



# Electrical Power Systems Power Generation Products Catalog

Power Management, Control and Protection Devices for  
Distributed Generation Equipment and Switchgear



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## Chapter 1. Introduction

Woodward is recognized as a leader in the field of advanced power generation and distribution controls. Our products and services benefit from decades of power management expertise and are world-renowned for quality and dependability. In particular, Woodward’s experience with paralleling systems is unmatched in the industry.

Founded in 1870, Woodward has over 135 years experience in prime mover control. We are a publically-traded company, listed as WGOV on the United States NASDAQ exchange.

With over 30 locations on 5 continents, Woodward's power management products are backed by a global network of sales and applications engineering support personnel. Together with our network of Woodward Authorized Distributors, we are positioned around the globe to serve you better, *on your schedule*.

Product development is executed by an international team of expert engineers, who can be called on to design tailor-made, innovative solutions to meet specific requirements for OEM manufacturers in the Switchgear, Wind Power, Marine Switchboard and Petrochemical industries.



Product training is offered in North America at our Corporate Headquarters in Fort Collins, Colorado, and through Woodward Authorized Distributors. A current list of training courses can be found at: <http://www.woodward.com/support/support/training/training.cfm>

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Depend on experience... depend on Woodward.

# Chapter 2. Generator Controls


## 2.1 easYgen™ Stand-Alone Genset Controls

P/N

### easYgen™-300 Series Single Genset Control Product Specification: 37217


	<b>easYgen™-320</b>	Genset control for auto start, GCB operation, 1phase-2wire generator voltage measurement, generator voltage/frequency protection, 5 discrete inputs (up to 2 DIs configurable) and 4 relay outputs (1 configurable).	50-480 Vac	<b>8440-1798</b>
	<b>easYgen™-320/X</b>	Features of easYgen-320 + flexible generator voltage measurement, engine over/under speed protection, J1939 visualization via CANbus and MPU input.	50-480 Vac	<b>8440-1800</b>
	<b>easYgen™-350</b>	Genset control for auto start, AMF, GCB & MCB operation, 1phase-2wire generator voltage measurement, 3phase-4wire mains voltage measurement, generator voltage/frequency protection, 5 discrete inputs (up to 2 DIs configurable), 6 relay outputs (2 configurable).	50-480 Vac	<b>8440-1799</b>
	<b>easYgen™-350/X</b>	Features of easYgen-350 + flexible generator & mains voltage measurement, engine over/under speed protection, J1939 visualization via CANbus and MPU input.	50-480 Vac	<b>8440-1801</b>

### easYgen™-1000 Series Single Genset Control with CAN/J1939 Speed Bias Product Specification: 37180


	<b>easYgen™-1500</b>	Single genset control for remote and auto start, breaker control with AMF, open transition load transfer, <i>FlexApp™</i> , <i>FlexIn™</i> , <i>FlexRange™</i> , <i>FlexCAN™</i> , <i>DynamicsLCD™</i> , <i>LogicsManager™</i> , generator protection, J1939 protocol for ECU coupling and alarm management.	120&480 Vac; ..5 A	<b>8440-1809</b>
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## easYgen™ Stand-Alone Genset Control Accessories


### easYlite-100 Remote Annunciation Panel Product Specification: 37279

	<b>easYlite-100</b>	CANbus based, NFPA-110 remote annunciation with 18 LED output displays for the connection to the easYgen-1000 series.	easYgen-1000 Series LeoPC software	<b>8446-1006</b>
			easYgen-1000 Series Toolkit software	<b>8446-1023</b>

### IKD 1 Discrete Input/Output Expansion Module Product Specification: 37171

	<b>IKD 1</b>	Discrete expansion card (8x isolated discrete inputs, 8x isolated relay outputs and isolated power supply), CAN communication.		<b>8440-1041</b>
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### DPC Communication Cable Product Specification: N/A

	<b>DPC</b>	Cable allows LeoPC configuration of easYgen-300 and easYgen-1000 series controls.		<b>5417-557</b>
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## 2.2 easYgen™ Paralleling Genset Controls

