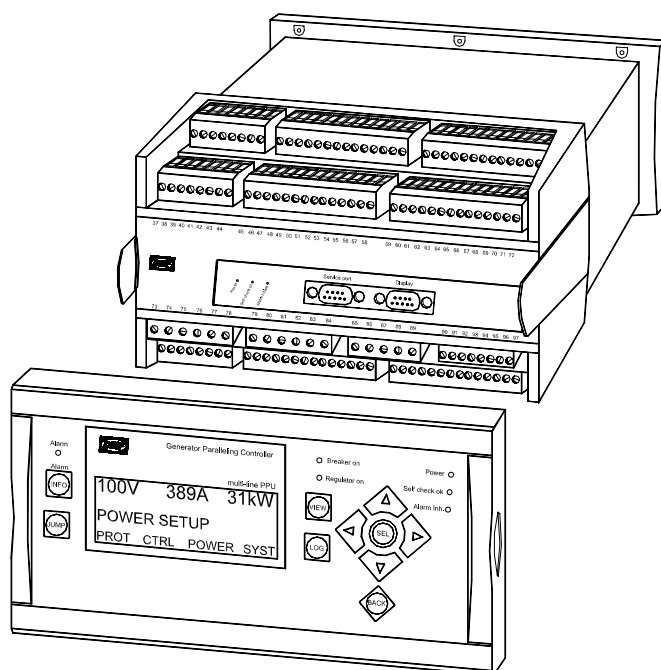# Description of options

DEIF

-power in control

Option G1
Start/stop/synchronisation outputs
Multi-line 2 – version 2

4189340273B
SW version 2.4X.X

- *Description of option*

- *Functional description*

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Table of contents

This manual is valid for standard multi-line 2 GPU units with firmware version 2.00.0 or later.

1. Warnings and legal information

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

> **The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.**

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

> **Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.**

Definitions

Throughout this document a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes

> **The notes provide general information which will be helpful for the reader to bear in mind.**

Warning

> **The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.**

2. Description of option

G1 option

This document describes the functionality of load dependent relay outputs for the GPU.

ⓘ   **The function described in this document is an option for the GPU. It is a standard function in the GPC/PPU.**

Function	ANSI no.
High power relay output	32
Low power relay output	32, 37

Terminal description

A relay output PCB (Printed Circuit Board) is installed in slot #8 in the GPU unit. This ensures that there are relays available for the load dependent start/stop relays but it is possible to use any of the available relays.

Term.	Function	Technical data	Description
126	NO	Relay 10 250V AC, 8A	Relay output, configurable
127	Com.		
128	NO	Relay 11 250V AC, 8A	Relay output, configurable
129	Com.		
130	NO	Relay 12 250V AC, 8A	Relay output, configurable
131	Com.		
132	NO	Relay 13 250V AC, 8A	Relay output, configurable
133	Com.		

The PCB relay output includes four relays which can be used as configurable relay outputs similar to the other relays available in the unit. For further information, please refer to the functional description.

3.   Functional description

The load dependent start/stop functionality uses one relay for **'start next generator'** and one relay for **'stop next generator'**. It is also possible just to use one of the functions if it is not desired to use both the start and the stop function.

The function load dependent start and stop does not give the possibilities of a power management system such as priority selection and available power calculations. This means that the switchboard manufacturer must take care of starting and stopping the next gen-set(s) and their priority.

The relays can, for example, be used as inputs for the power management system.

Start next generator (high load)

