

easYgen-3400XT/3500XT


Genset Control for Complex Paralleling Operation

DESCRIPTION

Woodward raised the standard in genset paralleling control and power management system with the easYgen-3000XT Series controllers. These controllers come with standardized software that is simple to configure, yet easily customized for individual applications. Enhanced connectivity enables fast, reliable and secure interfacing to other controls and communications systems while the enhanced hardware is a drop-in replacement for previous generation easYgen-3000 Series Controls.

The easYgen-3500XT with a dedicated CANopen network for connectivity to up to 16 LS-5 Circuit Breaker Controls, enables control of complex distribution systems having multiple utility feeds and tie breakers, and parallel load sharing of up to 32 generators on up to 32 different bus segments. Redundant load sharing is selectable using both Ethernet B and C networks for improved reliability. The control combines complete engine-generator control and protection with advanced, peer-to-peer paralleling functionality and innovative features in a robust, attractive, user-friendly and all-in-one package. The easYgen-3500 XT controls are designed to direct connect up to 690Vac and operate to 4000m above sea level without derating.

The easYgen-3500XT is available in two packages. P1, focused at complex paralleling applications provides redundant Ethernet communication, LS-5 connectivity, and standard I/O set, while P2, Co-Gen/CHP model offers expanded onboard I/O set, 3-ph busbar voltage measurement capability and an interface expansion card slot for an additional interface/protocol. These packages also come without a display in a rugged metal housing suitable for back panel installations (easYgen-3400XT-P1 and easYgen-3400XT-P2 respectively). A sophisticated touch screen remote panel (RP-3000XT) complements them as operator control panel. A version of easYgen-3500XT (easYgen-3500XT-P1-LT and easYgen-3500XT-P2-LT) is designed to operate down to -40°C for outdoor applications.

FEATURES

- Full connectivity of up to 32 Generators and 16 LS-5 circuit breaker controls in one application
- Run-up synchronization / Dead Field Paralleling to quickly get several synchronous generators onto the load
- Three-phase true RMS power sensing with Class I accuracy
- Operation modes: AUTO, STOP, MANUAL, and TEST - accessible through face plate or discrete input
- Breaker control: Slip frequency / phase matching synchronization, open / close control, breaker monitoring
- Load transfer: open / closed transition, interchange, soft loading / unloading, Utility parallel
- Load share and device to device communication over CAN or Ethernet (Redundant possible)
- Remote control via interface (Modbus TCP, Modbus RTU) and via discrete/analog inputs for adjusting speed, frequency, voltage, power, reactive power, and power factor set points
- Freely configurable PID controllers for various control purposes, such as heating circuit control (CHP applications), water level, fuel level, pressure and / or other process variables
- Direct support to several ECUs: Scania S6, MTU ADEC ECU7/8/9, Volvo EMS2 & EDC4, Deutz EMR2 & EMR3, MAN MFR / EDC7, SISU EEM, Cummins and Woodward EGS02 ECU
- Field ECU support and additional I/O expansion board connectivity through sequencer files
- "System Update" function for online troubleshooting and adding / removing generator sets
- Time / Date synchronization over Simple Network Time Protocol (SNTP)
- Cylinder head / exhaust temperature monitoring (Temperatures come from J1939 or CANopen devices)
- Woodward ToolKit™ software for flexible setup from a single connection to the network. The ToolKit can be accessed either via USB, or Ethernet or CAN ports.
- Multi-lingual capability: English, German, Spanish, French, Italian, Portuguese, Japanese, Chinese, Russian, Turkish, Polish, Slovakian, Finnish, Swedish

New Features

- ✓ Built-In Redundant Ethernet
- ✓ Power Measurement Class 1
- ✓ Direct Connect Up to 690 V_{AC}
- ✓ AnalogManager & Editable Screens
- ✓ Multi-Interface ToolKit connectivity
- ✓ New face plate with tactile buttons
- ✓ Drop-In replacement

- Premium genset control for complex paralleling applications of up to 32 gensets and up to 16 MCB/GGB/Tie Breakers in
- Prime Power & Cogeneration (CHP)
- Peak shaving operation
- Emergency operation
- Import/Export operation
- Islanded & Utility parallel operation
- Integrated Generator Group Breaker (GGB) control
- Run-Up Synchronization
- Master or Slave control capability
- Complete engine, generator and utility protection
- Up to 9 communication ports: 3xEthernet, 3xCAN (CANOpen and J1939), RS-485, USB, Interface expansion card
- Customizable logic, HMI screens, and alarms
- Dedicated low temperature display variants
- UL61010, UL6200, RoHS2 and marine (ABS, LR) compliance

