can be certain of an efficient design, installation, and commissioning process throughout the retrofit.

### Features and Benefits

- Fast DSP processor with 20µs sample time
- Internal power module up to 50A
- Powerful ARM-based communication module
- Four control modes (Ug, If, VAR, PF) with auto-tracking
- Five limiters (MFCL, V/Hz, PQL, FCL, SCL) and PSS
- Built in protection functions
- Data logging at 1ms and 50ms sampling rates
- Programmable I/O digital and analog
- Configuration for redundant operation
- AVR/FCR selection
- Ethernet /RS232/485/USB connectivity



### RDEX-2 Main Components:

- Supplied with up to 400Vac Power Supply or PMG
- Upwards of 330Vdc Field Breaker
- Crowbar - DC Over Voltage Protection and Discharge
- Rotor Ground Fault Detection
- Field Flashing Circuit Embedded in Power Module
- Generator Breaker (52G) Control and Tripping
- Auto Sync and Sync Check Relays Integration
- Remote Communication Ability
  
- HMI with:
  - AVR Configuration and Control
  - Generator Parameters
  - Sync and Sync-Check Status
  - Generator and Engine Performance Mapping
  - Synchronization Timing Oscillograph and Quality Data
  
- Automatic Voltage Regulator (AVR) features:
  - Auto/Manual Control Mode
  - VAR/PF Control Mode
  - Power System Stabilizer (PSS)
  - Over Excitation Limiter (OEL)
  - Under Excitation Limiter (UEL)
  - Volt / Hertz Limiter (VHZZ)
  - Reactive Compensation
  - Ethernet Modbus remote communication
  - IRIG-B Time Sync
  - Generator Simulation Software

### Generator Simulator

The Generator Simulator is a powerful tool for engineers working in the field of excitation systems and power distribution.

The software, which runs directly on the DSP (digital signal processor) of the controller, enables the user to simulate complex simulations involving a synchronous generator, quickly and easily. It simplifies the process of cold commissioning excitation systems by simulating parts of the system.

It also allows one to adjust and check the performance of control loops, limiters, and the power system stabilizer before first excitation, which guarantees a safe and smooth live commissioning process.

# RDEX-2 Excitation System

Retrofit System | Smart – Reliable - Feasible

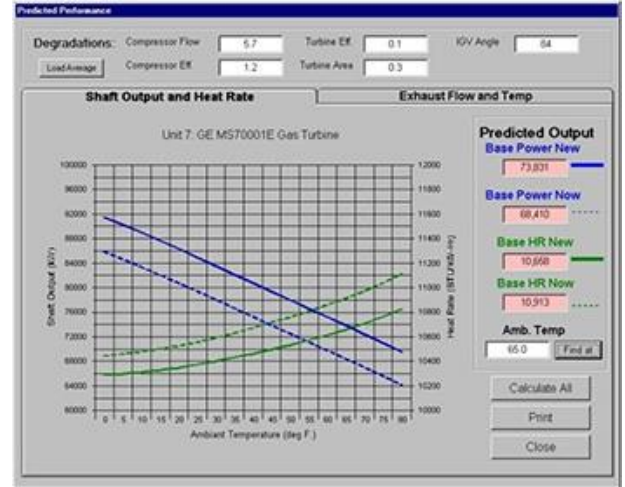


## Generator and Prime Mover Performance Software

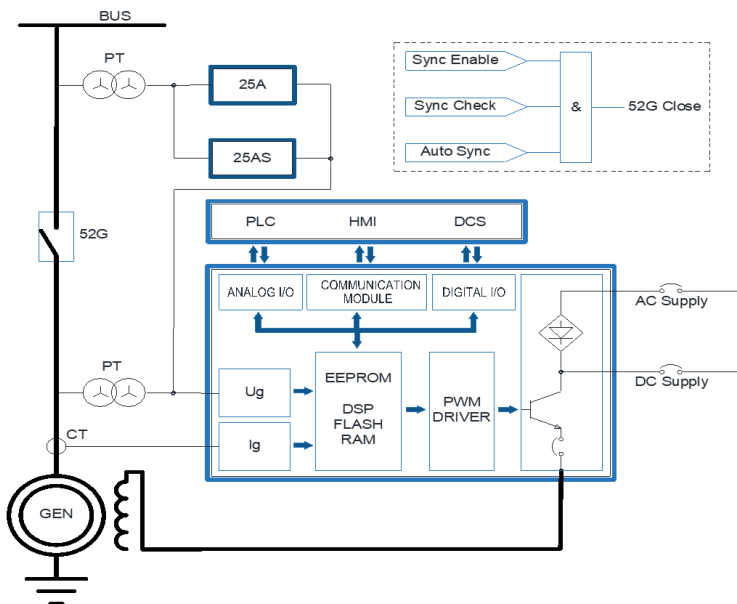
This tool allows the user to evaluate the state of the prime mover (Gas Turbine) and when necessary, take on maintenance intervention such as inlet compressor cleaning, water injection verification and IGV/Nozzle calibration, where appropriate.

The system compares projected power delivery against actual power production on a real time basis. Considering duct losses and ambient temperature performance curves, this system plots projected power and actual power generated under all ambient conditions.

Data logging and real time trend analysis gives the operator predictive tools to optimize their power production with a resulting reduction in fuel consumption and exhaust emissions.

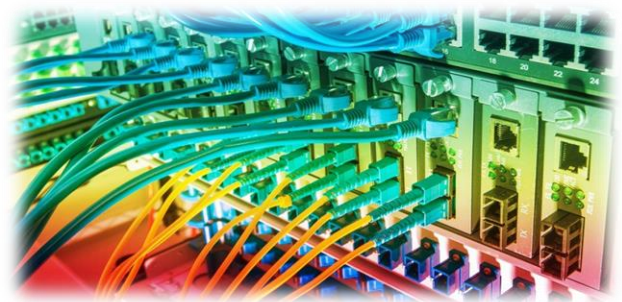


## RDEX-2 One Line Diagram



## Auto Synchronization and Sync check

The RDEX-2 is equipped with both Auto-sync and Sync-check modules that control the generator breaker during normal synchronization and black start conditions. In addition, this synchronization data is fed into the AVR HMI making available historical data in the event of problems associated with synchronization.



## Communication

- Modbus RTU 232/422/485
- Modbus TCP/IP
- 4-20mA Analog I/O
- 24VDC –120Vdc Digital I/O
- IEC60870-5-104
- IEC61850

## General Technical Data

### Internal Firing Bridge Configuration

<b>I<sub>fn</sub></b> - Maximum Excitation Continuous Current	50Adc
<b>I<sub>fmax</sub></b> - Maximum Excitation Ceiling Current for 10s	100Adc
<b>U<sub>nmax</sub></b> - Maximum Supply Voltage	400 Vac or PMG
<b>U<sub>fmax</sub></b> - Maximum Excitation Continuous Voltage	330 Vdc
<b>U<sub>ins</sub></b> - Dielectric Isolation Voltage of Power Circuit	2000Vac
<b>U<sub>ins-pulse</sub></b> - Dielectric Isolation Voltage of Firing Pulses Circuit	500Vac