



AGC 150

Basic knowledge



Synchronizing Controllers



GPC-3
Base mounted
Non-Power Management



AGC 200
Front mounted
Standard Power Management



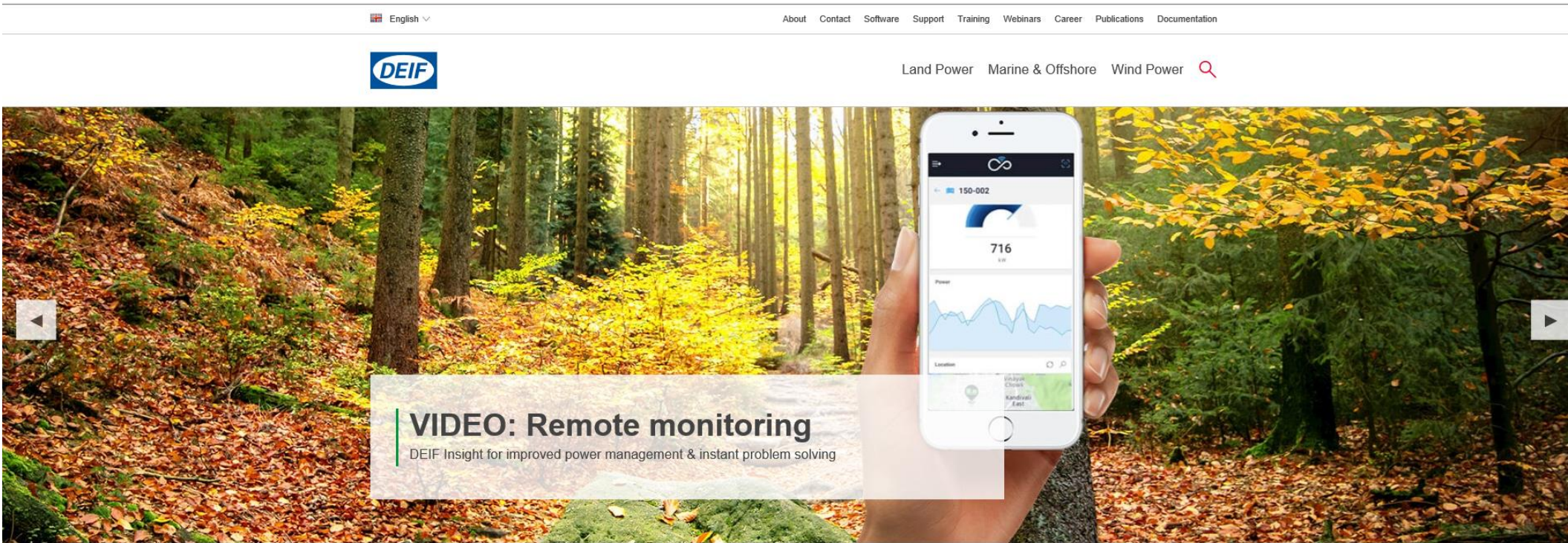
AGC-4
Base mounted
Custom Power Management



AGC 150
Front mounted
Simple Power Management

Documentation

www.deif.com contains all manuals for the controllers



Maximise your business

Award-winning global supplier of innovative power management solutions, engine & genset controllers, switchboard equipment, marine bridge instrumentation and renewable energy control solutions.

Documentation

English

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Land Power Marine & Offshore Wind Power

Products / AGC 150 AGC 150

AGC 150 - Advanced Genset Controller
The AGC 150 is a genset controller containing all necessary functions for control and protection of a genset. The slim design makes the controller suitable for paralleling even small gensets thus the AGC 150 is integrable in nearly all types of gensets.

Pages
[WEBINAR: AGC 150 Produktvorstellung](#) - [WEBINAR: AGC 150](#)

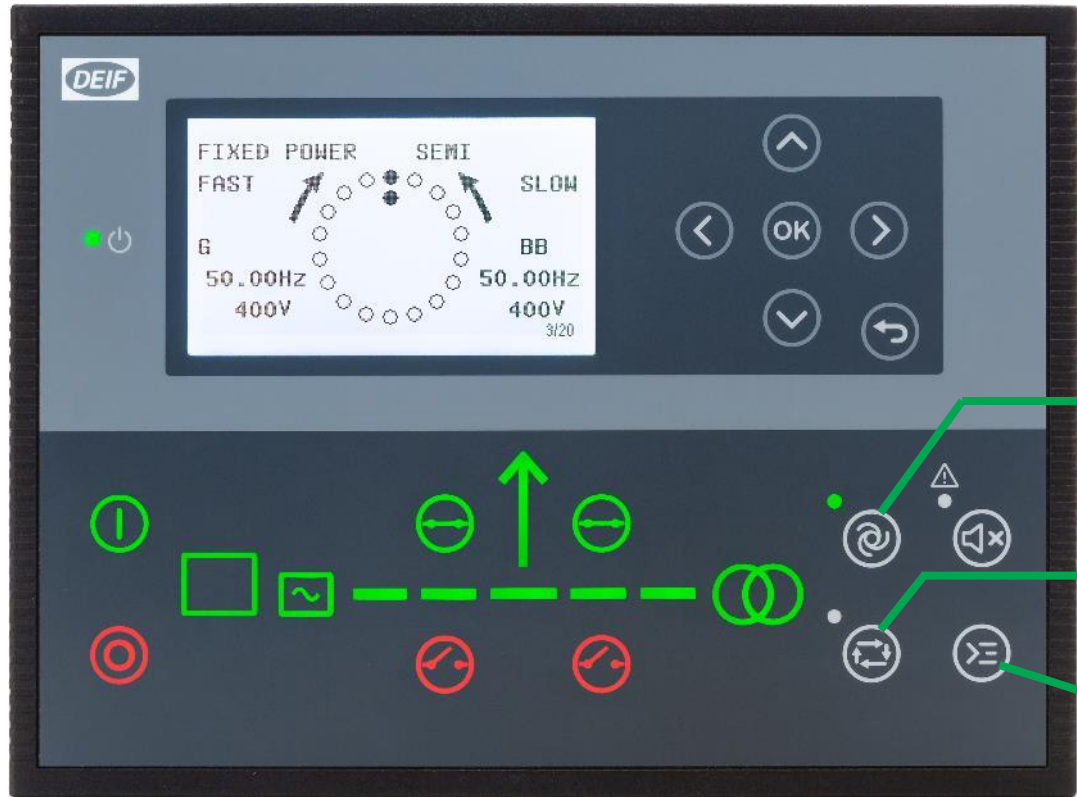
Subsegments
[INDUSTRY: First-mover in hybrid microgrid solutions](#) - [INDUSTRY: Naval vessels](#) - [INDUSTRY: Hydro](#)

Description Features Videos & Media **Documentation**

Documents

- + Brochures/Handouts
- + Data Sheet
- + Designer's Handbook
- + Installation Instructions
- + Operator's Manual

AGC 150



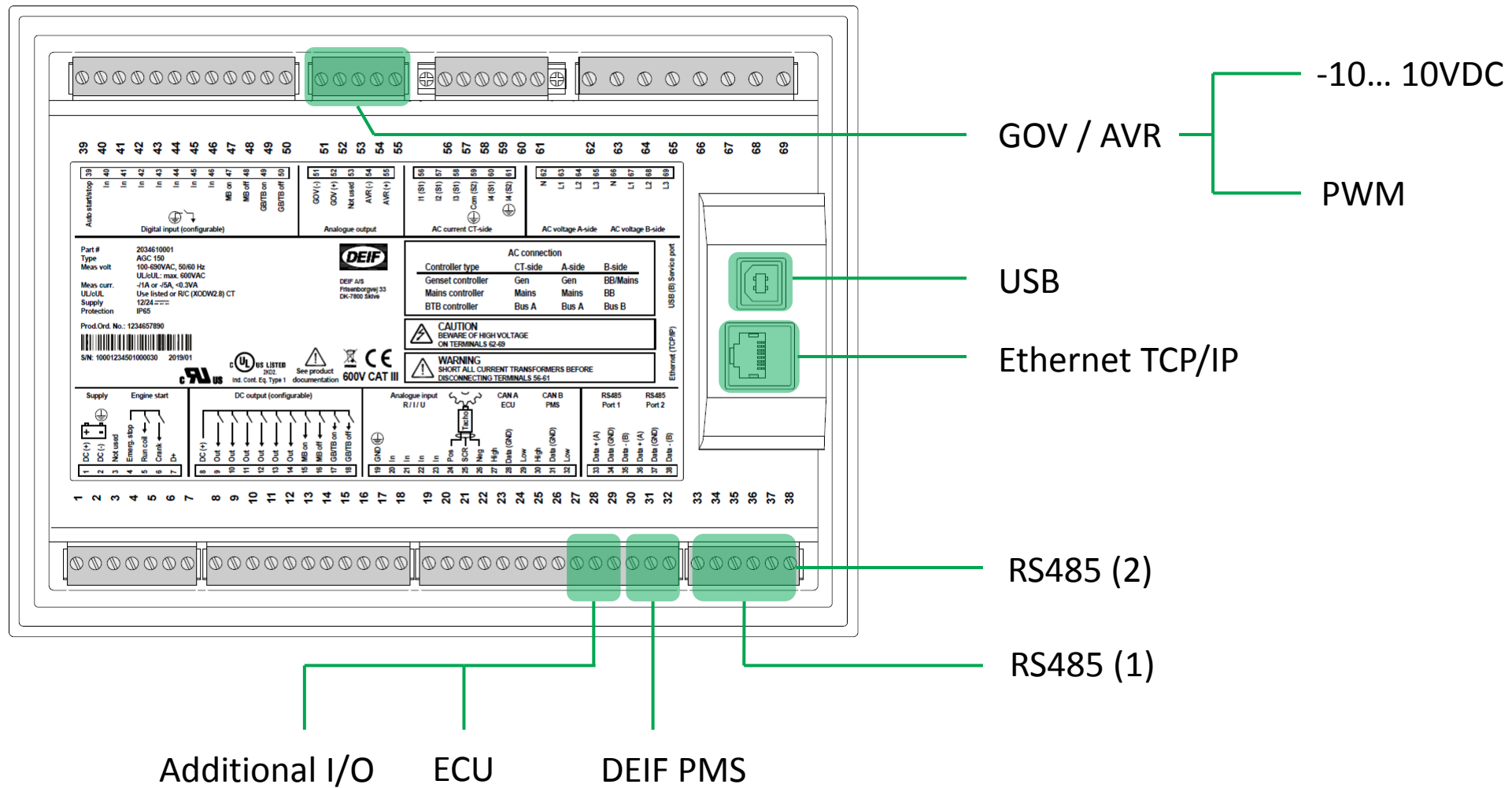
AUTO

SEMI AUTO

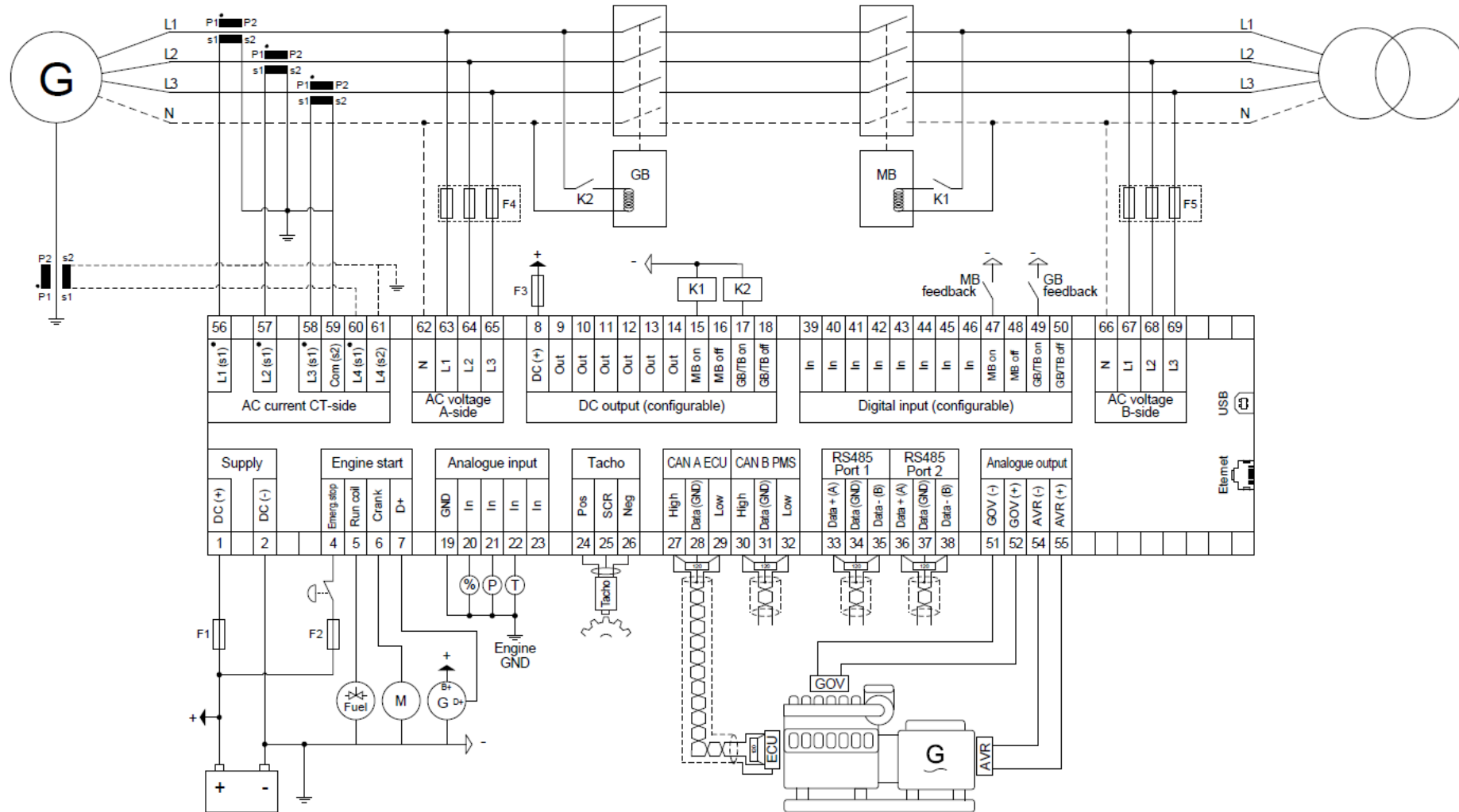
Shortcut Menu

DG BLOCKED FOR START
Jump
Mode
Test
Lamp test

AGC 150



Typical wiring



Basic Settings

Setup Current Transformer

The image shows the DEIF software interface for configuring a 3-phase current transformer (CT). The interface is divided into a left sidebar with navigation options and a main configuration area.

Software Interface:

- View mode:** Tree (selected) / List
- Basic settings:**
 - Application type
 - Measurement setup
 - Wiring connection
 - Scaling
 - Voltage transformer
 - Current transformer
 - 3 phase CT** (highlighted)
 - 4th CT
 - Mains transducer settings
 - Nominal settings
 - Controller settings
 - Communication
 - Engine
 - Generator

- Advanced Protection**
- Parameters**
- Advanced Protection**
- Parameters**
- Advanced Protection**

3 phase CT Configuration:

- G Primary I:**
 - Description: Generator current transformer value primary side
 - Set point: 1000 A (5 .. 9000)
- G Secondary I:**
 - Description: Generator current transformer value secondary side
 - Set point: 1A (dropdown menu with options 1A, 1A, 5A)

Wiring Diagram:

The diagram illustrates the electrical connections for a generator (G) through a circuit breaker (K1, K2) and a generator breaker (GB) to a busbar system. It shows three phases (L1, L2, L3) and a neutral line (N). The CTs are connected to the primary side of the circuit breaker. The secondary side of the CTs is connected to the terminal block of the DEIF device.

