

easYgen-3400XT/3500XT


Genset Control for Complex Paralleling Operation

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
- UL 61010, UL 6200, **CSA**, RoHS 2, and marine (ABS, LR) compliance

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 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 are available 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 an 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 via Ethernet, or via CAN ports.
- Multi-lingual capability: English, German, Spanish, French, Italian, Portuguese, Japanese, Chinese, Russian, Turkish, Polish, Slovakian, Finnish, Swedish

SPECIFICATIONS

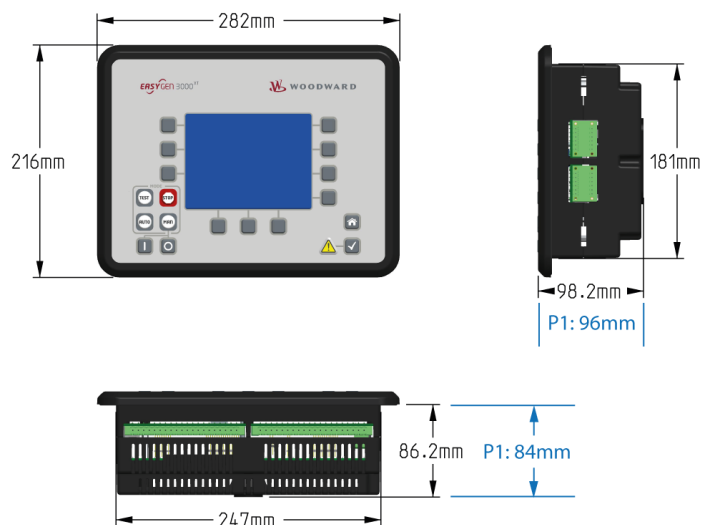
Power supply	12/24 V _{DC} (8 to 40 V _{DC})
Intrinsic consumption	max. 22 W (LT: max.32 W)
Ambient temperature (operation)	-20 to 70 °C (LT: -40 to 70 °C)
Ambient temperature (storage)	-30 to 80 °C / -22 to 176 °F
Ambient humidity	95%, non-condensing
Voltage (software configurable)	(Δ/Δ)
100 V _{AC} 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
Linear measuring range	50 to 650,000 V _{AC}
Measuring frequency	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}
Burden	1 to 32,000 A
Rated short-time overcurrent (1 s)	< 0.10 VA
Accuracy	[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

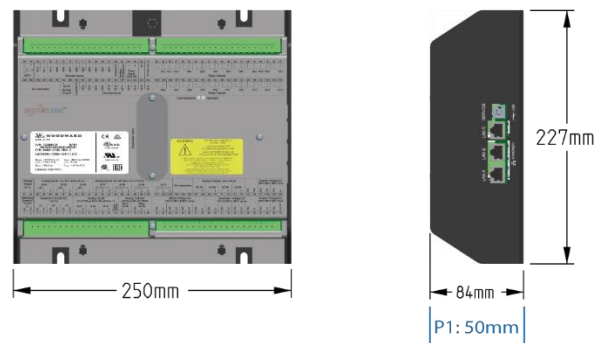
Analog inputs (isolated)	freely scalable
Type 1	0 to 1 V / 0 to 2000 Ohms / 0 to 20 mA
Resolution	16 Bit
Maximum permissible voltage against genset Ground	9 V
Maximum permissible voltage between genset Ground & PE	100 V
Type 2 (P2 only)	0 to 10 V / 0 to 20 mA
Resolution	14 Bit
Maximum permissible voltage 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	$\pm 10 V / \pm 20 mA / PWM$
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 $\pm 10 V$ (scalable)	internal resistance
Output $\pm 20 mA$ (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, CSA
Marine	LR (Type Approval), 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

Discrete Inputs																Relay Outputs																							
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
MPU																R12 R11 R10 R09 R08 R07 R06 R05 R04 R03 R02 R01																							
Discrete Inputs																Relay Outputs																							
No connection																R22 R21 R20 R19 R18 R17 R16 R15 R14 R13																							
Discrete Inputs																Relay Outputs																							

Analog Inputs																Analog Outputs															
0 to 10 V 0/4 to 20 mA																0 to 250 Ohm 0 to 2.5 kOhm															
AI 04 AI 05 AI 06 AI 07 AI 08 AI 09																AI 10															
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 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																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** & **LS-512/LS-522** (Product Specification # 37522 and #37661/37663)
- 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
- Data **TelegramMapper** software (Application Note # 37684)
- 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 and Phoenix expansion CAN Couplers



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For more information contact:

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EASYGEN 3000 ^{XT}	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 <100 ms)	FlexApp™	3			
Number of supported Woodward LS-5 units (1 or 2 breaker controls) ^{#1}		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	DynamicsLCD™	-		✓	
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)		1000			
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	LogicsManager™	max. 12	max. 22	max. 12	max. 22
External discrete inputs / outputs via CANopen		32 / 32			
Analog inputs ^{#2} , configurable	FlexIn™	3	10	3	10
Analog outputs: ± 10V, ± 20mA, PWM; configurable	AnalogManager™	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 ^{#3}	FlexCAN™	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), CSA (USA and Canada),		✓			
BDEW, VDE, EAC, CE Marked					
LR, ABS Marine					
Part Numbers					
Front panel mounting with display ^{#4}		-	-	8440-2085	8440-2088
(... and enhanced operating temperature range)				(8440-2086)	(8440-2089)
Cabinet back mounting w/o display		8440-2084	8440-2087	-	-

^{#1} The easYgen-3500/LS5 communication system allows up to 48 members on the bus. ^{#3} CAN#2 freely selectable during configuration between CANopen or J1939; please

feel free to request more information

^{#2} Selectable senders: VDO (0 to 180 Ohm, 0 to 5 bar), VDO (0 to 180 Ohm, 0 to 10 bar), ^{#4} a screw and a clamp kit are delivered with the unit for fastening

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)