easYgen-2000 Series

Option Manual | Genset Control

easYgen-2500 Rental (Option K33)

Software Version 1.00xx

37537

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Brief Overview

NOTICE!

This option manual must be used together with the device standard manual. A option manual only describes the additional functionality of the device. Please refer to *'Additional functionality' on page 5* for details.

The following standard manual is required to install, commission and operate the device:

– easYgen-2200/2500 manual (37535)

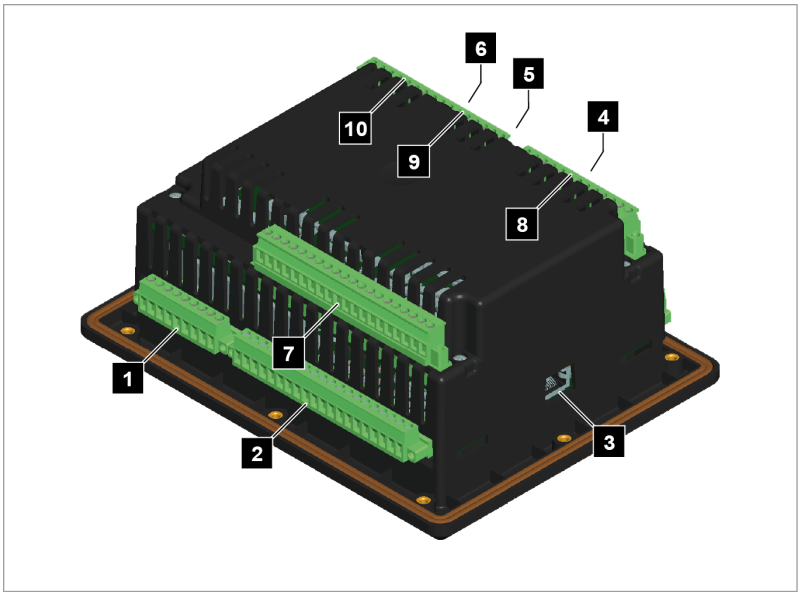


Fig. 1: easYgen-2500 (housing)

1 Analog output and generator CT terminal
2 Mains/generator/busbar PT terminal
3 Service port connector (USB/RS-232)[1]
4 Relay outputs terminal
5 Discrete inputs terminal
6 CAN bus interface terminal #1
7 Analog input/outputs terminal and discrete inputs terminal
8 Relay outputs terminal
9 CAN bus interface terminal #2
10 RS-485 interface terminal

[1] Optional configuration cable for ToolKit configuration software and external extensions/applications required:

– *USB connector: DPC-USB direct configuration cable – P/N 5417-1251*
– *RS-232 connector: DPC-RS-232 direct configuration cable – P/N 5417-557*

The easYgen-2000 Series are control units for engine-generator system management applications.

The control units can be used in applications such as: rental generators, stand-by, AMF and peak shaving.