P/N

### easYgen™-2000 Series Paralleling Genset Control Product Specification: 37448

	<p><b>easYgen™-2200 Package 1</b> (MPU input)</p>	<p>Paralleling genset control for 1 unit to utility, or up to 16 units in island operation. Remote and auto start, synchronization breaker control with AMF, open/closed transition load transfer, soft loading, interchange, <i>FlexApp</i>, <i>FlexIn</i>, <i>FlexRange</i>, <i>FlexCAN</i>, <i>DynamicsLCD</i>, <i>LogicsManager</i>, generator, engine, and mains protection, speed measurement via magnetic pickup, induction generator compatible, 1 analog output.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1855</b></p>
	<p><b>easYgen™-2200 Package 2</b> (ECU input)</p>	<p>Features of easYgen-2200/P1, speed measurement via ECU [CAN/J1939], 1 analog output.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1857</b></p>
	<p><b>easYgen™-2500 Package 1</b> (MPU or ECU input, RS-485 Modbus)</p>	<p>Paralleling genset control for 1 unit to utility, or up to 16 units in island operation. Remote and auto start, synchronization breaker control with AMF, open/closed transition load transfer, soft loading, interchange, <i>FlexApp</i>, <i>FlexIn</i>, <i>FlexRange</i>, <i>FlexCAN</i>, <i>DynamicsLCD</i>, <i>LogicsManager</i>, generator, engine, and mains protection, speed measurement via magnetic pickup or ECU [CAN/J1939], RS-485 Modbus RTU, induction generator compatible, 4 analog outputs.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1884</b></p>

### easYgen™-3000 Series Paralleling Genset Control Product Specification: 37258

	<p><b>easYgen™-3200 Package 1</b></p>	<p>Paralleling genset control for up to 32 units in isolated or mains parallel operation, remote and auto start, load sharing with load-dependent start/stop, synchronization breaker control with AMF, open/closed transition load transfer, soft loading, interchange, <i>FlexApp</i>, <i>FlexIn</i>, <i>FlexRange</i>, <i>FlexCAN</i>, <i>DynamicsLCD</i>, <i>LogicsManager</i>, generator, engine, and mains protection.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1923</b> (Replaces <b>8440-1831</b>)</p>
	<p><b>easYgen™-3200 Package 2</b> (Cogeneration version)</p>	<p>Cogeneration package: features of easYgen-3200 + 3 freely configurable PID controllers, connectivity for up to 32 external DIs and DOS as well as 16 AIs and 4 AOs, display and evaluation of 100 J1939 analog values.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1925</b> (Replaces <b>8440-1843</b>)</p>
	<p><b>easYgen™-3100 Package 1</b></p>	<p>Paralleling genset control for up to 32 units in isolated or mains parallel operation, remote and auto start, load sharing with load-dependent start/stop, synchronization breaker control with AMF, open/closed transition load transfer, soft loading, interchange, <i>FlexApp</i>, <i>FlexIn</i>, <i>FlexRange</i>, <i>FlexCAN</i>, <i>DynamicsLCD</i>, <i>LogicsManager</i>, generator, engine, and mains protection, back-panel mounted aluminum housing.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1930</b> (Replaces <b>8440-1817</b>)</p>
	<p><b>easYgen™-3100 Package 2</b> (Cogeneration version)</p>	<p>Cogeneration package: features of easYgen-3100 + 3 freely configurable PID controllers, connectivity for up to 32 external DIs and DOS as well as 16 AIs and 4 AOs, display and evaluation of 100 J1939 analog values.</p>	<p>120&amp;480 Vac; ..5 A <b>8440-1932</b> (Replaces <b>8440-1845</b>)</p>

# easYgen™ Paralleling Genset Control Accessories

P/N

## RP-3000 Remote Genset Control Panel Product Specification: 37446



**RP-3000  
Package 1**

Remote control and annunciation panel for use with the back-panel mounted easYgen-3100 or door-mounted easYgen-3200 generator controls, allows remote control, remote visualization (including synch-scope) and password-protected remote configuration, allows manual operation of easYgen-3100 controls, CAN communication.