As illustrated in the below diagram, the delay for the start relay starts when the load exceeds the adjusted start limit. The relay will deactivate again when the load falls below the start limit and the off delay has expired.
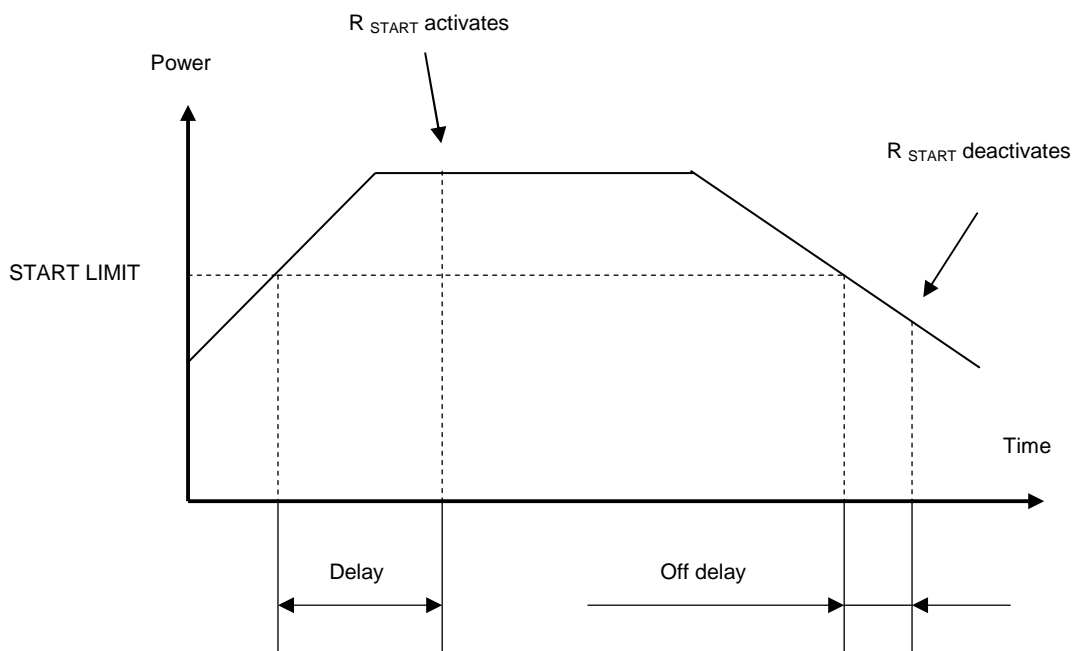
The load dependent start relay reacts based on the power measurement of the GPU only. It is not dependent on a running signal from the gen-set or the CB position (these signals are not monitored by the GPU).

Stop next generator (low load)

As illustrated in the below diagram, the stop relay activates after a delay. The timer starts when the load drops below the adjusted stop level, and when the delay has expired the relay activates. The relay deactivates when the load exceeds the stop level when the off delay has expired. The off delay is adjustable.

Power

R $_{STOP}$ activates   R $_{STOP}$ deactivates

STOP LIMIT

Time

Delay   Off delay
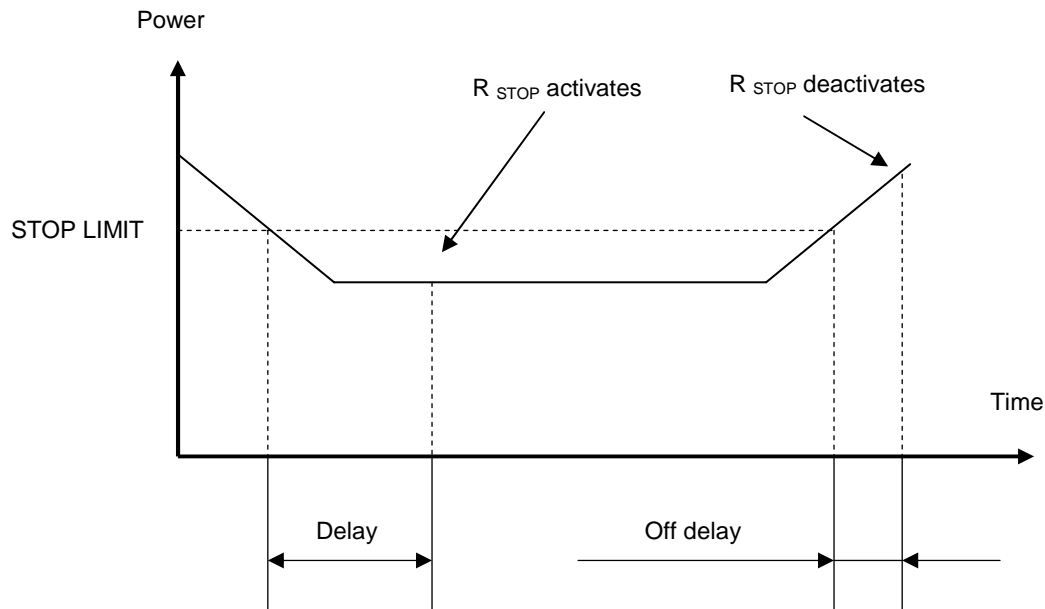
The load dependent stop relay reacts based on the power measurement of the GPU only. It is not dependent on a running signal from the gen-set or the CB position (these signals are not monitored by the GPU).

Configuration

The settings are configured through the display or through the PC utility software.

Refer to the designers' reference handbook for information about navigating in the display.

PC utility software configuration

The configuration of the relays is done in 2 steps when the parameter list is uploaded from the GPU to the PC.

Step 1: configuration of the set point

Open menu 4260 in the utility software and adjust the set point, timer and relay output.

> ⓘ **Output A and output B must be adjusted to the same relay to avoid alarms when the set point is reached.**

Step 2: configuration of selected relay

Open the menu of the selected relay – in this example where relay 13 is used you must open menu 4730. Here, the relay function must be set to "limit". The purpose of this is to avoid an alarm when the relay activates.

The timer adjusted in this dialog box is the off delay which is shown in the above drawings.

