



AGC 150

Basic knowledge



Synchronizing Controllers



GPC-3
Base mounted
Non-Power Management



AGC 200
Front mounted
Standard Power Management



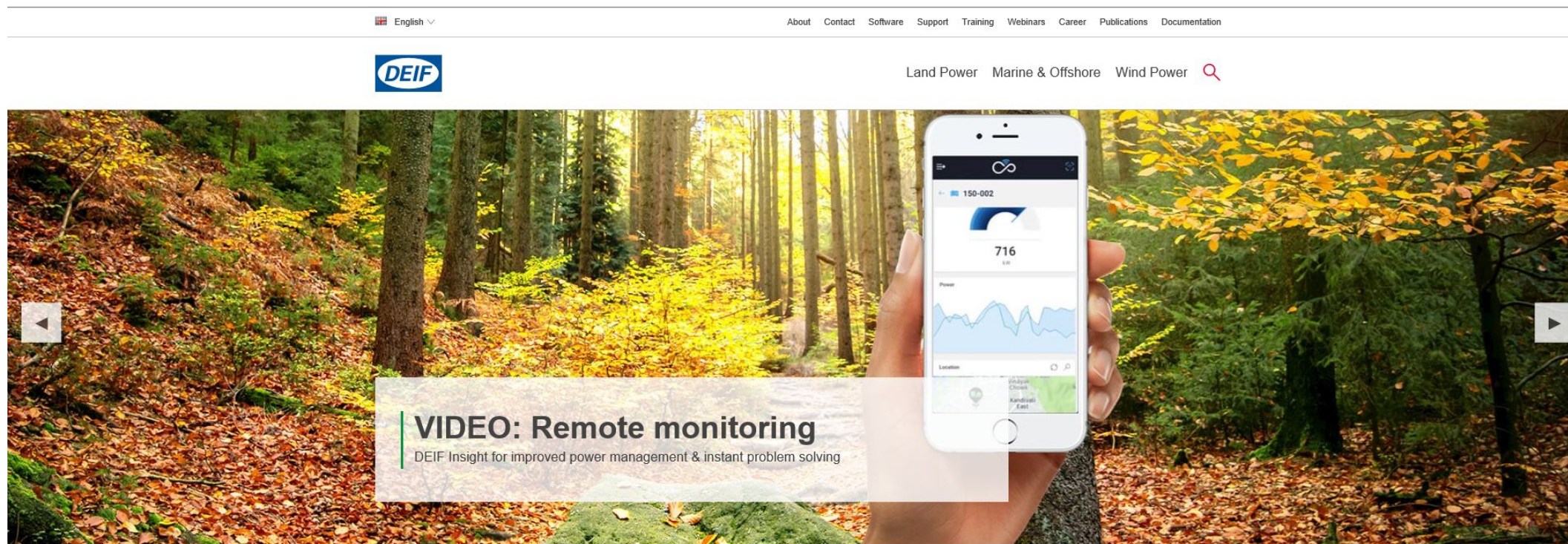
AGC-4
Base mounted
Custom Power Management



AGC 150
Front mounted
Simple Power Management

Documentation

www.deif.com contains all manuals for the controllers



The screenshot shows the DEIF website interface. At the top, there is a navigation bar with 'English' and a dropdown arrow, and a menu with 'About', 'Contact', 'Software', 'Support', 'Training', 'Webinars', 'Career', 'Publications', and 'Documentation'. Below this is the DEIF logo and navigation links for 'Land Power', 'Marine & Offshore', and 'Wind Power' with a search icon. The main content area features a video player with a background image of a hand holding a smartphone displaying a monitoring dashboard. The dashboard shows a large gauge with the number '716', a line graph, and a location map. A text overlay on the video reads: 'VIDEO: Remote monitoring' and 'DEIF Insight for improved power management & instant problem solving'. Below the video player are four small circles, with the first one filled in green.

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

About Contact Career Software Support Training Webinars Whitepapers Publications Documentation

DEIF 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](#)

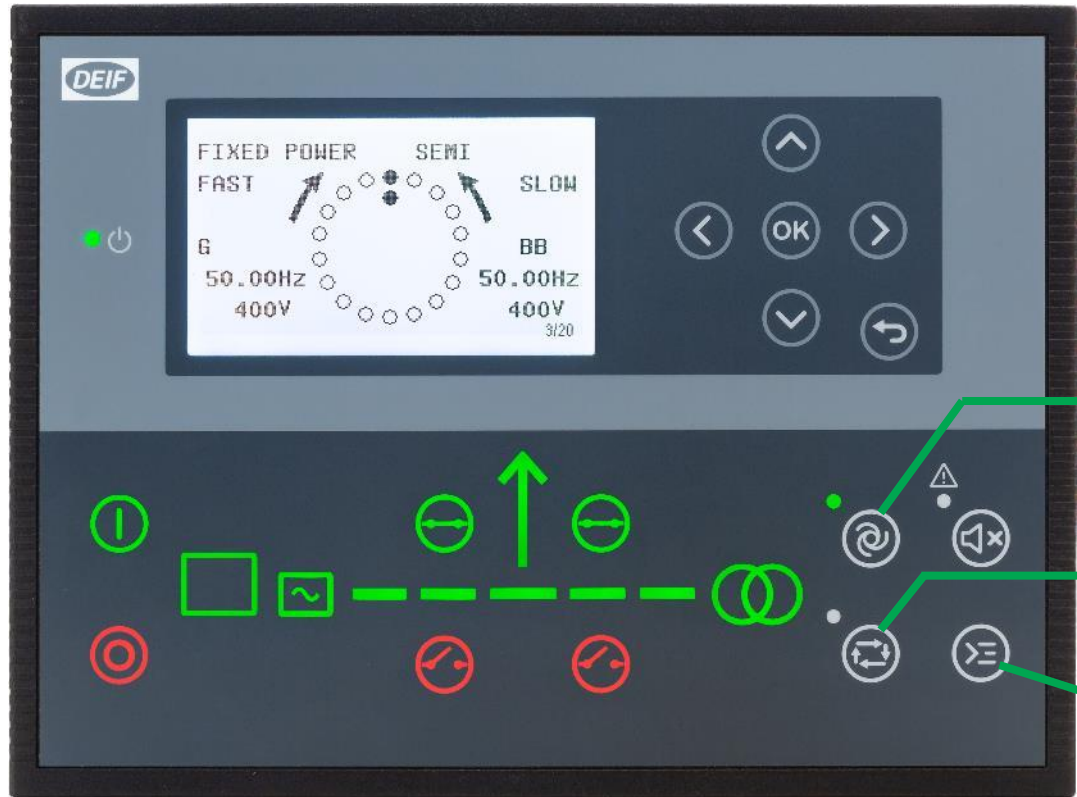
Subsegments
[INDUSTRY: First-mover in hybrid microgrid solutions](#) - [INDUSTRY: Naval vessels](#) - [INDUSTRY: Hydro](#)

Description Features Videos & Media **Documentation**

Documents

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

AGC 150



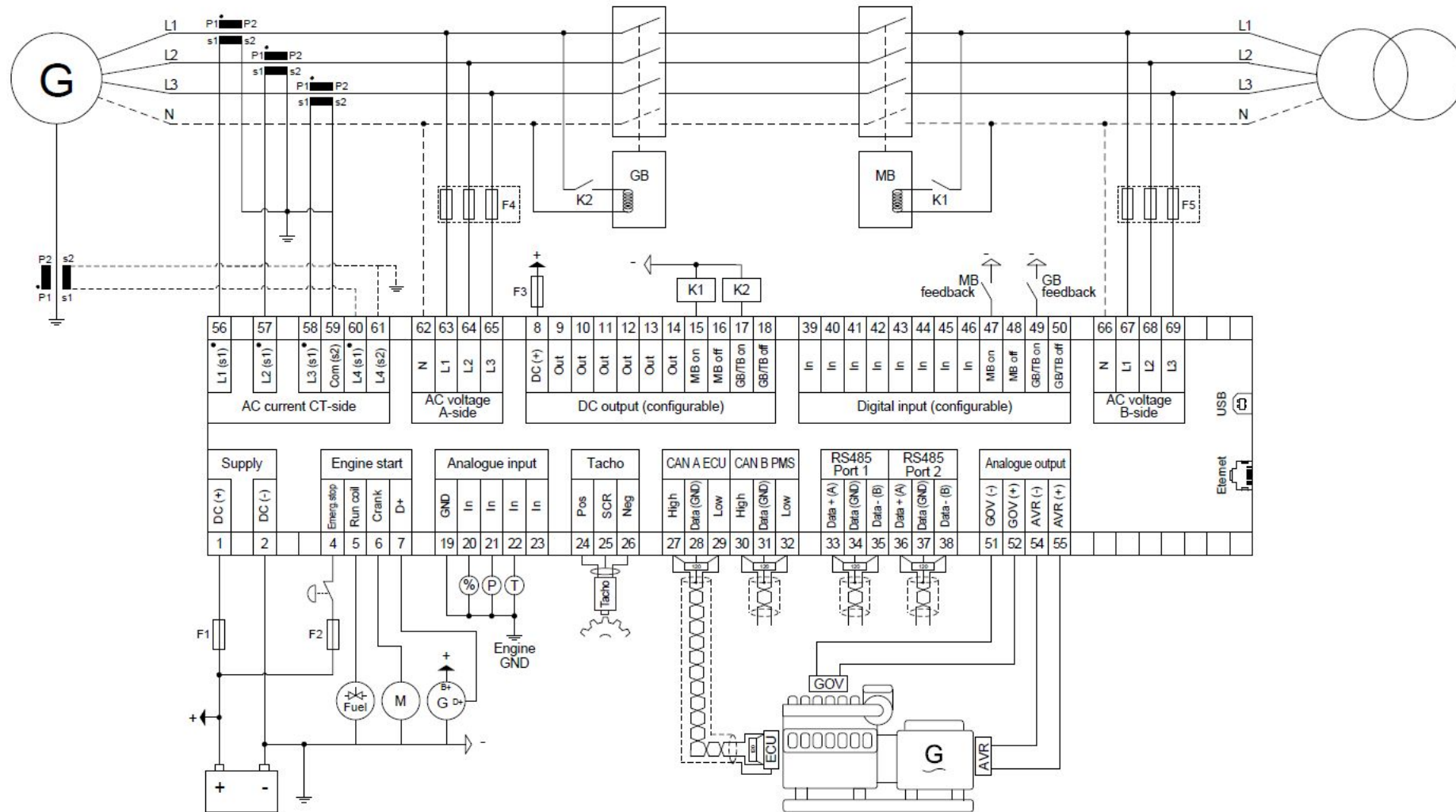
AUTO

SEMI AUTO

Shortcut Menu

DG BLOCKED FOR START
Jump
Mode
Test
Lamp test

Typical wiring



Basic Settings

Setup Current Transformer

The image displays 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**
- I/O**

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) with three phases (L1, L2, L3) and a neutral (N). It shows the primary and secondary windings of the CTs, labeled P1, P2, s1, and s2. The secondary windings are connected to a terminal block with the following pins:

Pin	Terminal Label
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	MB on
48	MB off
49	GB/TB on
50	GB/TB off
66	N
67	L1
68	L2
69	L3

Additional components shown include a generator (G), a circuit breaker (K1), a generator breaker (GB), a motor breaker (MB), and fuses (F3, F4, F5). Feedback signals for MB and GB are also indicated.

