

easYgen | GC-3400XT



Salient Features

- ✓ Command up to 248 gensets sorted into 8 groups of 31 gensets each
- ✓ Cascaded control architecture with
 - Peer-to-peer communication
 - Load share line redundancy at each level
- ✓ PC based emulation tool for testing load dependent start/stop sequence
- ✓ Direct Connect up to 690 V_{AC}

Group Controller for large fleet of gensets

DESCRIPTION

Woodward's group controller, GC-3400XT is designed to manage virtually any large scale power generation system you can imagine. It enables you to command up to 248 gensets, with complete genset management, synchronization, dead bus prioritization, load share, and load dependent start/stop capabilities, in combination with Woodward's easYgen-3400XT/3500XT equipped genset controllers. These controllers come with standardized software that is simple to configure, yet easily customizable for individual applications. Peer-to-peer communication between the controls and load share line redundancy at each level ensures single-fail-safe operation of your power generation control system.

The GC-3400XT is based on a scalable multi-master control concept to combine up to 31x easYgen-3000XT equipped gensets with one group controller in a group. The groups are scaled up to x8, i.e. a total up to 248 gensets can be managed in an application. The data flow within the group is handled by CAN or Ethernet or CAN & Ethernet bus. The group controller collects and sorts the data of its group and acts like a "Big Genset" control to the other GCs. The data flow among the group controllers is handled by second communication bus Ethernet B or Ethernet C or Ethernet B & C. Through the decoupling of the overall data flow, the bus bandwidth is kept low and the single genset operation is kept safe, should a group controller become the point of failure. Furthermore, the group controller may handle a group breaker, to synchronize or prioritize dead busbar closing. Additionally, the group controller supports the synchronization and soft loading/unloading of a tie- or mains breaker. Comprehensive diagnostics, monitoring and system update function are implemented to help fast commissioning of the system.

Woodward's easYgen-3400XT/3500XT K51 is an exceptionally versatile genset control with complete engine-generator control and protection, genset breaker synchronization, dead bus arbitration and isochronous/droop load share capabilities. The easYgen-3500XT is available in two packages, P1 and P2, both are compatible to work with GC-3400XT. Both the packages are available without a display in a rugged metal housing suitable for back panel installations. A sophisticated touch screen remote panel (RP-3000XT) complements them as an operator control panel.

FEATURES

- Full connectivity of up to 248 gensets sorted into 8 groups of 31 gensets each. One GC-3400XT per group
- Redundant or single load share communication over CAN/Ethernet between easYgen and group controller
- Redundant or single load share communication over Ethernet among group controllers
- Dedicated Ethernet Modbus TCP communication line to external Modbus master (PLC, SCADA etc.)
- Active and reactive load sharing and load dependent start/stop (LDSS) management of the whole fleet
- LDSS algorithm is emulated with a PC software and the final settings are transferred directly to the GC
- Supports synchronization and soft loading/unloading of a tie- or mains breaker
- Phase angle compensation (Vector group adjustment) in case transformers are used in the application
- Comprehensive monitoring of all interfaces, loss of redundancy and breaker feedback plausibility check
- "System Update" function for troubleshooting and fast commissioning
- Time / Date synchronization over Simple Network Time Protocol (SNTP)
- 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.

- **Applications**
 - Prime Power
 - Peak shaving
 - Emergency standby
 - Import-Export
 - Island parallel
 - Mains parallel
- **Redundant CAN-Ethernet communication between GC-3400XT and easYgen**
- **Redundant Ethernet-Ethernet communication among GC-3400XT**
- **Generator Group Breaker (GGB) synchronization and busbar arbitration**
- **Mains Circuit Breaker (MCB) synchronization and soft loading / unloading**
- **Load dependent start / stop (LDSS) for the entire fleet**
- **Comprehensive diagnostics, monitoring and system update function**
- **LDSS Emulation tool**
 - Emulate generator sequencing on a PC
 - Transfer the final settings directly to the GC-3400XT
- **UL 61010, UL 6200, CSA, and CE compliance**

