



LS-5 Series

LS-511/521

Circuit Breaker Control & Protection

DESCRIPTION

The LS-5 Series are synchronizer controllers with integrated protective functions. They are designed to enable complex power management applications with multiple incoming mains and bus breakers in combination with easYgen-3400/3500 equipped genset controllers.

The LS-5 devices will manage synchronization, loading and un-loading on each bus segment and send the required voltage and frequency references via CAN bus to the easYgen-3400/3500 genset controllers. LS-5 devices which are located on the incoming mains breakers will automatically detect mains failures and start the corresponding gensets accordingly. Wiring efforts are reduced to a minimum, since only one CAN bus connection is required between all LS-5 and easYgen-3400/3500 controllers. It is not required to wire any AC measurement signals or discrete inputs/outputs between the LS-5 and easYgen-3400/3500 controllers.

Extensive remote control capabilities via discrete inputs or interfaces are provided to easily integrate the LS-5 into each application environment.

The LS-5 Series is available in two different housing versions. The LS-521 with a plastic housing and graphic LCD display is designed to be mounted on the cabinet's front door. The LS-511 with an aluminum powder coated housing without display is designed to be back panel DIN Rail mounted.

FEATURES

- Up to 16 LS-5 units can be operated in one network with up to 32 easYgen-3400/3500
 - Phase match or slip frequency synchronization with voltage matching
 - Full protection package (including df/dt (ROCOF), phase shift and mains voltage increasing protection according to new German grid code requirements in VDE-0126-1-1)
 - Segment control for the load sharing
 - Event Log with up to 300 entries
 - Automatic date and time synchronization between the LS-5 units and the connected easYgen-3400/3500 controls
 - LS-5 "Stand alone" mode without the easYgen-3400/3500 is possible
 - Preconfigured application modes for the most common applications in the field (MCB or MCB/GGB application)
 - Automatic and Manual mode
 - Full remote control via CAN or RS-485 interface
 - In case transformers are used in the application, vector group adjustment is available
 - Breaker open/close failure detection
 - Mains decoupling "Test" mode
 - Multilingual capability
 - Lock Keypad feature
 - 8 Freely configurable LED's are available on the LS-511 back panel mountable device
- Designed as solution for complex power management applications
 - Up to 16 LS-5 units can be utilized in one application
 - Up to 32 bus segments are possible
 - Synchronization and protection in one compact controller
 - Adjustable vector groups for Synchronization
 - Automatic mains failure detection
 - Automatic and Manual mode
 - LS-5 "Stand alone" mode for use without easYgen-3400/3500 System
 - LogicsManager functionality
 - CAN and RS-485 interfaces for remote control and visualization purposes
 - True RMS sensing
 - Available as cabinet front door mounted device or DIN-Rail back panel mounted metal housing
 - Freely configurable relay outputs
 - Freely configurable discrete inputs
 - QV monitoring
 - Time-dependent voltage monitoring

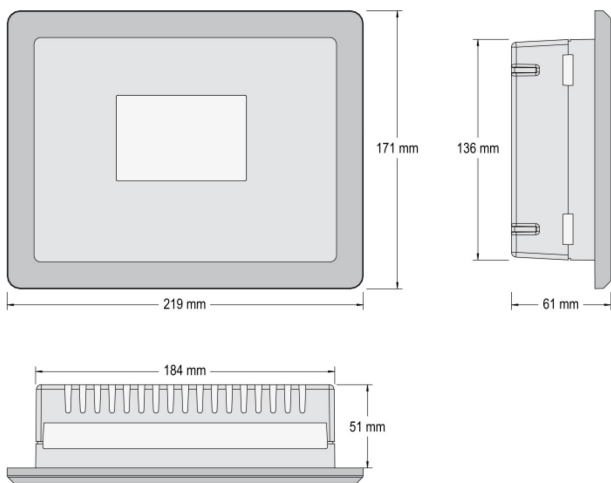
SPECIFICATIONS

Power supply..... 12/24 Vdc (8 to 40 Vdc)
 Intrinsic consumption max.~ 5 W (LS-511)
 max.~ 6 W (LS-521)
 Ambient temperature (operation).....-20 to 70 °C / -4 to 158 °F
 Ambient temperature (storage).....-30 to 85 °C / -22 to 185 °F
 Ambient humidity.....95 %, non-condensing
Voltage ($\sqrt{\Delta}$)
 120 Vac [1] Rated (V_{rated}).....69/120 Vac
 Max. value (V_{max}).....86/150 Vac
 Rated voltage phase – ground150 Vac
 Surge volt. (V_{surge}).....2.5 kV
and 480 Vac [4] Rated (V_{rated}).....277/480 Vac
 Max. value (V_{max}).....346/600 Vac
 Rated voltage phase – ground300 Vac
 Surge volt. (V_{surge}).....4.0 kV
 AccuracyClass 1
 Linear measuring range1.25× V_{rated}
 Measuring frequency.....50/60 Hz (40 to 85 Hz)
 High Impedance Input; Resistance per path.....[1] 0.498 M Ω , [4] 2.0 M Ω
 Max. power consumption per path.....< 0.15 W
Current (Isolated) Rated (I_{rated}).....[1] ..1 A or [5] ..1/5 A
 Linear measuring range $I_{gen} = 1.5 \times I_{rated}$
 Burden.....< 0.15 VA
 Rated short-time current (1 s).....[1] 50× I_{rated} , [5] 10× I_{rated}
Discrete inputsisolated
 Input range12/24 Vdc (8 to 40 Vdc)
 Input resistance..... approx. 20 kOhms