Terminal Block Connections:

Terminal	Connection
56	L1 (s1)
57	L2 (s1)
58	L3 (s1)
59	Com (s2)
60	L4 (s1)
61	L4 (s2)
62	N
63	L1
64	L2
65	L3
8	DC (+)
9	Out
10	Out
11	Out
12	Out
13	Out
14	Out
15	MB on
16	MB off
17	GB/TB on
18	GB/TB off
39	In
40	In
41	In
42	In
43	In
44	In
45	In
46	In
47	In
48	MB on
49	MB off
50	GB/TB on
51	GB/TB off
66	N
67	L1
68	L2
69	L3
70	USB

Configurable CT: A callout box highlights the CT terminals (P1, P2, s1, s2) on the terminal block, indicating they are configurable.

Basic Settings

Nominal settings

The image displays the DEIF software interface for configuring a generator's nominal settings. The interface is divided into a left sidebar with navigation options (Advanced Protection, Parameters, I/O) and a main workspace. The workspace shows a tree view of settings under 'Basic settings', with 'Nominal settings' expanded to 'Power' and '3 phase nominal' selected. The 'Set point' for 'Nominal generator power set point 1' is set to 480 kW. Below the settings, a detailed electrical schematic diagram illustrates the generator (G) connected to a busbar system. The busbar is equipped with three-phase nominal current transformers (CTs) and voltage transformers. The schematic includes components like circuit breakers (K1, K2), fuses (F3, F4, F5), and a generator breaker (GB). The bottom of the diagram shows a terminal block with various inputs and outputs, including AC current CT-side, AC voltage A-side, DC output, digital input, and AC voltage B-side.

DEIF

View mode: Tree List

3 phase nominal

Nom. P 1

Description: Nominal generator power set point 1

Set point: 480 kW (10 .. 20000)

Basic settings

- Application type
- Measurement setup
- Nominal settings
 - Voltage
 - Generator nominal U
 - Busbar nominal U
 - Current
 - 3 phase nominal
 - 4th CT nominal
 - Frequency
 - Power
 - 3 phase nominal
 - 4th CT nominal
 - RPM

Advanced Protection

Parameters

I/O

Configurable CT

AC current CT-side

AC voltage A-side

DC output (configurable)

Digital input (configurable)

AC voltage B-side

USB

Start Sequence

1. Before starting, **start prepare** ON (Relay 9). Can be used to activate pre-heating element.

If not required, timer can be changed to 0s to reduce starting time.

2. Shortly after, **Starter/crank** (relay 6) and **Run coil** (relay 5), both ON.

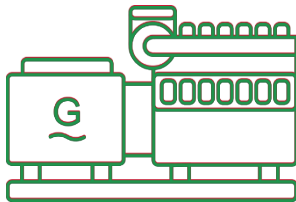
Once running feedback detected, **Starter/crank** is deactivated.

3. **Run coil** activates continuously all the time, for the duration of engine running.



Glow plug

starting
running



I/O settings

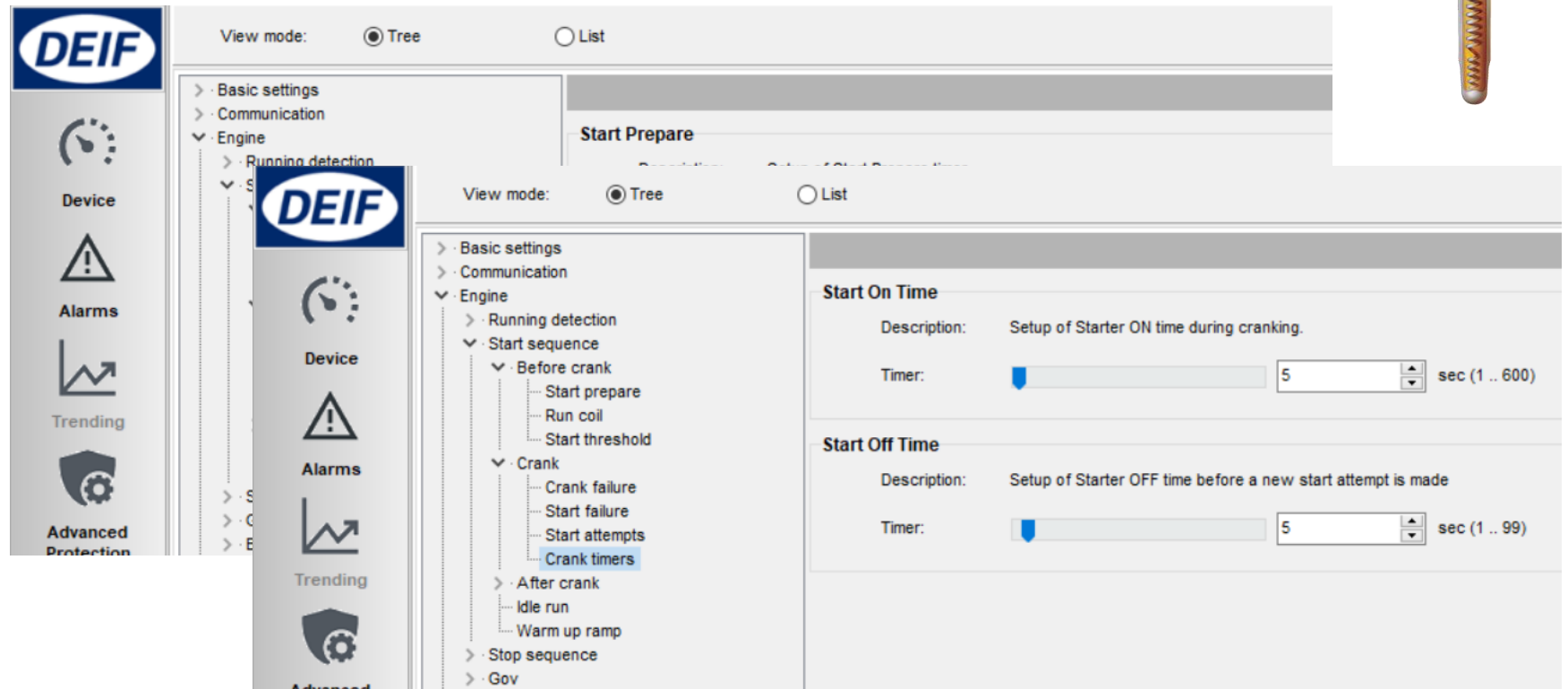
Inputs Outputs

Relay 5
I/O number / function Run coil

Relay 6
I/O number / function Starter (Crank)

Relay 9
I/O number / function Start prepare

Relay 10
I/O number / function Stop coil



View mode: Tree List

DEIF

Basic settings
Communication
Engine

Running detection

Start Prepare

View mode: Tree List

DEIF

Basic settings
Communication
Engine

Running detection

Start sequence

Before crank

Start prepare

Run coil

Start threshold

Crank

Crank failure

Start failure

Start attempts

Crank timers

After crank

Idle run

Warm up ramp

Stop sequence

Gov

Start On Time

Description: Setup of Starter ON time during cranking.

Timer: 5 sec (1 .. 600)

Start Off Time

Description: Setup of Starter OFF time before a new start attempt is made

Timer: 5 sec (1 .. 99)

Generator Protection

Checkmark [✓] = enable

The screenshot displays the DEIF software interface for generator protection configuration. On the left is a navigation tree with categories like Device, Alarms, Trending, Advanced Protection, and Parameters. The 'Parameters' section is expanded to show 'Generator' settings, including 'Reverse power'. The main area shows two protection levels:

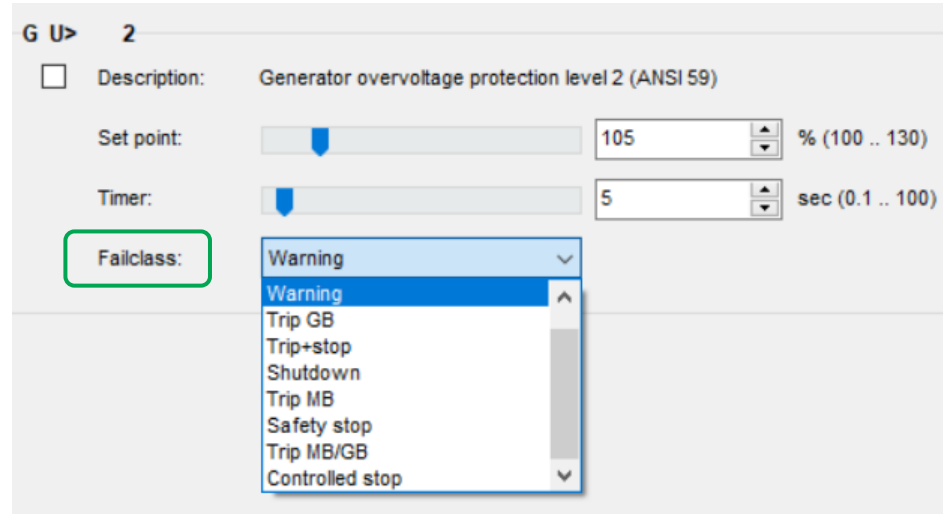
- P> 1**: Reverse power protection level 1 (ANSI 32).
 - Description: Reverse power protection level 1 (ANSI 32)
 - Set point: -5 % (-200 .. 0)
 - Timer: 10 sec (0.1 .. 100)
 - Failclass: Trip GB
- P> 2**: Reverse power protection level 2 (ANSI 32).
 - Description: Reverse power protection level 2 (ANSI 32)
 - Set point: -5 % (-200 .. 0)
 - Timer: 10 sec (0.1 .. 100)
 - Failclass: Trip GB

Other protection types listed in the background include Over-voltage, Over-current, Earth fault inverse time over-current, Over-frequency, Under-frequency, and Reverse power.

And many more protections...

Generator Protection

Fail class:



The screenshot shows a configuration window for a generator protection function. The title is "G U> 2". The description is "Generator overvoltage protection level 2 (ANSI 59)". The set point is 105% (range 100..130). The timer is 5 seconds (range 0.1..100). The "Failclass" dropdown menu is open, showing the following options: Warning, Trip GB, Trip+stop, Shutdown, Trip MB, Safety stop, Trip MB/GB, and Controlled stop. The "Warning" option is currently selected.

Trip + stop = GB trip, engine stop after cooling down

Safety stop = Extra genset start up & replace faulty genset

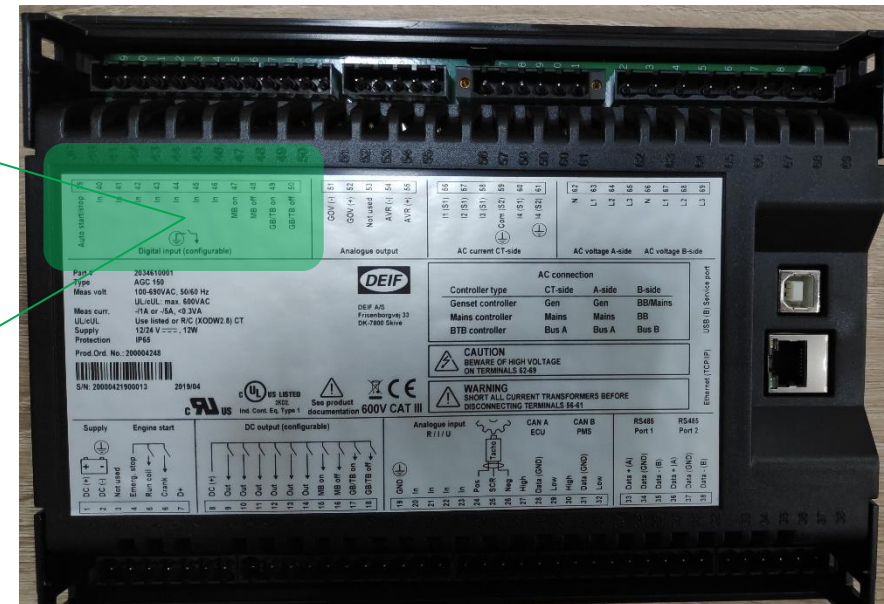
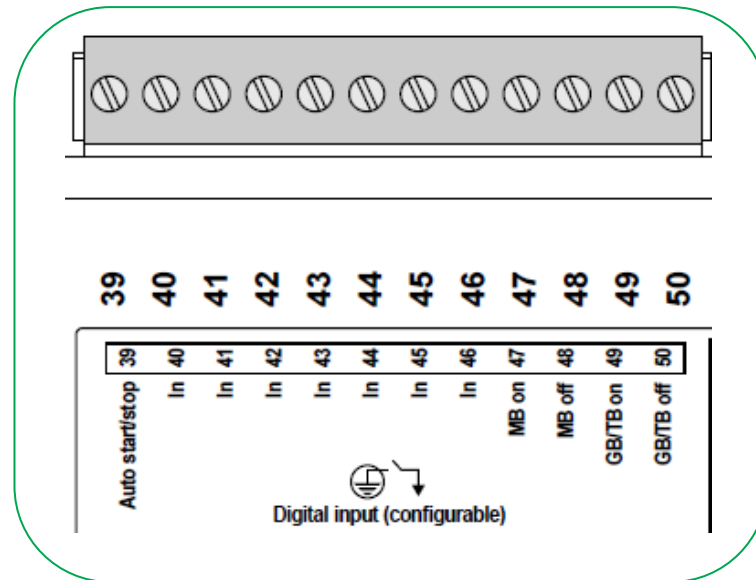
Trip MB/GB = In application "Single DG with mains", will trip MB instead

Digital Input

12 digital inputs, activated by negative (-) VDC signal

Each can be configured as:

1. **Alarms** → setup by Display or USW
2. **Function** → setup by USW only



Digital Input

1. Digital input as **alarm**

Parameter > I/O settings > Inputs > *Digital inputs*

The screenshot shows the DEIF parameter configuration interface. On the left is a navigation tree with categories: Device, Alarms, Trending, and Advanced Protection. Under 'Advanced Protection', the 'Parameters' section is selected, and the tree shows 'I/O settings' > 'Inputs' > 'Digital input'. The main area is titled 'Digital input' and shows three digital input configurations: Digital input 39, Digital input 40, and Digital input 41. Each configuration has a checkbox, a description, a timer, and a failclass dropdown menu. Green callout boxes provide instructions: '[v] to enable' points to the checkbox for Digital input 39; 'Set delay' points to the timer for Digital input 39; and 'Action' points to the failclass dropdown for Digital input 40, which is currently open and showing options like Warning, Trip GB, Trip+stop, Shutdown, Trip MB, Safety stop, Trip MB/GB, and Controlled stop.