**8446-1018**

For use with Package 1 version easYgen-3000 controllers.



**RP-3000  
Package 2**

Remote control and annunciation panel for use with the back-panel mounted easYgen-3100 or door-mounted easYgen-3200 generator controls, allows remote control, remote visualization (including synch-scope) and password-protected remote configuration, allows manual operation of easYgen-3100 controls, CAN communication.

**8446-1019**

For use with Package 2 version easYgen-3000 controllers.

## IKD 1 Discrete Input/Output Expansion Module Product Specification: 37171



**IKD 1**

Discrete expansion card (8x isolated discrete inputs, 8x isolated relay outputs and isolated power supply), CAN communication.

**8440-1041**

## LSG Analog / RS-485 load Share Gateway Product Specification: 37451



**LSG  
(real (kW) load  
sharing)**

Load share gateway for the easYgen-2000 and easYgen-3000 paralleling genset controls, for real load sharing with EGCP-2 generator controls over RS-485, or with legacy controls (2301A, Woodward LSM analog load share modules, SPMD-11, Barber Colman POW-R-CON) through a configurable analog bias signal.

**8444-1075**



**LSG  
(reactive (kVAR)  
load sharing)**

Load share gateway for the easYgen-2000 and easYgen-3000 paralleling genset controls, for reactive load sharing with legacy genset controls (SPMD-11) through 0-5 Vdc analog bias signal.

**8444-1074**

## easYlite-100 Remote Annunciation Panel Product Specification: 37279



**easYlite-100**

CANbus based, NFPA-110 remote annunciation with 18 LED output displays for the connection to the easYgen-2000 and easYgen-3000 series.

easYgen-2000/3000  
Series  
Toolkit software

**8446-1023**

## 2.3 GCP-30 Paralleling Genset Controls

P/N

### GCP-31 Series Paralleling Genset Control Product Specification: 03240



**GCP-31/BPQ** Paralleling genset control for up to 14 units, one breaker control, remote start, synchronization, generator/mains/engine protection, load/VAR sharing, analog controller outputs, system level CANbus, 2 languages

50-150 Vac; ../5 A **8440-1609**  
60-480 Vac; ../5 A **8440-1610**



**GCP-31/XPQ** Features of **GCP-31/BPQ** + 2 analog outputs, 7 analog inputs, event recorder, coupling to LS 4

50-150 Vac; ../5 A **8440-1558**  
60-480 Vac; ../5 A **8440-1559**



**GCP-31/XPQ+SC10** Features of **GCP-31/XPQ** + engine CANbus (e.g. mtu MDEC, mtu ADEC, Caterpillar EMCP-3, Volvo EMS 2, Scania S6, SAE J1939, IKD1, ST3)  
(MOST ENGINE ECUs)

50-150 Vac; ../5 A **8440-1560**  
60-480 Vac; ../5 A **8440-1561**



**GCP-31/XPQ+SB03** Features of **GCP-31/XPQ** + engine RS-232 interface (Caterpillar CCM for ECM&EMCP-II (not EMCP-3))  
(CATERPILLAR ECUs)

50-150 Vac; ../5 A **8440-1562**  
60-480 Vac; ../5 A **8440-1563**

### GCP-31 Series Paralleling Genset Control for Rental Applications Product Specification: 37316



**GCP-31/RPQ+SC09** Paralleling genset rental package control for up to 8 units with features of **GCP-31/XPQ** (without LS 4 coupling), plus special features for rental applications including switchable voltages/frequencies, engine CANbus (e.g. mtu MDEC, mtu ADEC, Volvo EMS 2, Scania S6, SAE J1939, IKD1)

60-480 Vac; ../5 A **8440-1764**

### GCP-32 Paralleling Genset Control Product Specification: 03240



**GCP-32/XPQ** Paralleling genset control for up to 14 units, two breaker control, remote and auto start; synchronization, load transfer via open/closed transition, soft load/unload (interchange mode), generator/mains/engine protection, load/VAR sharing, analog controller outputs, system level CANbus, 2 languages, 2 analog outputs, 7 analog inputs, event recorder

