



APPLICATIONS

The easYgen-3000 is a versatile genset control, which may be adapted individually to every application. Primarily the intuitive user guidance via the 5.7" LC display and the various selectable languages make the easYgen-3000 a user-friendly control unit. With this, the easYgen-3000 continues the outstanding and highly reliable control solutions of our easYgen series.

The easYgen-3000 is able to control up to 32 gensets connected in a network with automatic sequencing (contact your Woodward sales office if you want to use more than 16 gensets). Load management features include automatic base loading/peak shaving, import/export control and emergency power/back up power generation.

FlexApp™ - This feature provides the tools to easily configure the easYgen-3000. Four different operating modes may be selected:

- **Measuring transducer/engine control [0-CB-Mode {0}]**
for engine start/stop and generator measuring and protection no breaker control
- **1-breaker-control [GCB open, {1o}]**
above plus "GCB open" breaker control as generator protection
- **1-breaker-control [GCB open/close, {1oc}]**
above plus full generator breaker control for stand-by power applications and generator soft loading and unloading
- **2-breaker-control [GCB/MCB open/close, {2oc}]**
above plus AMF, open/closed transition, and interchange load transfer applications

DynamicsLCD™ - The interactive LC display ensures an intuitive user guidance.

FlexIn™ - The unit provides three analog inputs that can be freely configured (adaptable for use with each type of sender) as:

- **VDO:** 0 to 180Ohm [0 to 5bar/0 to 10bar]; 0 to 380Ohm [40 to 120°C/50 to 150°C], isolated (2-pole) and non-isolated (1-pole) ground senders only
- **Resistive input:** 0-500 Ohm, Pt100, linear 2-point, user-defined 9-point
- **0/4 to 20 mA:** linear 2-point, user-defined 9-point

Flexible Outputs - Free configurable speed- and voltage bias outputs for many speed governors and voltage regulators. The outputs can also be used as freely scalable outputs.

FlexCAN™ - The flexible, isolated CAN bus allows networks for multiple uses. Selectable during configuration: CANopen protocols; coupling of IKD 1 expansion cards (up to 16DI/16DOs) as well as of 3rd party expansion cards (request more detailed information from our sales department).

ECU monitoring and alarm management as well as remote start/stop and control commands with various ECUs via the J1939 protocol are possible (supported ECUs: Scania S6, MTU ADEC, Volvo EMS2 & EDC4, Deutz EMR2 and standard messages).

LogicsManager™ - The **LogicsManager** enables you to change the internal operation sequences of the control.

The various measuring values, inputs and internal states or constant values may be combined logically by Boolean operators and programmable timers. This enables you to create and/or modify monitoring and control functions.

Genset Control for Multiple Unit Operation

DESCRIPTION

I/Os

The easYgen-3000 provides the following I/Os:

- **FlexRange™** - Two separate sets of 3-phase true r.m.s. voltage measuring inputs for the generator and mains and 2-phase busbar voltage:
 - 100 Vac rated (max. 150 Vac)
 - 400 Vac rated (max. 600 Vac)
- 3-phase true r.m.s. generator current/power
- 1-phase true r.m.s. current input freely configurable either as mains current measurement or ground current measurement (ground fault protection)
- 1 speed input (magnetic/switching)
- 10 configurable discrete alarm inputs
- **LogicsManager™** - up to 12 programmable discr. outputs
- **FlexIn™** - 3 configurable analog inputs
- **Flexible Outputs** - 2 configurable analog outputs
- **FlexCAN™** - Two CAN bus communication networks (up to 32 participants, isolated)
- Two serial ports supporting RS-485 and RS-232 (isolated)

Protection (ANSI #)

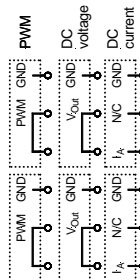
Generator: Over-/undervoltage (59/27), over-/underfrequency (81O/U), unbalanced voltage, dead bus detection, overload (32), unbalanced load (46), reverse/reduced power (32R/F), definite overcurrent and time-overcurrent (50/51), inverse time-overcurrent (IEC255), measured ground fault (50N/51N), phase rotation
 Engine: Over-/underspeed (12), battery over-/undervoltage, auxiliary excitation, speed/frequency mismatch
 Mains: Load, kvar, over-/undervoltage (59/27), over-/underfrequency (81O/U), phase shift, rotation field
 Various additional monitoring functions for generator, mains and engine values, breakers, analog inputs, interfaces, battery and load sharing participants