View mode: Tree List

DEIF

Basic settings
Communication
Engine
Generator
Busbar
Mains
Breakers
Synchronisation
Power set points
Power management
I/O settings
 Inputs
 Digital input
 Outputs
 External I/O
Functions
Alternative configuration
USW specific parameters

Digital input

Description: Setup of digital input on terminal 39
Timer: 10 sec (0 .. 100)
Failclass: Warning

Description: Setup of digital input on terminal 40
Timer: 10 sec (0 .. 100)
Failclass: Warning

Description: Setup of digital input on terminal 41
Timer: 10 sec (0 .. 100)
Failclass: Warning

[v] to enable

Set delay

Action

Digital Input

2. Digital input as Function

Click icon *I/O settings*

File Connection Parameters Help

DEIF

Device

Alarms

Trending

Advanced Protection

Parameters

DG active power 0 kW

DG current 0 A

DG reactive power 0 kvar

Angle diff. 0°

Consumer

GB

Hz 53 55

50

48

45

0.0 Hz

V 375 500

250

125

0

0 V

Configuration input/output settings

I/O settings

Inputs Outputs

Start enable

I/O number / function Not used

Auto start/stop

I/O number / function Dig. input 39, Term 39

Remote Start

I/O number / function Not used

Remote Stop

I/O number / function Not used

Alternative start

I/O number / function Not used

Remove starter

I/O number / function Not used

Low speed

I/O number / function Not used

Binary running detection

I/O number / function Not used

Remote GB On

Close

Digital Input

Default assignment

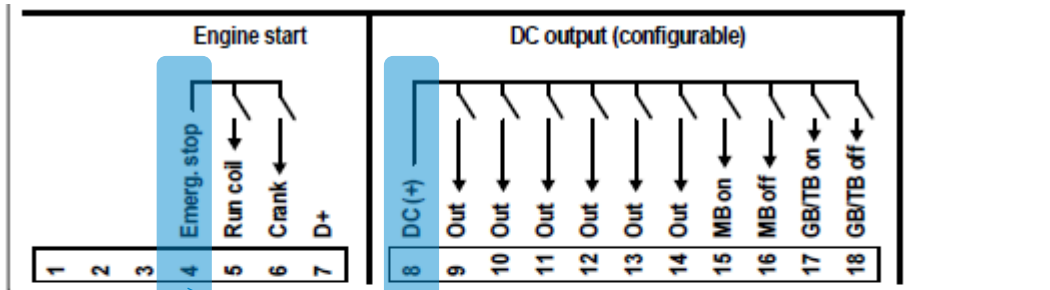
Terminal no.	Function	Remarks
39	Auto start/stop	For remote start signal
40	Not used	
41	Not used	
42	Not used	
43	Not used	
44	Not used	
45	Not used	
46	Not used	
47	Status MB ON	For application with Mains
48	Status MB OFF	For application with Mains
49	Status GB ON	
50	Status GB OFF	

Digital Output

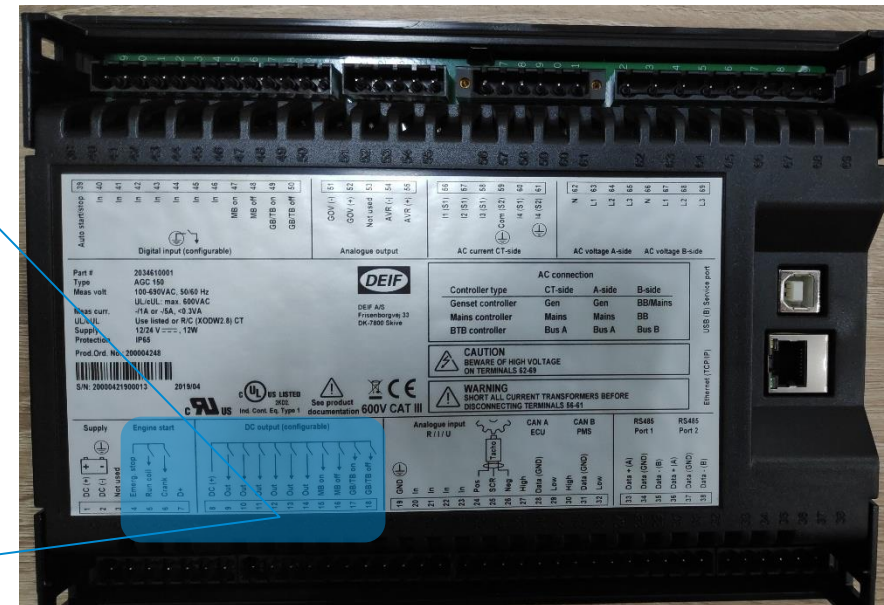
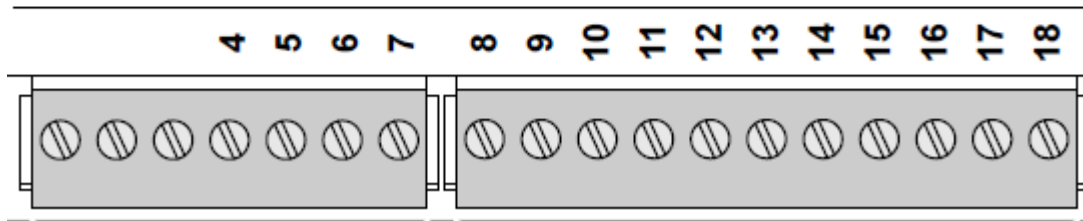
12 digital outputs (DC outputs)

Require common positive (+) VDC

Configuration by USW



(+) VDC



Digital Output

Setup digital output

Click icon *I/O settings*

The screenshot shows the DEIF software interface. On the left is a navigation sidebar with icons for Device, Alarms, Trending, Advanced Protection, and Parameters. The main area displays a power system diagram with a generator (GB) connected to a consumer. Key parameters are shown: DG active power (0 kW), DG current (0 A), DG reactive power (0 kvar), and Angle diff. (0°). There are also two analog meters: one for frequency (Hz) showing 0.0 Hz and one for voltage (V) showing 0 V. A blue callout box with a gear icon and the text "Configuration input/output settings" points to a gear icon in the top toolbar.

The screenshot shows the "I/O settings" dialog box. It has tabs for "Inputs" and "Outputs". The "Outputs" tab is active, showing a list of relays from Relay 5 to Relay 15. Each relay has a dropdown menu for "I/O number / function".

Relay	I/O number / function
Relay 5	Run coil
Relay 6	Starter (Crank)
Relay 9	Start prepare
Relay 10	Stop coil
Relay 11	Stop coil
Relay 12	Double starter
Relay 13	Siren
Relay 14	Load group 1
Relay 15	Load group 2
Relay 16	Load group 3
Relay 17	Load group 4
Relay 18	Load group 5
Relay 19	Not used
Relay 20	Not used

A dropdown menu is open for Relay 10, showing the following options: Stop coil, Double starter, Siren, Load group 1, Load group 2, Load group 3, Load group 4, and Load group 5. The "Close" button is at the bottom right.

Digital output

Default assignment:

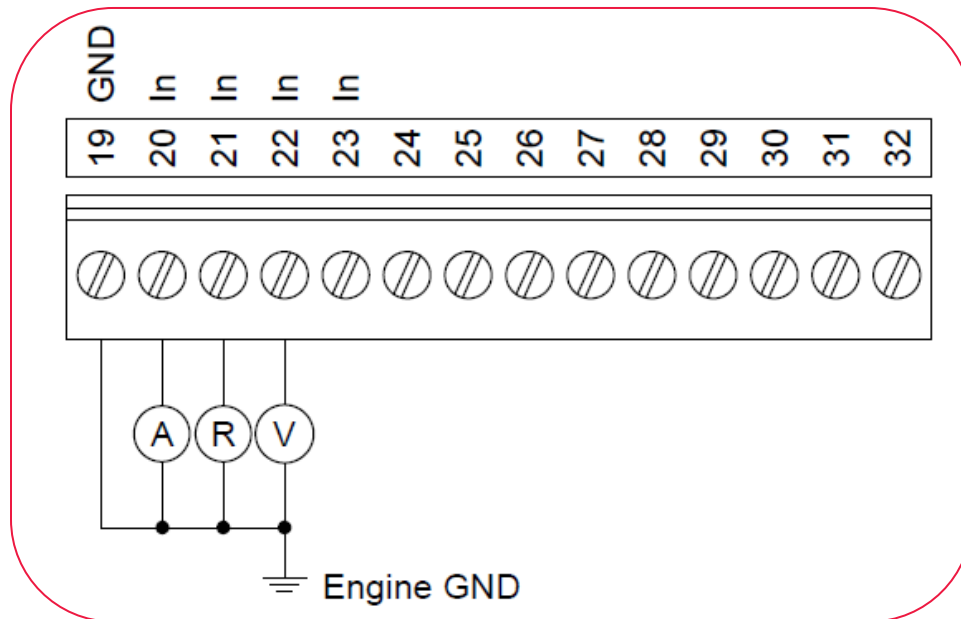
Terminal no.	Function	Remarks
4	Common (+) for DO 5-6	Also serves as Emergency stop
5	Run coil	
6	Starter (crank)	
-----	-----	-----
8	Common (+) for DO 9-18	
9	Start prepare	
10	Stop coil	
11	Status OK	
12	Horn	
13	Not used	
14	Not used	
15	MB ON	For application with Mains
16	MB OFF	For application with Mains
17	GB ON	
18	GB OFF	

Analog Input

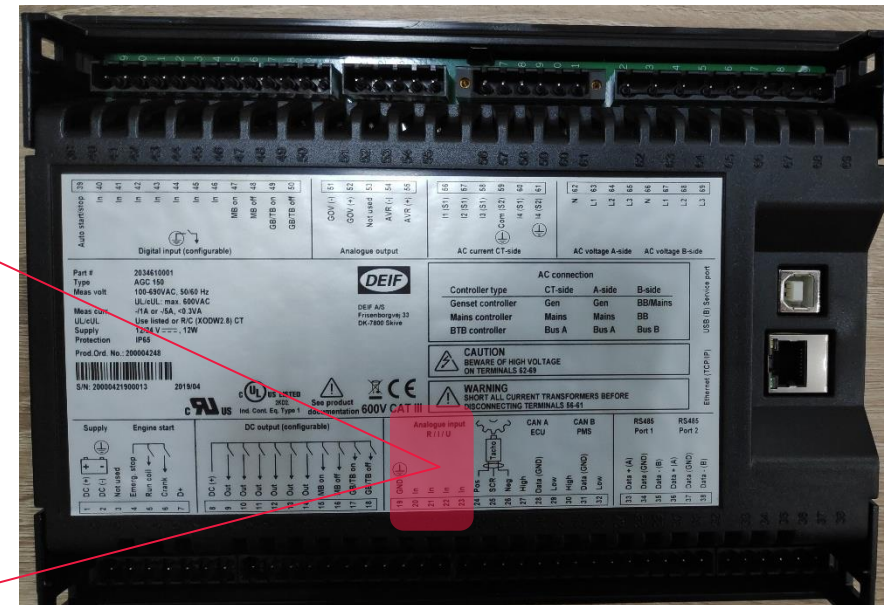
4 multi inputs

Selectable for:

- 4-20 mA
- 0-10 VDC
- PT100
- Binary input
- RMI Oil Pressure
- RMI Water Temperature
- RMI Fuel Level



Setup by USW



Analog Input

Configuring multi inputs

DEIF

Advanced Protection

Parameters

Inputs/Outputs

Multi Input

Options

Logs

Translations

Input 20 | Input 21 | Input 22 | Input 23

Input type: RMI oil pressure

Scaling: V 1/10

Selected curve

Configurable curve

Set point	Input	Output
Set point 1	10	40
Set point 2	44.9	50
Set point 3	81	60
Set point 4	134.7	80
Set point 5	184	100
Set point 6	200	110
Set point 7	210	115
Set point 8	220	120

RMI type: Configurable (Bar/celsius)

Select RMI Type

- Configurable
- Oil pres. type 1 (bar)
- Oil pres. type 2 (bar)
- Oil pres. type 4 (bar)

1st Alarm

Alarm when input is: High

Set point: 5

Delay: 10 Sec.

Fail class: Warning

Output A: Not used

Output B: Not used

Auto acknowledge: OFF

Inhibits: Inhibits...

2nd Alarm

Alarm when input is: Disable

Set point: 5

Delay: 10 Sec.

Fail class: Warning

Output A: Not used

Output B: Not used

Auto acknowledge: OFF

Inhibits: Inhibits...

Input & Output Text

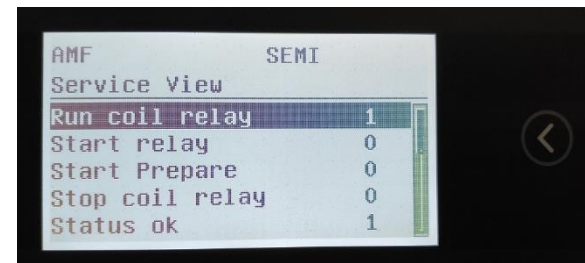
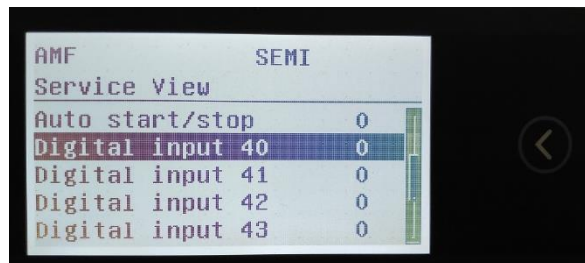
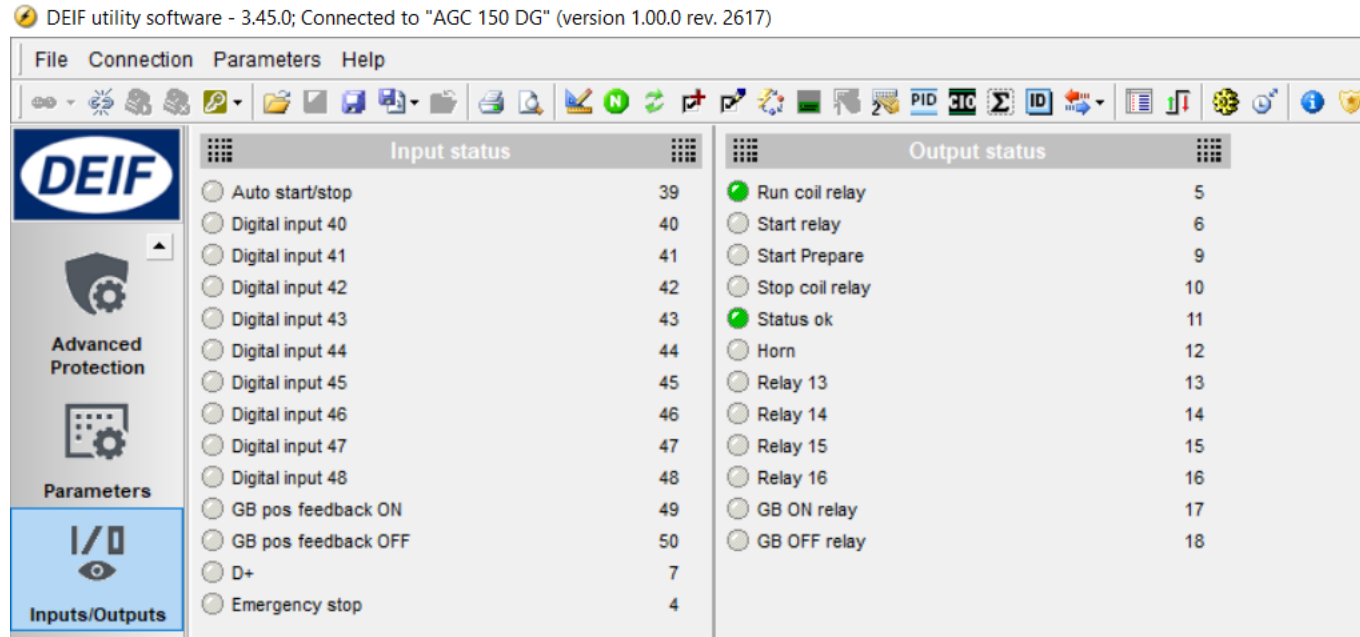
To change text, use **Translations**

The screenshot shows the DEIF software interface. A 'Find' dialog box is open, displaying a search for 'digital input' in the 'Master language'. The dialog includes options for 'Case sensitive', 'From start', and 'Exact search', along with 'Find', 'Find next', 'Count', and 'Close' buttons. The background shows a table with columns for 'Status', 'Master language', and 'Language'. The row for 'Digital input 40' is highlighted in blue, and the text 'ENGINE FAULT' is visible in the 'Language' column for that row.