Configurable CT: A callout points to the secondary winding terminals (P2, s2, s1, F1) of the CT, indicating they are configurable.

Basic Settings

Nominal settings

The image displays the DEIF software interface for configuring a 3-phase nominal generator power set point. 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 'Power' > '3 phase nominal' selected. The main display area shows the 'Nom. P 1' configuration, including a description 'Nominal generator power set point 1' and a 'Set point' value of 480 kW (range 10..20000). A red box highlights the 'Set point' field.

Below the software interface is a detailed electrical schematic diagram of the generator and its connection to a busbar system. The generator (G) is connected to a busbar through a circuit breaker (K1) and a generator breaker (GB). The busbar is connected to a transformer (T) and a motor (M). The schematic includes various components such as fuses (F1-F5), switches (K1, K2), and feedback loops (MB feedback, GB feedback). The diagram is annotated with green and blue circles and arrows, linking the software settings to the physical components. A blue circle highlights the CT connections, labeled 'Configurable CT'.

The schematic diagram shows the following components and connections:

- Generator (G) connected to busbar through circuit breaker (K1) and generator breaker (GB).
- Busbar connected to transformer (T) and motor (M).
- Various fuses (F1-F5) and switches (K1, K2) are shown.
- Feedback loops (MB feedback, GB feedback) are indicated.
- The diagram is annotated with green and blue circles and arrows, linking the software settings to the physical components.

The bottom of the diagram shows a terminal block with the following 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
	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.

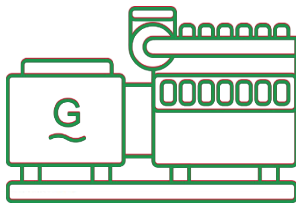
Once running feedback detected, **Starter/crank** is deactivated.

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

DEIF

View mode: Tree List

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

DEIF

View mode: Tree List

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 AC configuration, AVR, Voltage protections, Current protections, Frequency protections, and Power protections. The 'Reverse power' option under Power protections is highlighted. The main area shows a list of protection functions: Over-voltage, Over-current, Earth fault inverse time over-current, Over-frequency, Under-frequency, and Reverse power. Two levels of reverse power protection are detailed below:

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

Each protection level includes a checkbox to enable it, a set point slider and input field, a timer slider and input field, and a failclass dropdown menu. There are also icons for edit and favorite for each level.

And many more

Generator Protection

Fail class:



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

I/O

DIGITAL INPUT

DIGITAL OUTPUT

ANALOG INPUT

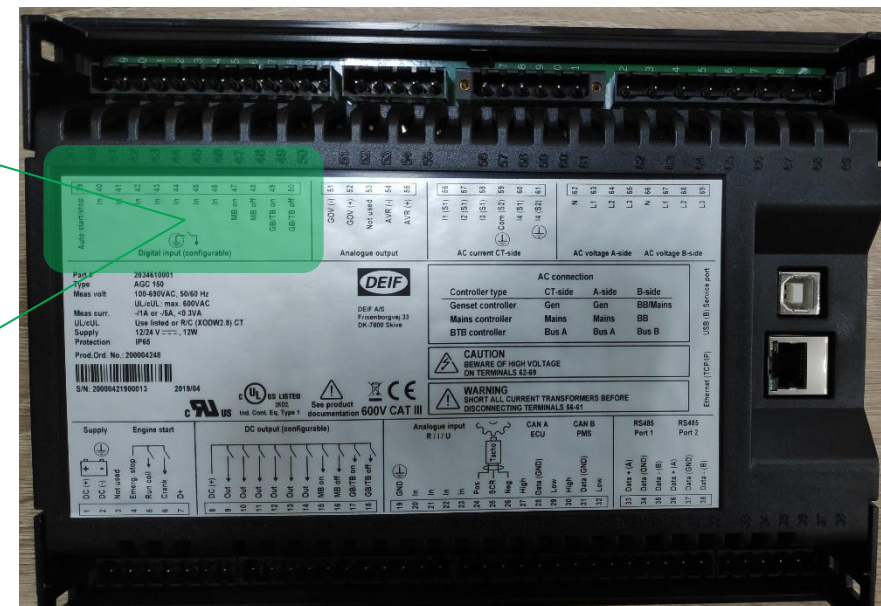
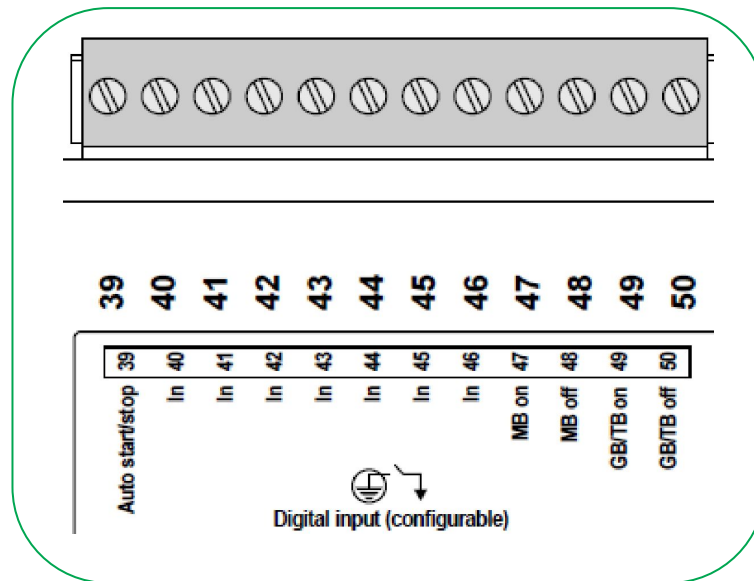


Digital Input

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. The left sidebar contains navigation icons for Device, Alarms, Trending, and Advanced Protection, with the Parameters icon selected. The main area is titled "Digital input" and shows settings for three digital inputs: 39, 40, and 41. Input 39 is enabled (checkbox checked) and has a timer of 10 seconds and a failclass of Warning. Input 40 is disabled (checkbox unchecked) and has a timer of 10 seconds and a failclass of Warning. Input 41 is disabled (checkbox unchecked) and has a timer of 10 seconds and a failclass of Warning. A dropdown menu is open for the failclass of input 40, showing options: Warning, Trip GB, Trip+stop, Shutdown, Trip MB, Safety stop, Trip MB/GB, and Controlled stop. Green callout boxes highlight the "[√] to enable" checkbox for input 39, the "Set delay" timer field for input 39, and the "Action" dropdown menu for input 40.

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 39

Description: Setup of digital input on terminal 39

Timer: 10 sec (0 .. 100)

Failclass: Warning

Digital input 40

Description: Setup of digital input on terminal 40

Timer: 10 sec (0 .. 100)

Failclass: Warning

Digital input 41

Description: Setup of digital input on terminal 41

Timer: 10 sec (0 .. 100)