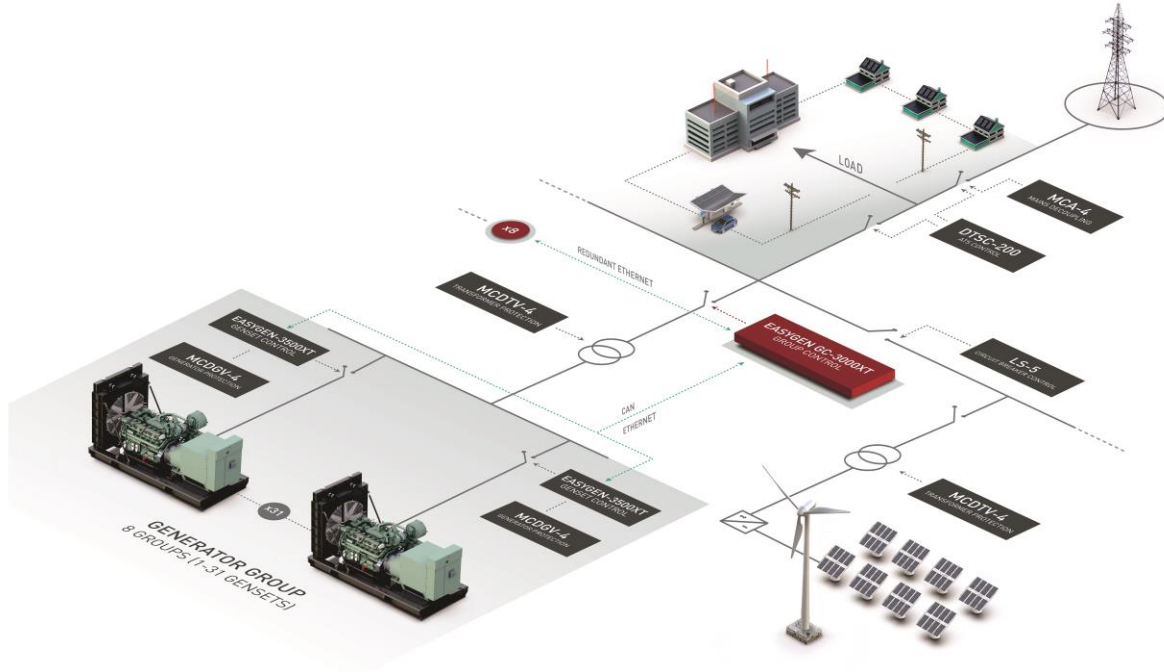
SPECIFICATIONS

Power supply 12/24 V_{DC} (8 to 40 V_{DC})
 Intrinsic consumption max. 22 W
Ambient temperature (operation) -40 to 70 °C / -40 to 158 °F
 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

Discrete inputs isolated
 Input range 12/24 V_{DC} (8 to 40 V_{DC})
 Input resistance approx. 20 kOhms
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}
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
Housing Back panel mounting Powder Coated Sheet metal housing
 Dimensions WxHxD P1: 250 × 228 × 50 mm
 Connection screw/plug terminals 2.5 mm²
 Protection system IP 20
 Weight approx. 1,750 g
Disturbance test (CE) tested according to applicable IEC standards
Listings CE, UL, cUL, EAC, CSA

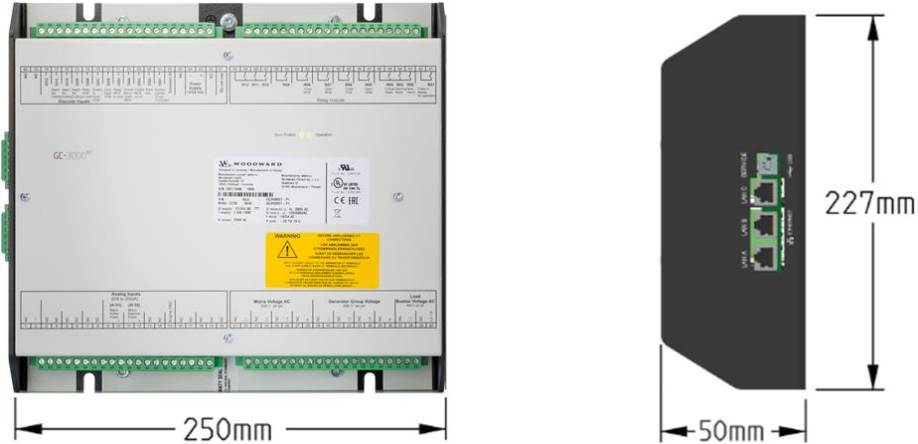
* 3 phase 3 wire Δ constellations are limited to 600 V_{AC} system