Status	Master language	Language
	Relay 13	Relay 13
	Relay 14	Relay 14
	Relay 15	Relay 15
	Relay 16	Relay 16
	Relay 17	Relay 17
	Relay 18	Relay 18
	Digital input 39	Digital input 39
	Digital input 40	ENGINE FAULT
	Digital input 41	Digital input 41
	Digital input 42	Digital input 42
	Digital input 43	Digital input 43
	Digital input 44	Digital input 44
	Digital input 45	Digital input 45
	Digital input 46	Digital input 46
	Digital input 47	Digital input 47
	Digital input 48	Digital input 48

Input & Output Status

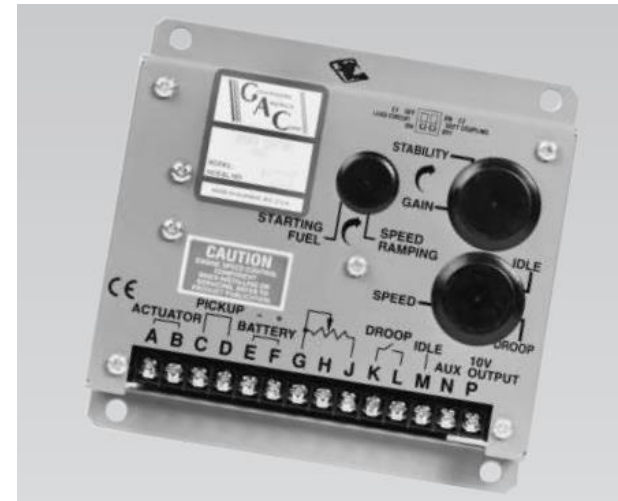
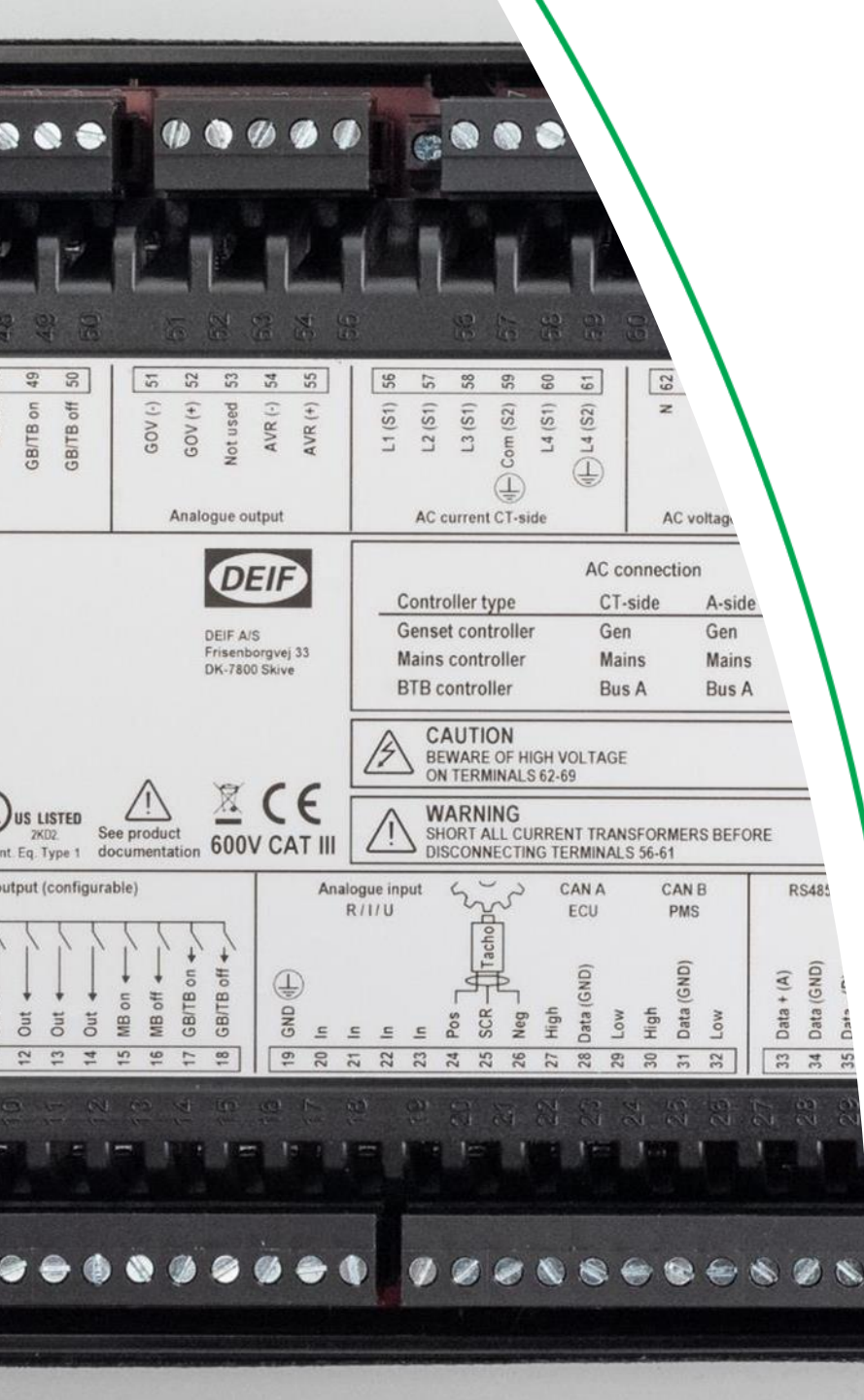
Any digital input/output can be monitored through USW and display



Analog Regulation

SPEED REGULATION - ANALOG

VOLTAGE REGULATION - ANALOG

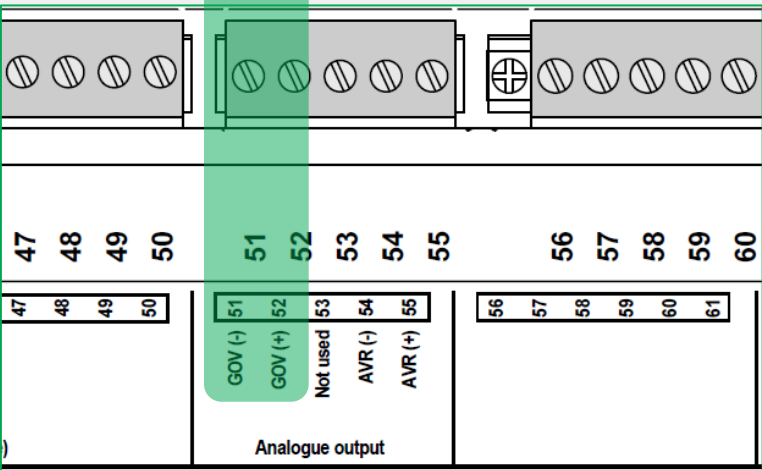


Speed Regulation - Analog

1. Setup terminal analog output

Parameter > Engine > Gov > *General configuration*

The screenshot shows the DEIF software interface with the 'Reg. output GOV' parameter selected. The 'Set point' dropdown is set to 'Analogue'. The 'Governor output' dropdown is set to 'Analogue', and 'Output A' is set to 'Transducer 52'. A 'Parameter "Reg. output GOV" (Channel 2781)' dialog box is open, showing options for 'Set point', 'Password level', and checkboxes for 'Enable', 'High Alarm', 'Inverse proportional', and 'Auto acknowledge'. A green arrow points from the 'Analogue' option in the 'Set point' dropdown to the dialog box, and another green arrow points from the 'Analogue' option in the 'Governor output' dropdown to the dialog box. A green box labeled 'More setting' is also visible.



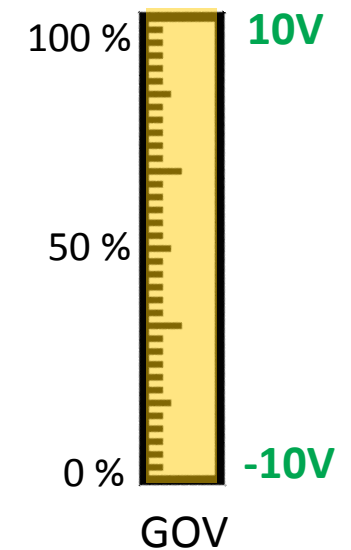
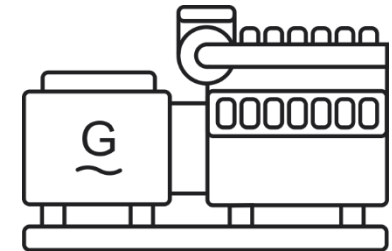
Speed Regulation - Analog

2. Setting analog output range (VDC)

Parameter > Engine > Gov > General configuration > *AOUT 52 limits*

The screenshot shows the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and Advanced Protection. The main area is titled 'AOUT 52 limits' and contains three sections:

- AOUT 52 Gov Type**: Description: Setup of analog out 52 for governor type. Set point: Adjustable.
- AOUT 52 Limits**: Description: Minimum limit for analogue output 52. Set point: -10 V (-10.5 .. 5).
- AOUT 52 Limits**: Description: Maximum limit for analogue output 52. Set point: 10 V (-5 .. 10.5).



Speed Regulation - Analog

3. Setting offset / center

Parameter > Engine > Gov > *Offset for control signal*

The screenshot shows the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and Advanced Protection. The main area displays a tree view of parameters under 'Engine' > 'Gov'. The 'Offset for control signal' parameter is selected and highlighted. The right pane shows the configuration for 'GOV output offset 1', including a description and a slider set to 50%.

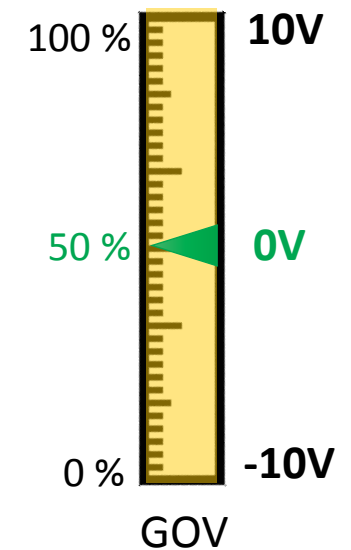
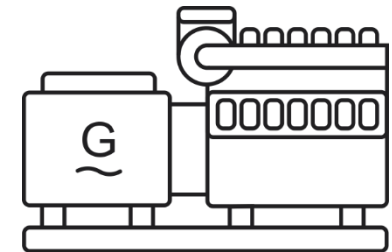
View mode: Tree List

Offset for control signal

GOV output offset 1

Description: Offset of the analogue output used for governor regulation set point 1

Set point: % (0 .. 100)

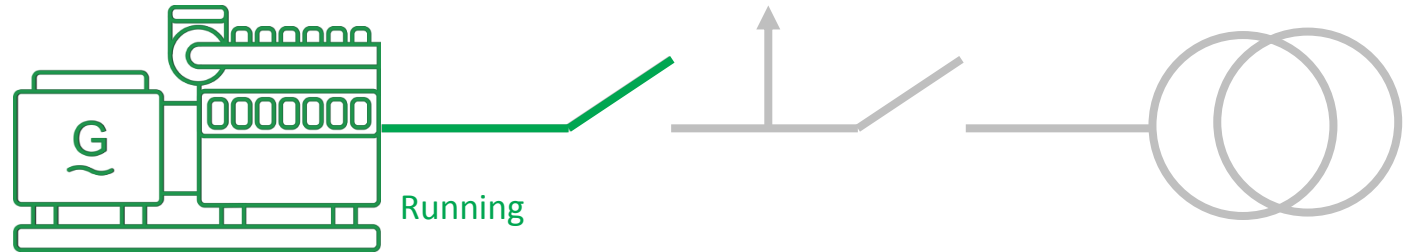


Speed Regulation – Analog Gain

1. PID Island

Parameter > Engine > Gov > Speed PID

> *Island (analog/EIC)*



The screenshot displays the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and Advanced Protection. The main area shows a tree view of parameters under 'Engine > Gov > Speed PID', with 'Island (analog/EIC)' selected. The right panel shows the configuration for this mode:

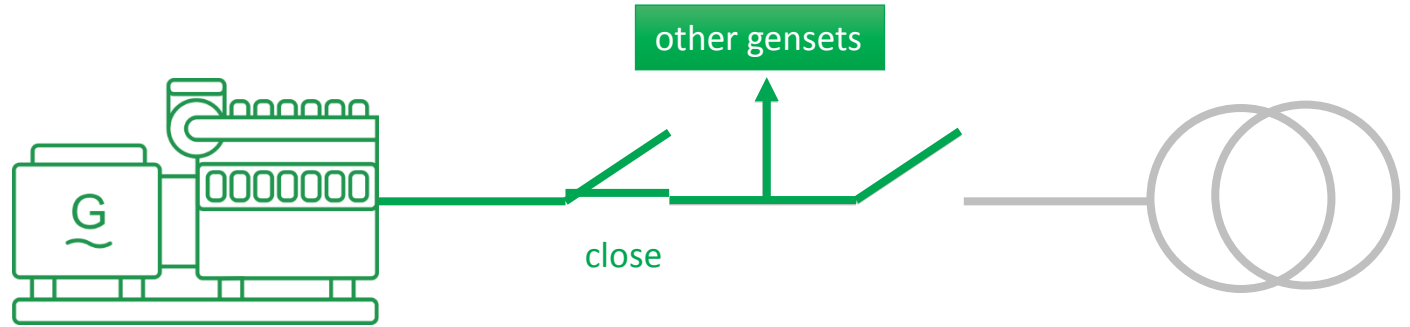
Parameter	Description	Set point	Range
f Kp	Proportional gain value of the PID controller for frequency regulation	2.5	(0 .. 60)
f Ti	Integral time value of the PID controller for frequency regulation	1.5 s	(0 .. 60)
f Td	Differential time value of the PID controller for frequency regulation	0 s	(0 .. 2)

Speed Regulation – Analog Gain

2. PID Load sharing

Parameter > Engine > Gov > Speed PID

> Load share (analog/EIC)



The screenshot shows the DEIF control interface. The navigation tree on the left includes: Device, Alarms, Trending, Advanced Protection, Basic settings, Communication, Engine (Running detection, Start sequence, Stop sequence), Gov (General configuration, Relay configuration, EIC configuration), Speed PID (Island (analog/EIC), Island (relay), Load share (analog/EIC), Load share (relay), Mains parallel (analog/EIC), Mains parallel (relay)), Manuel step, Offset for control signal, Regulation failure, and Battery/Aux supply. The main configuration area is titled "Load share (analog/EIC)" and contains three sections:

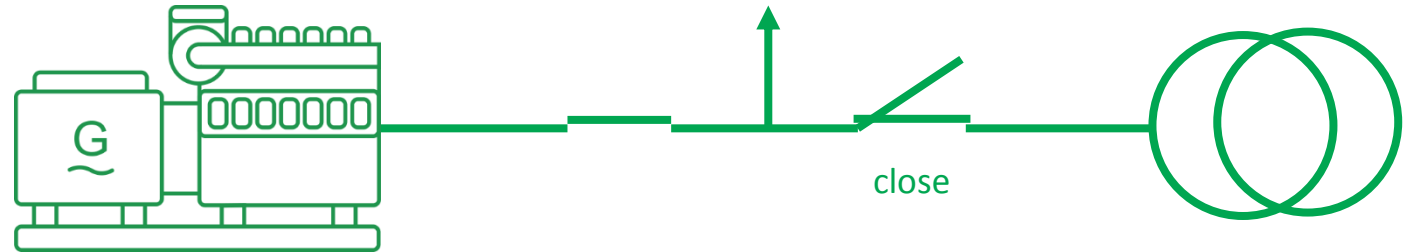
- P loadsh. f Kp**
Description: Proportional gain value of the PID controller for load sharing
Set point: 2.5 (0 .. 60)
- P loadsh. f Ti**
Description: Integral time value of the PID controller for load sharing
Set point: 1.5 s (0 .. 60)
- P loadsh. f Td**
Description: Differential time value of the PID controller for load sharing
Set point: 0 s (0 .. 2)

Speed Regulation – Analog Gain

3. PID Mains parallel

Parameter > Engine > Gov > Speed PID

> *Mains parallel (analog/EIC)*



DEIF

View mode: Tree List

- > Basic settings
- > Communication
- ▼ Engine
 - > Running detection
 - > Start sequence
 - > Stop sequence
 - ▼ Gov
 - > General configuration
 - > Relay configuration
 - > EIC configuration
 - ▼ Speed PID
 - Island (analog/EIC)
 - Island (relay)
 - Load share (analog/EIC)
 - Load share (relay)
 - Mains parallel (analog/EIC)**
 - Mains parallel (relay)
 - Manuel step
 - Offset for control signal
 - Regulation failure
 - > Battery/Aux supply

Mains parallel (analog/EIC)

P Kp
Description: Proportional gain value of the PID controller for power regulation
Set point: (0 .. 60)

P Ti
Description: Integral time value of the PID controller for power regulation
Set point: s (0 .. 60)

P Td
Description: Differential time value of the PID controller for power regulation
Set point: s (0 .. 2)

Voltage Regulation - Analog

1. Setup terminal analog output

Parameter > Generator > AVR > *General configuration*

The screenshot displays the DEIF software interface for configuring the AVR (Automatic Voltage Regulator) output. The left sidebar shows the navigation tree with 'Parameters' selected. The main area shows the 'General configuration' for 'Reg. output AVR' and 'AVR output'. A dialog box titled 'Parameter "Reg. output AVR" (Channel 2782)' is open, showing the 'Set point' set to 'Analogue' and 'Password level' set to 'service'. The 'AVR output' section shows 'Output A' set to 'Transducer 55'. A blue box labeled 'More setting' is visible in the bottom right corner of the interface.

