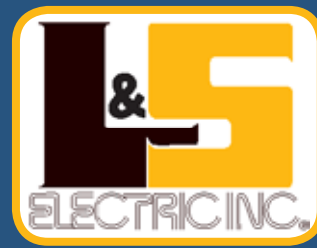


Locations



Dedicated People, Quality Products, and Above All, Service.

L&S - AGS: Advanced Governor System



Dedicated People, Quality Products, and Above All, Service.

L&S Electric is a worldwide leading supplier of integrated solutions for the power generation industry. We serve clients throughout the United States, Canada, Asia, Europe, and Central and South America.



Value Added Resellers (VARs) Located In:

- Argentina
- Chile
- Colombia
- Costa Rica
- Ecuador
- Guatemala
- Peru
- Singapore

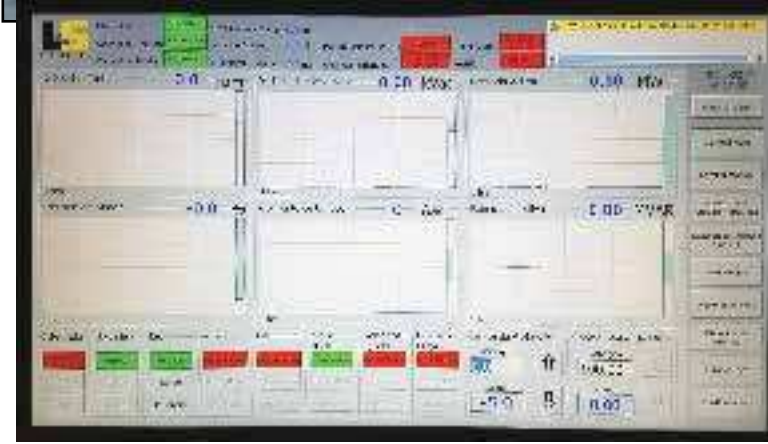


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L&S Electric
1810 County Road XX
Rothschild, WI 54474
877.258.5128



The newest governor to the L&S Electric lineup. Based on the same platform as our LS-AES Excitation System, the integration between the two systems creates seamless efficiency.



The LS-AGS:

- Designed for Francis, Kaplan and Impulse turbine control and monitoring
- Retrofits existing mechanical, analog, and early digital governor systems with minimal downtime
- Standardized design reduces installation, spare parts, and training costs
- User configurable to facilitate integration into existing control systems to meet current and future requirements
- Designed with proven technologies and control algorithms developed by experienced professionals in the governor field
- Fully tested and simulated at L&S Electric's in-house laboratory per IEC-60308 and ASME-PTC-29
- Designed to meet IEEE 125, IEEE-1207, IEC 61362 as well as WECC requirements
- Commissioned and serviced directly by L&S Electric's field service and engineering professionals
- After sales support, 24 hrs a day, 7 days a week, 365 days a year
- Backed by a 1-year standard warranty





Dedicated People, Quality Products, and Above All, Service.

LS-AGS: Advanced Governor System

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LS-AGS Advanced Governor System

- 3 phase unit voltage sensing
- 3 phase current sensing, 1A or 5 AC nominal range
- Single phase bus voltage sensing for frequency matching
- 50 or 60 Hz nominal frequency
- DC Field Current/Voltage sensing
- All control and monitoring are done from the standard operator interface (*based on LS-AES-* model offering*); with the setup, configuration, tuning and trending done from the LS-ACT (*object oriented Configuration and Maintenance Tool*)

	AGS
Discrete Inputs	24
Discrete Outputs	24
Analog Inputs	
	4-20 mA
Analog Outputs	
	4-20 mA
Speed Inputs	2
CT Inputs	3
PT Inputs	4
IRIG-B Inputs	1

LS-AGS

IEC-61131-3 Programming	Yes
True RMS Sensing	Yes
Internal Power Monitor	Yes
Selectable PID or PIDD Control	Yes
Step Response Utility for PID validation	Yes
Local & Remote Control	Yes
Auto & Manual Control	Yes
Off-Line and On-Line Control	Yes
Isolated Control	Yes
Speed Control	Yes
Speed Droop Control	Yes
Power Control	Yes
Level Control (Head or Tail)	Yes
Synchronous Condense Control	Yes
Brakes Control	Yes
Creep Detection Logic	Yes
Automatic Loading/Unloading	Yes
Gate Limit, On-Line and Off-Line	Yes
Configurable Speed, Power, and Actuator Position Switches	Yes
2D or 3D CAM Control Algorithms	Yes, on Kaplan and Pelton Controllers
Needle Control & Monitoring Functions	Yes, on Pelton Controllers
"Water-Waisting" Control Mode	Yes, on Pelton Controllers
Bumpless Transfer Between Control Modes	Yes
Generator Soft-Start Control Function	Yes
Ability to Force Outputs for Hardware and Software Verification	Yes
Two Speed Channels, for PT or Speed Pickup	Yes
PT Speed Sensing Transducer	Yes
Redundant Inputs for Actuator Position Sensing	Yes
Selectable Interface Language (English, Spanish, French)	Yes
Francis Turbine Control & Monitoring Functions	Yes
Pelton Turbine Control & Monitoring Functions	Optional
Kaplan Turbine Control & Monitoring Functions	Optional
Hydraulic Pressure Supply System (HPSS) Control & Monitoring for high and low pressure systems	Yes
3.4" OIT	Yes
15" HMI	Optional

LS-AGS

Real-Time Trending @ 100 msec Sample Rate	Yes, using windows based tool or using standard 15" operator interface
Disturbance/Transient Analysis Data Logging @ 4 msec Sample Rate	Yes, Comtrade
Real-Time trending @ 4 msec Sample Rate for Tuning (Scope)	Yes, LS-ACT
True Wave Oscillography @ 2kHz Sample Rate	Yes, LS-ACT
Sequence of Events with Time Stamping to 1 msec	Yes, LS-ACT
Event Logging (Historical / Active Alarms)	Yes, using opt. 15" operator interface
Historical Trending	Yes, using opt. 15" operator interface
Extensive Alarm & Trip Monitoring	Yes
User-friendly LS-ACT (MS Windows-Based Configuration & Maintenance Tool for System Tuning, Configuration, and Setup)	Yes
Control Signal to Actuator Control Valve(s), 4-20mA	Yes
Control Signal to Actuator Control Valve(s), +/-10 VDC	Custom if required
Additional Configurable DI & DO	Custom if required
Additional Configurable AI & AO	Custom if required
Internal Automatic Synchronizer	Optional
External Automatic Synchronizer	Optional
Serial Port - Modbus RTU for Local 3.4" OIT	Yes
Ethernet - Modbus TCP/IP for Remote Communications	Yes
Ethernet IP	Optional
Ethernet - DNP3	Optional
IRIG-B Time Synchronization	Yes
NTP Time Synchronization for OIT and Processor Timing, Only	Yes
Redundant Controller	Optional
User Configurable Logic, Using Controller Programming Software	Yes
Frequency Matching	Yes
Load Sharing Via Communications	Yes
Actuator Timing Test Function	Yes
Adjustable "Operational Speed Deadband"	Yes
Analog & Discrete Setpoints	Yes
Tuning Parameter Report Utility	Yes