

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**

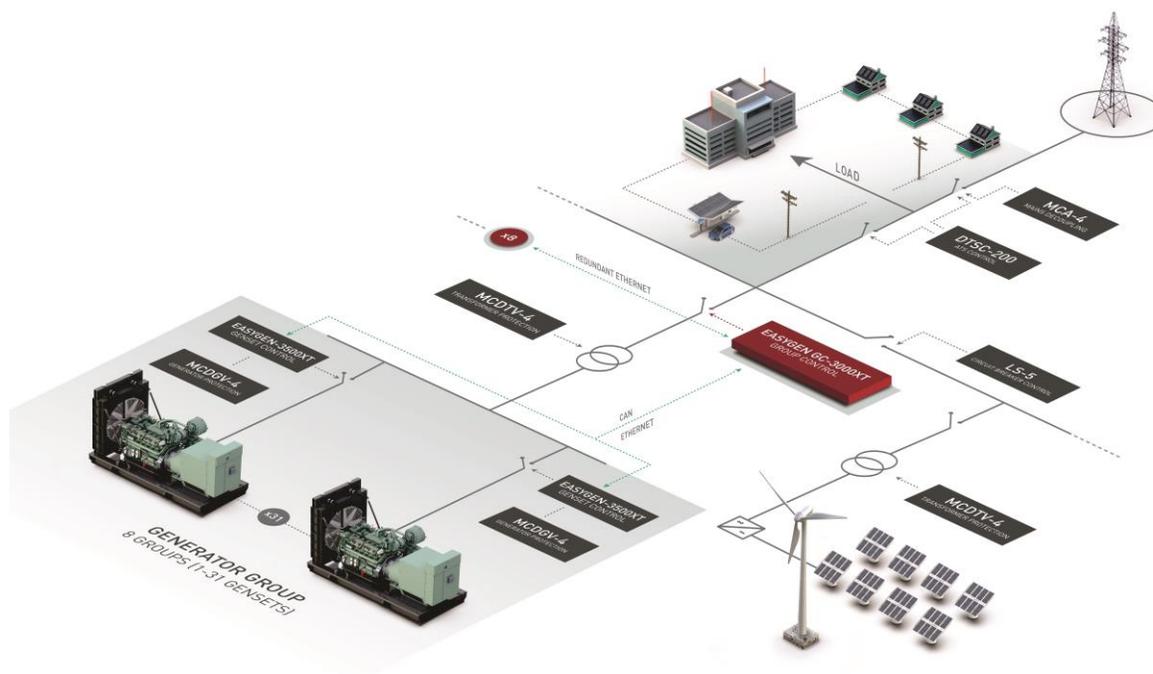
SPECIFICATIONS

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)	(λ/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 mm ²
Protection system	IP 20
Weight	approx. 1,750 g
Disturbance test (CE)	tested according to applicable IEC standards
Listings	CE, UL, cUL, EAC, CSA

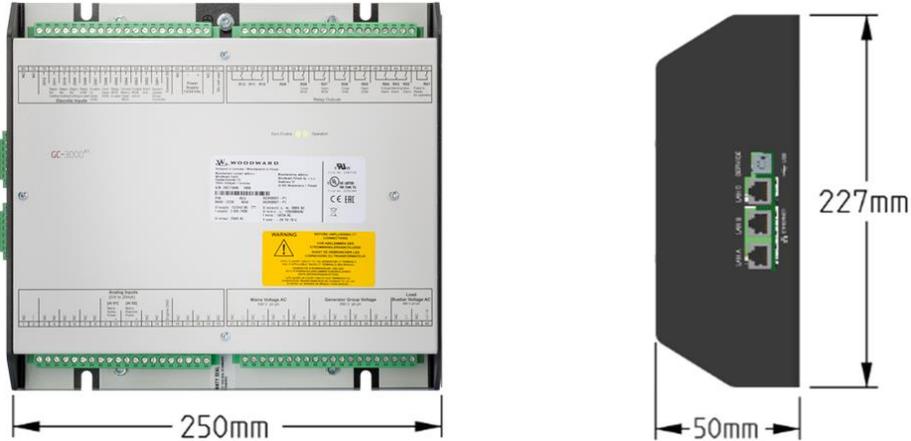
* 3 phase 3 wire Δ constellations are limited to 600 V_{AC} system