Reg. output AVR
Description: Selection of regulation output used for AVR regulation
Set point: Analogue

AVR output
Description: Transducer selection number in case of analogue output for the voltage regulator
Output A: Transducer 55

Parameter "Reg. output AVR" (Channel 2782)
Set point: Analogue
Password level: service
Enable:
High Alarm:
Inverse proportional:
Auto acknowledge:
Inhibits...:

Terminal Block Diagram:

47	48	49	50	51	52	53	54	55	56	57	58	59	60	
47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
				GOV (-)	GOV (+)	Not used	AVR (-)	AVR (+)						
Analogue output														

Voltage Regulation - Analog

2. Setting analog output range & center

Parameter > Generator > AVR > General configuration > [AOUT 55 limits](#)

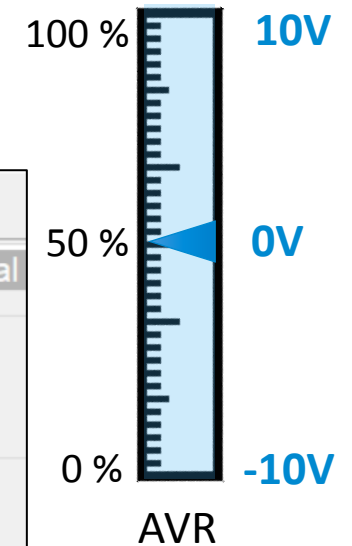
Parameter > Generator > AVR > [Offset for control signal](#)

The screenshot shows the DEIF parameter configuration interface for 'AOUT 55 Limits'. The left sidebar contains navigation icons for Device, Alarms, Trending, and Parameters. The main area is titled 'AOUT 55 Limits' and shows the following configuration:

- AOUT 55 AVR Type**
 - Description: Setup of analog out 55 for AVR type
 - Set point: Adjustable
- AOUT 55 Limits**
 - Description: Minimum limit for analogue output 55
 - Set point: -10 V (-10.5 .. 5)

The screenshot shows the DEIF parameter configuration interface for 'Offset for control signal'. The left sidebar contains navigation icons for Device, Alarms, Trending, and Parameters. The main area is titled 'Offset for control signal' and shows the following configuration:

- AVR output offset 1**
 - Description: Offset of the analogue output used for AVR regulation set point 1
 - Set point: 50 % (0 .. 100)



Voltage Regulation – Analog Gain

Same principle with speed PID

Parameter > Generator > AVR > Voltage PID >

- Island (analog/EIC)
- Load share (analog/EIC)
- Mains parallel (analog/EIC)

The screenshot displays the DEIF control software interface. On the left, a sidebar contains navigation icons for Device, Alarms, Trending, and Advanced Protection. The main area shows a hierarchical tree view of parameters. The path 'Generator > AVR > Voltage PID' is expanded, and three specific modes are highlighted: 'Island (analog/EIC)', 'Load share (analog/EIC)', and 'Mains parallel (analog/EIC)'. Each mode is shown in a separate window, displaying its respective PID parameters:

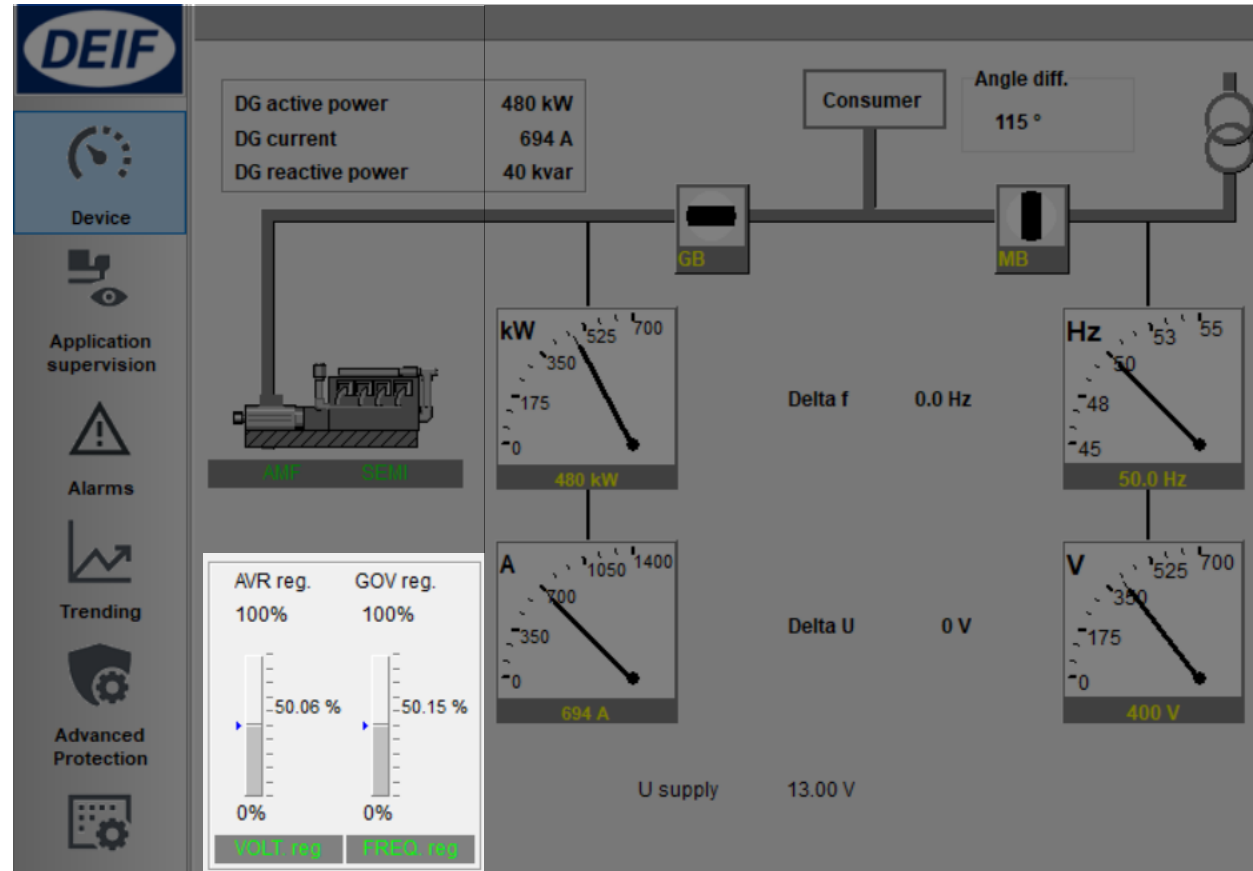
- Island (analog/EIC):** Shows the parameter 'U Kp'.
- Load share (analog/EIC):** Shows the parameter 'Q loadsh. U Kp'.
- Mains parallel (analog/EIC):** Shows three parameters: 'Q Kp' (Proportional gain value of the PID controller for reactive power regulation, set point 2.5), 'Q Ti' (Integral time value of the PID controller for reactive power regulation, set point 1.5 s), and 'Q Td' (Differential time value of the PID controller for reactive power regulation, set point 0 s).

Analog Regulation Status

Check **Device**

> Governor reg.

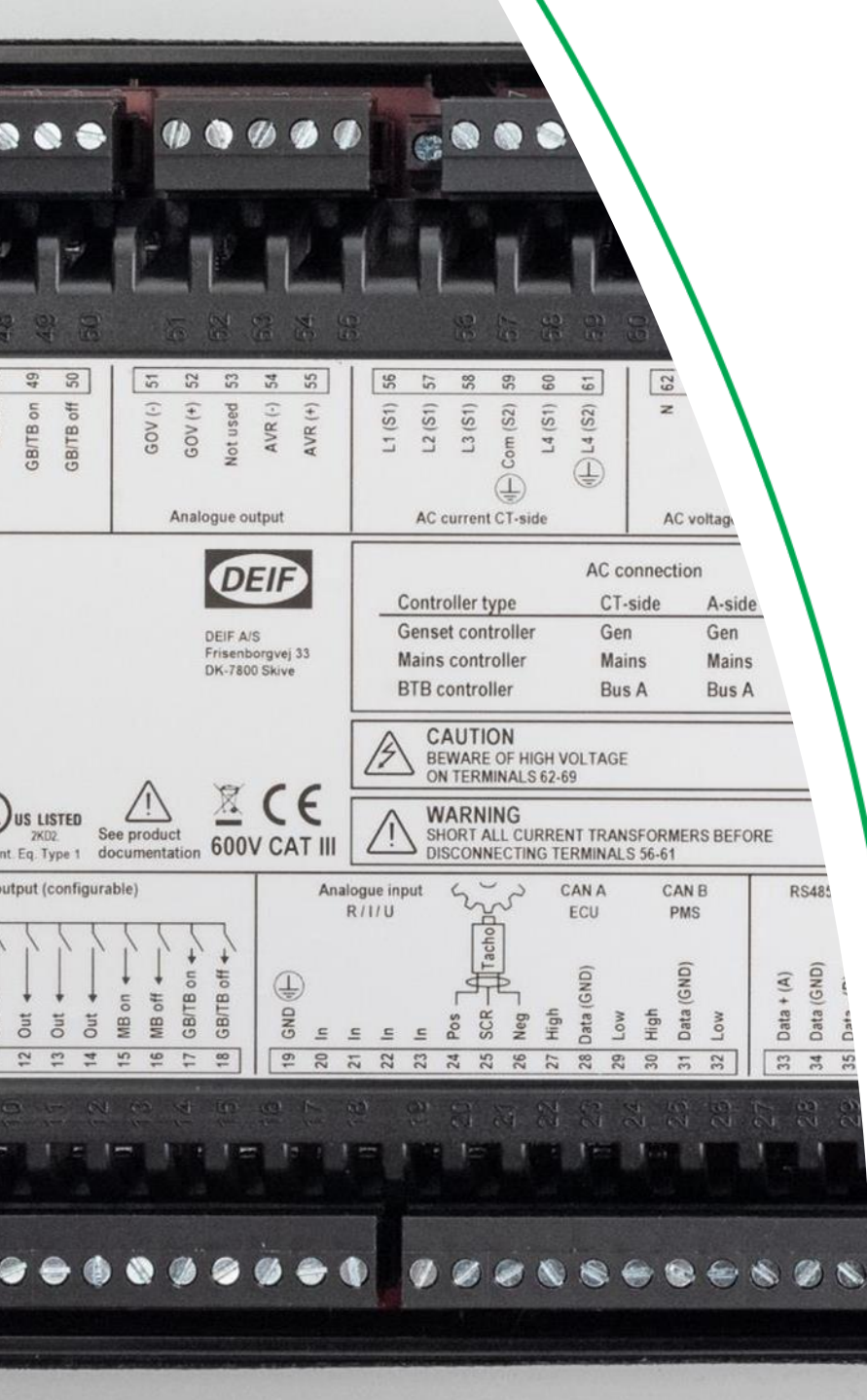
> AVR reg.



Relay regulation

SPEED REGULATION - RELAY

VOLTAGE REGULATION - RELAY



Speed Regulation - Relay

1. Change Gov setting to relay

Parameter > Engine > Gov > *General configuration*

The screenshot displays the DEIF control interface. On the left, a sidebar contains navigation icons for Device, Alarms, Trending, and Advanced. The main area shows a tree view on the left with 'Gov' expanded and 'General configuration' selected. The right pane is titled 'General configuration' and contains the following settings:

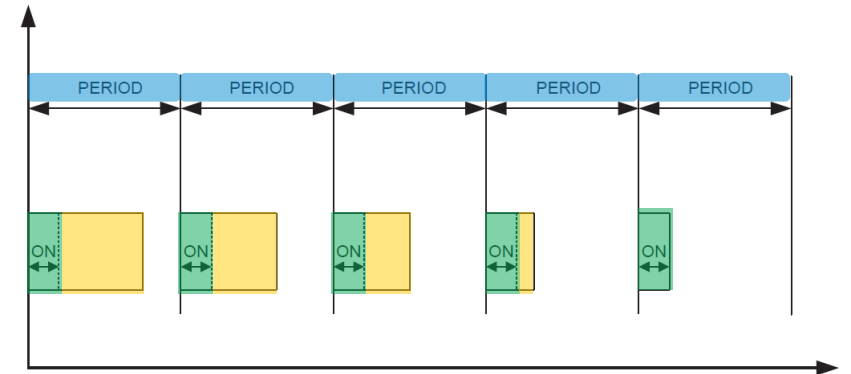
- Reg. output GOV**
Description: Selection of regulation output used for governor regulation
Set point: **EIC** (dropdown menu open showing options: EIC, Relay, Analogue, EIC)
- Governor output**
Description: Transducer selection number in case of analogue output for the speed governor
Output A: **Disabled** (dropdown menu)

Annotations on the screenshot include a green arrow pointing to the 'Relay' option in the dropdown menu with the text 'Select "Relay"', and a grey arrow pointing to the 'Disabled' dropdown menu with the text 'ignore this part..'.

Speed Regulation - Relay

2. Setup pulse signal and choosing relay terminals

Parameter > Engine > Gov > Relay configuration > *Output and period*



The screenshot shows the DEIF control software interface. The left sidebar contains navigation icons for Device, Alarms, Trending, and Advanced Protection. The main area is titled 'Output and period' and contains two configuration sections:

- GOV ON time:** Description: The min. ON time of the relay outputs used for governor relay regulation. Set point: 500 ms (10 .. 6500).
- GOV period time:** Description: The regulator period time used for governor relay regulation. Set point: 2500 ms (250 .. 32500).

Below these sections, there are two dropdown menus for 'Output A' and 'Output B'. 'Output A' is currently set to 'Terminal 13' and 'Output B' is set to 'Terminal 14'. A red box highlights these dropdowns, with red arrows pointing to them labeled 'Increase' and 'Decrease'. A red box below the dropdowns contains the text 'Select any unused DO'.

