

# EGCP-3 LS

## Multi-unit Load Share Generator System Control Package

### Description

The EGCP-3 LS is a powerful microprocessor-based generator system control and management package designed for the most demanding power generation applications.

The EGCP-3 LS combines engine, generator, power system, switchgear, bus and generator monitoring, protection, and control functions in a single, compact, and cost-effective package.

Perfect for medium and large-sized generation systems, the EGCP-3 LS is designed for use in stand-alone, peaking, or utility paralleled systems.

The LS can be operated alone or networked together with other LS units or EGCP-3 MC units to provide a total system solution for most applications.



### Applications

#### Real kW Load Control

- True RMS power calculations
- Speed bias signal to engine speed control, configurable for  $\pm 3$  Vdc, 0–5 Vdc, 500 Hz PWM, 4–20 mA, digital raise/lower
- Configurable load/unload ramp rates
- Isochronous load-sharing of up to 16 EGCP-3 LS units using percentage based load sharing
- Process control
- Externally adjustable load or process references (using Analog Inputs or Modbus)

#### Reactive kVAR Control

- Voltage bias signal to AVR configurable for digital raise/lower, 4–20 mA,  $\pm 1$ ,  $\pm 3$ , or  $\pm 9$  Vdc
- Configurable load/unload ramp rates
- PF sharing on isolated buses using percentage based reactive load sharing
- VAR/PF control using percentage based load sharing during process or baseload
- Externally adjustable VAR or PF references (using Analog Inputs or Modbus)
- Manual voltage control capability

#### Engine Control/Protection

- Configurable start sequencing
- KVA-controlled cooldown timer
- Oil pressure monitoring (idle/rated)
- Coolant temperature monitoring
- Battery voltage monitoring
- Speed monitoring with overspeed protection

#### Automatic Unit Sequencing

- Automatically starts and stops gen-sets based on plant load
- Automatic generator set loading and unloading for bumpless transfer
- Configurable plant load start/stop levels and timers
- Configurable generator priority sequencing

- Complete generator system control package
- Automatic load-demand sequencing of multiple units
- Synchronization of breakers or contactors
- Comprehensive system protection—engine, bus, and generator
- Revenue-grade power and energy metering
- Digital display of engine, bus, generator, and system data
- Real kW and reactive kVAR load sharing and control
- Advanced network communications with Echelon<sup>®</sup> and Modbus<sup>®</sup> networks
- DSLC<sup>™</sup> compatible (not compatible with manually bound DSLC units)
- Built-in system diagnostics

**Synchronizing**

- Phase match or slip frequency synchronization with voltage matching
- Full three-phase sensing on both buses
- Manual synchronization capability
- Adjustable phase window, voltage window, re-close attempts, re-close timing
- Dead bus closing logic internal to the control
- Synch check (25)
- Breakers or contactors

**Communications**

- Modbus® \* RTU via RS-232/-422/-485 serial ports
- ServLink, Watch Window via RS-232/-422/-485 serial ports
- Echelon® \*\* TP/XF-1250 network (LON)

**Diagnostic Features**

- Breaker/Contactor synchronization timeout and re-close alarms
- Breaker/Contactor feedback and shunt trip alarms
- Phase rotation mismatch
- Network communication error alarms
- Speed/Frequency mismatch (loss of MPU)
- Analog input out-of-range alarms
- Configuration check

\*—Modbus® is a trademark of Schneider Automation Inc.  
 \*\*—Echelon® is a trademark of Echelon Corporation