Sample application setup

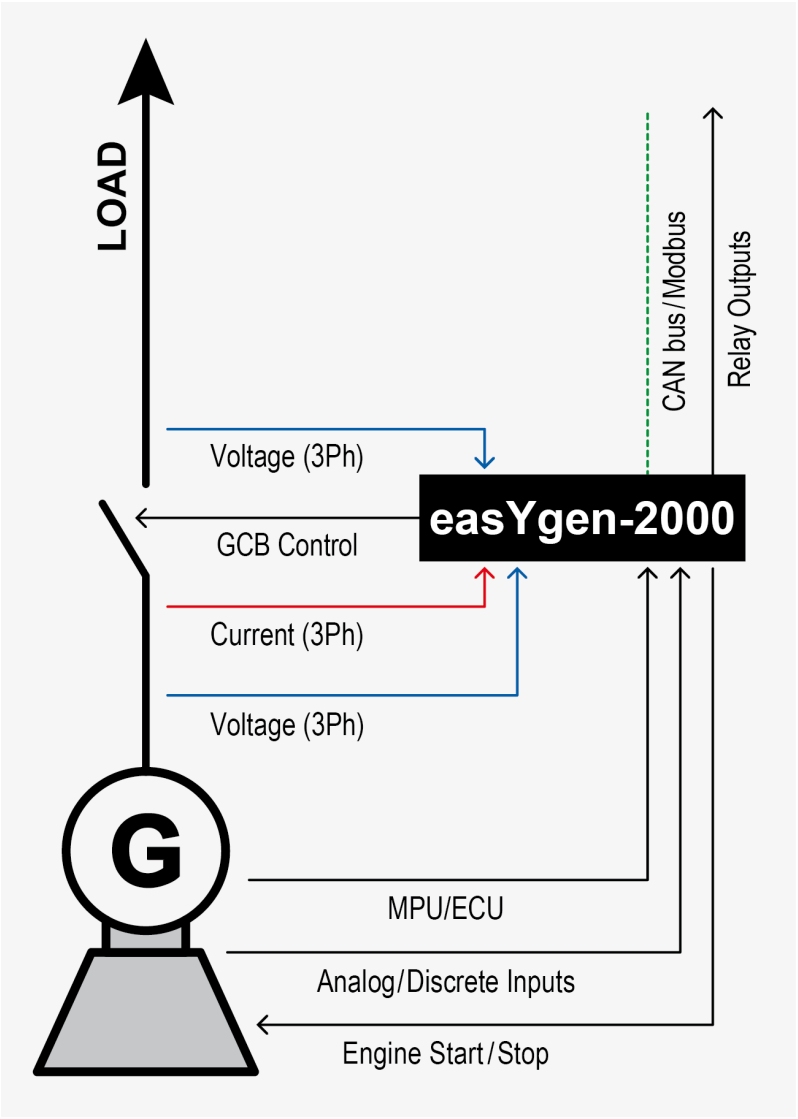


Fig. 2: Sample application setup

A typical application mode for the control unit is the use for operation of the GCB.

- In this case, the easYgen will function as an engine control with generator, mains and engine protection.
- The control unit can open and close the generator circuit breaker (GCB).

For a listing of additional application modes and setups please refer to 'Chapter: Application' in easYgen-2200/2500 manual (37535).

Additional functionality

The easYgen-2500 Rental controllers have some additional features compared to the standard easYgen-2500 controllers. The differences are listed below.

- *Switchable parameter sets. Refer to ↳ Chapter 2.1.1 ‘Switchable Parameter Sets’ on page 15 for details.*
- *Period of use counter. Refer to ↳ Chapter 2.1.2 ‘Configure Counters’ on page 21 for details.*
- *Specialised menu screens. Refer to ↳ Chapter 2.2.1 ‘Front Panel Access’ on page 21 for details.*
- *Open delta connected system. Refer to easYgen-2200/2500 manual (37535) for details. The setting range of "Generator voltage measuring" (parameter 1851) was extended to the entry "3Ph 4W OD".*

Scope of delivery

The following parts are included in the scope of delivery. Please check prior to the installation that all parts are present.

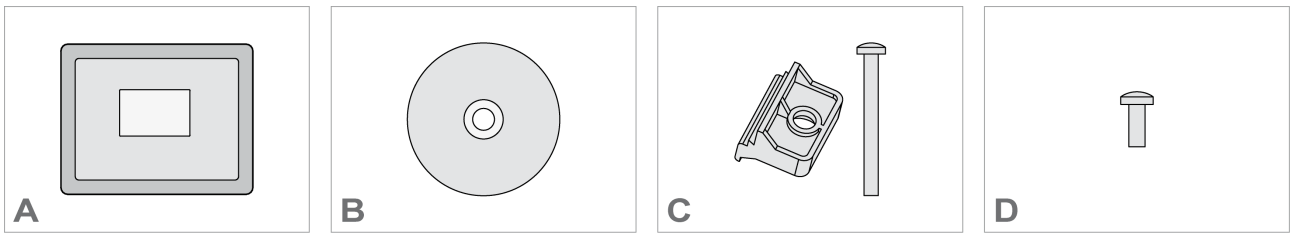


Fig. 3: Scope of delivery - schematic

A easYgen-2500 genset control
B Product CD (configuration software and manual)
C Clamp fastener installation material - 4x
D Screw kit installation material - 8x

Table of contents

1 General Information

1.1 About This Manual

1.1.1 Revision History

Rev.	Date	Editor	Changes
NEW	2012-02-20	TE	**Manual** ■ Release

1.1.2 Depiction Of Notes And Instructions

Safety instructions

Safety instructions are marked with symbols in these instructions. The safety instructions are always introduced by signal words that express the extent of the danger.

DANGER!

This combination of symbol and signal word indicates an immediately-dangerous situation that could cause death or severe injuries if not avoided.

WARNING!

This combination of symbol and signal word indicates a possibly-dangerous situation that could cause death or severe injuries if it is not avoided.

CAUTION!

This combination of symbol and signal word indicates a possibly-dangerous situation that could cause slight injuries if it is not avoided.

NOTICE!

This combination of symbol and signal word indicates a possibly-dangerous situation that could cause property and environmental damage if it is not avoided.