Failclass: Warning

[√] 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

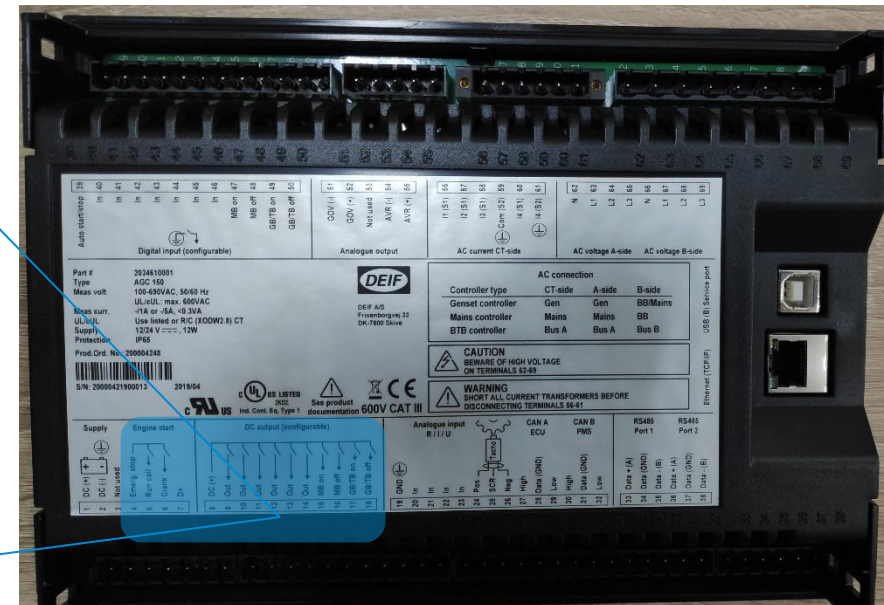
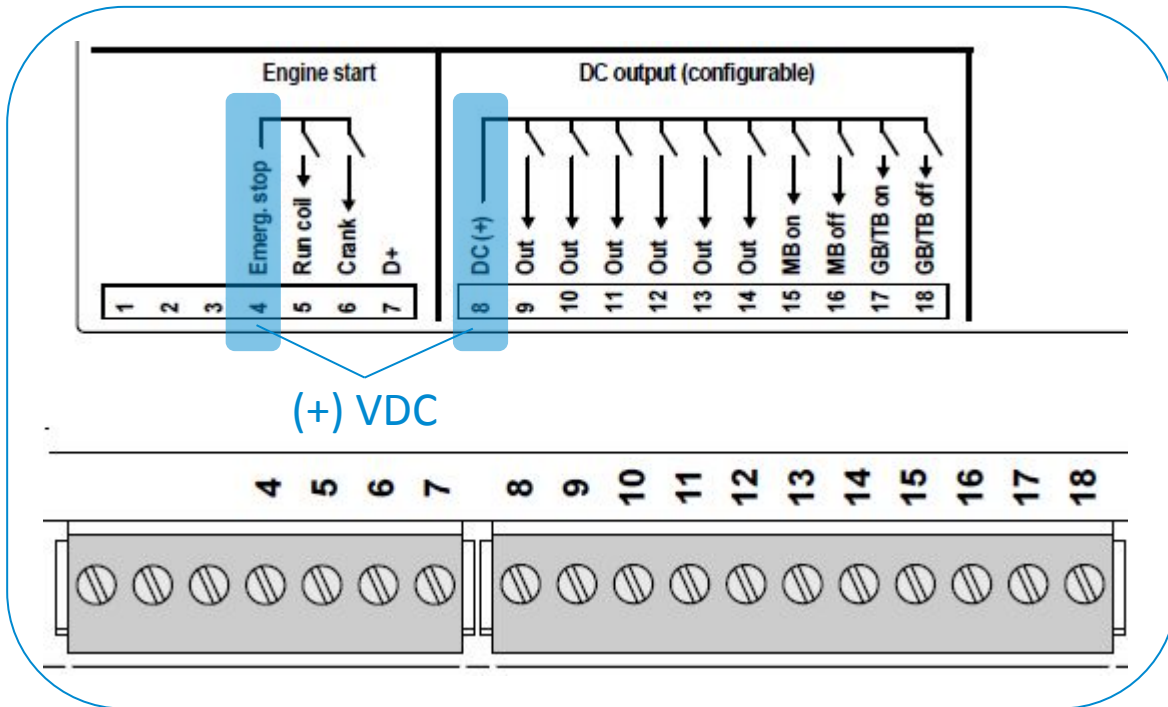
Terminal no.	Function	Remarks
39	Auto start/stop	For remote start signal
40	Not used	
41	Not used	
42	Not used	
43	Not used	
44	Not used	
45	Not used	
46	Not used	
47	Status MB ON	For application with Mains
48	Status MB OFF	For application with Mains
49	Status GB ON	
50	Status GB OFF	

Digital Output

12 digital outputs (DC outputs)

Require common positive (+) VDC

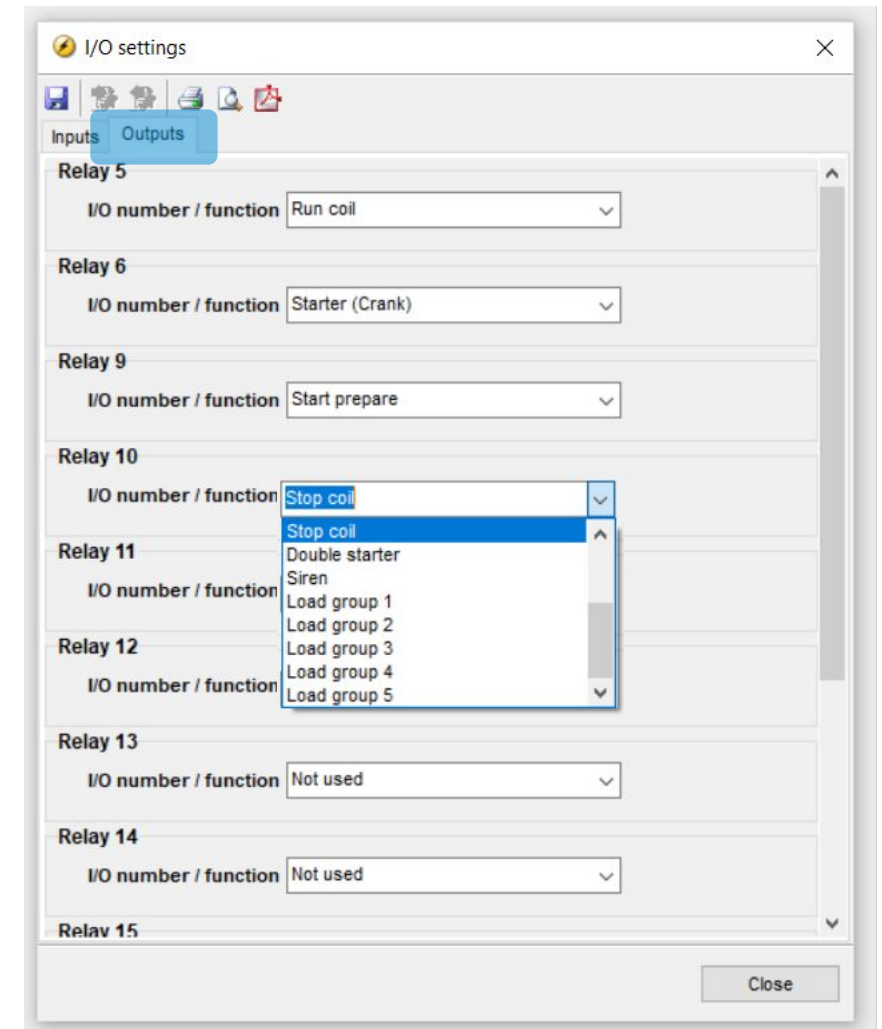
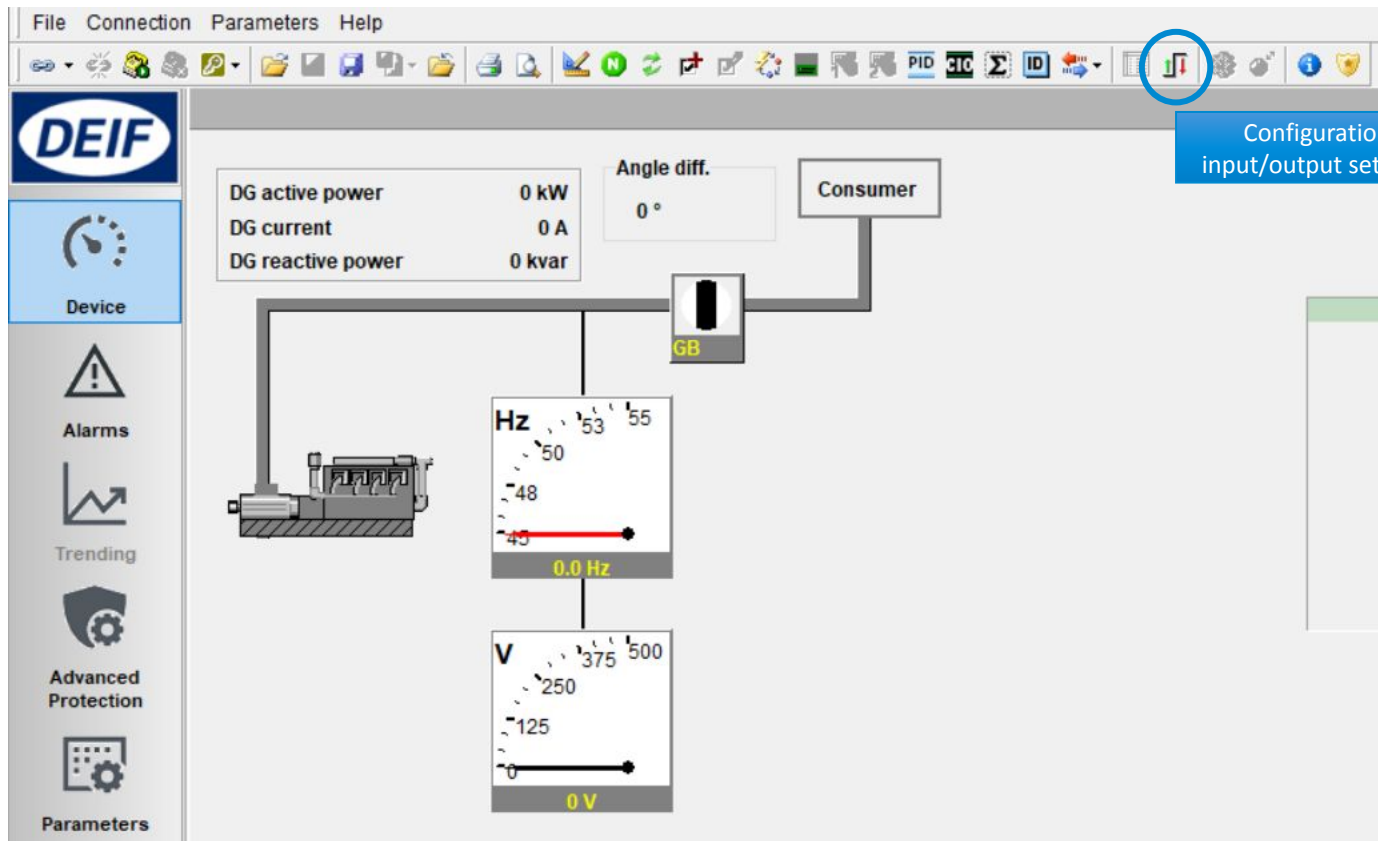
Configuration by USW



Digital Output

Setup digital output

Click icon *I/O settings*



Digital output

Default assignment:

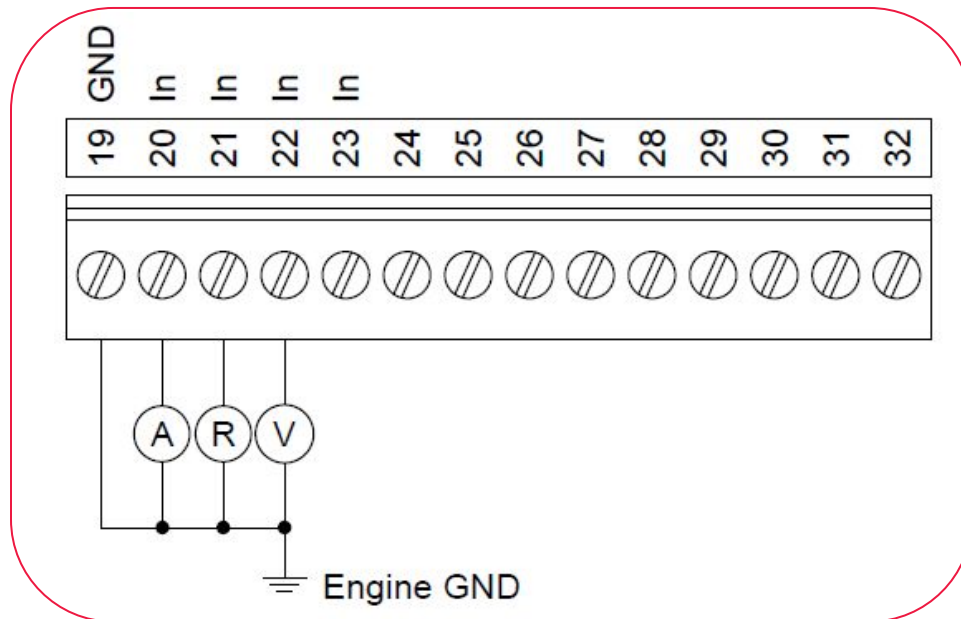
Terminal no.	Function	Remarks
4	Common (+) for DO 5-6	Also serves as Emergency stop
5	Run coil	
6	Starter (crank)	
-----	-----	-----
8	Common (+) for DO 9-18	
9	Start prepare	
10	Stop coil	
11	Status OK	
12	Horn	
13	Not used	
14	Not used	
15	MB ON	For application with Mains
16	MB OFF	For application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

Analog Input

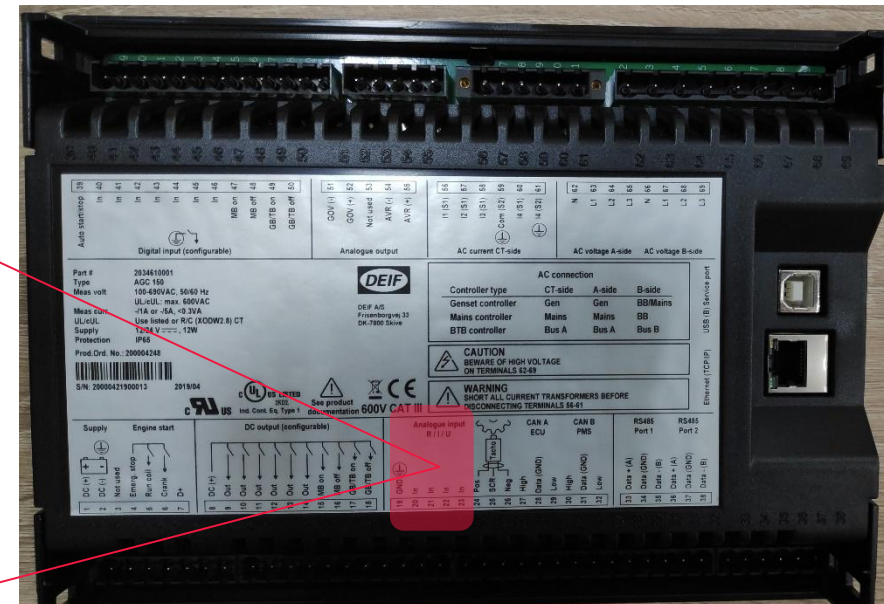
4 multi inputs

Selectable for:

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



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: 1/10

Selected curve

Input	Output
40	40
50	50
60	60
80	80
100	100
110	110
115	115
120	120

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

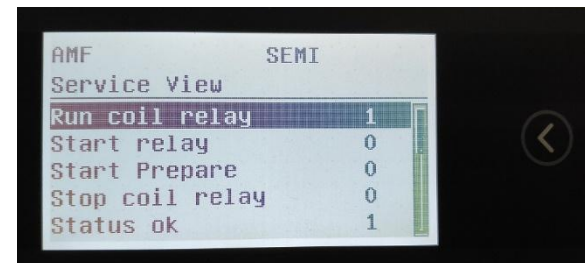
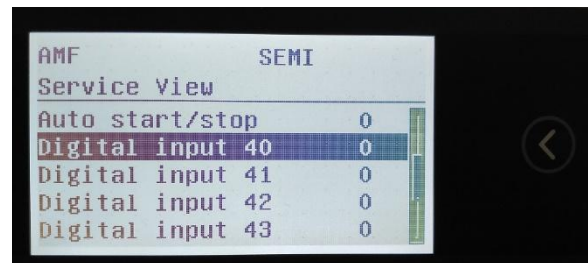
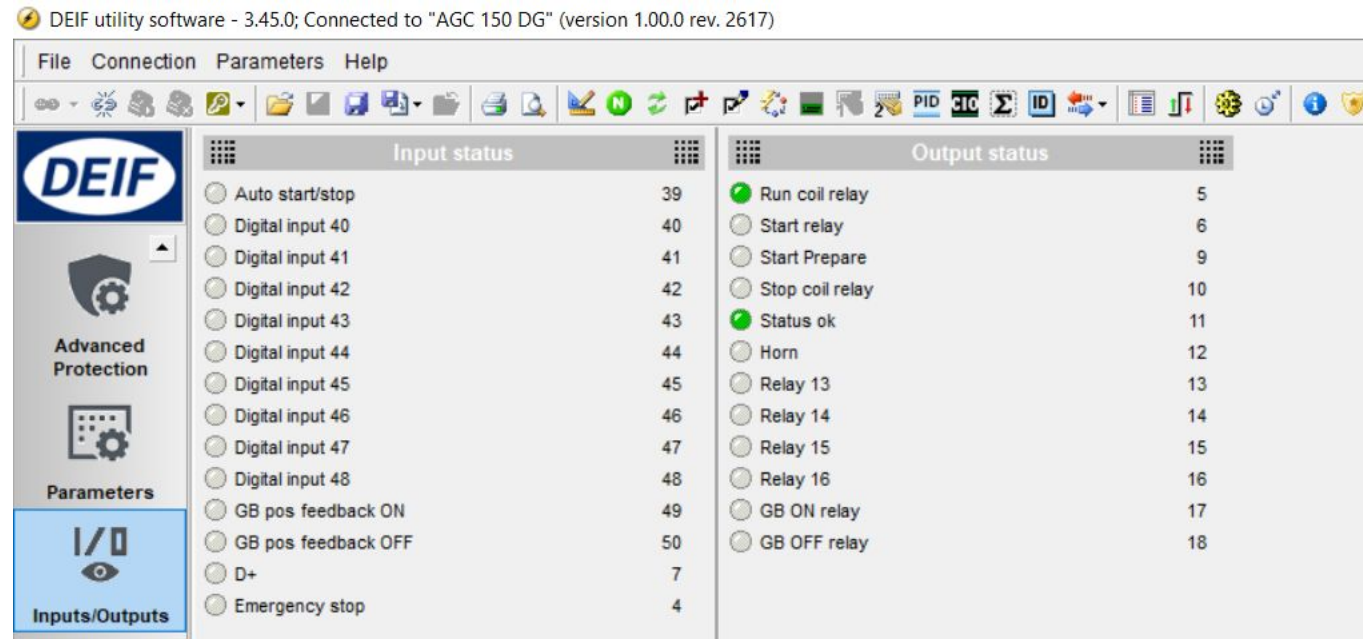
To change text, use **Translations**

The screenshot displays the DEIF software interface. A 'Find' dialog box is open, showing 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 of digital inputs, with 'Digital input 40' highlighted in blue and its value 'ENGINE FAULT' highlighted in green. The interface also includes a menu bar (File, Connection, Parameters, Help), a toolbar, and a sidebar with icons for 'Options', 'Logs', 'Translations', and 'M-Logic & AOP'.

Status	Master language	Language 4
	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