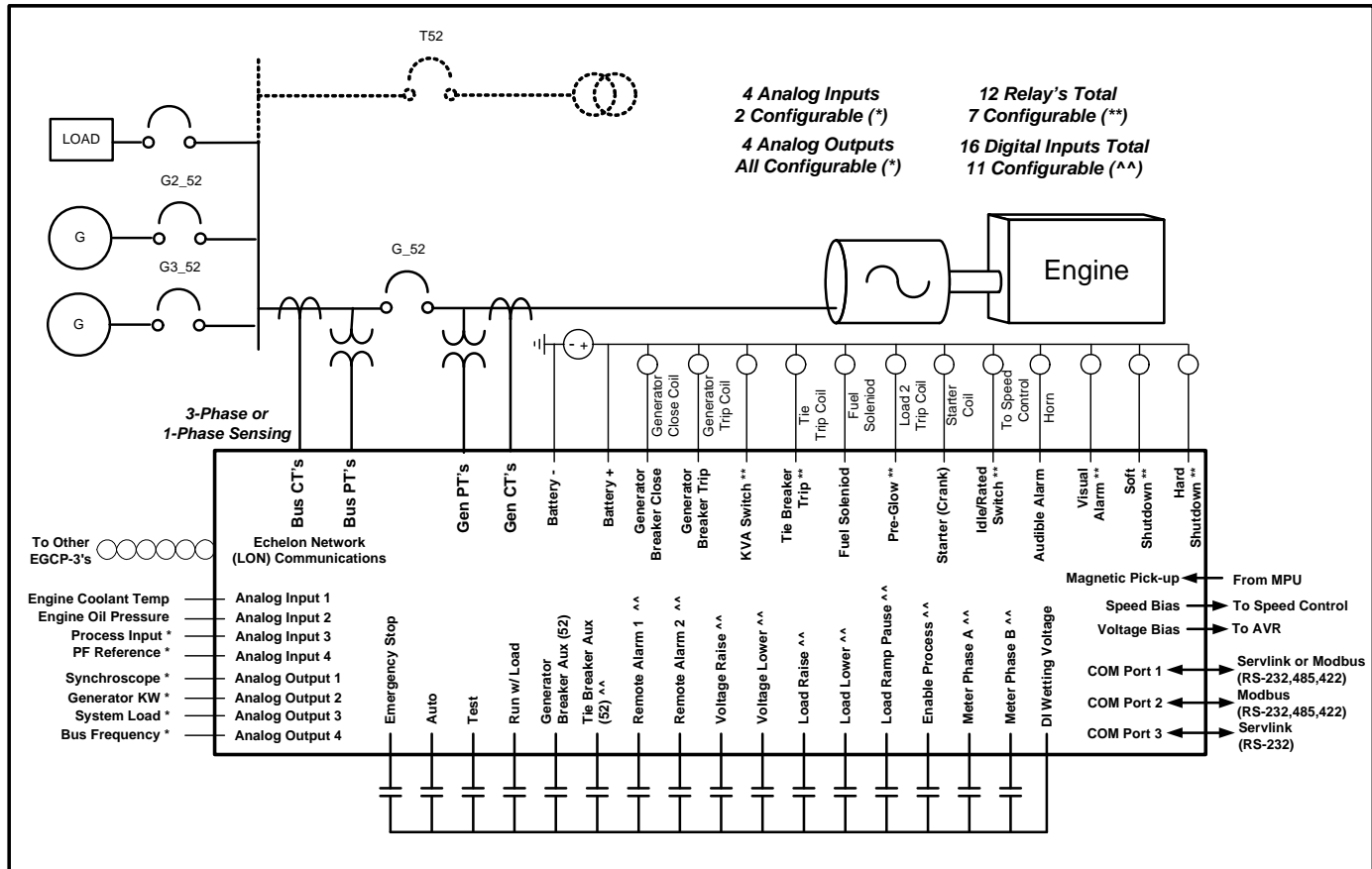
**Bus Protective Features**

- Over/Under Voltage (59, 27)
- Over/Under Frequency (81O, 81U)
- Directional (Forward/Reverse) Power (32) \*
- Negative Sequence Phase Overcurrent (46)
- Negative Sequence Phase Overvoltage (47)
- Phase Overcurrent (51) \*
- Voltage Restrained Phase Overcurrent (51V) \*
- Directional VAR
- Phase Current Imbalance (46) \*