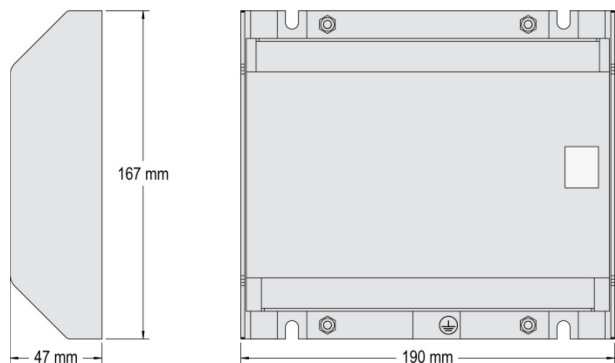
Relay outputspotential free
 Contact material.....AgCdO
 Load (GP)2.00 Aac@250 Vac
 2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
 Pilot duty (PD).....
 1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Housing (LS-521) Front door mounting..... Plastic housing
 Dimensions WxHxD219 × 171 × 61 mm
 Front cutout WxH186 [+1.1] × 138 [+1.0] mm
 Connection.....screw/plug terminals 2.5 mm²
 Front.....insulating surface
 Sealing Front.....IP65 (with screw fastening)
 Front.....IP54 (with clamp fastening)
 BackIP20
 Weight.....approx. 850 g
Housing (LS-511) Back panel mounting.....Sheet metal housing
 Dimensions WxHxD190 × 167 × 47 mm
 Connection.....screw/plug terminals 2.5 mm²
 Protection systemIP 20
 Weight.....approx. 840 g
Disturbance test (CE)tested according to applicable EN guidelines
ListingsUL/cUL, GOST-R
MarineLR (Type Approval), ABS (Design Assessment)

DIMENSIONS

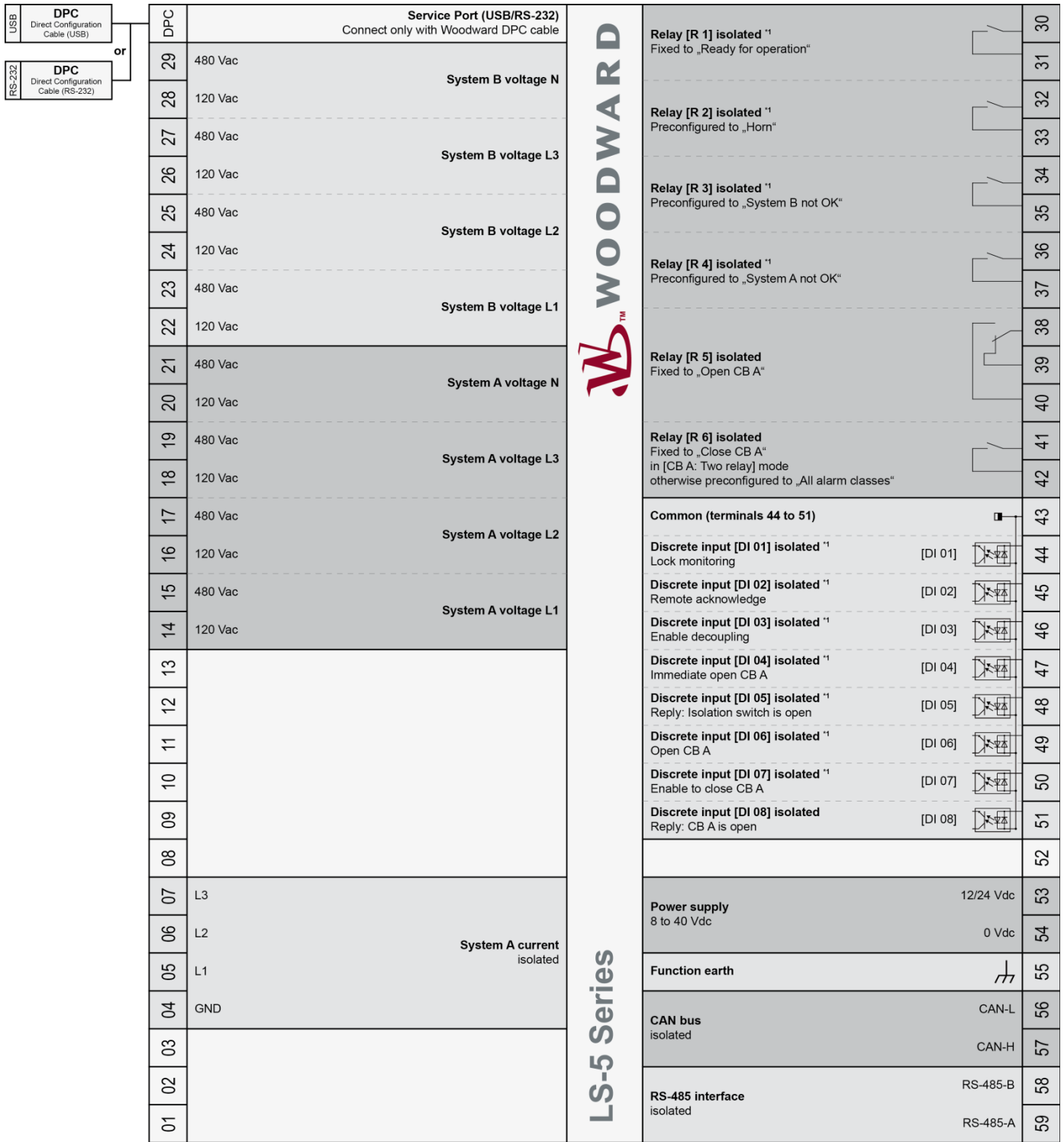
Plastic housing for front panel mounting



