



APPLICATIONS

The easYgen-2000 Series are versatile genset controllers, including complete control, monitor and protection features.

FlexApp™ - This feature provides the tools to easily configure the easYgen-2000 Series. Different operating modes may be selected by simple configuration:

- Multiple unit island parallel operation up to 16 units (load sharing with automatic process and load sequencing)
- Single unit mains parallel operation
- Different breaker control modes (including close/open/synch commands):
 - None breaker control for application w/ external breaker control or no breaker.
 - Generator breaker control for e.g. stand by application or mains parallel applications.
 - Generator and mains breaker control for e.g. AMF, open/closed transitions, parallel, interchange and soft loading programs

FlexIn™ - The units provide three multitype analog inputs that can be freely configured for different type of sender either as a resistive or as current input:

- **Resistive input:** 0-500 Ohm, for Pt100, linear 2-point, user-defined 9-point and **VDO:** 0 to 180Ohm [0 to 5bar/0 to 10bar]; 0 to 380Ohm [40 to 120°C/50 to 150°C],

- **0/4 to 20 mA:** linear 2-point, user-defined 9-point

The senders can be isolated (2-pole) or can offer a ground return (1 pole)

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

FlexCAN™ - Flexible and isolated CAN bus providing different protocols: CANopen protocols; coupling of IKD 1 expansion cards (up to 16DIs/16DOs) as well as of 3rd party expansion cards (request more detailed information from our sales department). ECU 1939 communication with start/stop and alarm management.

Supported ECU: Scania EMS/S6, Deutz EMR2, Volvo EMS2, MTU ADEC, Woodward EGS, MAN EDC7, SISU EEM2/3, Cummins and J1939 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.

* Depends on easYgen-2000 Package (P1/P2). Check last page for details.

Genset Control for Multiple Unit Operation

DESCRIPTION

I/Os

- **FlexRange™** - Two separate sets of 3-phase true r.m.s. voltage measuring inputs for the generator and mains:
 - 120 Vac rated (max. 150 Vac)
 - 480 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 11 programmable relay outputs *
- **FlexIn™** - up to 4 configurable analog inputs *
- **Flexible Outputs** - up to 4 configurable analog outputs *
- **FlexCAN™** - up to 2 CAN bus communication networks *

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, breaker failure monitoring

Engine: Over-/underspeed (12), battery over-/undervoltage, auxiliary excitation, speed/frequency mismatch

Mains: Over-/undervoltage (59/27), over-/underfrequency (81O/U), phase shift, rotation field

Features

- 128x64 dot graphical interactive 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 (auto or remote controlled)
- Power and reactive power load sharing with up to 16 units including load-dependent start/stop
- kWh, kvarh
- Operating hours/start/maintenance counters - Operating hours also available from a connected ECU via J1939/CAN
- Configurable trip levels/delays/alarm classes
- PC and/or front panel configurable (ToolKit software)
- Multi-level password protection
- Multi-lingual capability (11 languages in 1 unit configurable: English, German, French, Spanish, Chinese, Japanese, Italian, Portuguese, Turkish, Russian, Polish)
- Event recorder (300 events, FIFO) with real time clock (battery backed; min. 5 years)
- Remote control via interface / discrete inputs
- Control of asynchronous generators

- Isolated & mains parallel operation
- Load transfer programs
- Softload features
- Open/closed transition
- Synchronization with phase matching and slip frequency
- AMF
- Up to 16 units for load sharing and load-dependent start/stop
- 120V-480V true r.m.s. voltage sensing
- True r.m.s. current sensing
- Generator kWh meter
- Support of asynchronous generators
- Counters for engine starts, operating hours, maintenance call
- Freely configurable discrete & analog I/Os
- Multi-lingual display
- CANopen / J1939 ECU
- Modbus RTU Protocol
- CE marked
- UL/cUL Listing
- GL/LR Marine Approval (pending)