**Generator Protective Features**

- Over/Under Voltage (59, 27)
- Over/Under Frequency (81O, 81U)
- Directional (Import/Export) Power (32) \*
- Negative Sequence Phase Overcurrent (46)
- Negative Sequence Phase Overvoltage (47)
- Phase Overcurrent (51) \*
- Directional VAR
- Phase Current Imbalance (46) \*
- Speed/Frequency Mismatch
- Overspeed (12)

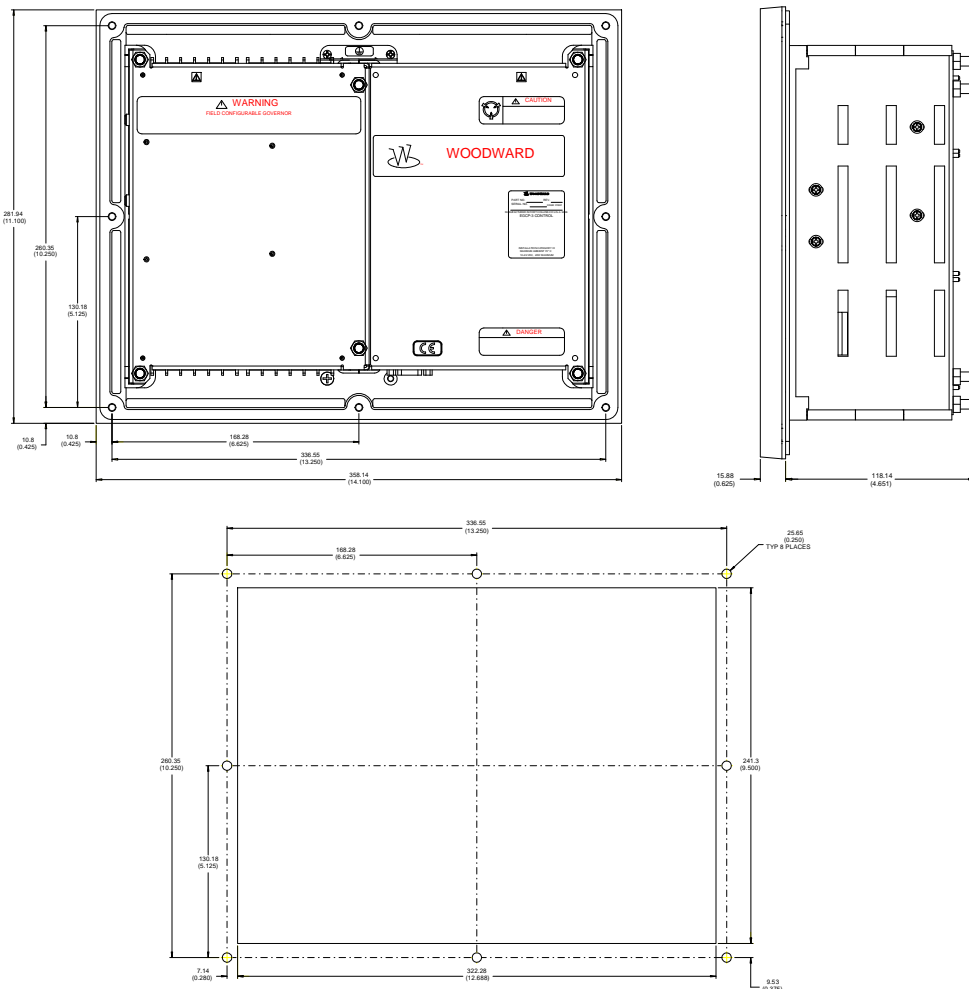
\*—Inverse Time Protections implemented are according to IEEE C37.112 "Very Inverse" curves