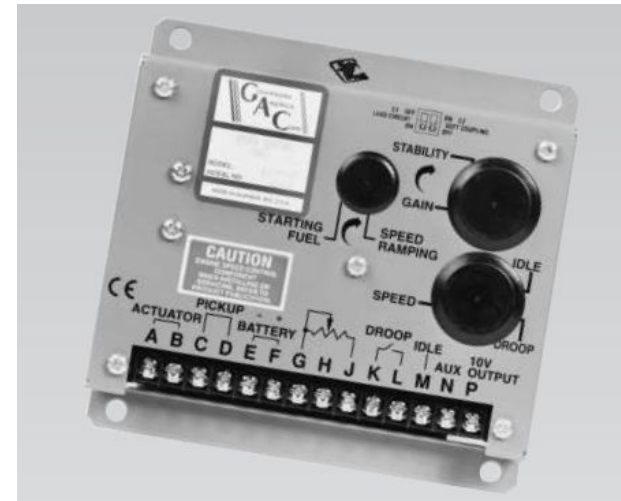
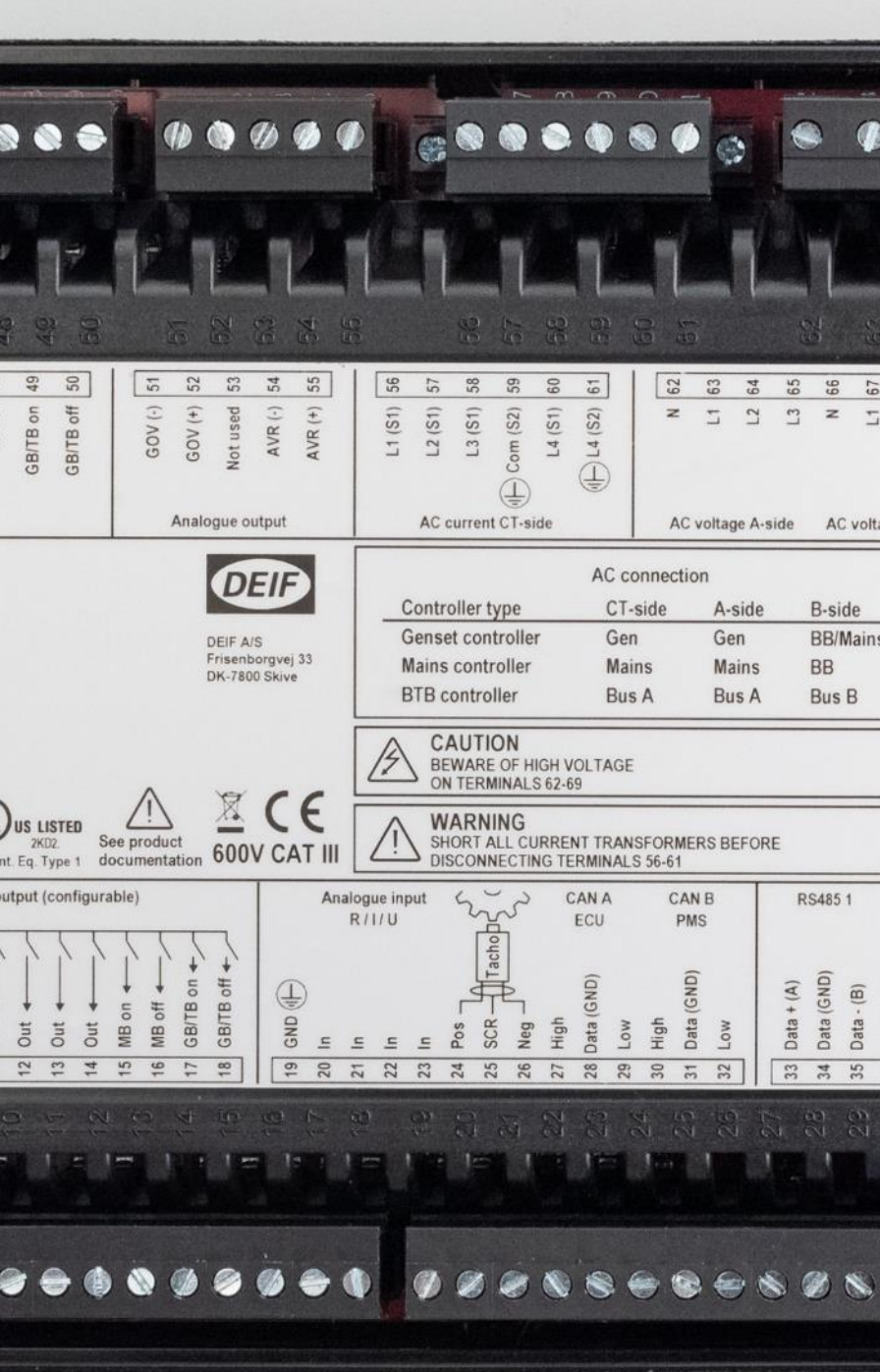
Any digital input/output can be monitored through USW and display



Analog Regulation

SPEED REGULATION - ANALOG

VOLTAGE REGULATION - ANALOG

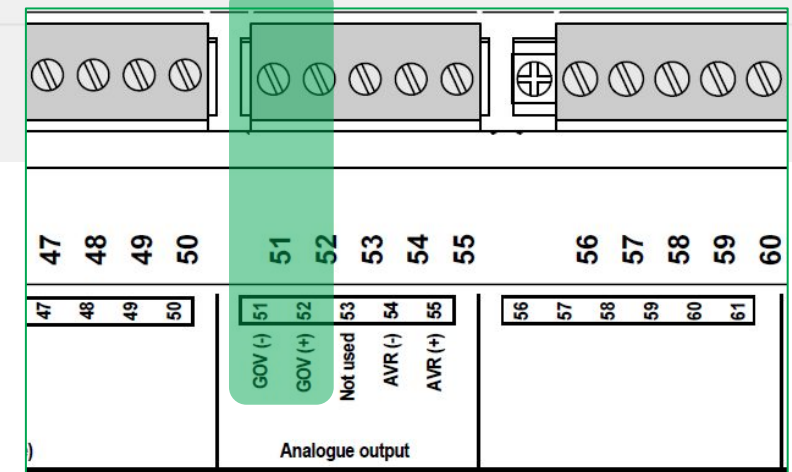


Speed Regulation - Analog

1. Setup terminal analog output

Parameter > Engine > Gov > *General configuration*

The screenshot shows the DEIF software interface with the 'General configuration' window open for the 'Reg. output GOV' parameter. The 'Set point' dropdown is set to 'Analogue', and the 'Output A' dropdown is set to 'Transducer 52'. A 'Parameter "Reg. output GOV" (Channel 2781)' dialog box is also visible, showing the 'Analogue' set point and 'service' password level. Green arrows point from the 'Analogue' and 'Transducer 52' selections in the main window to the dialog box. A 'More setting' button is highlighted in the bottom right corner.



Speed Regulation - Analog

2. Setting analog output range (VDC)

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

View mode: Tree List

DEIF

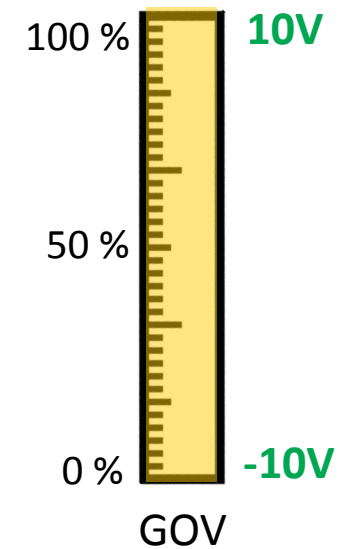
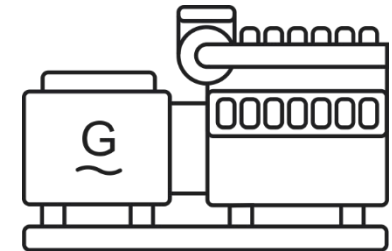
- > Basic settings
- > Communication
- > Engine
 - > Running detection
 - > Start sequence
 - > Stop sequence
 - > Gov
 - > General configuration
 - AOUT 52 limits**
 - PWM 52 setup
 - > Relay configuration
 - > EIC configuration
 - > Speed PID
 - Manuel step
 - Offset for control signal
 - Regulation failure
 - > Battery/Aux supply
 - > Protections
 - > Maintenance
 - Shutdown Override
- > Generator

AOUT 52 limits

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%.

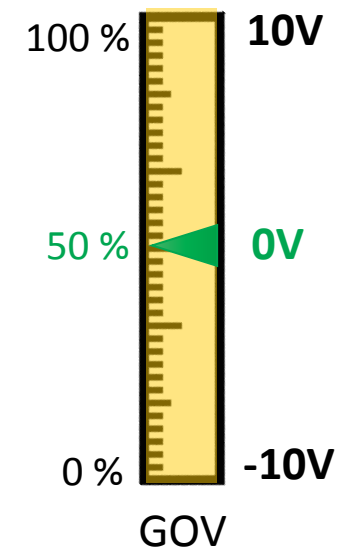
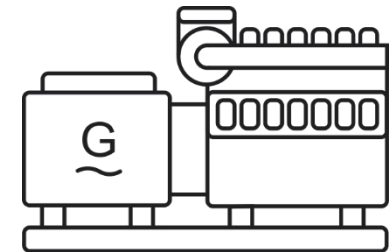
View mode: Tree List

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)

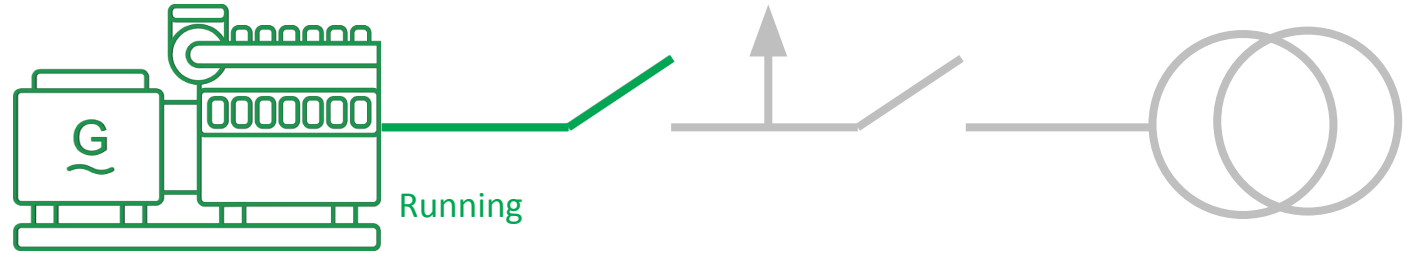


Speed Regulation – Analog Gain

1. PID Island

Parameter > Engine > Gov > Speed PID

> *Island (analog/EIC)*



The screenshot displays the DEIF control interface. The left sidebar shows a navigation tree with 'Island (analog/EIC)' selected. The main panel shows the configuration for this parameter, including three PID controller settings:

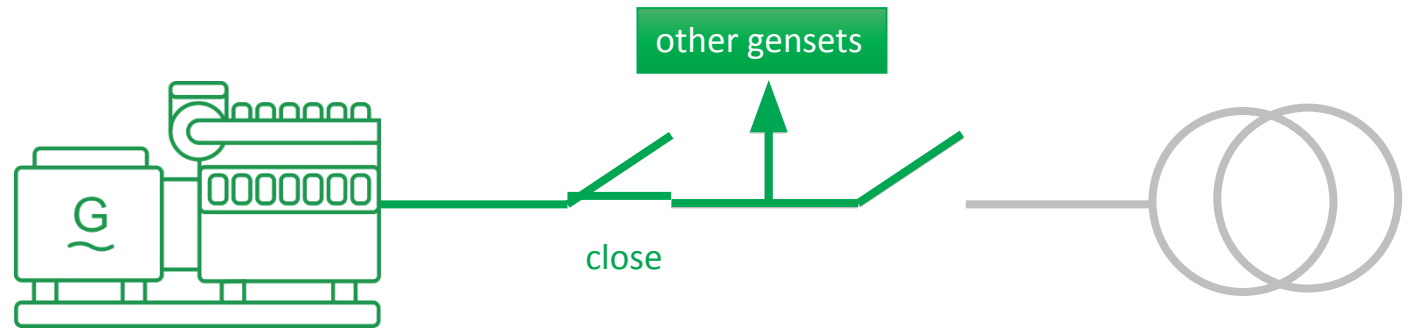
Parameter	Description	Set point	Range
f Kp	Proportional gain value of the PID controller for frequency regulation	2.5	(0 .. 60)
f Ti	Integral time value of the PID controller for frequency regulation	1.5 s	s (0 .. 60)
f Td	Differential time value of the PID controller for frequency regulation	0	s (0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