SPECIFICATIONS

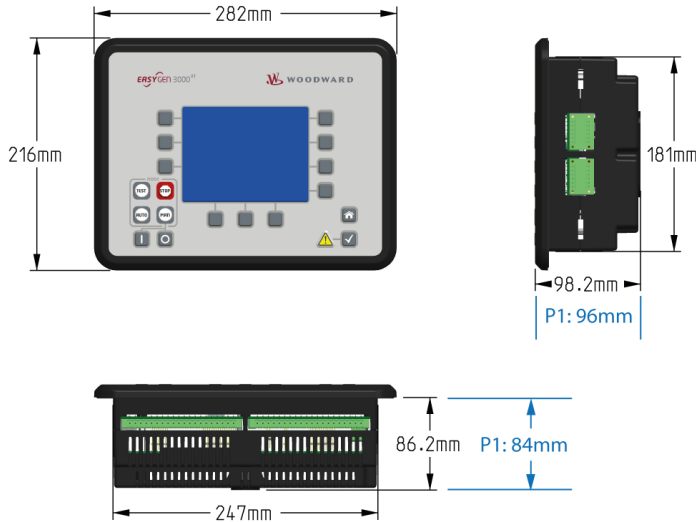
Power supply	12/24 V _{DC} (8 to 40 V _{DC})
Intrinsic consumption	max. 22 W (LT: max.32 W)
Ambient temperature (operation)	-20 to 70 °C (LT: -40 to 70 °C)
Ambient temperature (storage)	-30 to 80 °C / -22 to 176 °F
Ambient humidity.....	95%, non-condensing
Voltage (software configurable)	(Δ/Δ)
100 V _{AC} Rated (V _{rated}).....	69/120 V _{AC}
Max. value (V _{max}).....	86/150 V _{AC}
and 400/600 V_{AC} Rated (V_{rated})*	400/690 V _{AC}
Max. value (V _{max}).....	520/897 V _{AC}
Rated surge volt. (V _{surge}).....	6.0 kV
Accuracy	Class 0.5
Measurable alternator windings .3p-3w, 3p-4w, 3p-4w OD, 1p-2w, 1p-3w	
Setting range..... primary.....	50 to 650,000 V _{AC}
Linear measuring range	1.25×V _{rated}
Measuring frequency	50/60 Hz (30 to 85 Hz)
High Impedance Input; Resistance per path.....	2.5 M Ω
Max. power consumption per path	< 0.15 W
Current (Isolated, software configurable) Rated (I _{rated}).....	1A or 5A
Linear measuring range	I _{gen} = 3.0×I _{rated}
Setting range.....	I _{mains/ground} = 1.5×I _{rated}
1 to 32,000 A	
Burden.....	< 0.10 VA
Rated short-time overcurrent (1 s)	[1] 50×I _{rated} , [5] 10×I _{rated}
Accuracy	Class 0.5
Power	
Setting range.....	0.5 to 99,999.9 kW/kvar
Accuracy	Class 1.0
Discrete inputs	isolated
Input range	12/24 V _{DC} (8 to 40 V _{DC})
Input resistance.....	approx. 20 kOhms
Transistor outputs (P2 only)	isolated
Rated switching voltage	max. 24 V _{DC}
Maximum switching voltage	40 V _{DC}
Maximum switching current	300 mA DC
Isolation Test voltage (<1s).....	500 V _{AC}
Isolation voltage (continuously).....	100 V _{AC/DC}
Relay outputs	isolated
Contact material	AgCdO
Load (GP).....	2.00 A _{AC} @250 V _{AC}
	2.00 A _{DC} @24 V _{DC} / 0.36 A _{DC} @125 V _{DC} / 0.18 A _{DC} @250 V _{DC}