Speed Regulation - Relay

3. Setup speed Gain

Parameter > Engine > Gov > Speed PID >

- Island (relay)
- Load share (relay)
- Mains Parallel (relay)

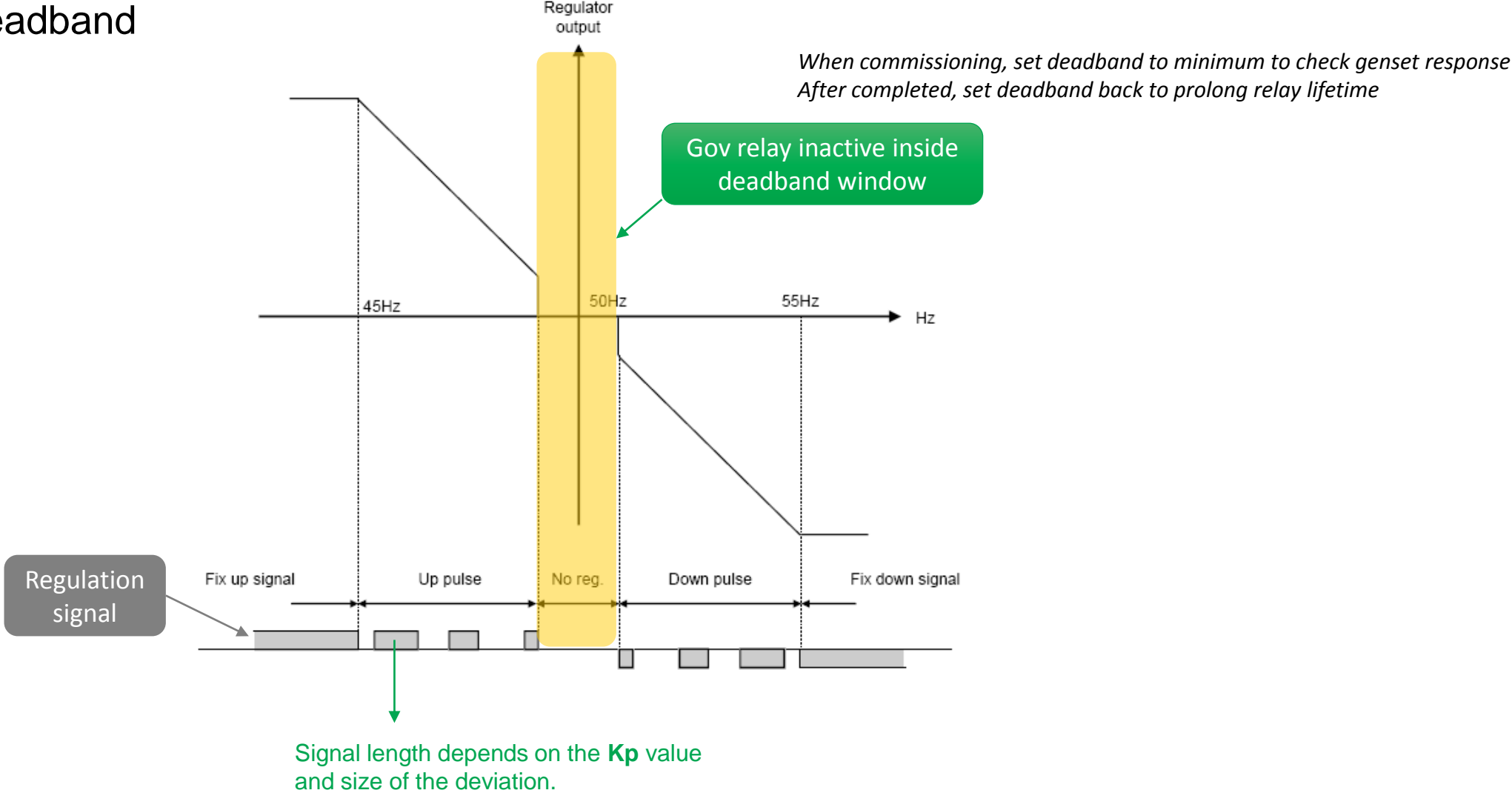
The screenshot displays the DEIF control interface. On the left, there is a sidebar with the DEIF logo and navigation icons for Device, Alarms, and Trending. The main area shows a tree view of parameters under 'Engine > Gov > Speed PID'. Three panels are overlaid on the interface, each showing the configuration for a specific relay:

- Island (relay)**: Shows the 'f deadband' parameter.
- Load share (relay)**: Shows the 'P L S f deadband' parameter.
- Mains parallel (relay)**: Shows the 'P deadband' and 'P Kp relay' parameters.

The 'P deadband' parameter is set to 2% (0.2 .. 10) and the 'P Kp relay' parameter is set to 10 (0 .. 100).

Speed Regulation - Relay

Regulation Deadband



Voltage Regulation - Relay

1. Change AVR setting to relay

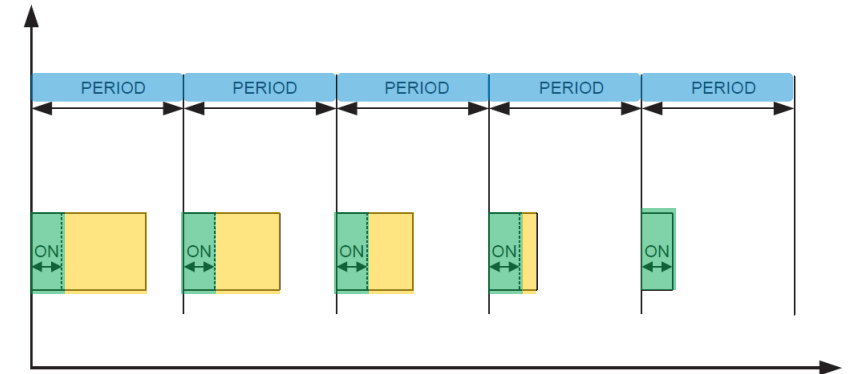
Parameter > Generator > AVR > *General configuration*

The screenshot displays the DEIF control interface. On the left is a navigation menu with categories: Device, Alarms, Trending, and Advanced. The 'Generator' section is expanded to 'AVR', and 'General configuration' is selected. The main panel shows the 'General configuration' page for 'Reg. output AVR'. The 'Set point' dropdown menu is open, showing options: EIC, Relay, Analogue, and EIC. A blue callout box with an arrow points to the 'Relay' option, containing the text 'Select "Relay"'. Below this, the 'AVR output' section is visible, with 'Output A' set to 'Transducer 55'. A grey callout box with an arrow points to the 'Transducer 55' dropdown, containing the text 'ignore this setting'.

Voltage Regulation - Relay

2. Setup pulse signal and choosing relay terminals

Parameter > Generator > AVR > Relay configuration > *Output and period*



View mode: Tree List

DEIF

- > Basic settings
- > Communication
- > Engine
- > Generator
 - > AC configuration
 - > AVR
 - > General configuration
 - > Relay configuration
 - Output and period
 - > DAVR configuration
 - > Voltage PID
 - Manuel step
 - Offset for control signal
 - Regulation failure
 - > Voltage protections
 - > Current protections
 - > Frequency protections
 - > Power protections
 - > Reactive power protections
- > Busbar
- > Mains
- > Breakers
- > Synchronisation
- > Power set points
- > Power management

Output and period

AVR ON time
Description: Min. ON time of the relay outputs for AVR regulation
Set point: 100 ms (10 .. 3000)

AVR period time
Description: AVR duty cycle time
Set point: 500 ms (50 .. 15000)

Output A: Not used → Relay Increase

Output B: Not used → Relay Decrease

Select any unused DO

Voltage Regulation - Relay

3. Setup voltage Gain

Parameter > Generator > AVR > Voltage PID >

- Island (relay)
- Load share (relay)
- Mains Parallel (relay)

*When commissioning, set deadband to minimum to check genset response
After completed, set deadband back to prolong relay lifetime*

The screenshot displays the DEIF control interface with a tree view on the left and three configuration panels on the right. The tree view shows the navigation path: Parameters > Generator > AVR > Voltage PID > Island (relay), Load share (relay), and Mains parallel (relay). The three panels show the following settings:

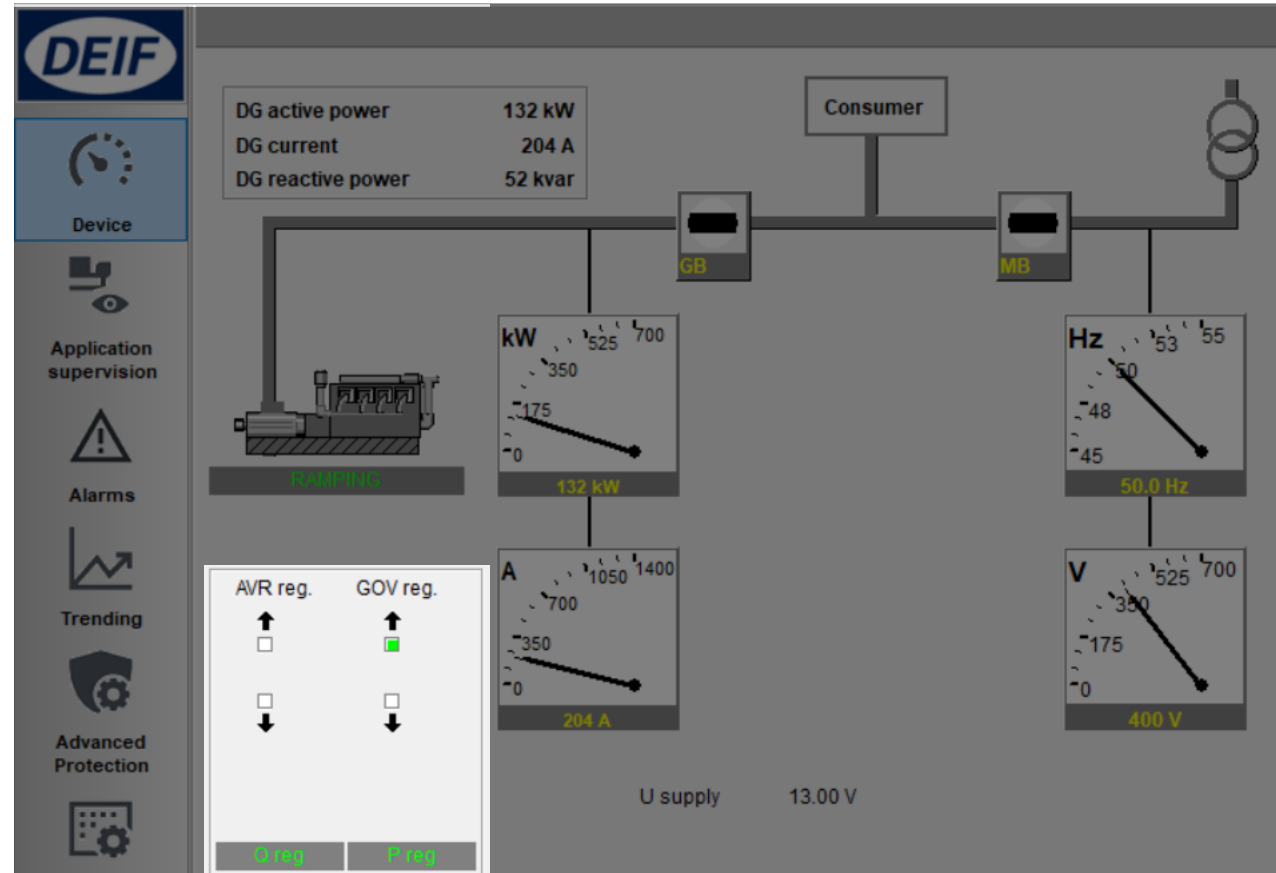
- Island (relay):** Q L S U deadband. Description: Deadband of the voltage regulation in load sharing.
- Load share (relay):** Q deadband. Description: Deadband of the controller for reactive power regulation. Set point: 2 % (0 .. 10).
- Mains parallel (relay):** Q Kp relay. Description: Proportional gain value for the reactive power regulation. Set point: 10 (0 .. 100).

Relay Regulation Status

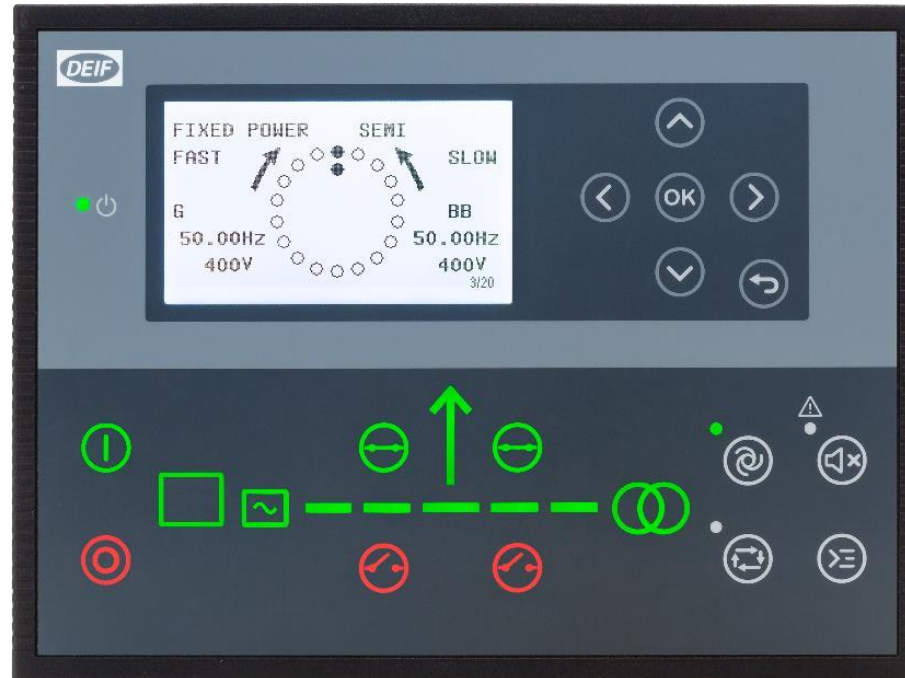
Check **Device**

> Governor reg.

> AVR reg.



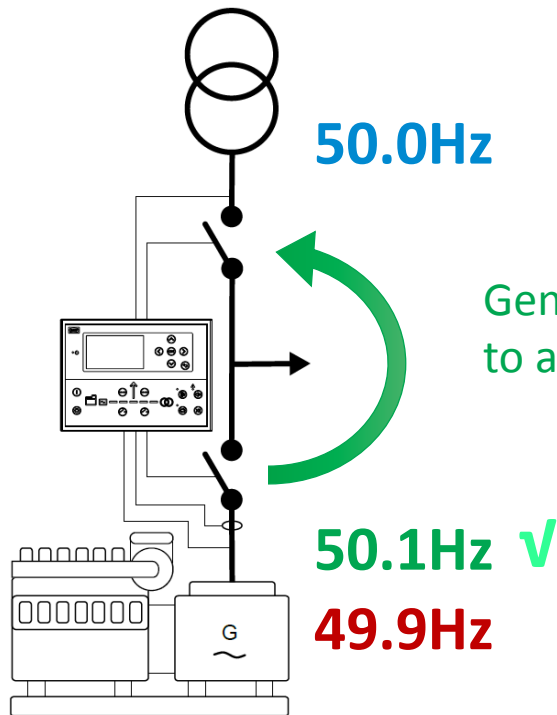
Synchronisation



Synchronisation

AGC always perform synchronism check before closing breakers

All modes: Auto, Semi Auto, and Manual



Genset should run slightly faster than bus to avoid reverse power ($f_{gen} > f_{bus}$)

Allowed maximum slip frequency: **0.3Hz**



Synchronisation

Change slip frequency & voltage

Synchronisation > Dynamic synchronisation

The screenshot shows the DEIF software interface. On the left is a navigation tree with 'Parameters' selected. The main area is titled 'Dynamic synchronisation' and contains two sections: 'Slip Frequency' (highlighted in green) and 'Slip Voltage'. The 'Slip Frequency' section includes 'Sync. dfMax' (set to 0.3 Hz) and 'Sync. dfMin' (set to 0 Hz). The 'Slip Voltage' section includes 'Sync. dUMax' (set to 5%) and 'Sync. dUMin' (set to -5%).