Tips and recommendations

This symbol indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

Additional markings

To emphasize instructions, results, lists, references, and other elements, the following markings are used in these instructions:

Marking	Explanation
→	Step-by-step instructions
⇨	Results of action steps
📖	References to sections of these instructions and to other relevant documents
■	Listing without fixed sequence
[Buttons]	Operating elements (e.g. buttons, switches), display elements (e.g. signal lamps)
'Display'	Screen elements (e.g. buttons, programming of function keys)

1.2 Copyright And Disclaimer

Disclaimer

All information and instructions in this operating manual have been provided under due consideration of applicable guidelines and regulations, the current and known state of the art, as well as our many years of in-house experience. Woodward GmbH assumes no liability for damages due to:

- Failure to comply with the instructions in this operating manual
- Improper use / misuse
- Willful operation by non-authorized persons
- Unauthorized conversions or non-approved technical modifications
- Use of non-approved spare parts

The originator is solely liable to the full extent for damages caused by such conduct. The agreed upon obligations in the delivery contract, the general terms and conditions, the manufacturer's delivery conditions, and the statutory regulations valid at the time the contract was concluded, apply.

Copyright

1.3 Service And Warranty

Our Customer Service is available for technical information. Please see page 2 for the contact data.

In addition, our employees are constantly interested in new information and experiences that arise from usage and could be valuable for the improvement of our products.

Warranty terms

For information on the locally applicable warranty terms, please refer to the sales documents provided with the product.

1.4 Safety

1.4.1 Intended Use

The genset control unit has been designed and constructed solely for the intended use described in this manual.

The genset control unit must be used exclusively for engine-generator system management applications.

- Intended use requires operation of the control unit within the specifications listed in 'Chapter: Technical Data' in easYgen-2200/2500 manual (37535).
- All permissible applications are outlined in 'Chapter: Application' in easYgen-2200/2500 manual (37535).
- Intended use also includes compliance with all instructions and safety notes presented in this manual.
- Any use which exceeds or differs from the intended use shall be considered improper use.
- No claims of any kind for damage will be entertained if such claims result from improper use.

NOTICE!

Damage due to improper use!

Improper use of the genset control unit may cause damage to the control unit as well as connected components.

Improper use includes, but is not limited to:

– Operation outside the specified operation conditions.

1.4.2 Personnel

WARNING!

Hazards due to insufficiently qualified personnel!

If unqualified personnel perform work on or with the control unit hazards may arise which can cause serious injury and substantial damage to property.

– Therefore, all work must only be carried out by appropriately qualified personnel.

This manual specifies the personnel qualifications required for the different areas of work, listed below:

The workforce must only consist of persons who can be expected to carry out their work reliably. Persons with impaired reactions due to, for example, the consumption of drugs, alcohol, or medication are prohibited.

When selecting personnel, the age-related and occupation-related regulations governing the usage location must be observed.

1.4.3 General Safety Notes

Electrical hazards

DANGER!

Life-threatening hazard from electric shock!

There is an imminent life-threatening hazard from electric shocks from live parts. Damage to insulation or to specific components can pose a life-threatening hazard.

- Only a qualified electrician should perform work on the electrical equipment.
- Immediately switch off the power supply and have it repaired if there is damage to the insulation.
- Before beginning work at live parts of electrical systems and resources, cut the electricity and ensure it remains off for the duration of the work. Comply with the five safety rules in the process:
  - cut electricity;
  - safeguard against restart;
  - ensure electricity is not flowing;
  - earth and short-circuit; and
  - cover or shield neighbouring live parts.
- Never bypass fuses or render them inoperable. Always use the correct amperage when changing fuses.
- Keep moisture away from live parts. Moisture can cause short circuits.

Prime mover safety

WARNING!

Hazards due to insufficient prime mover protection

The engine, turbine, or other type of prime mover should be equipped with an overspeed (overtemperature, or overpressure, where applicable) shutdown device(s), that operates totally independently of the prime mover control device(s) to protect against runaway or damage to the engine, turbine, or other type of prime mover with possible personal injury or loss of life should the mechanical-hydraulic gov-ernor(s) or electric control(s), the actuator(s), fuel control(s), the driving mechanism(s), the linkage(s), or the controlled device(s) fail.

Modifications

WARNING!

Hazards due to unauthorized modifications

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment.

Any unauthorized modifications:

– constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage
– invalidate product certifications or listings.

Use of batteries/alternators

NOTICE!

Damage to the control system due to improper handling

Disconnecting a battery from a control system that uses an alternator or battery-charging device whilst the charging device is still connected causes damage to the control system.

– Make sure the charging device is turned off before disconnecting the battery from the system.

Electrostatic discharge

Protective equipment: ■ ESD wrist band

NOTICE!

Damage from electrostatic discharge

All electronic equipment sensitive to damage from electrostatic discharge, which can cause the control unit to malfunction or fail.

– To protect electronic components from static damage, take the precautions listed below.

1. Avoid build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as easily as synthetics.

2. Before any maintenance work on the control unit, ground yourself by touching and holding a grounded metal object (pipes, cabinets, equipment, etc.) to discharge any static electricity.