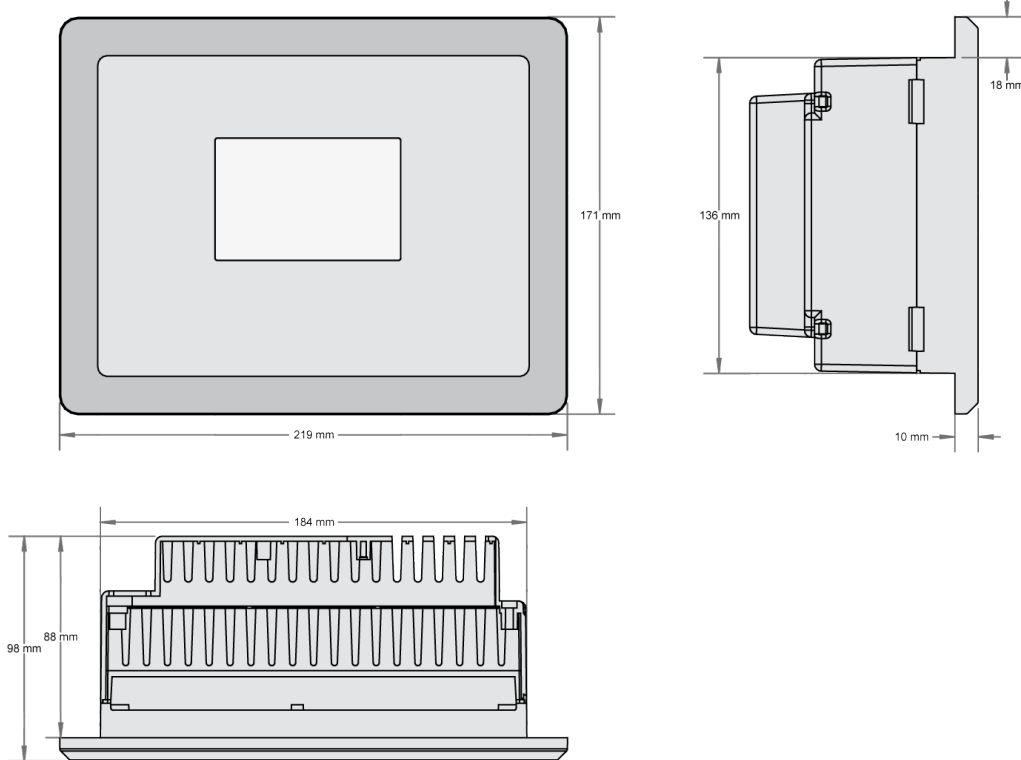
SPECIFICATIONS

Power supply 12/24 Vdc (8 to 40 Vdc)
 Intrinsic consumption max. ~ 8 W (easYgen-2200)
 max. ~ 12 W (easYgen-2500)
 Ambient temperature (operation) -20 to 70 °C / -4 to 158 °F
 Ambient temperature (storage) -30 to 85 °C / -22 to 185 °F
 Ambient humidity 95 %, non-condensing
Voltage (λ/Δ)
 120 Vac [1] Rated (V_{rated}) 69/120 Vac
 Max. value (V_{max}) 86/150 Vac
 Rated voltage phase – ground 150 Vac
 Surge volt. (V_{surge}) 2.5 kV
and 480 Vac [4] Rated (V_{rated}) 277/480 Vac
 Max. value (V_{max}) 346/600 Vac
 Rated voltage phase – ground 300 Vac
 Surge volt. (V_{surge}) 4.0 kV
 Accuracy Class 1
 Linear measuring range 1.25× V_{rated}
 Measuring frequency 50/60 Hz (40 to 85 Hz)
 High Impedance Input; Resistance per path [1] 0.498 M Ω , [4] 2.0 M Ω
 Max. power consumption per path < 0.15 W
Current (isolated) Rated (I_{rated}) [1] ..1 A or [5] ..15 A
 Linear measuring range $I_{gen} = 3.0 \times I_{rated}$
 $I_{mains/ground} = 1.5 \times I_{rated}$
 Burden < 0.15 VA
 Rated short-time current (1 s) [1] 50× I_{rated} , [5] 10× I_{rated}
Discrete inputs isolated
 Input range 12/24 Vdc (8 to 40 Vdc)
 Input resistance approx. 20 kOhms