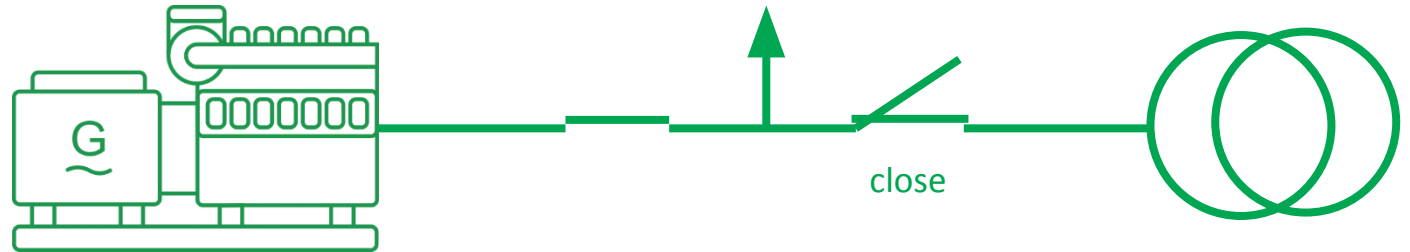
- P loadsh. f Kp**
Description: Proportional gain value of the PID controller for load sharing
Set point: 2.5 (0 .. 60)
- P loadsh. f Ti**
Description: Integral time value of the PID controller for load sharing
Set point: 1.5 s (0 .. 60)
- P loadsh. f Td**
Description: Differential time value of the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



The screenshot shows the DEIF control interface. On the left is a navigation tree with the following structure:

- 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

The main panel displays the configuration for 'Mains parallel (analog/EIC)'. It includes three PID parameters:

- P Kp**: Proportional gain value of the PID controller for power regulation. Set point: 2.5 (range 0 .. 60).
- P Ti**: Integral time value of the PID controller for power regulation. Set point: 1.5 s (range 0 .. 60).
- P Td**: Differential time value of the PID controller for power regulation. Set point: 0 s (range 0 .. 2).

Voltage Regulation - Analog

1. Setup terminal analog output

Parameter > Generator > AVR > *General configuration*

The screenshot displays the DEIF control software interface. On the left is a navigation tree with 'Parameters' selected. The main area shows the 'General configuration' for 'Reg. output AVR'. The 'Set point' is set to 'Analogue'. Below, the 'AVR output' section shows 'Output A' set to 'Transducer 55'. A modal window titled 'Parameter "Reg. output AVR" (Channel 2782)' is open, showing the same configuration options. A blue box labeled 'More setting' is positioned near the modal. At the bottom right, a terminal block diagram shows terminals 47-61. A blue vertical bar highlights terminals 54 and 55, which are labeled 'AVR (-)' and 'AVR (+)' respectively. A blue line connects the 'Transducer 55' dropdown in the software to terminal 55 in the 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](#)

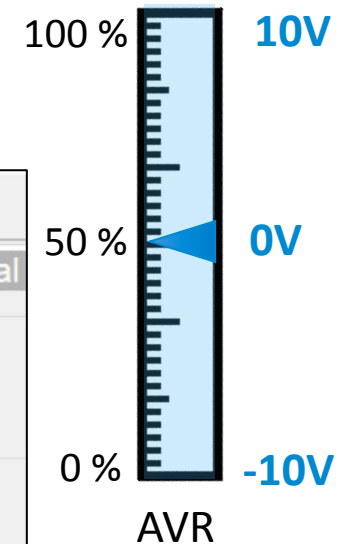
Parameter > Generator > AVR > [Offset for control signal](#)

The screenshot shows the DEIF parameter configuration interface. 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:

- View mode:** Tree (selected), List
- Navigation:** Basic settings, Communication, Engine, Generator > AC configuration > AVR > General configuration > AOUT 55 Limits
- 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:

- View mode:** Tree (selected), List
- Navigation:** Basic settings, Communication, Engine, Generator > AC configuration > AVR > General configuration > Offset for control signal
- 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 is a navigation sidebar with icons for Device, Alarms, Trending, and Advanced Protection. The main area shows a tree view of parameters under 'Generator > AVR > Voltage PID'. Three overlapping windows are shown, each displaying a different parameter's configuration page:

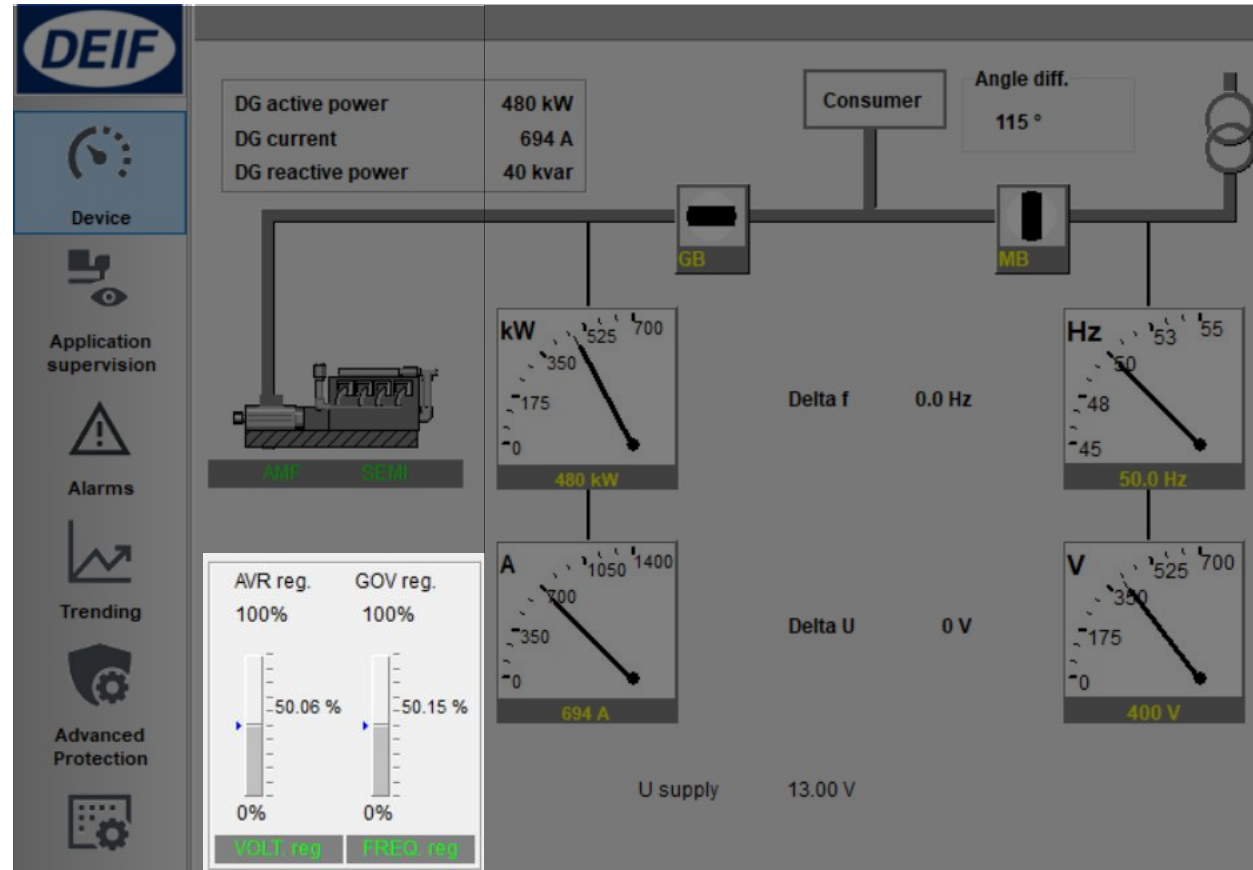
- Island (analog/EIC)**: Shows the 'U Kp' parameter.
- Load share (analog/EIC)**: Shows the 'Q loadsh. U Kp' parameter.
- Mains parallel (analog/EIC)**: Shows three parameters: 'Q Kp', 'Q Ti', and 'Q Td'.
 - Q Kp**: Description: Proportional gain value of the PID controller for reactive power regulation. Set point: 2.5 (range 0..60).
 - Q Ti**: Description: Integral time value of the PID controller for reactive power regulation. Set point: 1.5 s (range 0..60).
 - Q Td**: Description: Differential time value of the PID controller for reactive power regulation. Set point: 0 s (range 0..2).