50-150 Vac; ../5 A **8440-1574**  
60-480 Vac; ../5 A **8440-1575**



**GCP-32/XPQ+SC10** Features of **GCP-32/XPQ** + engine CANbus (e.g. mtu MDEC, mtu ADEC, Caterpillar EMCP-3, Volvo EMS 2, Scania S6, SAE J1939, IKD1, ST3)  
(MOST ENGINE ECU's)

50-150 Vac; ../5 A **8440-1576**  
60-480 Vac; ../5 A **8440-1577**



**GCP-32/XPQ+SB03** Features of **GCP-32/XPQ** + engine RS-232 interface (Caterpillar CCM for ECM&EMCP-II(not EMCP-3))  
(CATERPILLAR ECU's)

50-150 Vac; ../5 A **8440-1578**  
60-480 Vac; ../5 A **8440-1579**

# GCP-30 Paralleling Genset Control Accessories

P/N

## **IKD 1 Discrete Input/Output Expansion Module**

**Product Specification: 37171**



**IKD 1**

Discrete expansion card (8x isolated discrete inputs, 8x isolated relay outputs and isolated power supply), CAN communication

**8440-1041**

## **DPC Communication Cable**

**Product Specification: N/A**



**DPC**

Cable allows LeoPC configuration of GCP-30 series controls

**5417-557**

## **LS 4 Circuit Breaker Control**

**Product Specification: 37167**



**LS 4**

Circuit (tie) breaker control with CAN communication, for use with up to (14) GCP-31/XP genset controls and up to (8) LS 4 breaker controls

120 Vac; ..5 A

**8440-1031**

480 Vac; ..5 A

**8440-1006**

## **GW 4**

**Product Specifications: 37170**



**GW 4**

Communication gateway for use with GCP-30 controls (converts from CAN to ...)

RS-232/LDP

**5448-910**

RS-232/Modbus

**5448-895**

RS-485/Modbus



**5448-901**

Profibus DP Slave

**5448-902**

## 2.4 EGCP-2 Generator Controls

P/N

<b>EGCP-2 Series</b>		<b>Product Specification: 03219</b>	
	<b>EGCP-2</b>	Paralleling genset control for up to 8 units, remote start, synchronization, generator/engine protection, load/VAR sharing, automatic sequencing, Modbus communication interfaces. High-voltage version (150–300 Vac PT sensing range).	150-300 Vac; ..5 A <b>8406-120</b>
	<b>EGCP-2</b>	Paralleling genset control for up to 8 units, remote start, synchronization, generator/engine protection, load/VAR sharing, automatic sequencing, Modbus communication interfaces. Low-voltage version (50–150 Vac PT sensing range).	50-150 Vac; ..5 A <b>8406-121</b>

## EGCP-2 Generator Control Accessories

<b>Conversion Cable</b>	Cable allows PC configuration of EGCP-2 series controls, converts RS-422 to RS-232.	<b>Product Specification: N/A</b> <b>5417-551</b>
<b>Connector Kit</b>	Wiring harness connector kit, required for connection to each EGCP-2 controller.	<b>Product Specification: N/A</b> <b>8928-301</b>



## 2.5 EGCP-3 Generator System Controls

P/N

**EGCP-3 Series** **Product Specification: 03300**



**EGCP-3/LS**

Precise metering generator set control package. Control functions include: engine start/stop functions, engine monitoring and alarm, generator monitoring and alarm, synchronization for one generator circuit breaker, real and reactive load control (including droop, load sharing, and baseload functions), harmonic measurement and compensation for load sharing calculation, 0.25% primary measurement accuracy, Modbus and Woodward Servlink communication interfaces. Applicable for all sizes of generator sets with up to four separate generator busses and as many as 16 units.