   Alternatively wear an ESD wrist band connected to ground.

3. Keep plastic, vinyl, and Styrofoam materials (such as plastic or Styrofoam cups, cigarette packages, cellophane wrappers, vinyl books or folders, plastic bottles, etc.) away from the control unit, modules and work area.

4. Opening the control cover may void the unit warranty. Do not remove the printed circuit board (PCB) from the control cabinet unless instructed by this manual.

If instructed by this manual to remove the PCB from the control cabinet, follow these precautions:

- *Ensure that the device is completely voltage-free (all connectors have to be disconnected).*
- *Do not touch any part of the PCB except the edges.*
- *Do not touch the electrical conductors, connectors, or components with conductive devices or with bare hands.*
- *When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.*

For additional information on how to prevent damage to electronic components caused by improper handling, read and observe the precautions in:

- *"Woodward manual 82715, Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules".*

1.4.4 Protective Equipment And Tools

Protective gear

Personal protective equipment serves to protect risks to the safety and health of persons as well as to protect delicate components during work.

Certain tasks presented in this manual require the personnel to wear protective equipment. Specific required equipment is listed in each individual set of instructions.

The cumulative required personal protective equipment is detailed below:

ESD wrist band
The ESD (**e**lectro**s**tatic **d**ischarge) wrist band keeps the user's body set to ground potential. This measure protects sensitive electronic components from damage due to electrostatic discharge.

Tools

Use of the proper tools ensures successful and safe execution of tasks presented in this manual.

Specific required tools are listed in each individual set of instructions.

The cumulative required tools are detailed below:

2 Additional Functionality

General notes

This chapter only describes the additional functionality of this option device compared to the standard device of the product series.

2.1 Configuration

2.1.1 Switchable Parameter Sets

General notes

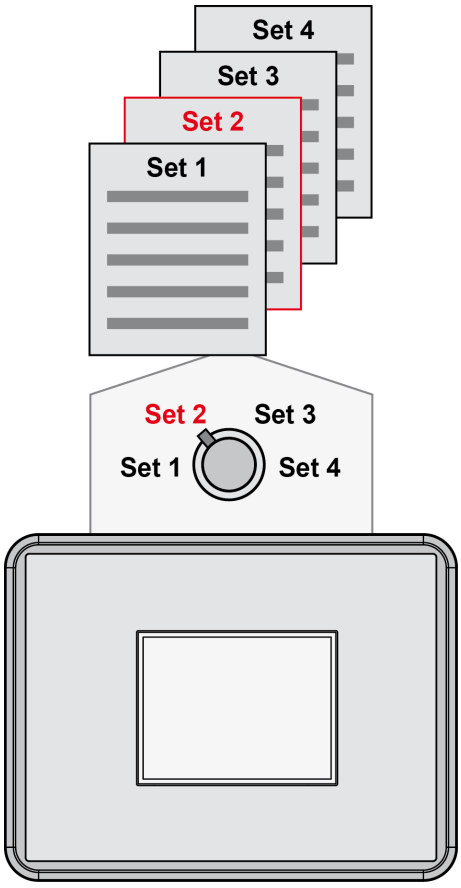


Fig. 4: Switchable parameter sets - external switch

The easYgen with rental functionality provides four switchable parameter sets. This allows to configure and store four independent device settings. These settings can be easily switched by using one of the the following access methods:

- External switch (Fig. 4)
- External access with a PC using the ToolKit configuration software
- Access via the front panel

If the switchable parameter set is triggered, the display indicates "Set change" and the logical command variable "24.63", "24.64" or "24.65" will be enabled.

Parameter set 1 is pre-assigned by default to this function.

The following overview (↳ *Table 'Parameter sets' on page 15*) shows the parameter sets in detail.

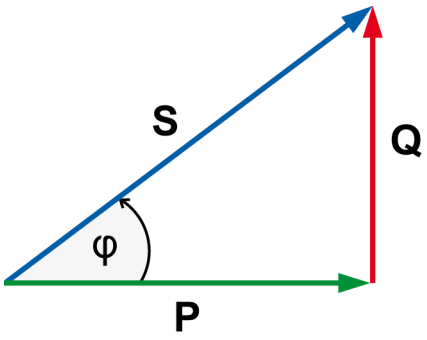
The column "Original" in the table below shows the original parameter of the standard device. This parameter is still present as visualization value in the controller. The device functions are controlled by the parameter sets 1 to 4.