Here, to sync with 50.0Hz 400V busbar, genset need to run:

- Freq between 50.0 – 50.3Hz
- Voltage between 380 – 420V

Normally no need changing these settings

This is a close-up of the 'Slip Voltage' section in the DEIF software. It shows two parameters: 'Sync. dUMax' with a description 'Max. allowable voltage difference for Dynamic synchronisation' and a set point of 5% (range 2..10); and 'Sync. dUMin' with a description 'Max. allowable value the regulated voltage must be below voltage to sync to' and a set point of -5% (range -10..0).

Application

SINGLE GENSET

MULTIPLE GENSETS



Adapting Mimic



Standalone Island



Standalone AMF



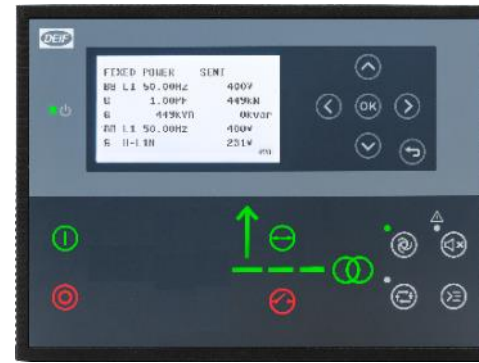
Standalone Parallel without MB



Genset



MAINS+TB



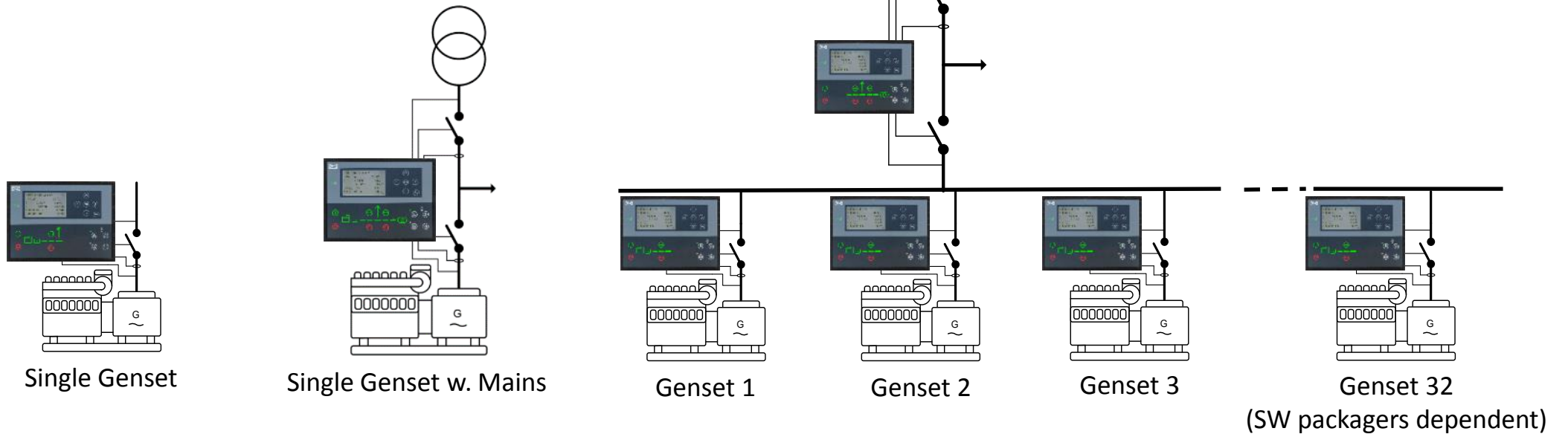
MAINS



BTB

Typical Applications for AGC 150

- Single Genset
- Single Genset with Mains
- Multiple Genset's with Mains

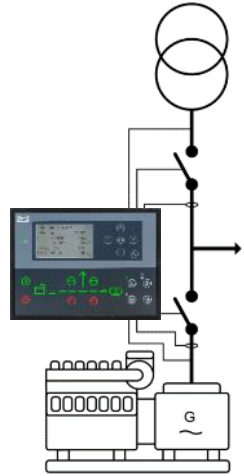


Application

SINGLE GENSET

Single Genset

- Application configuration
- New plant configuration



Single Genset with Mains

The screenshot shows the DEIF software interface for configuring an application. The main window is titled "Application 1: Standard plant". On the left, there is a sidebar with the DEIF logo and several icons: a checkmark, a globe, and a gear. The "Application configuration" icon is highlighted with a green arrow. The main area is divided into "Area control" and "Area configuration - Top". Under "Area configuration - Top", the "Source" dropdown is set to "Mains", and the "ID" dropdown is set to "Mains". A green arrow points to the "Mains" option in the "ID" dropdown. Below this, the "Bottom" section has "Source" set to "Diesel gen", "ID" set to "0", and "GB" set to "Pulse". A "Plant options" dialog box is open on the right, showing "Product type" as "AGC 150 DG" and "Plant type" as "Single DG". A green arrow points to the "Single DG" option in the "Plant type" dropdown. The dialog box also has "Application emulation" set to "Off".

Single Genset

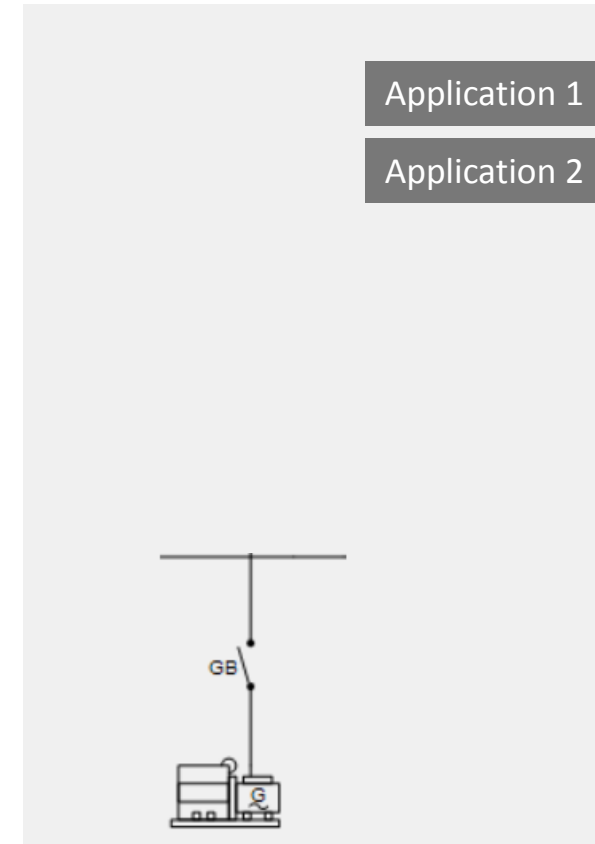
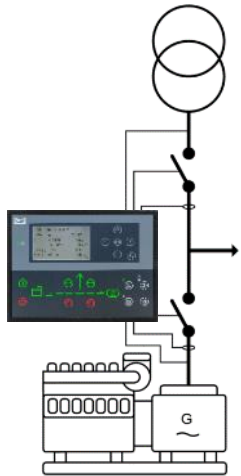
Alternative setup:*

Access from AGC 150 display:

Settings > Basic settings > Application type > Standalone or PM >

> Application select > Active Application

change active application from **[1]** to **[2]**

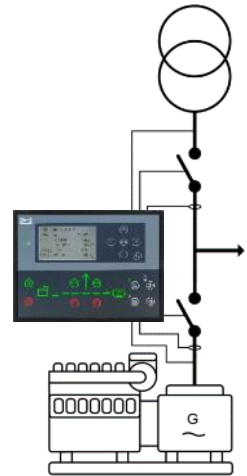


*Only works if application 2 in default factory setting

Single Genset

Select Genset Mode

Parameter > Basic settings > Application type > Genset type > *Genset/plant mode*

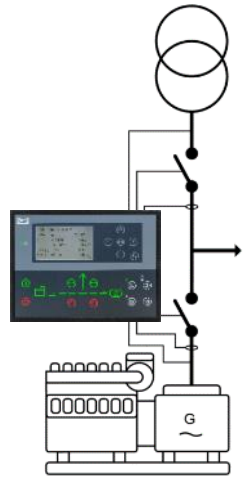


The screenshot shows the DEIF control interface. The left sidebar contains navigation icons for Device, Alarms, Trending, Advanced Protection, and Parameters. The main area displays a tree view of settings under 'Basic settings' > 'Application type' > 'Genset type' > 'Genset/plant mode'. The 'Genset/plant mode' section is expanded, showing a 'Genset Mode' dropdown menu. The dropdown menu is open, showing the following options: Island operation, Island operation, Auto Mains Failure (highlighted), Peak shaving, Fixed Power, Mains Power Export, Load take over, Power management, and Dry alternator. A green arrow points to the 'Auto Mains Failure' option with the text 'Example: AMF'. The 'View mode' is set to 'Tree'.

Single Genset

Enable Back Synchronising

Parameter > Synchronisation > *Mains parallel settings*



DEIF

View mode: Tree List

Mains parallel settings

- > Basic settings
- > Communication
- > Engine
- > Generator
- > Busbar
- > Mains
- > Breakers
- ▼ Synchronisation
 - Synchronisation type
 - Dynamic synchronisation
 - Synchronisation regulator
 - > Static synchronisation
 - > Synchronisation failure
 - > CBE (Close before excitation)
 - Angle offset
 - **Mains parallel settings**
 - Mains synchronisation inhibit
 - Deadbus closing

Back Synchronising

Description: synchronising ON/OFF

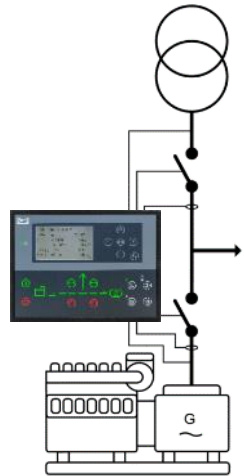
Sync. to mains

Description: Allow synchronising MB

Single Genset

AMF delay settings

Parameter > Mains > AMF function > *AMF timer*



Navigation menu:

- > Basic settings
- > Communication
- > Engine
- > Generator
- > Busbar
- ▼ Mains
 - > Protections
 - Overlap
 - > Voltage and frequency limits
 - ▼ AMF functions
 - Start sequence ib AMF mode
 - AMF timer
 - > Breakers
 - > Synchronisation
 - > Power set points
 - > Power management
 - > I/O settings
 - > Functions
 - > Alternative configuration
 - > USW specific parameters

AMF timer

Parameter	Description	Timer Value	Range
U mains failure	Timer for mains failure voltage detection	5	sec (0.5 .. 990)
Mains OK Delay U	Timer for mains voltage ok detection	60	sec (2 .. 9900)
f mains failure	Timer for mains failure frequency detection	5	sec (0.5 .. 990)
Mains OK Delay f	Timer for mains frequency ok detection	60	sec (2 .. 9900)
Modeshift	Allow switch to AMF mode	Mode shift off	

Mains failure delay

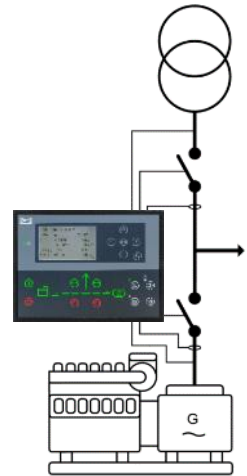
Mains Ok delay

Modeshift ON: Other modes retain AMF function when Mains fail

Single Genset

Mains failure voltage setpoint

Parameter > Mains > Voltage and frequency limits > *Voltage limits*



DEIF

View mode: Tree List

- > Basic settings
- > Communication
- > Engine
- > Generator
- > Busbar
- > Mains
 - > Protections
 - Overlap
 - > Voltage and frequency limits
 - Voltage settings**
 - Frequency settings
 - > AMF functions
 - > Breakers
 - > Synchronisation

Voltage settings

Low Voltage

Description: set point for mains voltage range low

Set point: % (30 .. 100)

High Voltage

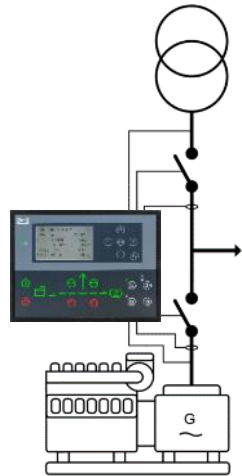
Description: set point for mains voltage range high

Set point: % (100 .. 120)

Single Genset

Done setup single genset?

Check **Application Supervision**



DEIF utility software - 3.45.0; Connected to "AGC 150 DG" (version 1.00.0 rev. 2617)

File Connection Parameters Help

DEIF

Device

Application supervision

Alarms

Trending

Color legend

- Busbar-
- Hz/V blackout
- Hz/V not Ok
- Hz/V Ok

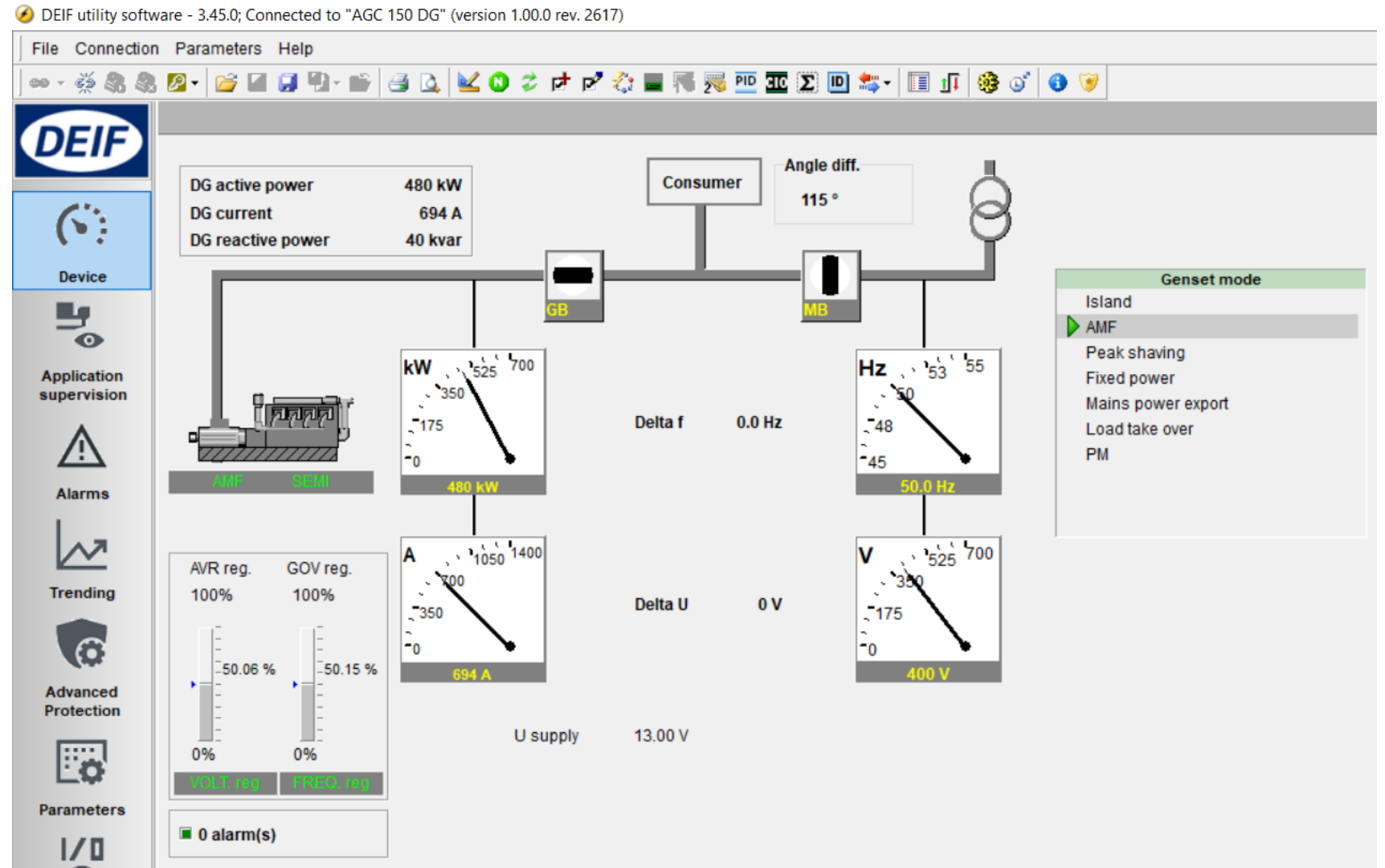
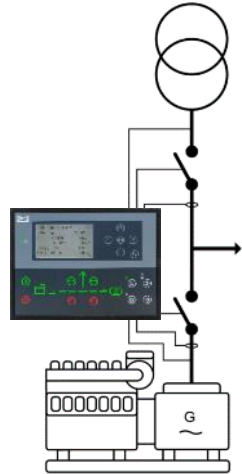
- Gen-sets-
- NotRunning Ready to autostart
- NotRunning Not ready to autostart
- Running Hz/V blackout
- Running Hz/V Ok