50-300 Vac; ..5 A **8406-113**

**EGCP-3 Series** **Product Specification: 03301**



**EGCP-3/MC**

Master control unit for an EGCP-3 system. Control Functions include: mains monitoring and alarm, synchronization and circuit breaker sequencing for mains breaker and generator group breakers, open, closed and soft transition, real and reactive load control (including baseload, import/export control, and process control), time of day operation schedules, and mains demand operation schedules.

50-300 Vac; ..5 A **8406-114**

Complex, multiple utility feeds and tie breakers can be controlled with additional EGCP-3/MC units, see Application Sheet 51224.

## EGCP-3 Generator System Control Accessories

**LON Termination Module** **Product Specification: N/A**



Used to terminate a network when DSLC™ controls are not available or when the network architecture is required.

**9905-760**

# Chapter 3. Automatic Transfer Switch Controls

P/N

## DTSC-200 Series ATS Control Product Specification: 37398



**DTSC-200**

For open, delayed or closed transfer using circuit breakers or latching contactors. In-phase monitoring (synch check) can be enabled for all transition types to ensure smooth transition. Selectable application modes: Main-Gen, Gen-Gen or Main-Main. *LogicsManager* programmable Boolean logic functions allow for complex transfer schemes without using external relay logic or a separate PLC. *FlexApp*, *FlexRange*, *DynamicsLCD*, transfer inhibit, extended parallel, source selection, load shed/restore, elevator pre-signal. Expandable discrete I/O, PC and front face programmability, CANopen and RS-485 Modbus. Perfect for PLC-based ATS retrofits.

100&400 Vac; ..5 A **8440-1868**  
(Replaces **8440-1779**)

## DTSC-50 Series ATS Control Product Specification: 37455



**DTSC-50**

For open transfer using contactors. Three-phase voltage and frequency measurement for mains and generator, auto or manual operation. Seven-segment display gives voltage, frequency, alarm codes, engine hours and number of transfers. Freely configurable inputs/outputs. Breaker open/close monitoring eliminates the need for external interlock relays. Engine start/cool-down, maintenance counter. PC and front face programmability.

480 Vac **8440-1939**  
(Replaces **8440-1894**)

## Automatic Transfer Switch Control Accessories

### IKD 1 Discrete Input/Output Expansion Module Product Specification: 37171



**IKD 1**

Discrete expansion card (8x isolated discrete inputs, 8x isolated relay outputs and isolated power supply), CAN communication

**8440-1041**

### DPC Communication Cable Product Specification: N/A



**DPC**

Cable allows LeoPC or Toolkit configuration of DTSC-50 and DTSC-200 series controls

**5417-557**

# Chapter 4. Synchronizers

P/N

## SPM-A Analog Load Share Module Product Specification: 82383



<b>SPM-A</b>	Analog speed and phase synchronizer, no voltage match	no voltage matching	<b>9907-028</b>
	Analog speed and phase synchronizer, 1% voltage match	1% voltage matching	<b>9907-029</b>
	Analog speed and phase synchronizer, 5% voltage match	5% voltage matching	<b>9905-003</b>

## SPM-D10 Digital Synchronizer for 1 Breaker, 1-Phase synch Product Specification: 37297



<b>SPM-D10</b>	Synchronizer for one breaker, discrete raise/lower for speed and voltage bias	100 Vac 400 Vac	<b>5448-890</b> <b>8440-1019</b>
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<b>SPM-D10/N</b>	Synchronizer for one breaker, discrete raise/lower for speed and voltage bias, wide-range power supply (90 to 265 Vac/dc)	100 Vac 400 Vac	<b>8440-1432</b> <b>8440-1433</b>
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<b>SPM-D10/X</b>	Synchronizer for one breaker, analog outputs for speed and voltage bias	100 Vac 400 Vac	<b>5448-893</b> <b>8440-1301</b>
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<b>SPM-D10/XN</b>	Synchronizer for one breaker, analog outputs for speed and voltage bias, wide-range power supply (90 to 265 Vac/dc)	100 Vac 400 Vac	<b>8440-1667</b> <b>8440-1668</b>
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## SPM-D10 Digital Synchronizer for 1 Breaker, 3-Phase synch Product Specification: 37298