Features

- **FlexApp™** - (Four application modes)
- **DynamicsLCD™** - 320x240 pixel graphical interactive 5.7" LC display with soft keys
- Start/stop logic for Diesel/Gas engines
- Engine pre-glow or purge control
- Warm-up control via timer or coolant temperature
- Speed, frequency, voltage, power, reactive power, and power factor set points via analog input or interface
- Power and reactive power load sharing with up to 32 units including load-dependent start/stop
- kWh meter, kvarh meter
- Operating hours/start/maintenance counters
- Configurable trip levels/delays/alarm classes
- PC and/or front panel configurable (ToolKit software)
- Multi-level password protection
- Multi-lingual capability (English, German, French, Spanish, Chinese, Japanese, Italian, Portuguese, Turkish, Russian)
- Event recorder (300 events, FIFO) with real time clock (battery backed; min. 5 years)
- Remote control via interface / discrete inputs

- Isolated & mains parallel operation
- Import/export control at interchange point
- Softload features
- Open/closed transition
- Synchronization with phase matching and slip frequency
- AMF
- Up to 32 units for load sharing
- Load-dependent start/stop for up to 32 units
- 100V-480V True r.m.s. voltage sensing with **FlexRange™**
- True r.m.s. current sensing
- kWh, kvarh meter
- Counters for engine starts, operating hours, maintenance call
- Freely configurable discrete & analog I/Os
- Multi-lingual capability
- CANopen / J1939 ECU Control
- Modbus RTU Protocol
- CE marked
- UL/cUL Listing
- LR Marine Approval

TERMINAL DIAGRAM



9-pin male submini-D connector	Terminal	Signal / Description	Notes	9-pin male submini-D connector
	2	CAN-L	Interface #4 CAN bus #2 Engine level (isolated)	
	3	GND		
	7	CAN-H		
	1	s1	Ground current (or mains current) (isolated)	
	2	s2		
	3	s1	Generator current (isolated)	
	4	s2		
	5	s1	L2	
	6	s2		
	7	s1	L3	
	8	s2		
	9	-	Analog input [AI 01] (0 to 500 Ohm / 0/4 to 20 mA)	
	10	+		
	11	-	Analog input [AI 02] (0 to 500 Ohm / 0/4 to 20 mA)	
	12	+		
	13	-	Analog input [AI 03] (0 to 500 Ohm / 0/4 to 20 mA)	
	14	+		
	15	+	Analog output [AO 01] (+/-10Vdc / +/-20mA / PWM)	
	16	-		
	17	-	(isolated)	
	18	+		
	19	-	Analog output [AO 02] (+/-10Vdc / +/-20mA / PWM)	
	20	+		
	21	100 Vac	FlexRange	
	22	400 Vac		
	23	100 Vac		
	24	400 Vac		
	25	100 Vac		
	26	400 Vac		
	27	100 Vac		
	28	400 Vac		
	29	100 Vac		
	30	400 Vac		
	31	100 Vac		
	32	400 Vac		
	33	100 Vac		
	34	400 Vac		
	35	100 Vac		
	36	400 Vac		
	37	100 Vac		
	38	400 Vac		
	39	100 Vac		
	40	400 Vac		
	2	B	Interface #2 RS-485 (isolated) #1 Serial #2	
	4	B'		
	7	A		
	8	2: RxD	Interface #1 RS-232 (isolated) Serial #1	
	9	3: TxD		
	5	5: GND		
	6	7: RTS		
	8	8: CTS		
	41	Relay 01: <i>LogicsManager</i> configurable Fixed to: Ready for operation	[R 01]	
	42	Relay 02: <i>LogicsManager</i> configurable Default: Centralized alarm	[R 02]	
	43	Relay 03: <i>LogicsManager</i> configurable Default: Starter	[R 03]	
	44	Relay 04: <i>LogicsManager</i> configurable Default: Fuel solenoid / gas valve	[R 04]	
	45	Relay 05: <i>LogicsManager</i> configurable Default: Preglow	[R 05]	
	46	Relay 06: Command: close GCB (only in {10c} or {20c} application mode) or <i>LogicsManager</i> configurable	[R 06]	
	47	Relay 07: Command: open GCB (only in {10}, {10c}, or {20c} app. mode) or <i>LogicsManager</i> configurable	[R 07]	
	48	Relay 08: Command: close MCB (only in {20c} application mode) or <i>LogicsManager</i> configurable	[R 08]	
	49	Relay 09: Command: open MCB (only in {20c} application mode) or <i>LogicsManager</i> configurable	[R 09]	
	50	Relay 10: <i>LogicsManager</i> configurable Default: Auxiliary services	[R 10]	
	51	Relay 11: <i>LogicsManager</i> configurable Default: Alarm class A or B	[R 11]	
	52	Relay 12: <i>LogicsManager</i> configurable Default: Alarm class C, D, E, or F	[R 12]	
	60	Protective Earth PE		
	61	Engine ground		
	62	Power supply isolated, 8 to 40 Vdc	+	
	63	Auxiliary excitation D+ (isolated)	-	
	64	DI Common for terminals 67-78		
	65	Discrete Input 01: Configurable (isolated) Default: Emergency Stop	[DI 01]	
	66	Discrete Input 02: Configurable (isolated) Default: Start in ALUTO	[DI 02]	
	67	Discrete Input 03: Configurable (isolated) Default: Low oil pressure	[DI 03]	
	68	Discrete Input 04: Configurable (isolated) Default: Coolant temperature	[DI 04]	
	69	Discrete Input 05: Configurable (isolated) Default: External alarm acknowledgement	[DI 05]	
	70	Discrete Input 06: Configurable (isolated) Default: Enable MCB	[DI 06]	
	71	Discrete Input 07: Reply: MCB open (isol.)	[DI 07]	
	72	Discrete Input 08: Reply: GCB open (isol.)	[DI 08]	
	73	Discrete Input 09: Configurable (isolated)	[DI 09]	
	74	Discrete Input 10: Configurable (isolated)	[DI 10]	
	75	Discrete Input 11: Configurable (isolated)	[DI 11]	
	76	Discrete Input 12: Configurable (isolated)	[DI 12]	
	77	MPU (pickup)	+	
	78		-	
	79	Interface #3 CAN bus #1 Guidance/system level (isolated)	FlexCAN	
	80	2: CAN-L		
		3: GND		
		7: CAN-H		