**EGCP-3 LS Interactions**

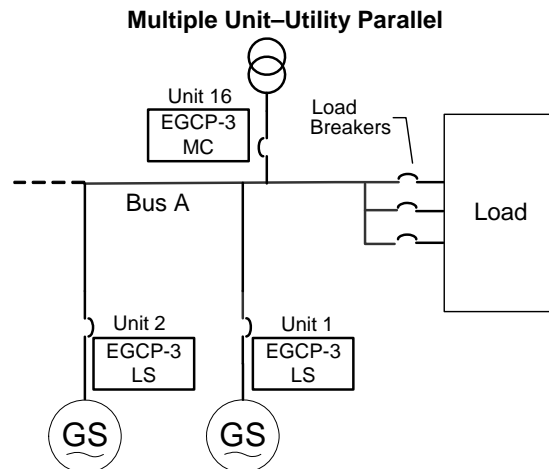
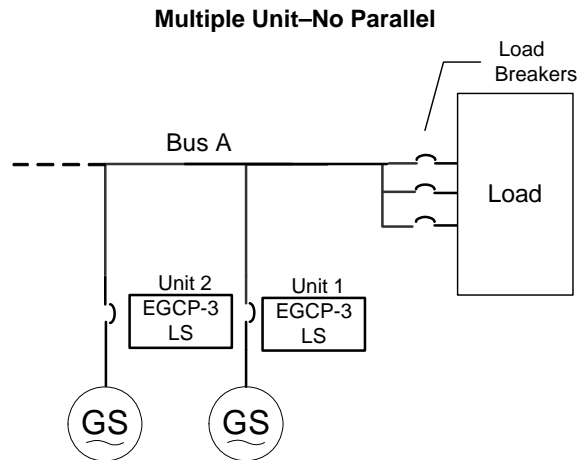
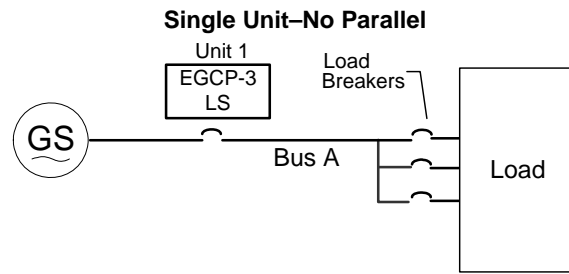
# Hardware Specifications

Size:	282 mm (11.1") high x 358 mm (14.1") wide x 134 mm (5.275") deep
Operator Interface Panel:	8 (20 character) lines plus membrane keypad
Power Supply Voltage:	24 Vdc system (18–32 Vdc nominal; 9–40 Vdc maximum)
Control Part Numbers:	LS: 8406-113
	Installation Manual: 26122
	Operation Manual: 26194
Connectors:	Terminal blocks are screwless CageClamp-style blocks. PT and CT inputs are fixed screw terminals.
Voltage Measuring Input Range:	70–300 Vac
Current Measuring Inputs:	5 Aac RMS nominal, 7 Aac RMS maximum
Rated short-time current (1 sec)	10 X (I) rated (8406-113 Rev E or later)
Temperature Range:	–20 to +70 °C (–4 to +158 °F) operating –30 to +80 °C (–22 to +176 °F) storage
Humidity:	95% at 60 °C non-condensing
Enclosure Rating:	Type 4 (NEMA) requirements from the front panel and properly installed in an equivalent enclosure
Vibration:	Suitable for engine skid or control cabinet Random Test: 10–2000 Hz at 0.04 G <sup>2</sup> /Hz and 8.2 Grms PSD
Mechanical Shock:	30 G peak, 11 ms duration, non-operating
Regulatory Compliance:	Class I, Division 2, Groups A, B, C, D for North America Zone 2, Group IIC for Europe Declared to the EMC; Low-Voltage, and ATEX Directives
Marine Type Approval:	American Bureau of Shipping, Bureau Veritas, Det Norske Veritas, and Lloyds Register



**EGCP-3 Outline Drawing and Panel Layout Template**  
(Do not use for construction)

## EGCP-E LS Applications/Configurations



### Other Configurations

- Single Utility–Multiple Bus
- Multiple Utility–Single/Multiple Bus

For a complete set of EGCP-3 Installation/Operation manuals or Application Notes on the above configurations, download from the Woodward website at: [www.woodward.com/publications](http://www.woodward.com/publications)



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