<b>SPM-D10/YB</b>	Synchronizer for one breaker (three-phase voltage measurement), discrete raise/lower for speed and voltage bias	100 Vac 400 Vac	<b>5448-906</b> <b>8440-1021</b>
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<b>SPM-D10/NYB</b>	Features of <b>SPM-D10/YB</b> + wide-range power supply (90 to 250 Vac/dc)	100 Vac 400 Vac	<b>8440-1434</b> <b>8440-1435</b>
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## SPM-D11 Digital Synchronizer for 1 Breaker, 3-Phase synch, Load Sharing Product Specification: 37292



<b>SPM-D11/LSR</b> 12/24 V	Synchronizer for one breaker with power control and analog power/VAR sharing, 3 alarm and 3 signaling relays, discrete raise/lower for speed and voltage bias	100 Vac; ..5 A 400 Vac; ..5 A	<b>8440-1703</b> <b>8440-1686</b>
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<b>SPM-D11/LSXR</b> 12/24 V	Features of <b>SPM-D11/LSR</b> + analog outputs for speed and voltage bias	100 Vac; ..5 A 400 Vac; ..5 A	<b>8440-1706</b> <b>8440-1666</b>
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<b>SPM-D11/LSXR</b> 24 V	Features of <b>SPM-D11/LSXR</b> + wide-range discrete inputs (18-250 Vac or Vdc)	100 Vac; ..5 A 400 Vac; ..5 A	<b>8440-1713</b> <b>8440-1715</b>
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## SPM-D21 Digital Synchronizer for 2 Breakers, 3-Phase, Load Sharing Product Specification: 37293



<b>SPM-D21/PSVX</b>	Synchronizer for two breakers with power control incl. generator/mains protection, analog outputs for speed and voltage bias	100 Vac; ..5 A 400 Vac; ..5 A	<b>8440-1027</b> <b>8440-1029</b>
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## Synchronizer Accessories


### DPC Communication Cable Product Specification: N/A





<b>DPC</b>	Cable allows LeoPC configuration of SPM-D synchronizers		<b>5417-557</b>
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# Chapter 5. Load Share Controls

P/N


<b>Load Sharing Modules</b>		<b>Product Specification: 82686</b>	
	<b>LSM</b>	Load sharing module with isochronous and droop load-sharing capability, 115/230 Vac power input, ±3 Vdc bias output	±3 Vdc bias output <b>9907-173</b>
		Load sharing module with isochronous and droop load-sharing capability, 24 Vdc power input, Caterpillar PWM bias output	CAT PWM bias output <b>9907-838</b> <b>(Replaces 9907-175)</b>
		Load sharing module with isochronous and droop load-sharing capability, 24 Vdc power input, 0.5- 4.5 Vdc bias output	0.5 to 4.5 Vdc bias output <b>9907-252</b>

<b>DSLCTM</b>		<b>Product Specification: 02006</b>	
	<b>DSLCTM</b>	Synchronizer and load control for parallel or isolated systems. Load sensor, dead bus closing system, VAR/PF, process control, LON communication. Requires MSLC or external mains breaker control for utility parallel. With ±3 Vdc speed bias.	WYE, 120/240 Vac <b>9905-795</b> Open delta, 120 Vac <b>9905-797</b> Open delta, 240 Vac <b>9905-363</b>
		Same as above but with speed bias 1 to 5 Vdc.	WYE, 120/240 Vac <b>9905-603</b> Open delta, 120 Vac <b>9905-708</b>
		Same as above but with speed bias 0.5 to 4.5 Vdc.	WYE, 120/240 Vac <b>9905-355</b> Open delta, 120 Vac <b>9905-367</b>
		Same as above but with speed bias for Caterpillar PWM.	WYE, 120/240 Vac <b>9905-799</b> Open delta, 120 Vac <b>9905-373</b>

