DESCRIPTION

Woodward blended the original solid DSLEC™ with another decade of application experiences in developing the new DSLC-2™. The DSLC-2™ excels in either simple generator or complex generator system applications. The DSLC-2™/MSLC-2™ combination provides multiple unit, segment, utility and intertie breaker control for complex power systems.

The Woodward DSLC-2™ control is a microprocessor-based synchronizer and load control designed for use on three-phase AC generators. The DSLC-2™ control combines synchronizer, load sensor, load control, dead bus closing system, VAR, power factor and process control, all integrated into one powerful package. Applications allow up to 32 generators to be precisely paralleled and controlled. A dedicated Ethernet system provides seamless communications between DSLC-2™ and MSLC-2™ units. A second Ethernet port is provided for customer remote control and monitoring capability using Modbus TCP allowing easy DCS and PLC interfacing. Modbus RTU is available through a separate RS-485 port.

Slip frequency or phase matching automatic synchronizing with or without dead bus closing is selectable.

The DSLC-2™ control senses true RMS power and provides soft bump-less loading and unloading functions. It can either base load or set import/export/process power levels against the utility, or accurately share loads on isolated, multiple generator systems.

VAR and power factor control flexibility allows you to either provide a set level of VARs to the utility or to maintain a constant power factor for reliable operation. The VAR/PF control also shares kVARs in an isolated systems, maintaining proportional reactive loads (kVARs) on all machines more accurately than droop or cross-current voltage systems.

FEATURES

- Dedicated Ethernet line for precise system communications between all DSLC-2’s™ and MSLC-2’s™ significantly reduces system wiring.
- Ethernet Modbus TCP for remote control and monitoring.
- Flexible hardware allows the new DSLC-2™ to be used in different applications which previously would have required one of 12 separate DSLC™ part numbers.
- Integrated DSLC-2™ and MSLC-2™ system functionality eliminates the need for redundant sensors (like PTs, CTs, and MOPs) that connect to individual modules such as the load sensors and synchronizers.
- Back panel mounting and a reduced size frees up door space and provides easy wiring.
- Eliminates the need for additional relay logic to control dead bus closing.
- Slip frequency paralleling, voltage matching, and speed bias transfer between the synchronizer and load control result in smooth paralleling without the risk of reverse power trips.
- Three-phase true RMS power sensing makes the DSLC-2™ control accurate even with unbalanced phase loading and voltage fluctuations.
- The Woodward ToolKit™ software allows flexible setup using the same basic menu tree as the original DSLEC™ plus an overview screen. No hand held programmer is required. Graphical overview of generator and bus bar parameters with trending makes the DSLC-2™ commissioning friendly.
SPECIFICATIONS

Power supply..........................................................12/24 Vdc (8 to 40 Vdc)
Intrinsic consumption ............................................max. 15 W
Ambient temperature (operation)..............-40°C to 70°C / -40 to 158°F
Ambient temperature (storage).................-40°C to 85°C / -40 to 185°F
Ambient humidity........................................95 %, non-condensing

Voltage .................................................................( A/V)

120 Vac [1] Rated (Vrated)........................................69/120 Vac
Max. value (Vmax)..................................................86/150 Vac
Rated voltage phase - ground..........................150 Vac
Rated surge volt (Vsurge)......................................2.5 kV
and 480 Vac [4] Rated (Vrated).........................277/480 Vac
Max. value (Vmax)..................................................346/600 Vac
Rated voltage phase - ground......................300 Vac
Rated surge volt (Vsurge)..................................4.0 kV

Accuracy ................................................................Class 0.5
Measurable alternator windings..................3p-3w, 3p-4w, 3p-4w OD
Setting range.....................................................50 to 650,000 Vac
Linear measuring range .................................1.25×Vrated
Measuring frequency........................................50/60 Hz (40 to 85 Hz)
High Impedance Input; Resistance per path......[1] 0.498 MΩ, [4] 2.0 MΩ
Max. power consumption per path..................< 0.15 W