Metal housing for cabinet mounting



TERMINAL DIAGRAM



Subject to technical modifications.

^{*1} = configurable via LogicsManager

LS-5 Series Wiring Diagram | Rev. A

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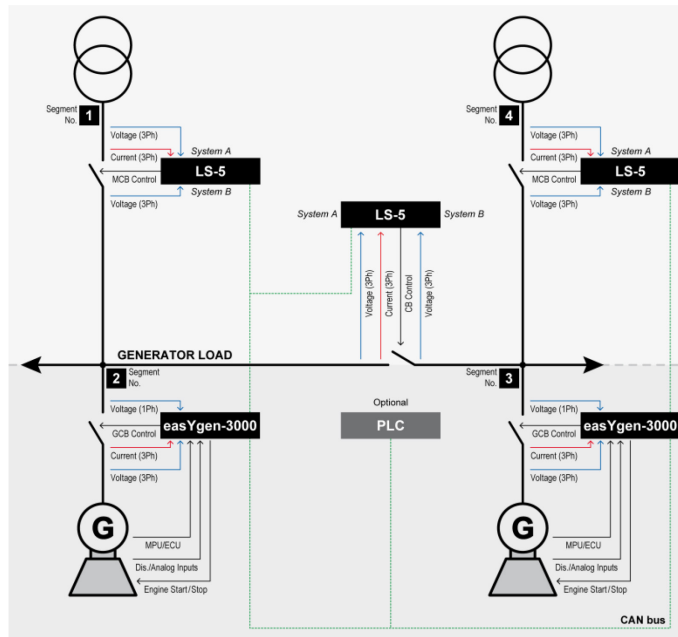
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EXAMPLE APPLICATION



FEATURES OVERVIEW

	LS-511	LS-521
I/Os		
Display	No	Yes
Configurable LEDs on Faceplate	Yes	No
System A/B voltage measurement	3-Phases + Neutral	3-Phases + Neutral
System A current measurement	3-Phase	3-Phase
Discrete inputs	8	8
Relay outputs	6	6
CAN Interface	1	1
RS-485 Interface	1	1
Control		
Automatic and Manual operating modes	✓	✓
Breaker synchronization (slip synchronization /phase matching)	✓	✓
Vector group adjustment for synchronization	✓	✓
Configurable dead bus closure direction	✓	✓
HMI		
Configuration via HMI and PC	✓	✓
Event recorder with real time clock (battery backup)	✓	✓
Date and Time Synchronization between LS-5 units and easYgen-3400/3500-P1	✓	✓
Protection		
Over-/undervoltage (59/27)	✓	✓
Over-/underfrequency (81O/U)	✓	✓
Voltage asymmetry (47)	✓	✓
Phase shift (78)	✓	✓
df/dt (ROCOF) (81)	✓	✓
QV monitoring	✓	✓
Time-dependent voltage	✓	✓
Mains voltage increase (accord. to VDE-AR-N-4105)	✓	✓
Monitoring		
Breaker open/close monitoring	✓	✓
Synchronization time out monitoring	✓	✓
Counter		
Circuit breaker closure counter	✓	✓
Listings/Approvals		
UL / cUL / GOST-R / LR & ABS Marine	✓	✓
CE Marked	✓	✓
Part Numbers		
LS-511 (1A / 5A)	8440-1951 / 8440-1946	---
LS-521 (1A / 5A)	---	8440-1952 / 8440-1947
DIN-Rail mounting Kit for LS-511	8923-1746	---
DPC-RS-232 direct configuration cable		5417-557
DPC-USB direct configuration cable		5417-1251