Parameter	ID				
	Set 1	Set 2	Set 3	Set 4	Original
System rated frequency	7462 ↳ p. 16	7463 ↳ p. 16	7464 ↳ p. 16	7465 ↳ p. 16	1750
Engine rated speed	4751 ↳ p. 16	4772 ↳ p. 17	4793 ↳ p. 17	4814 ↳ p. 17	1601
Generator rated voltage	4752 ↳ p. 17	4773 ↳ p. 17	4794 ↳ p. 17	4815 ↳ p. 17	1766
Mains/Busbar 1 rated voltage	4754 ↳ p. 17	4775 ↳ p. 17	4796 ↳ p. 17	4817 ↳ p. 17	1768 1781
Gen. rated active power [kW]	4756 ↳ p. 17	4777 ↳ p. 17	4798 ↳ p. 17	4819 ↳ p. 17	1752
Gen. rated react. power [kvar]	4758 ↳ p. 17	4779 ↳ p. 17	4800 ↳ p. 18	4821 ↳ p. 18	1758

Parameter	ID				
	Set 1	Set 2	Set 3	Set 4	Original
Generator rated current	4760 p. 18	4781 p. 18	4802 p. 18	4823 p. 18	1754
Gen. CT primary rated current	4761 p. 18	4782 p. 18	4803 p. 18	4824 p. 18	1806
Int. freq. control setpoint 1	4762 p. 18	4783 p. 18	4804 p. 18	4825 p. 18	5500
Int. voltage control setpoint 1	4763 p. 18	4784 p. 18	4805 p. 18	4826 p. 18	5600
Int. load control setpoint 1	4765 p. 18	4786 p. 18	4807 p. 18	4828 p. 19	5520
Int. power factor setpoint 1	4767 p. 19	4788 p. 19	4809 p. 19	4830 p. 19	5620
Load setpoint 1	7450 p. 19	7451 p. 19	7452 p. 19	7453 p. 19	5526
Application mode	7454 p. 19	7455 p. 19	7456 p. 19	7457 p. 19	3401
Breaker transition mode	7458 p. 20	7459 p. 20	7460 p. 20	7461 p. 20	3411

Table 1: Parameter sets

Dependencies



PF Power Factor
P Active Power [kW]
S Apparent power [kVA]
Q Reactive Power [kvar]

The AC power triangle illustrates the dependencies between active power, apparent power, reactive power and power factor.

- PF = P/S = cos Φ
- $Q = \sqrt{(S^2-P^2)}$
- $S = \sqrt{(P^2+Q^2)}$
- P = S * PF

Fig. 5: AC power triangle

ID	Parameter	CL	Setting range [Default]	Description
7462 7463 7464 7465	**System rated frequency**	2	50 / 60 Hz 7462: **[50 Hz]** 7463: **[60 Hz]** 7464: **[50 Hz]** 7465: **[60 Hz]**	The rated frequency of the system is used as a reference figure for all frequency related functions, which use a percentage value, like frequency monitoring, breaker operation windows or the Analog Manager.
				Notes Original parameter 1750 is still present as visualization value in the controller.
4751	**Engine rated speed**	2	500 to 4,000 rpm	Number of revolutions per minute of the engine at rated engine speed. The speed control with an ECU via J1939 CAN bus refers to this value.

ID	Parameter	CL	Setting range [Default]	Description
4772 4793 4814			4751: **[1,500 rpm]** 4772: **[1,800 rpm]** 4793: **[1,500 rpm]** 4814: **[1,800 rpm]**	
				Notes Original parameter 1601 is still present as visualization value in the controller.
4752 4773 4794 4815	**Generator rated voltage**	2	50 to 650000 V 4752: **[400 V]** 4773: **[240 V]** 4794: **[200 V]** 4815: **[200 V]**	This value refers to the rated voltage of the generator (generator voltage on data plate) and is the voltage measured on the potential transformer primary. The generator potential transformer primary voltage is entered in this parameter. The generator rated voltage is used as a reference figure for all generator voltage related functions, which use a percentage value, like generator voltage monitoring, breaker operation windows or the Analog Manager.
				Notes Original parameter 1766 is still present as visualization value in the controller.
4754 4775 4796 4817	**Mains/Busbar 1 rated voltage**	2	50 to 650000 V 4754: **[400 V]** 4775: **[240 V]** 4796: **[200 V]** 4817: **[200 V]**	**Busbar 1 rated voltage** (application mode A01, A02 and A03) This value refers to the rated voltage of busbar 1 and is the voltage measured on the potential transformer primary. If voltage measuring is configured to 1Ph 3W, the WYE voltage (VL1N) must be entered here. The busbar 1 potential transformer primary voltage is entered in this parameter. The busbar rated voltage is used as a reference figure for all busbar voltage related functions, which use a percentage value, like synchronization. **Mains rated voltage** (application mode A04) This value refers to the rated voltage of the mains and is the voltage measured on the potential transformer primary. The mains potential transformer primary voltage is entered in this parameter. The mains rated voltage is used as a reference figure for all mains voltage related functions, which use a percentage value, like mains voltage monitoring, breaker operation windows or the Analog Manager.
				Notes Original parameter 1768 and 1781 are still present as visualization value in the controller.
4756 4777 4798 4819	**Gen. rated active power [kW]**	2	0.5 to 99999.9 kW **[200.0 kW]**	This value specifies the generator real power rating, which is used as a reference figure for related functions. The generator rated active power is the generator apparent power multiplied by the generator power factor (typically ~0.8). These values are indicated in the generator data plate (*'Dependencies' on page 16*).
				Notes Original parameter 1752 is still present as visualization value in the controller.
4758 4779	**Gen. rated react. power [kvar]**	2	0.5 to 99999.9 kvar	This value specifies the generator reactive power rating, which is used as a reference figure for related functions. The generator rated reactive power also depends on the generator values (*'Dependencies' on page 16*).