<b>MSLC</b>		<b>Product Specification: 02021</b>	
	<b>MSLC</b>	Master synchronizer and load control, Phase matching and slip frequency automatic synchronizing of the local plant bus to the main power grid. Loading and unloading against the power grid. Base load, import/export and plant process control.	WYE, 120/240 Vac <b>9907-004</b> Open delta, 120 Vac <b>9907-005</b> Open delta, 240 Vac <b>9907-006</b>

## Load Share Control Accessories

<b>Hand Held Programmer for DSLCTM and MSLC</b>		<b>Product Specification: N/A</b>	
		Hand held programmer for configuration of DSLCTM and MSLC series controls	<b>9907-205</b>

<b>LON Termination Module</b>		<b>Product Specification: N/A</b>	
		Used to terminate a network when DSLCTM controls are not available or when the network architecture is required.	<b>9905-760</b>

<b>LON Termination Switch</b>		<b>Product Specification: N/A</b>	
		Required for split bus applications	
			Energize <b>5441-019</b> De-energize <b>5441-021</b>

# Chapter 6. Multi-Function Relays

P/N

## MFR 11 Generator Protection Relays (Voltage Only) Product Specification: 03244



**MFR11/MP** Digital multi function relay for voltage monitoring: over/under voltage (27/59), over/under frequency (81 O/U), voltage asymmetry (47). With 3 configurable relay outputs, 24 Vdc power.

100 Vac; ..5 A **5448-884**  
400 Vac; ..5 A **8441-1023**



**MFR11/G59** Features of **MFR11/MP** w/ vector shift (78) and ROCOF (81RL), 8 configurable relay outputs.

100 Vac; ..5 A **5448-885**  
400 Vac; ..5 A **LR20406**

## MFR 13 Generator Protection Relays (Voltage/Current/Power) Product Specification: 03245



**MFR13/GP** Digital multi function relay for voltage/current/power monitoring: over/under voltage (27/59), over/under frequency (81 O/U), voltage asymmetry (47), overload (32), reverse power (32R), reduced power (32F/37), unbalanced load (46), loss of excitation (40Q), time over current (50/51), voltage restraint time over current (51V), calculated ground fault (50GS). With 3 configurable relay outputs, 24 Vdc power.

100 Vac; ..5 A **5448-886**  
400 Vac; ..5 A **LR21035**



**MFR13/GPX** Features of **MFR13/GP** w/out calculated ground fault, with synch check (25), 8 configurable relay outputs.

100 Vac; ..5 A **5448-898**  
400 Vac; ..5 A **8441-1033**



**MFR13/GPX-I** Features of **MFR13/GPX** plus RS-485 Modbus RTU

100 Vac; ..5 A **8441-1009**  
400 Vac; ..5 A **8441-1104**



**MFR13/GPY-I** Features of **MFR13/GPX** plus RS-485 Modbus RTU, 3 analog outputs, pulse output for kWh

100 Vac; ..5 A **8441-1086**  
400 Vac; ..5 A **8441-1095**



**MFR13/GPY-I-N** Features of **MFR13/GPY-I** with 90-265 Vac/dc power

100 Vac; ..5 A **8441-1092**



**MFR13/K08** Features of **MFR13/GPX-I** with calculated ground fault (50GS).

100 Vac; ..5 A **8441-1087**

## ESDR Differential Current Protection Relays Product Specification: 03250



**ESDR 4** Three-phase differential current (87) protection with configurable tripping characteristics for generators and motors. Readiness relay, 3 relay outputs, blocking feature.

Front mount./5 A **8441-1010**  
DIN mount./5 A **LR20590**



**ESDR 4T** Features of **ESDR 4**, for transformers or generators and motors interconnected with transformers, with inrush detection/suppression.