Communication active | Connected to "AGC 150 DG" (version 1.00.0 rev. 2617) | COM3 (ID 1)

Single Genset

Or **Device**

For detailed monitoring



Application

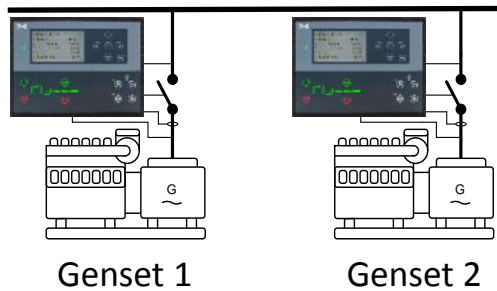
MULTIPLE GENSETS

Multiple Gensets

→ Application configuration

→ New plant configuration

2 Gensets

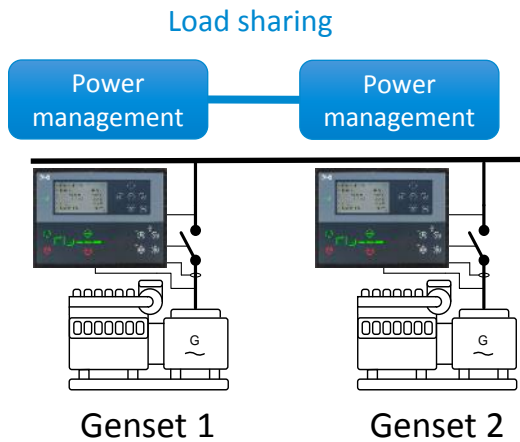


The screenshot shows the DEIF software interface for application configuration. The main window displays 'Application 1: Standard plant' with a schematic diagram of two gensets connected to a busbar. A blue box with the text 'Create drawing of 2 gensets' points to this schematic. On the left, a sidebar contains various icons, with 'Application configuration' highlighted. A 'Plant options' dialog box is open on the right, showing 'Product' as 'AGC 15', 'Plant type' as 'Standard', and 'Power management CAN' as 'Primary CAN'. A blue arrow points from the 'Standard' plant type dropdown to the 'Standard' option in the list. The status bar at the bottom indicates 'Not connected'.

Multiple Gensets

Select Genset Mode

Parameter > Basic settings > Application type > Genset type > *Genset/plant mode*

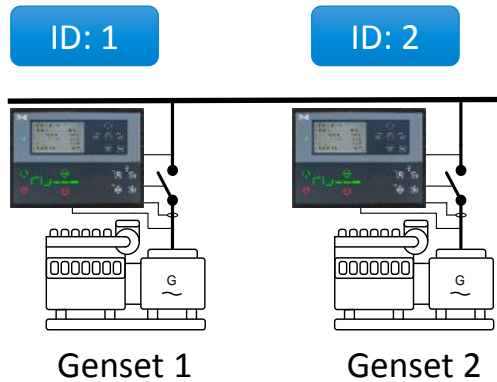


The screenshot shows the DEIF control interface. The left sidebar contains navigation icons for Device, Alarms, Trending, Advanced Protection, and Parameters. The main area displays a tree view of settings under 'Basic settings' > 'Application type' > 'Genset type' > 'Genset/plant mode'. The 'Genset/plant mode' dropdown menu is open, showing options: 'Power management', 'Auto. Mains Failure', 'Peak shaving', 'Fixed Power', 'Mains Power Export', 'Load take over', 'Power management', 'Dry alternator', and 'Ventilation'. A blue arrow points to the 'Power management' option with the text 'select power management'. The right panel shows the 'Genset/plant mode' configuration with 'Description: Generator running mode' and 'Set point: Power management'.

Multiple Gensets

Setup ID Number

Parameter > Communication > *Power management ID*



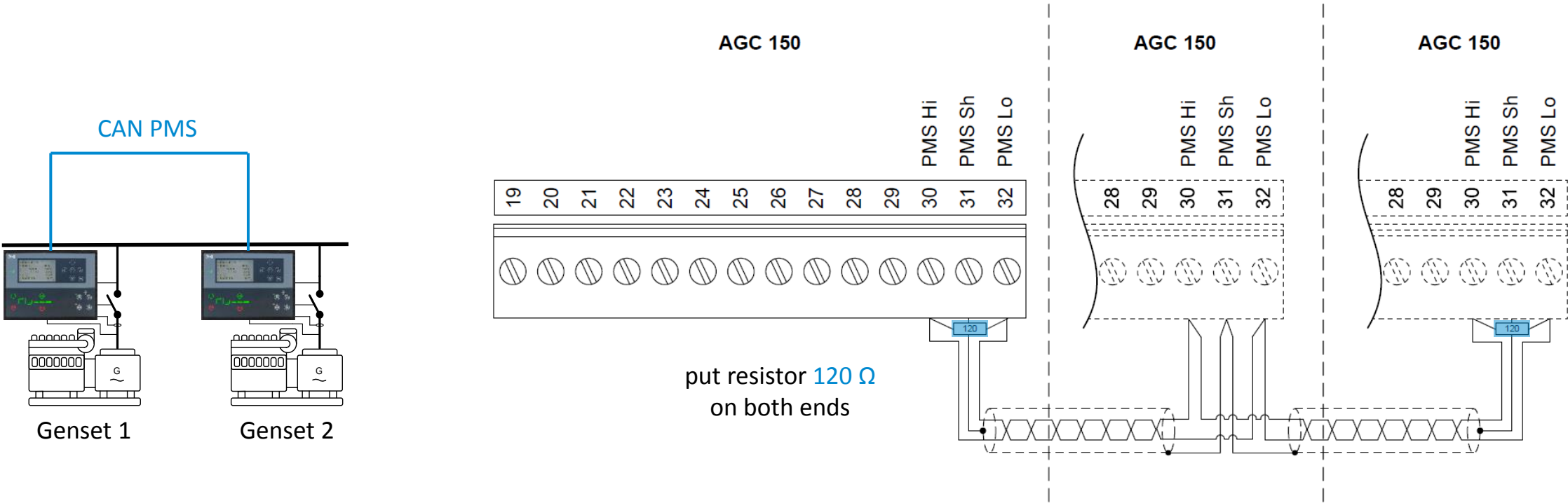
The screenshot shows the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and a gear icon. The main area is titled 'View mode: Tree' and 'List'. The 'Communication' menu is expanded to show 'Power management ID'. The right panel displays the configuration for 'Power management ID' with the following details:

- Int. comm. ID**
- Description: Internal communication ID number
- Set point: 1 (range 1 .. 32)

A blue callout box with the text 'add ID on every genset' is overlaid on the bottom right of the configuration panel.

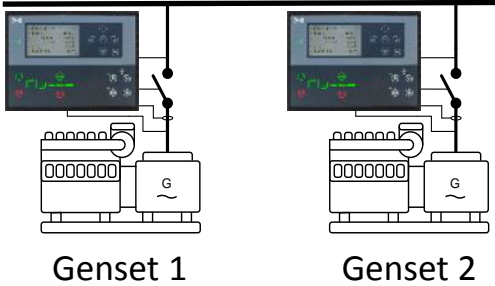
Multiple Gensets

CANbus wiring



Multiple Gensets

Check [Application Supervision](#)



The screenshot shows the DEIF utility software interface. The title bar reads "DEIF utility software - 3.45.0; Connected to 'AGC 150 DG' (version 1.00.0 rev. 2617)". The menu bar includes "File", "Connection", "Parameters", and "Help". The left sidebar has icons for "Device", "Application supervision" (highlighted), "Alarms", and "Trending". The main area displays a diagram of two gensets, GB1 and GB2, connected to a bus. GB1 is shown with a green status and a value of 480. GB2 is shown with a red 'X' status and a value of 0. A large "Emulation" watermark is visible in the center. The right sidebar contains a "Color legend" with the following entries:

Gen-sets	Status
	NotRunning Ready to autostart
	NotRunning Not ready to autostart
	Running Hz/V blackout
	Running Hz/V Ok
	Running Hz/V not Ok

The "Symbols" section includes:

	Alarm
	No info

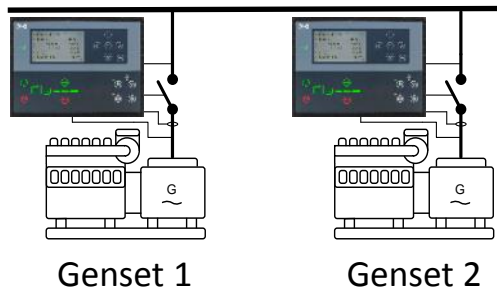
The bottom status bar shows "Communication active", "Connected to 'AGC 150 DG' (version 1.00.0 rev. 2617)", and "COM3 (ID 1)".

Incorrect communication will be shown

Power Management

LOAD DEPENDENT START/STOP

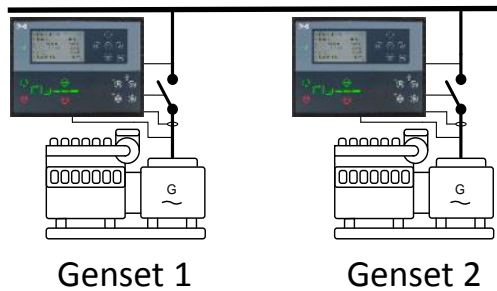
MULTI START



Load dependent start/stop

Configure Start/stop based on load Percentage

Parameter > Power management > *Load dependent start/stop configuration*



The screenshot shows the DEIF parameter configuration interface. The left sidebar contains the DEIF logo and navigation icons for 'Advanced Protection', 'Parameters', and 'I/O'. The main area is titled 'Load dependent Start/stop' and is divided into two sections:

- Ld. start/stop unit**: Description: Selection of either kW or kVA for calculation of the Load dependent Start and Stop values. Set point: kW (dropdown menu).
- Ld. start/stop type**: Description: Selection of either Percentage or Value for calculation of the Load dependent Start and Stop values. Set point: Value (dropdown menu), with 'Percentage' selected and highlighted by a green arrow pointing to it from a box labeled 'Set as Percentage'.

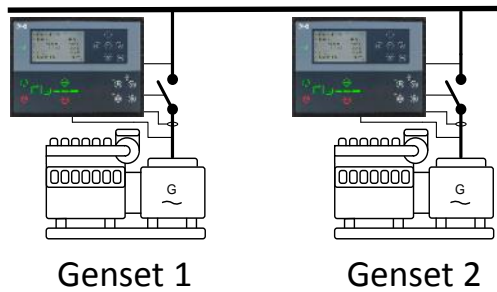
The parameter tree on the left shows the following structure:

- Basic settings
- Communication
- Engine
- Generator
- Busbar
- Mains
- Breakers
- Synchronisation
- Power set points
- Power management
 - Start/stop for Island
 - Easy connect
 - Load dependent Start/stop configuration (highlighted)
 - Load dependent start 1

Load dependent start/stop

Start percentage setpoint

Parameter > Power management > *Load dependent start 1*



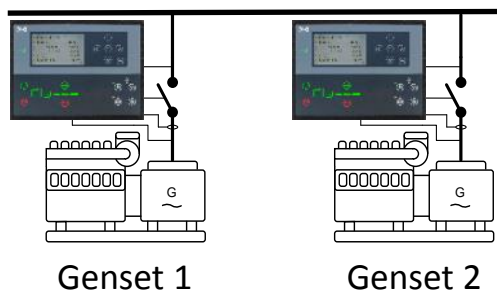
The screenshot displays the 'Load dependent start 1' configuration page. The left sidebar shows a navigation menu with 'Parameters' selected. The main content area is titled 'Load dependent start 1' and contains four sections:

- Ld. start limit P:** Description: Setting for Load dependent Start in kW. Set point: 100 kW (1 .. 20000).
- Ld. start limit S:** Description: Setting for Load dependent Start in kVA. Set point: 100 kVA (1 .. 20000).
- Ld. start limit %:** Description: Setting for Load dependent Start in Percentage. Set point: 90 % (1 .. 100).
- Ld. start timer:** Description: Setup of Load dependent Start limits. Timer: 10 sec (0 .. 990). A green box highlights the '10' value, with the text 'Start delay' next to it.

Load dependent start/stop

Stop percentage setpoint

Parameter > Power management > *Load dependent stop 1*



The screenshot displays the 'Parameters' menu with 'Load dependent stop 1' selected. The configuration details are as follows:

Parameter	Description	Set point	Units	Notes
Ld. stop limit P	Setting for Load dependent Stop in kW	200	kW (1 .. 20000)	
Ld. stop limit S	Setting for Load dependent Stop in KVA	200	kVA (1 .. 20000)	
Ld. stop limit %	Setting for Load dependent Stop in Percentage	70	% (1 .. 100)	% capacity after 1 genset removed
Ld. stop timer	Setup of Load dependent Stop limits	30	sec (5 .. 990)	Stopping delay

Multi start

Setup of how many gensets start together

Parameter > Power management > *Multi start set*

The diagram on the left shows two gensets, Genset 1 and Genset 2, connected to a common busbar. An 'Autostart/stop input' is connected to the busbar. Each genset has a 'Start' button. The middle screenshot shows the 'Parameters' menu with 'Multi start set' selected under 'Power management'. The right screenshot shows the 'Multi start set' configuration page. The 'Set point' dropdown is open, showing options: 'Auto calculation', 'Start 1 DG', 'Start 2 DG', 'Start 3 DG', 'Start 4 DG', 'Start 5 DG', 'Start 6 DG', and 'Start 7 DG'. A blue arrow points to 'Start 2 DG' with the text 'Select Start 2 DG'. The 'Min. run. set 1' section shows a 'Set point' of '1' (range 0..32). The 'Multistart conf' section shows a 'Set point' of 'Multi start set 1'.

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