Analog Regulation Status

Check **Device**

> *Governor reg.*

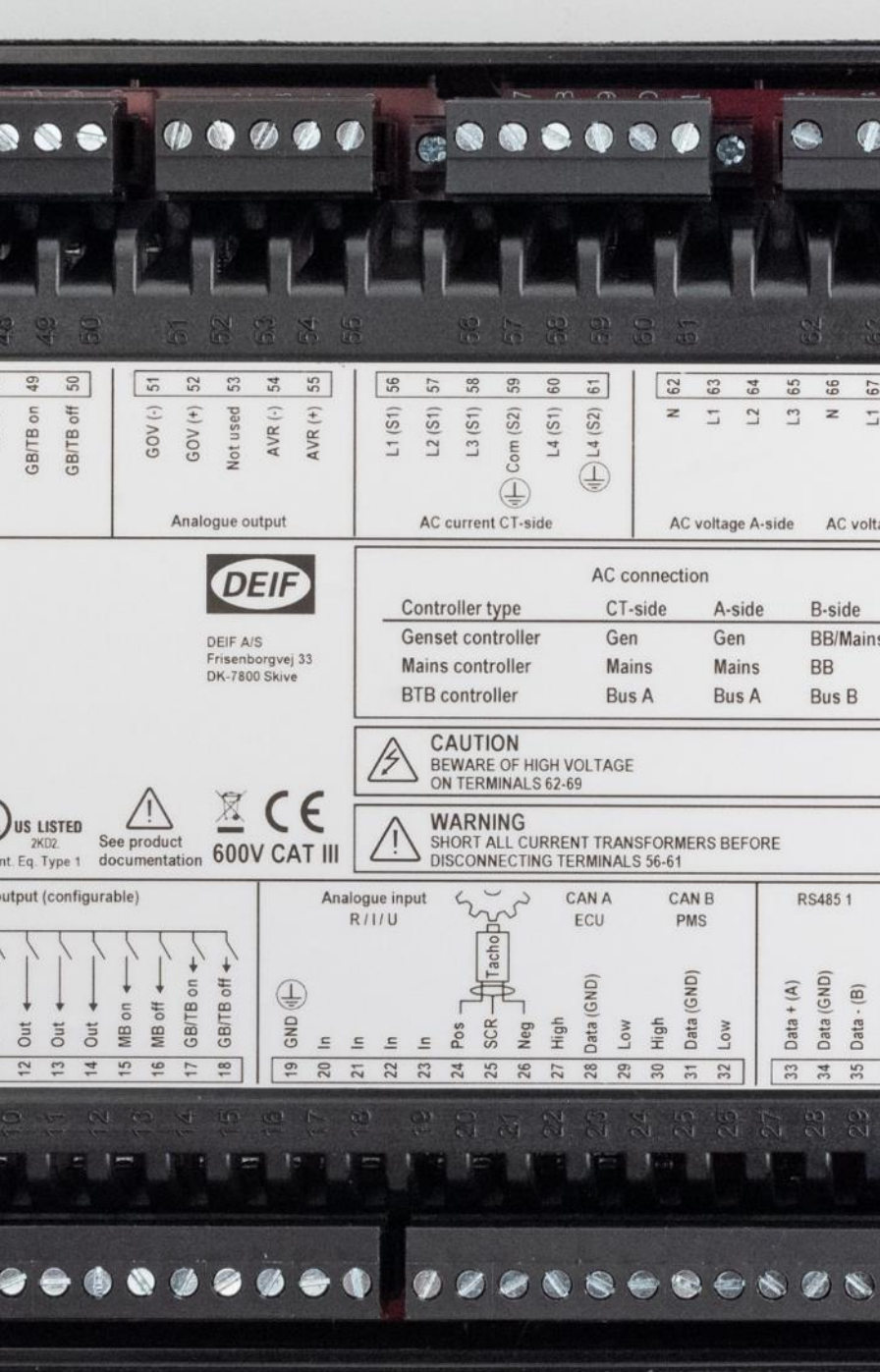
> *AVR reg.*



Relay regulation

SPEED REGULATION - RELAY

VOLTAGE REGULATION - RELAY



Speed Regulation - Relay

1. Change Gov setting to relay

Parameter > Engine > Gov > *General configuration*

The screenshot shows the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and Advanced. The main area is titled 'General configuration' and contains the following settings:

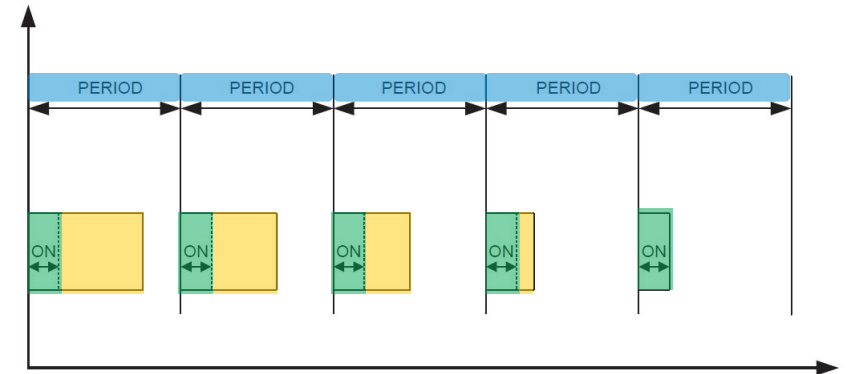
- Reg. output GOV**
 - Description: Selection of regulation output used for governor regulation
 - Set point: **EIC** (dropdown menu is open, showing options: EIC, **Relay**, Analogue, EIC)
- Governor output**
 - Description: Transducer selection number in case of analogue output for the speed governor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



View mode: Tree List

DEIF

- > Basic settings
- > Communication
- > Engine
 - > Running detection
 - > Start sequence
 - > Stop sequence
- > Gov
 - > General configuration
 - > Relay configuration
 - Output and period**
 - > EIC configuration
 - > Speed PID
 - Manuel step
 - Offset for control signal
 - Regulation failure
 - > Battery/Aux supply
 - > Protections
 - > Maintenance
 - Shutdown Override
- > Generator

Output and period

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)

Output A: Terminal 13 → Increase

Output B: Terminal 14 → Decrease

Select any unused DO

Speed Regulation - Relay

3. Setup speed Gain

Parameter > Engine > Gov > Speed PID >

□ Island (relay)

□ Load share (relay)

□ Mains Parallel (relay)

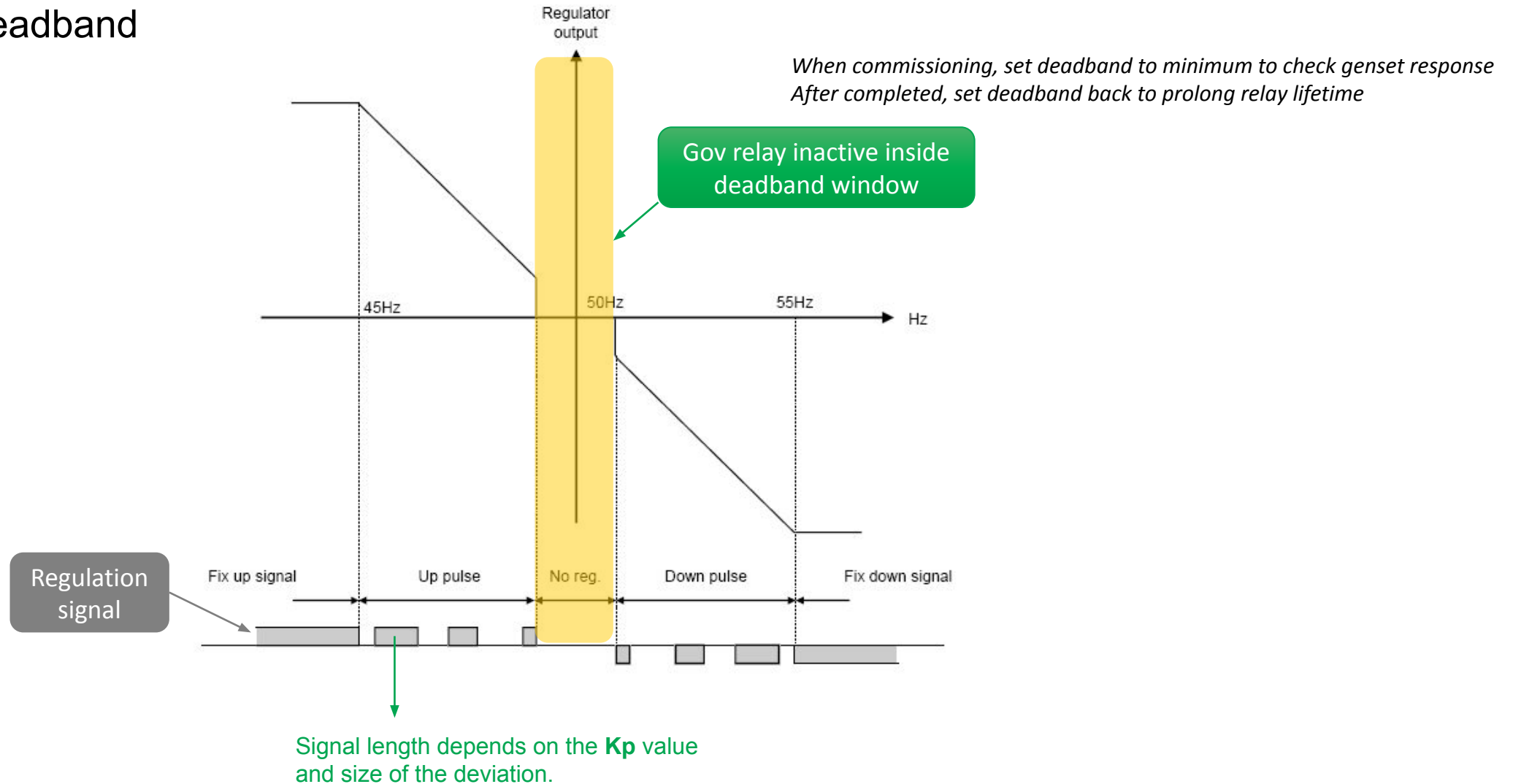
The screenshot displays the DEIF control interface. On the left, there is a sidebar with icons for 'Device', 'Alarms', and 'Trending'. The main area shows a tree view of parameters under 'Engine > Gov > Speed PID'. Three panels are overlaid on the interface, each showing the configuration for a specific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

- Island (relay)**: Shows the 'P deadband' parameter with a set point of 2 % (0.2 .. 10).
- Load share (relay)**: Shows the 'P Kp relay' parameter with a set point of 10 (0 .. 100).
- Mains parallel (relay)**: Shows the 'P deadband' parameter with a set point of 2 % (0.2 .. 10).

The interface also includes a 'View mode' selector (Tree/List) and a 'DEIF' logo in the top left corner.