Relay outputs potential free
 Contact material AgCdO
 Load (GP) 2.00 Aac@250 Vac
 2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
 Pilot duty (PD)
 1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Analog inputs (none isolated) freely scaleable
 Type 0 to 500/2500 Ohms / 0 to 20 mA
 Resolution 11 Bit
Analog outputs (isolated) freely scaleable
 Type ± 10 V / ± 20 mA / PWM
 Insulation voltage (continuously) 100 Vac
 Insulation test voltage (≤ 5 s) 1000 Vac
 Resolution 11/12 Bit (depending on output)
 ± 10 V (scaleable) internal resistance ~ 500 Ohms
 ± 20 mA (scaleable) maximum load 500 Ohms
Housing Front panel flush mounting Plastic housing
 Dimensions WxHxD 219 × 171 × 61 mm (easYgen-2200)
 219 × 171 × 98 mm (easYgen-2500)
 Front cutout WxH 186 [+1.1] × 138 [+1.0] mm
 Connection screw/plug terminals 2.5 mm²
 Front insulating surface
 Sealing Front IP65 (with screw fastening)
 Front IP54 (with clamp fastening)
 Back IP20
 Weight approx. 800 g (easYgen-2200)
 approx. 1,100 g (easYgen-2500)
Disturbance test (CE) tested according to applicable EN guidelines
Listings UL/cUL
Marine Approvals GL/LR (pending), others upon request

DIMENSIONS

Plastic housing for front panel mounting



easYgen-2500 P1 – dimensions

TERMINAL DIAGRAM

Service Port (RS-232) Connect only with Woodward DPC cable		WOODWARD easYgen-2500 P1	
80		Relay [R 7] Isolated Fixed to „Command: open GCB“ if GCB open relay used (NC, NO) otherwise preconfigured to „mains decoupling“	108
81		Relay [R 8] Isolated Fixed to „Command: close MCB“ if MCB open relay used (NC, NO) otherwise preconfigured to „mains decoupling“	107
82		Relay [R 9] Isolated Fixed to „Command: Fuel solenoid open“ otherwise preconfigured to „mains decoupling“	106
83		Relay [R 10] Isolated Preconfigured to Auxiliary services configurable via LogicsManager	105
84		Relay [R 11] Isolated Fixed to „Main alarm“ otherwise preconfigured to „mains decoupling“	104
85			103
86			102
87			101
88			100
89			99
90			98
91			97
92			96
93			95
94			94
95			93
96			92
97			91
98			90
99			89
100			88
101			87
102			86
103			85
104			84
105			83
106			82
107			81
108			80