Front mount./5 A **5448-897**  
DIN mount./5 A **8441-1047**

## Multi-Function Relay Accessories




### DPC Communication Cable Product Specification: N/A




**DPC** Cable allows LeoPC configuration of MFR and ESDR series controls

**5417-557**

# Chapter 7. Expansion Modules

		P/N
<b>TUG 4</b>		<b>Product Specification: 37169</b>
	<b>TUG 408</b> Temperature monitoring unit (8x Pt100)	<b>8441-1128</b>
	<b>TUG 412</b> Temperature monitoring unit (12x Pt100)	<b>8441-1127</b>
	<b>TUG 412/SU</b> Temperature monitoring unit (12x Pt100), RS-485 Modbus interface	<b>8441-1137</b>
	Temperature monitoring unit (12x Pt100), Profibus DP Slave interface	<b>8441-1130</b>
	<b>TUG 416</b> Temperature monitoring unit (16x Pt100)	<b>8441-1133</b>
	<b>TUG 416/SU</b> Temperature monitoring unit (16x Pt100), RS-485 Modbus interface	<b>8441-1013</b>
	Temperature monitoring unit (16x Pt100), Profibus DP Slave interface	<b>8441-1136</b>
<b>UMT 1</b>		<b>Product Specification: 37168</b>
	<b>UMT 1/A3</b> Measuring transducer with 3 analog outputs, pulse output for kWh/kVARh	100 Vac; ../1 A <b>LR20411</b> 100 Vac; ../5 A <b>5448-909</b> 400 Vac; ../5 A <b>LR20949</b>
	<b>UMT 1/A3SU</b> Measuring transducer with 3 analog outputs, pulse output for kWh/kVARh, and RS-485 Modbus or Profibus DP interface	100 Vac; ../1 A, Modbus <b>8444-1022</b> 100 Vac; ../5 A, Modbus <b>8444-1002</b> 400 Vac; ../1 A, Modbus <b>8444-1043</b> 400 Vac; ../5 A, Modbus <b>8444-1009</b> 120 Vac; ../1 A, Profibus <b>8444-1027</b>
	<b>UMT 1/A6</b> Measuring transducer with 6 analog outputs, pulse output for kWh/kVARh	100 Vac; ../1 A <b>LR21296</b> 100 Vac; ../5 A <b>8444-1019</b> 400 Vac; ../1 A <b>LR21159</b> 400 Vac; ../5 A <b>8444-1057</b>
<b>IKD 1 Discrete Input/Output Expansion Module</b>		<b>Product Specification: 37171</b>
	<b>IKD 1</b> Discrete expansion card (8x isolated discrete inputs, 8x isolated relay outputs and isolated power supply), CAN communication	<b>8440-1041</b>

## Expansion Module Accessories

<b>DPC Communication Cable</b>		<b>Product Specification: N/A</b>
	<b>DPC</b> Cable allows LeoPC configuration of TUG and UMT series controls	<b>5417-557</b>

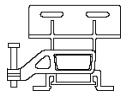
## Chapter 8. Accessories and Spare Parts

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P/N

### Brackets

Product Specification: N/A



#### Brackets

APRANORM housing Type E (Height 72 mm), delivered in a set of two. Fits SPMD, MFR-13, LS4, GW4.

8923-1023

#### Note:

The kit consists of 2× brackets, 2× level adjuster, 4× self-drilling screws, 4× back-plate screws, and 1× installation notes (P/N 9989-4012).

### Fixing Clamps

Product Specification: N/A



#### Fixing Clamps

For all APRANORM housing types (one piece).

LR01543

#### Note:

Two fixing clamps will be delivered together with the unit. The clamps can be used to fix the unit for flush-mounting. If you require more of the fixing clamps you will receive one per order.

### Terminal Strip Kits

Product Specification: N/A



#### Terminal Strip Kits

Kit-Plug Set for LS 4

8923-1026

Kit-Plug Set for UMT 1

8923-1027

Kit-Plug Set for GCP-30

8923-1028

Kit-Plug Set for SPM-D

8923-1032

Kit-Plug Set for easYgen-3000 series

8923-1314

Kit-Plug Set for easYgen-1000 series

8923-1055

Kit-Plug Set for easYgen-320

8923-1155

Kit-Plug Set for easYgen-350

8923-1156

Kit-Plug Set for easYgen-320/X

8923-1157

Kit-Plug Set for easYgen-350/X

8923-1158



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