* 3 phase 3 wire Δ constellations are limited to 600 V_{AC} system

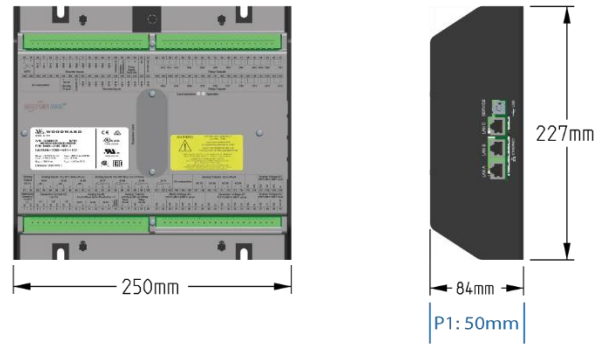
Analog inputs (isolated)	freely scalable
Type 1	0 to 1 V / 0 to 2000 Ohms / 0 to 20 mA
Resolution	16 Bit
Maximum permissible voltage against genset Ground.....	9 V
Maximum permissible voltage between genset Ground & PE	100 V
Type 2 (P2 only).....	0 to 10 V / 0 to 20 mA
Resolution	14 Bit
Maximum permissible voltage against PE (Ground)	100 V
Maximum differential voltage to other DC Analog Inputs	15 V
Type 3 (P2 only).....	0 to 250 Ohms / 0 to 2500 Ohms
Resolution	14 Bit
Maximum permissible voltage against PE (Ground)	100 V
Maximum differential voltage to other DC Analog Inputs	10 V
Analog outputs (isolated)	freely scalable
Type 1	± 10 V / ± 20 mA / PWM
Basic insulation voltage (continuously, AVR _{out}).....	500 V _{AC}
Reinforced insulation voltage (continuously, AVR _{out})	300 V _{AC}
Insulation voltage (continuously, GoV _{out})	100 V _{AC}
Resolution	12 Bit
Output ± 10 V (scalable).....	internal resistance
Output ± 20 mA (scalable).....	maximum load 500 Ohms
Type 2 (P2 only).....	0/4 to 20 mA
Insulation voltage (continuously)	100 V _{AC}
Insulation voltage (test; >2 s).....	1700 V _{AC}
Resolution	12 Bit
Output	maximum load 500 Ohms
Housing Front panel flush mounting.....	Plastic housing
Dimensions WxHxD	282 × 216 × 96 mm
Front cutout WxH	249 [+1.1] × 183 [+1.0] mm
Connection.....	screw/plug terminals 2.5 mm ²
Front.....	insulating surface
Sealing	Front..... IP66 (with screw fastening)
	Front..... IP54 (with clamp fastening)
	Back..... IP20
Weight.....	approx. 1,850 g
Housing Back panel mounting.....	Powder Coated Sheet metal housing
Dimensions WxHxD P1:.....	250 × 228 × 50 mm
	P2:..... 250 × 228 × 84 mm
Connection.....	screw/plug terminals 2.5 mm ²
Protection system	IP 20
Weight.....	approx. 1,750 g
Disturbance test (CE)	tested according to applicable IEC standards
Listings	CE, UL, EAC, VDE, BDEW; pending: CSA
Marine	LR (Type Approval), pending: ABS (Type Approval)

DIMENSIONS

Plastic housing for front panel mounting



Metal housing for cabinet mounting



P1 is more compact (note depth/height in blue)

TERMINAL DIAGRAM

80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41																																																					
<table border="1"> <tr> <td>MPU</td><td>D12</td><td>D11</td><td>D10</td><td>D09</td><td>D08</td><td>D07</td><td>D06</td><td>D05</td><td>D04</td><td>D03</td><td>D02</td><td>D01</td><td>Common DI</td><td>Auxiliary Excitation D+</td><td>Power Supply 12/24 Vdc</td><td>NC</td><td>Do Not Use</td> </tr> <tr> <td colspan="13">Discrete Inputs</td> <td colspan="2"></td> <td colspan="6">Relay Outputs</td> </tr> </table>																				MPU	D12	D11	D10	D09	D08	D07	D06	D05	D04	D03	D02	D01	Common DI	Auxiliary Excitation D+	Power Supply 12/24 Vdc	NC	Do Not Use	Discrete Inputs															Relay Outputs						<table border="1"> <tr> <td>R12</td><td>R11</td><td>R10</td><td>R09</td><td>R08</td><td>R07</td><td>R06</td><td>R05</td><td>R04</td><td>R03</td><td>R02</td><td>R01</td> </tr> <tr> <td colspan="12">Relay Outputs</td> </tr> </table>										R12	R11	R10	R09	R08	R07	R06	R05	R04	R03	R02	R01	Relay Outputs											
MPU	D12	D11	D10	D09	D08	D07	D06	D05	D04	D03	D02	D01	Common DI	Auxiliary Excitation D+	Power Supply 12/24 Vdc	NC	Do Not Use																																																																											
Discrete Inputs															Relay Outputs																																																																													
R12	R11	R10	R09	R08	R07	R06	R05	R04	R03	R02	R01																																																																																	
Relay Outputs																																																																																												
<table border="1"> <tr> <td>No connection</td><td>SO 02 Sinking Output</td><td>Common DI</td><td>D123</td><td>D122</td><td>D121</td><td>D120</td><td>D119</td><td>D118</td><td>D117</td><td>D116</td><td>D115</td><td>D114</td><td>D113</td> </tr> <tr> <td colspan="14">Discrete Inputs</td> <td colspan="6">Relay Outputs</td> </tr> </table>																				No connection	SO 02 Sinking Output	Common DI	D123	D122	D121	D120	D119	D118	D117	D116	D115	D114	D113	Discrete Inputs														Relay Outputs																																												
No connection	SO 02 Sinking Output	Common DI	D123	D122	D121	D120	D119	D118	D117	D116	D115	D114	D113																																																																															
Discrete Inputs														Relay Outputs																																																																														
Sinking Output SO 01		Analog Inputs 0 to 10 V 0/4 to 20 mA			Analog Inputs 0 to 250 Ohm 0 to 2.5 kOhm			Analog Inputs 0 to 1 V			Analog Outputs ±10 Vdc ±20 mA PWM			Analog Outputs 0/4 to 20 mA			Busbar Voltage AC 120 V 480 V 690 V ph-ph																																																																											
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120																																																					
Mains/Gnd Current AC 1 A 5 A		Generator Current AC 1 A 5 A			Analog Inputs 0 to 2 kOhm 0/4 to 20 mA 0 to 1 V			Analog Outputs ±10 Vdc ±20 mA PWM			Mains Voltage AC 120 V 480 V 690 V ph-ph			Generator Voltage AC 120 V 480 V 690 V ph-ph			Busbar Voltage AC 120 V 480 V 690 V ph-ph																																																																											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																																																					