Service Port (RS-232) Connect only with Woodward DPC cable		WOODWARD easYgen-2500 P1	
01		Relay [R 1] Isolated Fixed to Ready for operation	59
02		Relay [R 2] Isolated Preconfigured to Horn configurable via LogicsManager	58
03		Relay [R 3] Isolated Preconfigured to Starter configurable via LogicsManager	57
04		Relay [R 4] Isolated Preconfigured to Fuel solenoid configurable via LogicsManager	56
05		Relay [R 5] Isolated Fixed to „Command: open MCB“ if MCB Control is enabled otherwise preconfigured to „warning alarm“	55
06		Relay [R 6] Isolated Fixed to „Warning alarm“ if MCB Control is enabled otherwise preconfigured to „shut down alarm“	54
07		Common (terminals 44 to 51)	53
08		Discrete input [DI 01] Isolated Emergency stop (LogicsManager)	52
09		Discrete input [DI 02] Isolated Start in Aux (LogicsManager)	51
10		Discrete input [DI 03] Isolated Low oil pressure (LogicsManager)	50
11		Discrete input [DI 04] Isolated Coolant temp. (LogicsManager)	49
12		Discrete input [DI 05] Isolated Alarm acknowledge (LogicsManager)	48
13		Discrete input [DI 06] Isolated Enable MCE (LogicsManager)	47
14		Discrete input [DI 07] Isolated Reply: MCB open* (LogicsManager)	46
15		Discrete input [DI 08] Isolated Reply: GCB open (LogicsManager)	45
16		Auxiliary excitation	44
17		Power supply 8 to 40 Vdc	43
18		Function Earth	42
19		MPU input	41
20		CAN bus 1 isolated	40
21		CAN bus 2 isolated	39
22		CAN-L	38
23		CAN-H	37
24		Ground or mains current isolated	36
25		Generator current isolated	35
26		Generator Voltage L3	34
27		Generator Voltage L2	33
28		Generator Voltage L1	32
29		Generator Voltage N	31
30		Generator Voltage N	30

easYgen-2500 P1 – wiring diagram

Subject to technical modifications. easYgen-2500 P1 Wiring Diagram | Rev. v. F. * If MCB Control is enabled.

FEATURES OVERVIEW

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		easYgen-2000 Series			
		Model / Package	2200 P1	2200 P2	2500 P1
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		✓	✓	✓	
Control					
Different Breaker Operation modes <i>FlexApp™</i>		✓	✓	✓	
Automatic, Manual, and Stop operating modes		✓	✓	✓	
Single unit mains parallel operation		✓	✓	✓	
Multiple-unit island parallel operation (up to 16 units)		✓	✓	✓	
AMF (auto mains failure operation)		✓	✓	✓	
Stand-by operation		✓	✓	✓	
Critical mode operation		✓	✓	✓	
GCB and MCB synchronization (slip synchronization / 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 16 gensets		✓	✓	✓	
HMI					
Soft keys (advanced LC display)		✓	✓	✓	
Start/stop logic for Diesel/Gas engines		✓	✓	✓	
Generator kWh meter		✓	✓	✓	
Operating hours/start/maintenance counter		✓	✓	✓	
Configuration via PC #2		✓	✓	✓	
Event recorder entries with real time clock (battery backup)		300	300	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/underspeed		12/14	via Speed input	via ECU [CAN/J1939] via Speed input or ECU [CAN/J1939]	
Genset: speed/frequency mismatch			✓	✓	
Engine: D+ auxiliary excitation failure			✓	✓	
Mains: voltage/frequency/phase shift		59/27/810/81U/78	✓	✓	
Mains: rotation field			✓	✓	
I/Os					
Speed input (magnetic/switching; Pickup)			✓	✓	
Discrete alarm and control inputs (configurable) #4			8	10	
Discrete outputs (configurable) <i>LogicsManager™</i>			6	11	
External discrete inputs / outputs via CANopen (maximum)			16 / 16	16 / 16	
Analog inputs (configurable) <i>FlexIn™</i>			3	4	
Analog outputs (+/- 10V, +/- 20mA, PWM; configurable)			1	4	
CAN bus communication interfaces <i>FlexCAN™</i>			1	2	
RS-485Modbus RTU Slave interface			-	1	
Service Port (RS-232) - Woodward DPC cable required			✓	✓	
Listings/Approvals					
UL/cUL Listing			✓	✓	
LR Marine Approval (pending)			✓	✓	
CE Marked			✓	✓	
P/Ns			2200 P1	2200 P2	2500 P1
Plastic Housing					
1A CT inputs / front panel mounting with display #7		P/N	8440-1856	8440-1858	8440-1860
5A CT inputs / front panel mounting with display #7		P/N	8440-1855	8440-1857	8440-1884

#1 mains or ground current selectable

#2 via serial (external Woodward DPC cable required - P/N 5417-557) or CAN connection by ToolKit software

#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

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