ID	Parameter	CL	Setting range [Default]	Description
4800 4821			**[200.0 kvar]**	
				Notes Original parameter 1758 is still present as visualization value in the controller.
4760 4781 4802 4823	**Generator rated current**	2	1 to 32000 A 4760: **[300 A]** 4781: **[500 A]** 4802: **[600 A]** 4823: **[600 A]**	This value specifies the generator rated current, which is used as a reference figure for related functions.
				Notes Original parameter 1754 is still present as visualization value in the controller.
4761 4782 4803 4824	**Gen. CT primary rated current** (Generator current transformer primary rating)	2	1 to 32000 A/x 4761: **[500 A/x]** 4782: **[800 A/x]** 4803: **[1000 A/x]** 4824: **[1000 A/x]**	The input of the current transformer ratio is necessary for the indication and control of the actual monitored value. The current transformers ratio should be selected so that at least 60 % of the secondary current rating can be measured when the monitored system is at 100 % of operating capacity (i.e. at 100 % of system capacity a 5 A CT should output 3 A). If the current transformers are sized so that the percentage of the output is lower, the loss of resolution may cause inaccuracies in the monitoring and control functions and affect the functionality of the control.
				Notes Original parameter 1806 is still present as visualization value in the controller.
4762 4783 4804 4825	**Int. freq. control setpoint 1** (Internal frequency control setpoint 1)	0	15.00 to 85.00 Hz 4762: **[50.00 Hz]** 4783: **[60.00 Hz]** 4804: **[50.00 Hz]** 4825: **[60.00 Hz]**	The internal generator frequency setpoint 1 is defined in this screen. This value is the reference for the frequency controller when performing isolated and/or no-load operations. Generally 50 Hz or 60 Hz will be the values entered into this parameter. It is possible to enter a different value here.
				Notes Original parameter 5500 is still present as visualization value in the controller.
4763 4784 4805 4826	**Int. voltage control setpoint 1**	1	50 to 650,000 V 4763: **[400 V]** 4784: **[240 V]** 4805: **[200 V]** 4826: **[200 V]**	The internal generator voltage setpoint 1 is defined in this screen. This value is the reference for the voltage controller when performing isolated and/or no-load operations.
				Notes Original parameter 5600 is still present as visualization value in the controller.
4765 4786 4807	**Int. load control setpoint 1**	1	0.0 to 9999.9 kW **[100.0 kW]**	The load setpoint 1 is defined in this screen. This value is the reference for the load controller when performing parallel operations.

ID	Parameter	CL	Setting range **[Default]**	Description
4828	(Internal load control setpoint 1)			**Notes** Original parameter 5520 is still present as visualization value in the controller.
4767 4788 4809 4830	**Int. power factor setpoint 1**	1	-0.999 to +1.000 **[+1.000]**	The desired power factor may be configured here so that the reactive power is regulated in the system. The designations "–" and "+" stand for inductive/lagging (generator overexcited) and capacitive/leading (generator underexcited) reactive power. This setpoint is active only in mains parallel operation.
				Notes Original parameter 5620 is still present as visualization value in the controller.
7450 7451 7452 7453	**Load setpoint 1**	2	Import	The value entered for the import level shall always be supplied by the utility. All load swings are absorbed by the generator(s) provided the load rating for the generator(s) is not exceeded. The generator will always start when an import power operation is enabled.
			Export	The value entered for the export level shall always be supplied to the utility. All load swings are absorbed by the generator(s) provided the load rating for the generator(s) is not exceeded. The generator will always start when an export power operation is enabled.
			[Constant]	The generator shall always supply the value entered for the constant power level. All load swings are absorbed by the utility. The generator will always start when a constant power (base load) operation is enabled.
				Notes Original parameter 5526 is still present as visualization value in the controller.
7454 7455 7456 7457	**Application mode**	2		The unit may be configured for four different application modes. The discrete inputs and relay outputs are pre-defined dependent upon the selected application mode. Only the screens and functions that pertain to the application mode selected are displayed. The single line diagram in the main screen will change. Refer to 'Chapter: Application' in easYgen-2200/2500 manual (37535) for additional information.
			None	**Application mode A01** The control unit will function as an engine start/stop control with generator and engine protection. All necessary inputs and outputs are assigned and pre-defined.
			GCB open	**Application mode A02** The control unit will function as an engine start/stop control with generator and engine protection. The control unit can only open the GCB. All necessary inputs and outputs are assigned and pre-defined.
			7455; 7456; 7457: **[GCB]**	**Application mode A03** The control unit will function as a 1 CB unit. The control unit performs full control like synchronizing, opening and closing the GCB with generator and engine protection. All necessary inputs and outputs are assigned and pre-defined.
			7454: **[GCB/ MCB]**	**Application mode A04**