P2: pins 01-160 as shown above; P1: pins 01-80 only!

* pin 61
 easYgen-3400XT: No connection
 easYgen-3500XT: Protective earth

RELATED PRODUCTS

- Circuit Breaker Controller **LS-511/521** (Product Specification # 37522)
- Remote Panel **RP-3000XT** (Product Specification # 37592)
- **ToolKit** (Product Specification # 03366)
- I/O Expansion Board **IKD1** (Product Specification # 37171)
- Engine Speed Control **actiVgen** (Product Specification # 03419): P/N 8440-2100
- Load Share Gateway **LSG** (Product Specification # 37451)
- Electronic Pickup Unit **EPU-100** (Product Specification # 37562)
- CANbus based Remote Annunciator (Product Specification # 37279): **easYlite 100** P/N 8446-1023
- **Power Generation Learning Module** (Product Specification # 03412): P/N 8447-1012
- Profibus Gateway (Application Note # 37577): **ESEPRO** P/N 8445-1046
- Ethernet (Modbus/TCP) Gateway (Application Note # 37576): **ESENET** P/N 8445-1044
- CANbus to Fiber Optic Converters (Application Note # 37598): **DL-CAN** P/N 8445-1049 and **DL-CAN-R** P/N 8445-1048
- Remote Access Gateway (with HMS Netbiter **EasyConnect EC250** and **EC350**)
- Thermocouple Scanner (**AXIOMATIC AXC20**)
- WAGO expansion CAN Couplers

CONTACT

North & Central America

Tel.: +1 970 962 7331
 ✉ SalesPGD_NAandCA@woodward.com

South America

Tel.: +55 19 3708 4800
 ✉ SalesPGD_SA@woodward.com

Europe

Tel. Stuttgart: +49 711 78954 510
 Tel. Kempen: +49 2152 145 331
 ✉ SalesPGD_EUROPE@woodward.com

Middle East & Africa

Tel.: +971 2 6275185
 ✉ SalesPGD_MEA@woodward.com

Russia

Tel.: +7 812 319 3007
 ✉ SalesPGD_RUSSIA@woodward.com

China

Tel.: +86 512 8818 5515
 ✉ SalesPGD_CHINA@woodward.com

India

Tel.: +91 124 4399 500
 ✉ SalesPGD_INDIA@woodward.com

ASEAN & Oceania

Tel.: +49 711 78954 510
 ✉ SalesPGD_ASEAN@woodward.com

www.woodward.com

Subject to alterations, errors excepted.

Subject to technical modifications.

This document is distributed for informational purposes only. It is not to be construed as creating or becoming part of any Woodward Company contractual or warranty obligation unless expressly stated in a written sales contract.