Relay allocation

The four relays need to be used as follows:

- 2 relays for alarm relays
- 2 relays for load dependent start/stop

The table shows a possible selection of the relays:

	Relay 10	**Relay 11**	**Relay 12**	**Relay 13**
Load dependent START				X
Load dependent STOP			X	
Alarm relay function		X		
Alarm relay function	X			

Start/stop scenario

This diagram shows a (simplified) scenario where 3 DGs are started and stopped depending on the load dependent start/stop relays.

The scenario shows that gen-set 2 starts when gen-set 1 reaches 80%. The next gen-set to start is DG3 and the three sets load share at 53%.

When the load of all three gen-sets drops to the stop limit, which is 20%, the load-dependent stop relay activates and a gen-set (gen-set 3 in this example) can be stopped. The load continues to drop and at 20% load the next gen-set to stop is gen-set 2.
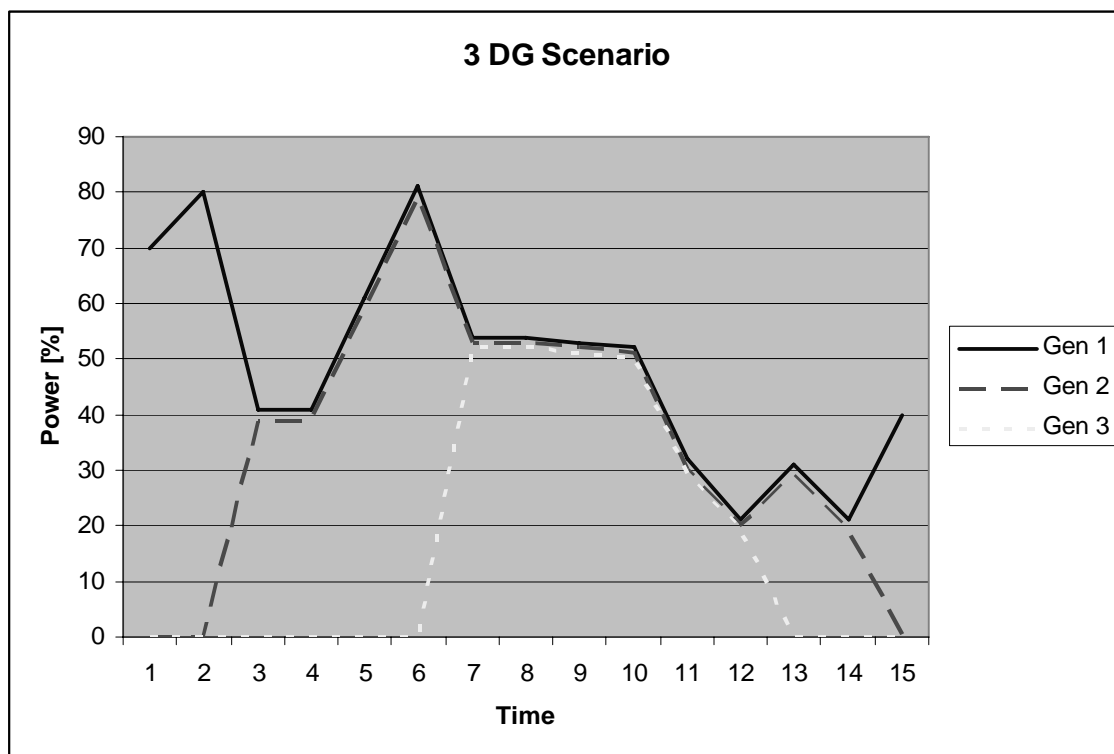
The scenario is shown in simplified form.

4. Parameter list

The setup of parameters is done via the display or the PC utility software (USW). In the following, the settings are presented in tables.

For further information about the structure of the parameter descriptions, please see the Designer's Reference Handbook.

4260 Start next generator (high power)

No.	Setting		Min. setting	Max. setting	Factory setting
4261	Start next gen.	Start point	50%	150%	80%
4262	Start next gen.	Timer	0 s	100 s	10 s
4263	Start next gen.	Relay output A	R0 (none)	Option	R10 (relay 10)
4264	Start next gen.	Relay output B	R0 (none)	dependent	R10 (relay 10)
4265	Start next gen.	Enable	OFF	ON	ON

4270 Stop next generator (low power)

No.	Setting		Min. setting	Max. setting	Factory setting
4271	Stop next gen.	Stop point	0%	100%	20%
4272	Stop next gen.	Timer	0 s	200 s	30 s
4273	Stop next gen.	Relay output A	R0 (none)	Option	R11 (relay 11)
4274	Stop next gen.	Relay output B	R0 (none)	dependent	R11 (relay 11)
4275	Stop next gen.	Enable	OFF	ON	ON

DEIF A/S reserves the right to change any of the above