ID	Parameter	CL	Setting range [Default]	Description
				The control unit will function as a 2 CB unit. The control unit performs full control like synchronizing, opening and closing the GCB and the MCB with generator and engine protection. The GCB/MCB perform also full load transfer via open/closed transition, interchange and parallel mode. All necessary inputs and outputs are assigned and pre-defined.
				Notes Original parameter 3401 is still present as visualization value in the controller.
7458 7459 7460 7461	**Breaker transition mode**	2	Parallel / Interchange / Closed Transit. / Open Tranistion / External **[Parallel]**	The control unit automatically controls the two breakers (MCB and GCB).
				Notes This parameter **only** applies to application mode A04. For a detailed explanation for each mode refer to 'Chapter: Configuration' in easYgen-2200/2500 manual (37535). The unit provides two alternative transition modes, which may be activated temporarily via the LogicsManager and override the transition mode configured in this parameter. Original parameter 3411 is still present as visualization value in the controller.
12985	**Parameter Set 2**	1	Determined by LogicsManager **[(0 & 1) & 1]**	Once the conditions of the LogicsManager have been fulfilled, parameter set 2 will be enabled.
				Notes The default "Parameter Set 1" is used, if more than one parameter set is enabled simultaneously.
12986	**Parameter Set 3**	1	Determined by LogicsManager **[(0 & 1) & 1]**	Once the conditions of the LogicsManager have been fulfilled, parameter set 3 will be enabled.
				Notes The default "Parameter Set 1" is used, if more than one parameter set is enabled simultaneously.
12987	**Parameter Set 4**	1	Determined by LogicsManager **[(0 & 1) & 1]**	Once the conditions of the LogicsManager have been fulfilled, parameter set 4 will be enabled.
				Notes The default "Parameter Set 1" is used, if more than one parameter set is enabled simultaneously.

2.1.2 Configure Counters

ID	Parameter	CL	Setting range [Default]	Description
2579	**Reset period of use counter**	2[1]	Yes / No **[No]**	If this parameter is configured to "Yes" the "period of use" counter is reset to "0". Once the counter "period of use" has been reset, the control unit changes this parameter to "No".
				Notes [1] The code level can be configured with "Codelevel for reset per. of use" (parameter 2581 p. 21). If your current code level does not match, this parameter is not visible.
2581	**Codelevel for reset per. of use**	3	0 to 5 **[0]**	This parameter defines which code level is necessary to reset the period of use counter (parameter 2579 p. 21).

2.2 Operation

2.2.1 Front Panel Access

Specialised menu screens

This following chapter gives a quick overview of the adjusted menu screens reflecting the additional features.

Configuration

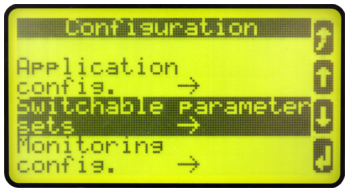


Fig. 6: Configuratiuon

The configuration screen has been extended by a sub-menu entry for the direct access to the switchable parameter sets 1 to 4.

Parameter

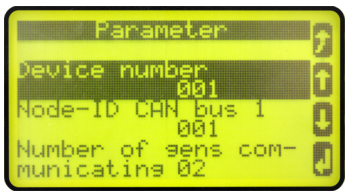


Fig. 7: Parameter

The parameter screen has been extended by entries for the direct access to following parameters:

- Device number
- Node-ID CAN bus 1
- Number of gens communicating

Counters configuration

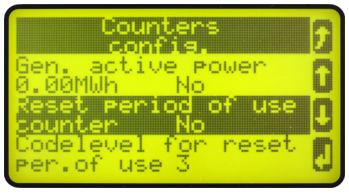


Fig. 8: Counters configuration

The counters configuration screen has been extended by entries for the direct access to following parameters:

- Reset period of use counter
- Codelevel for reset per. of use

Counters and service

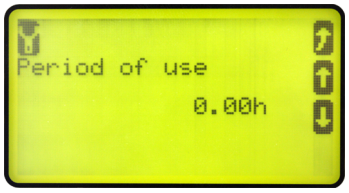


Fig. 9: Counters and service

The counters and service screen has been extended by the following entry:

- Period of use

Symbol/Softkey	Description
	Reset the maintenance and period of use counter.