We appreciate your comments about the content of our publications. Please send comments including the document number below to stgt-doc@woodward.com

© Woodward

All Rights Reserved

For more information contact:

EASYGEN 3000XT		easYgen-3000XT Series			
		Model	3400XT		3500XT
Package		P1	P2	P1(-LT)	P2(-LT)
Measuring					
Generator voltage (up to 690 V _{AC})		3-ph			
Generator current (1 A or 5 A software selectable)		3-ph			
Mains voltage (up to 690 V _{AC})		3-ph			
Mains or ground current (1 A or 5 A software selectable)		1-ph			
Busbar voltage (up to 690 V _{AC})		1-ph	3-ph	1-ph	3-ph
Control					
Breaker control logic (open and closed transition) <i>FlexApp™</i>		3			
Number of supported Woodward LS-5 unit		16			
Automatic, Manual, Stop, and test operating modes					
Single and multiple-unit operation					
Mains parallel multiple-unit operation (up to 32 units)					
AMF (auto mains failure) and stand-by operation					
Critical mode operation					
GCB and MCB synchronization (slipping / phase matching)		✓			
GGB (Generator Group Breaker) Control					
Import / export control (kW and kvar)					
Load-dependent start/stop					
n/f, V, P, Q, and PF control via analog input or interface					
Load/var sharing for up to 32 gensets					
Freely configurable PID controllers		3			
HMI					
Color Display with Softkey operation <i>DynamicsLCD™</i>		-		✓	
Start/stop logic for diesel / gas engines					
Counters for operating hours / starts / maintenance / active/reactive energy		✓			
Configuration via PC (USB serial connection & ToolKit software (included))					
Event recorder entries with real time clock (battery backup)		300			
Operating Temperature		-40 to 70 °C		(-40)/-20 to 70 °C	
Protection ANSI#					
Generator: voltage / frequency		59 / 27 / 810 / 81U			
Generator: overload, reverse/reduced power		32 / 32R / 32F			
Generator: Synch Check		25			
Generator: unbalanced load		46			
Generator: instantaneous overcurrent		50			
Generator: time-overcurrent (IEC 255 compliant)		51 / 51 V			
Generator: ground fault (measured ground current)		50G			
Generator: power factor		55			
Generator: rotation field					
Engine: overspeed / underspeed		12 / 14			
Engine: speed / frequency mismatch					
Engine: D+ auxiliary excitation failure					
Engine: Cylinder temperature					
Mains: voltage / frequency / synch check		59 / 27 / 810 / 81U / 25			
Mains: phase shift / rotation field / ROCOF (df/dt)		78			
Busbar: voltage / frequency / Phase Rotation		✓ / ✓ / -	✓ / ✓ / ✓	✓ / ✓ / -	✓ / ✓ / ✓
I/Os					
Speed input: magnetic / switching; Pickup		✓			
Discrete alarm inputs (configurable)		12 (9)	23 (20)	12 (9)	23 (20)
Discrete outputs, configurable <i>LogicsManager™</i>		max. 12	max. 22	max. 12	max. 22
External discrete inputs / outputs via CANopen		32 / 32			
Analog inputs #1, configurable <i>FlexIn™</i>		3	10	3	10
Analog outputs: ± 10V, ± 20mA, PWM; configurable <i>AnalogManager™</i>		2	2	2	2
Analog outputs: 0 to 20 mA (0 to 10 V with external 500 Ω resistor)		-	4	-	4
External analog inputs / outputs via CANopen		16/4			
Display and evaluation of J1939 analog values, "supported SPNs"		100			
CAN bus communication interfaces #2 <i>FlexCAN™</i>		3			
Ethernet Modbus TCP Slave interface		3			
USB Serial interface		1			
RS-485 Modbus RTU Slave interface		1			
Interface Expansion Capability		-	✓	-	✓
Listings/Approvals					
UL / cUL Listing (61010 ,6200), pending: CSA (USA and Canada), BDEW, VDE, EAC; CE Marked		✓			
LR, pending: ABS (TA)					
Part Numbers					
Front panel mounting with display #3 (... and enhanced operating temperature range)		-	-	8440-2085 (8440-2086)	8440-2088 (8440-2089)
Cabinet back mounting w/o display		8440-2084	8440-2087	-	-

#1 selectable senders: VDO (0 to 180 Ohm, 0 to 5 bar), VDO (0 to 180 Ohm, 0 to 10 bar), VDO (0 to 380 Ohm, 40 to 120°C), VDO (0 to 380 Ohm, 50 to 150°C), Pt100, Pt1000, resistive input (one- or two-pole, 2pt. linear or 9pt. user defined)

#2 CAN#2 freely selectable during configuration between CANopen or J1939; please feel free to request more information

#3 a screw and a clamp kit are delivered with the unit for fastening