Current (Isolated) Rated (I_isolated)....................[1] 1/5 A or [5] 1/5 A
Linear measuring range.......................................1.25×I_isolated
Imains/ground = 1.5×I_isolated

Setting range......................................................1 to 32,000 A
Burden..............................................................< 0.15 VA
Rated short-time current (1 s).........................[1] 50×Irated, [5] 10×Irated
Accuracy ..........................................................Class 0.5

Power ........................................................................0.5 to 99,999.9 kW/kvar
Setting range..........................................................0.5 to 99,999.9 kW/kvar
Discrete inputs..................................................isolated
Input range..................................................12/24 Vdc (8 to 40 Vdc)
Input resistance.................................................approx. 20 kΩs

Relay outputs..................................................potential free
Contact material................................................AgCdO
Load (GP) ..........................................................2.00 Aac@250 Vac
2.00 Aac@24 Vdc / 0.36 Aac@125 Vdc / 0.18 Aac@250 Vdc
Pilot duty (PD) ..................................................1.00 Aac@24 Vdc / 0.22 Aac@125 Vdc / 0.10 Aac@250 Vdc

Analog inputs (none isolated)........................freely scaleable
Type .................................................................0 to 10 V / 0 to 20 mA
Resolution ..........................................................11 Bit

Analog outputs (isolated)..............................freely scaleable
Type .................................................................± 10 V / ± 20 mA / PWM
Resolution ..........................................................11/12 Bit (depending on analog output)
± 10 V (scaleable) .............................................internal resistance approx. 500 Ohms
± 20 mA (scaleable) .............................................maximum load 500 Ohms

Analog outputs (isolated)..............................freely scaleable
Type .................................................................± 10 V / ± 20 mA / PWM
Resolution ..........................................................11/12 Bit (depending on analog output)
± 10 V (scaleable) .............................................internal resistance approx. 500 Ohms
± 20 mA (scaleable) .............................................maximum load 500 Ohms

Housing .........................................................Switch cabinet back mounting .....Sheet metal housing
Dimensions ..................................................WxHxD = 250 × 227 × 84 mm (9.84 × 9.00 × 3.30 in)
Connection..................................................screw/plug terminals 2.5 mm²
Protection system ............................................IP 20
Weight ............................................................approx. 1,900 g (4.2 lbs)
Disturbance test (CE) .......................................tested according to applicable EN guidelines
Listings ..........................................................UL, cUL, GOST-R, CSA
Marine ..........................................................LR (Type Approval), ABS (Design Assessment)

DIMENSIONS

Sheet metal housing for cabinet mounting
CONFIGURATION OF A TYPICAL APPLICATION USING DSLC-2™ AND MSLC-2™ DEVICES IN COMBINATION

- **DSLC-2™** – Terminal diagram
- **MSLC-2™** – Device No. 33 ... 48
- **PLC**
- **Switch A**
- **Switch B**
- **Network A**
- **Network B**
- **System A**
- **System B**
- **Aux. System B**
- **Char.**
- **Aux. Busbar**
- **Generator**

The diagram illustrates a typical application using DSLC-2™ and MSLC-2™ devices in combination, showing connections and configurations for various components.
TOOLKIT CONFIGURATION SOFTWARE

Woodward’s ToolKit Software provides the DSLC-2™ Home Page shown below. ToolKit provides user friendly configuration, commissioning assistance, displays all operating modes, and the overview pages show what other controls the DSLC-2™ is communicating with.

Note: The menu tree illustrated on the left side is similar to the original DSLC™ structure.

FEATURES OVERVIEW

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<tr>
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<th>MSLC-2</th>
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<td>RS-485 Interface</td>
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<td>LED 2</td>
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PART NUMBERS

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Accessories

Spare connector kit - P/N 8923-1806