APPLICATION



DIMENSIONS

Metal housing for cabinet mounting



TERMINAL DIAGRAM

Screw terminals		CAN#1		Ethernet #C		Ethernet #B		Ethernet #A	
80	1 CAN_GND								
79	2 CAN_L SHIELD								
78	3 CAN_H								
77	4 CAN_H								
76		[DI 109]	Discrete Input [DI 109] isolated ¹						
75		[DI 110]	Discrete Input [DI 110] isolated ¹						
74		[DI 098]	Discrete Input [DI 098] isolated						
73		[DI 099]	Discrete Input [DI 099] isolated						
72		[DI 097]	Discrete Input [DI 097] isolated						
71		[DI 098]	Discrete Input [DI 098] isolated						
70		[DI 041]	Discrete Input [DI 041] isolated						
69		[DI 042]	Discrete Input [DI 042] isolated						
68		[DI 021]	Discrete Input [DI 021] isolated						
67		[DI 022]	Discrete Input [DI 022] isolated						
66		[DI 011]	Discrete Input [DI 011] isolated						
65			Common (terminals 67 to 78)						
64			Power supply isolated, 8 to 40 Vdc ²						
63			NC						
62			Earth						
61			Earth						
60		[R112]	Relay [R112]						
59		[R111]	Relay [R111]						
58		[R109]	Relay [R109]						
57		[R108]	Relay [R108] isolated ¹						
56		[R099]	Relay [R099] isolated ¹						
55		[R098]	Relay [R098] isolated ¹						
54		[R087]	Relay [R087] isolated ¹						
53		[R077]	Relay [R077] isolated ¹						
52		[R066]	Relay [R066] isolated ¹						
51		[R055]	Relay [R055] isolated ¹						
50		[R044]	Relay [R044] isolated ¹						
49		[R033]	Relay [R033] isolated ¹						
48		[R022]	Relay [R022] isolated ¹						
47		[R011]	Relay [R011] isolated ¹						
46			Relay [R011] isolated ¹						
45			Fixed to Ready for operation						
44			Relay [R022] Normally Closed						
43			Relay [R033] Warning Alarm						
42			Relay [R044] Critical Alarm						
41			Relay [R055] Open GCB						
			Relay [R066] Close GCB						
			Relay [R077] Open MCB						
			Relay [R087] Close MCB						
			Relay [R098] Load breaker is energized						
			Relay [R109] Load breaker is energized						
			Relay [R111] Load breaker is energized						
			Relay [R112] Load breaker is energized						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						
			Relay [R011] isolated ¹						
			Relay [R022] isolated ¹						
			Relay [R033] isolated ¹						
			Relay [R044] isolated ¹						
			Relay [R055] isolated ¹						
			Relay [R066] isolated ¹						
			Relay [R077] isolated ¹						
			Relay [R087] isolated ¹						
			Relay [R098] isolated ¹						
			Relay [R099] isolated ¹						
			Relay [R109] isolated ¹						
			Relay [R111] isolated ¹						
			Relay [R112] isolated ¹						

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 2 678 4424
 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.

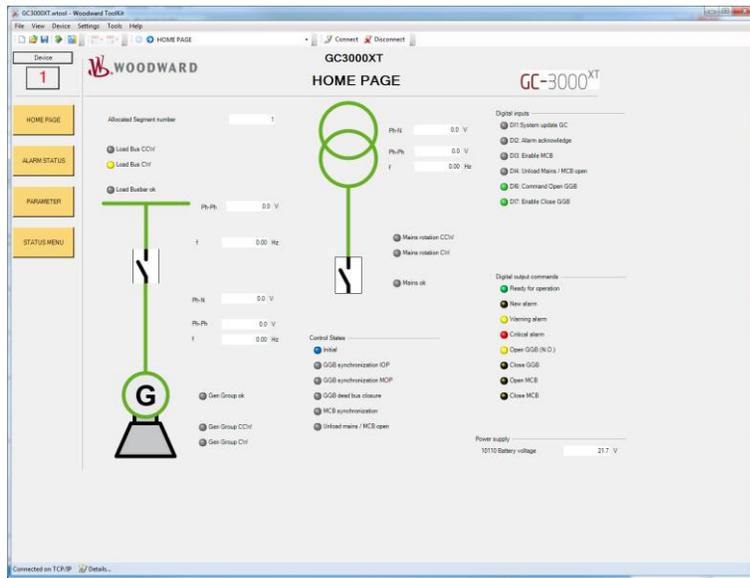
We appreciate your comments about the content of our publications. Please send comments including the document number below to stgt-doc@woodward.com

© Woodward

All Rights Reserved

For more information contact:

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