APPLICATION



DIMENSIONS

Metal housing for cabinet mounting



TERMINAL DIAGRAM

Terminal No.	Terminal Description	Notes	Signal Type	Voltage / Current
80	Screw terminals			
79	1 CAN_L GND			
78	2 CAN_L SHIELD			
77	3 CAN_H			
76	4 CAN_H			
75	CAN#1			
74	[DI 08]	Discrete Input [DI 08] isolated	Discrete	
73	[DI 09]	Discrete Input [DI 09] isolated	Discrete	
72	[DI 10]	Discrete Input [DI 10] isolated	Discrete	
71	[DI 11]	Discrete Input [DI 11] isolated	Discrete	
70	[DI 12]	Discrete Input [DI 12] isolated	Discrete	
69	[DI 03]	Discrete Input [DI 03] isolated	Discrete	
68	[DI 02]	Discrete Input [DI 02] isolated	Discrete	
67	[DI 01]	Discrete Input [DI 01] isolated	Discrete	
66	Common (terminals 67 to 78)			Engine GND
65	63	Power supply	Power	Isolated, 8 to 40 Vdc *2
64	62	NC		
61	61	Earth		
60	[R12]	Relay [R12]	Relay	
59	[R11]	Relay [R11]	Relay	
58	[R10]	Relay [R10]	Relay	
57	[R09]	Relay [R09]	Relay	
56	[R08]	Relay [R08]	Relay	
55	[R07]	Relay [R07]	Relay	
54	[R06]	Relay [R06]	Relay	
53	[R05]	Relay [R05]	Relay	
52	[R04]	Relay [R04]	Relay	
51	[R03]	Relay [R03]	Relay	
50	[R02]	Relay [R02]	Relay	
49	[R01]	Relay [R01]	Relay	
48	[R00]	Relay [R00]	Relay	
47	[R00]	Relay [R00]	Relay	
46	[R00]	Relay [R00]	Relay	
45	[R00]	Relay [R00]	Relay	
44	[R00]	Relay [R00]	Relay	
43	[R00]	Relay [R00]	Relay	
42	[R00]	Relay [R00]	Relay	
41	[R00]	Relay [R00]	Relay	
GC3000XT				
40	Ethernet #C	Ethernet #B	Ethernet #A	600 Vac
39	Load Busbar voltage	L2 / N		600 Vac
38	Load Busbar voltage	L1		600 Vac
37	Generator Group voltage	N		600 Vac
36	Generator Group voltage	L3		600 Vac
35	Generator Group voltage	L2		600 Vac
34	Generator Group voltage	L1		600 Vac
33	Generator Group voltage	L1		600 Vac
32	Generator Group voltage	L1		600 Vac
31	Generator Group voltage	L1		600 Vac
30	Generator Group voltage	L1		600 Vac
29	Generator Group voltage	L1		600 Vac
28	Generator Group voltage	L1		600 Vac
27	Generator Group voltage	L1		600 Vac
26	Generator Group voltage	L1		600 Vac
25	Generator Group voltage	L1		600 Vac
24	Generator Group voltage	L1		600 Vac
23	Generator Group voltage	L1		600 Vac
22	Generator Group voltage	L1		600 Vac
21	Generator Group voltage	L1		600 Vac
20	Generator Group voltage	L1		600 Vac
19	Generator Group voltage	L1		600 Vac
18	Generator Group voltage	L1		600 Vac
17	Generator Group voltage	L1		600 Vac
16	Generator Group voltage	L1		600 Vac
15	Generator Group voltage	L1		600 Vac
14	Generator Group voltage	L1		600 Vac
13	Generator Group voltage	L1		600 Vac
12	Generator Group voltage	L1		600 Vac
11	Generator Group voltage	L1		600 Vac
10	Generator Group voltage	L1		600 Vac
9	Generator Group voltage	L1		600 Vac
8	Generator Group voltage	L1		600 Vac
7	Generator Group voltage	L1		600 Vac
6	Generator Group voltage	L1		600 Vac
5	Generator Group voltage	L1		600 Vac
4	Generator Group voltage	L1		600 Vac
3	Generator Group voltage	L1		600 Vac
2	Generator Group voltage	L1		600 Vac
1	Generator Group voltage	L1		600 Vac

RELATED PRODUCTS

- Genset Controller **easYgen-3500XT-P1- K51** & **easYgen-3500XT-P2- K51** (Product Specification # 37583)
- **ToolKit** (Product Specification # 03366)
- **LDSS** Emulation Tool (Product Specification #37897)

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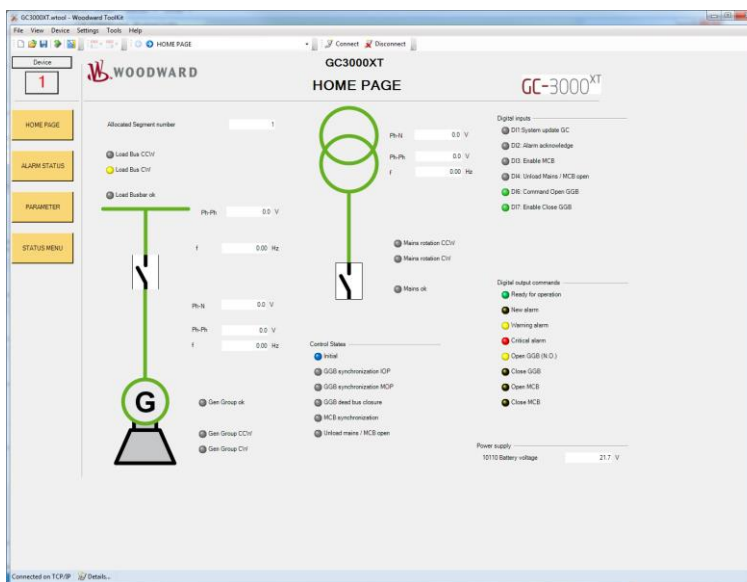
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For more information contact:

Woodward's ToolKit provides user-friendly configuration, commissioning assistance, visualization and the overview pages show what other controls the GC is communicating with. The GC-3400XT Home Page is shown below.



LDSS EMULATION TOOL OVERVIEW

LDSS Emulation Tool allows emulating a number of easYgen-3000XT, GC-3000XT, loads and mains connections and their load dependent start/stop behavior. The tool allows access by Modbus/TCP master to r/w the parameter set. The final settings file can be directly transferred to the GC-3400XT or can be used offline by ToolKit.



PART NUMBERS

Description	Order Code
GC-3400XT-P1	8440-2228
easYgen-3500XT-P1-K51	8440-2230
easYgen-3500XT-P2-K51	8440-2238