easYgen-3200 (Genset Control)

Subject to technical modifications.

FEATURES OVERVIEW

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		easYgen-3000 Series	
Model		3200	
Measuring			
Generator voltage (3-phase/4-wire)			✓
Generator current (3x true r.m.s.)			✓
Mains voltage (3-phase/4-wire)			✓
Mains or ground current (1x true r.m.s.) #1			✓
Busbar voltage (1-phase/2-wire)			✓
Control			
Breaker control logic	<i>FlexApp™</i>		2
Automatic, Manual, and Stop operating modes			✓
Single and multiple-unit operation			✓
Mains parallel multiple-unit operation (up to 32 units)			✓
AMF (auto mains failure operation)			✓
Stand-by operation			✓
Critical mode operation			✓
GCB and MCB synchronization (slipping / phase matching)			✓
Open (break-before-make) and closed (make-before-break) transition			✓
Interchange			✓
Load-dependent start/stop			✓
n/f, V, P, Q, and PF remote control via analog input or interface			✓
Load/var sharing for up to 32 gensets			✓
HMI			
Soft keys (advanced LC display)	<i>DynamicsLCD™</i>		✓
Start/stop logic for Diesel/Gas engines			✓
kWh meter, kvarh meter			✓
Operating hours/start/maintenance counter			✓
Configuration via PC #2			✓
Event recorder entries with real time clock (battery backup)			300
Protection		ANSI#	
Generator: voltage/frequency	59/27/810/81U		✓
Generator: overload, reverse/reduced power	32/32R/32F		✓
Generator: unbalanced load	46		✓
Generator: instantaneous overcurrent	50		✓
Generator: time-overcurrent (IEC 255 compliant)	51		✓
Generator: ground fault #3	50G		✓
Generator: power factor	55		✓
Generator: rotation field			✓
Engine: overspeed	12		✓
Engine: underspeed	14		✓
Engine: speed/frequency mismatch			✓
Engine: D+ auxiliary excitation failure			✓
Mains: voltage/frequency	59/27/810/81U		✓
Mains: rotation field			✓
Mains: phase shift	78		✓
I/Os			
Speed input (magnetic/switching; Pickup)			✓
Discrete alarm inputs (configurable) #4			10
Discrete outputs (configurable) #4	<i>LogicsManager™</i>		max. 12
Analog inputs #5 (configurable)	<i>FlexIn™</i>		3
Analog outputs (+/- 10V, +/- 20mA, PWM; configurable)			2
CAN bus communication interfaces #6	<i>FlexCAN™</i>		2
RS-485 Modbus RTU Slave interface(s)			1
RS-232 Modbus RTU Slave interface(s)			1
Listings/Approvals			
UL/cUL Listing			✓
LR Marine Approval			✓
CE Marked			✓
P/Ns			
1A CT inputs / front panel mounting with display #7	P/N 8440-		1816
5A CT inputs / front panel mounting with display #7	P/N 8440-		1831
Connector kit for easYgen-3200	P/N 8923-		1314

#1 mains or ground current selectable

#2 via serial connection and ToolKit software (included)

#3 measured ground current

#4 it is possible to connect up to two digital IO expansion boards (P/N 8440-1041), which provide 8 additional DIs and DOs each.

#5 selectable during configuration between 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, Resistive input (one- or two-pole, 2pt. linear or 9pt. user defined), or 20 mA (0/4 to 20 mA, freely configurable)

#6 freely selectable during configuration between CANopen or J1939; request information

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