The symbol is only visible if the correct code level is used.

2.3 Appendix

2.3.1 Data Protocols

CANopen/Modbus Data Protocol 5100 (Basic Visualization)

Modbus		CAN		Parameter ID	Description	Multiplier	Units
Modicon start addr.	Start addr. (*1)	Data byte 0 (Mux)	Data byte				
450001	450000	0	1,2		Protocol ID, always 5100		--
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
450109	450108	36	1,2	4150	Switchable parameter sets		
					Internal	Mask: 8000h	Bit
					Internal	Mask: 4000h	Bit
					Internal	Mask: 2000h	Bit
					Internal	Mask: 1000h	Bit
					Internal	Mask: 0800h	Bit
					Internal	Mask: 0400h	Bit
					Internal	Mask: 0200h	Bit
					Internal	Mask: 0100h	Bit
					Internal	Mask: 0080h	Bit
					Internal	Mask: 0040h	Bit
					Internal	Mask: 0020h	Bit
					Internal	Mask: 0010h	Bit
					Internal	Mask: 0008h	Bit
					Parameter set 4	Mask: 0004h	Bit
					Parameter set 3	Mask: 0002h	Bit

Modbus		CAN		Parameter ID	Description	Multiplier	Units
Modicon start addr.	Start addr. (*1)	Data byte 0 (Mux)	Data byte				
					Parameter set 2	Mask: 0001h	Bit
450110	450109	36	3,4,5,6	2580	Period of use counter		
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

CANopen/Modbus Data Protocol 5101 (Basic Visualization Without J1939)

Modbus		CAN		Parameter ID	Description	Multiplier	Units
Modicon start addr.	Start addr. (*1)	Data byte 0 (Mux)	Data byte				
450001	450000	0	1,2		Protocol ID, always 5101		--
. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
450109	450108	36	1,2	4150	Switchable parameter sets		
					Internal	Mask: 8000h	Bit
					Internal	Mask: 4000h	Bit
					Internal	Mask: 2000h	Bit
					Internal	Mask: 1000h	Bit
					Internal	Mask: 0800h	Bit
					Internal	Mask: 0400h	Bit
					Internal	Mask: 0200h	Bit
					Internal	Mask: 0100h	Bit
					Internal	Mask: 0080h	Bit
					Internal	Mask: 0040h	Bit
					Internal	Mask: 0020h	Bit
					Internal	Mask: 0010h	Bit
					Internal	Mask: 0008h	Bit
					Parameter set 4	Mask: 0004h	Bit
					Parameter set 3	Mask: 0002h	Bit
					Parameter set 2	Mask: 0001h	Bit
450110	450109	36	3,4,5,6	2580	Period of use counter		

2.3.2 LogicsManager Reference

Logical command variables Group 24: Flags condition 2

- Flags condition 2
- Logic command variables 24.01-24.65

No.	ID	Name	Function	Note
. . .	. . .	. . .		. . .
24.63	935	Parameter Set 2		TRUE, if the LogicsManager condition is fulfilled (LM: 12985)
24.64	936	Parameter Set 3		TRUE, if the LogicsManager condition is fulfilled (LM: 12986)
24.65	937	Parameter Set 4		TRUE, if the LogicsManager condition is fulfilled (LM: 12987)

2.3.3 Event And Alarm Reference

Status messages

Message text ID	Meaning
. . .	. . .
Set change 13285	**Set change** Once the parameter set is changed, the original parameters will be updated. This process could take a few seconds.

3 Glossary And List Of Abbreviations

CB	Circuit Breaker
CL	Code Level
CT	Current Transformer
DI	Discrete Input
DO	Discrete (Relay) Output
ECU	Engine Control Unit
FMI	Failure Mode Indicator
GCB	Generator Circuit Breaker
GGB	Generator Group Breaker
I	Current
IOP	Isolated Operation in Parallel
LDSS	Load-Dependent Start/Stop operation
MCB	Mains Circuit Breaker
MOP	Mains Operation in Parallel
MPU	Magnetic Pickup Unit
N.C.	Normally Closed (break) contact
N.O.	Normally Open (make) contact
OC	Occurrence Count
P	Real power
P/N	Part Number
PF	Power Factor
PID	Proportional Integral Derivative controller
PLC	Programmable Logic Control
PT	Potential (Voltage) Transformer
Q	Reactive power
S	Apparent power
S/N	Serial Number
SPN	Suspect Parameter Number
V	Voltage

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