Speed Regulation - Relay

Regulation Deadband



Voltage Regulation - Relay

1. Change AVR setting to relay

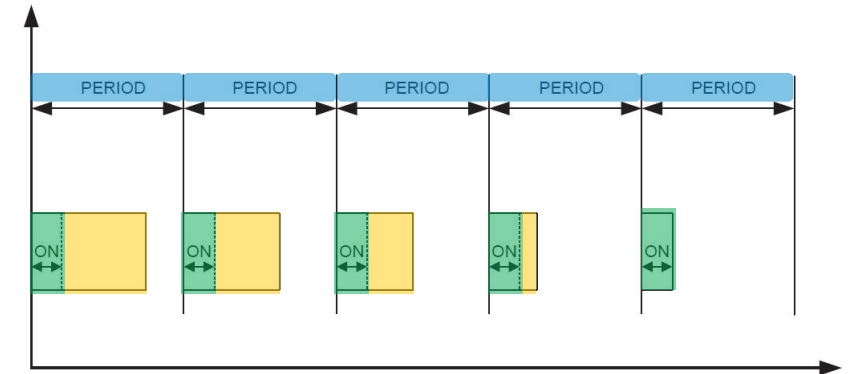
Parameter > Generator > AVR > *General configuration*

The screenshot displays the DEIF control interface. On the left is a navigation menu with icons for Device, Alarms, Trending, and Advanced. The main area shows the 'General configuration' page for the AVR. The 'Reg. output AVR' section has a description: 'Selection of regulation output used for AVR regulation'. The 'Set point' dropdown menu is open, showing options: EIC, Relay, Analogue, and EIC. A blue arrow points to the 'Relay' option with the text 'Select "Relay"'. The 'AVR output' section has a description: 'Transducer selection number in case of analogue output for the voltage regulator'. The 'Output A' dropdown menu is set to 'Transducer 55'. A grey arrow points to the 'Output A' dropdown menu with 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

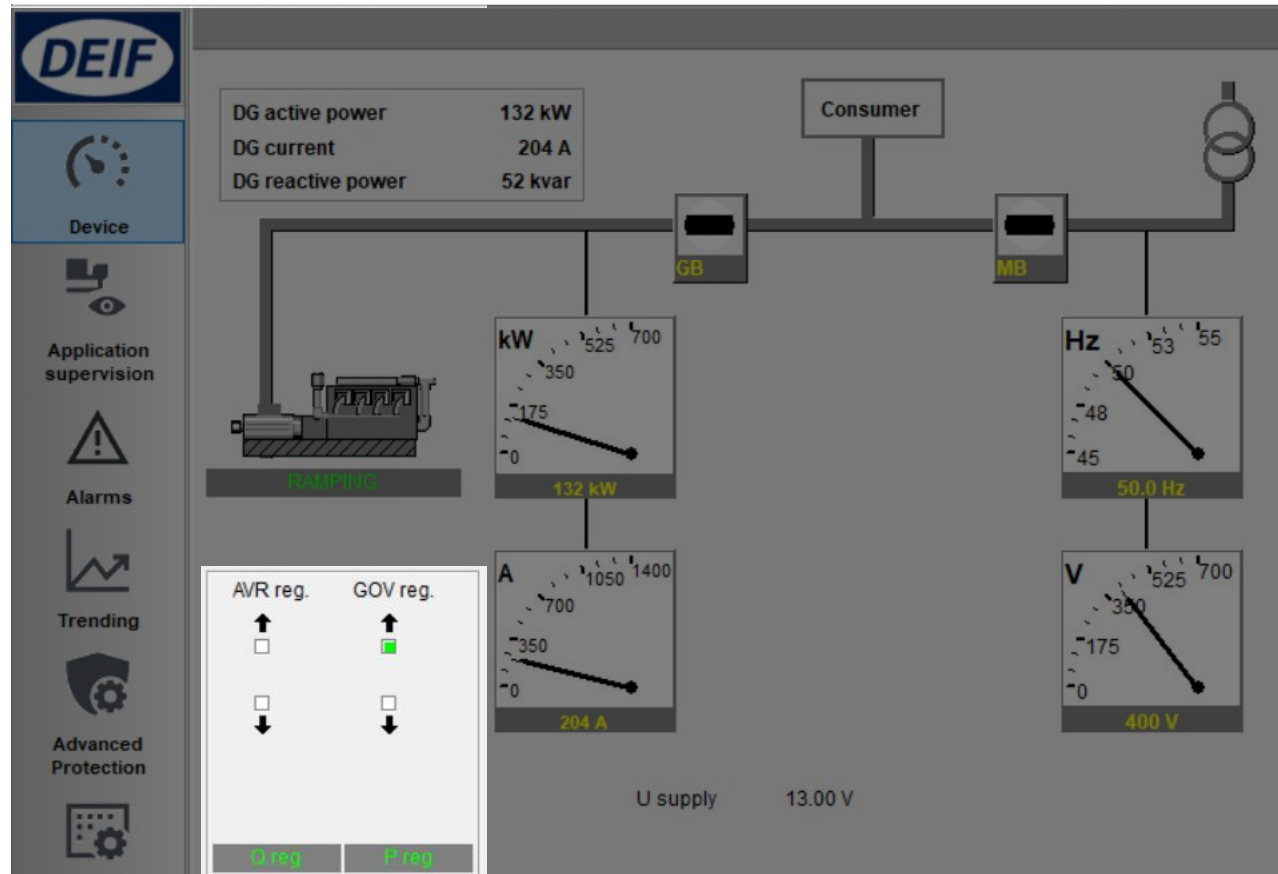
The screenshot displays the DEIF control software interface. On the left, a navigation tree shows the hierarchy: Basic settings, Communication, Engine, Generator, AC configuration, AVR, and Voltage PID. The 'Voltage PID' section is expanded, showing 'Island (relay)', 'Load share (relay)', and 'Mains parallel (relay)'. The main content area features three overlapping panels for each relay type. The 'Island (relay)' panel shows 'Q L S U deadband' with a description: 'Deadband of the voltage regulation in load sharing'. The 'Load share (relay)' panel shows 'Q deadband' with a description: 'Deadband of the controller for reactive power regulation' and a 'Set point' of 2%. The 'Mains parallel (relay)' panel shows 'Q Kp relay' with a description: 'Proportional gain value for the reactive power regulation' and a 'Set point' of 10. The right-hand panel contains the 'Q deadband' and 'Q Kp relay' settings, each with a slider and a numerical input field.

Relay Regulation Status

Check **Device**

> *Governor reg.*

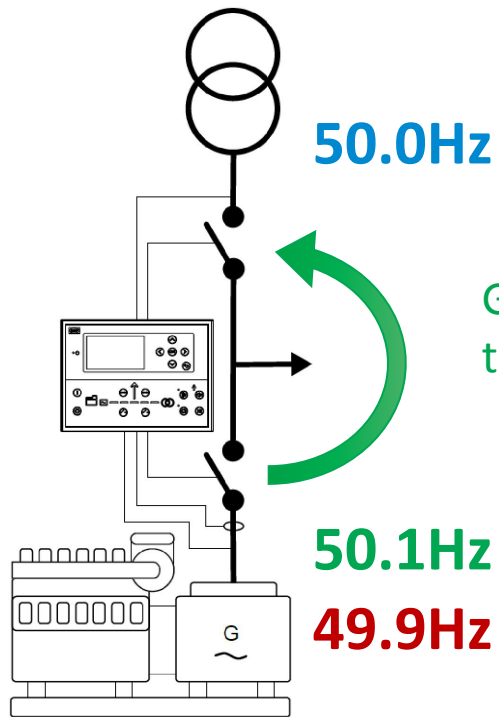
> *AVR reg.*



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 'Dynamic synchronisation'. The 'Slip Frequency' section includes 'Sync. dfMax' (Max. allowable frequency difference for Dynamic synchronisation) with a set point of 0.3 Hz, and 'Sync. dfMin' (Min. allowable frequency difference for Dynamic synchronisation) with a set point of 0 Hz.

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

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 Voltage' (highlighted in green) and 'Dynamic synchronisation'. The 'Slip Voltage' section includes 'Sync. dUMax' (Max. allowable voltage difference for Dynamic synchronisation) with a set point of 5%, and 'Sync. dUMin' (Max. allowable value the regulated voltage must be below voltage to sync to) with a set point of -5%.

Application

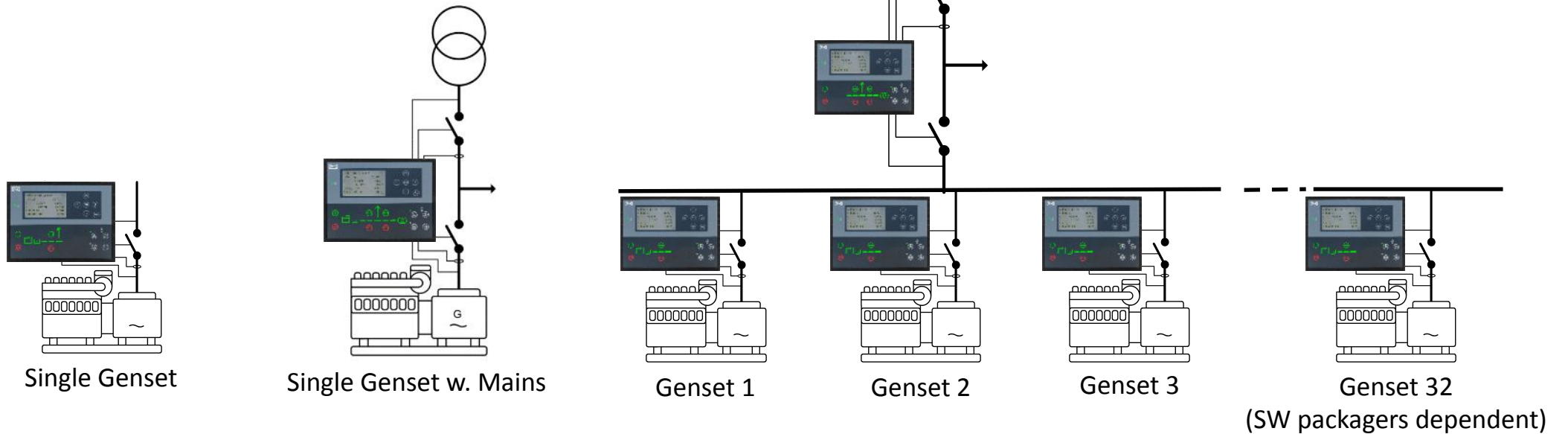
SINGLE GENSET

MULTIPLE GENSETS



Typical Applications for AGC 150

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

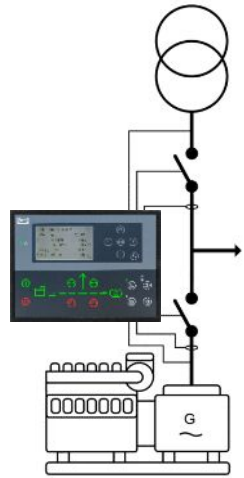


Application

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, a gear, and a plug. 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

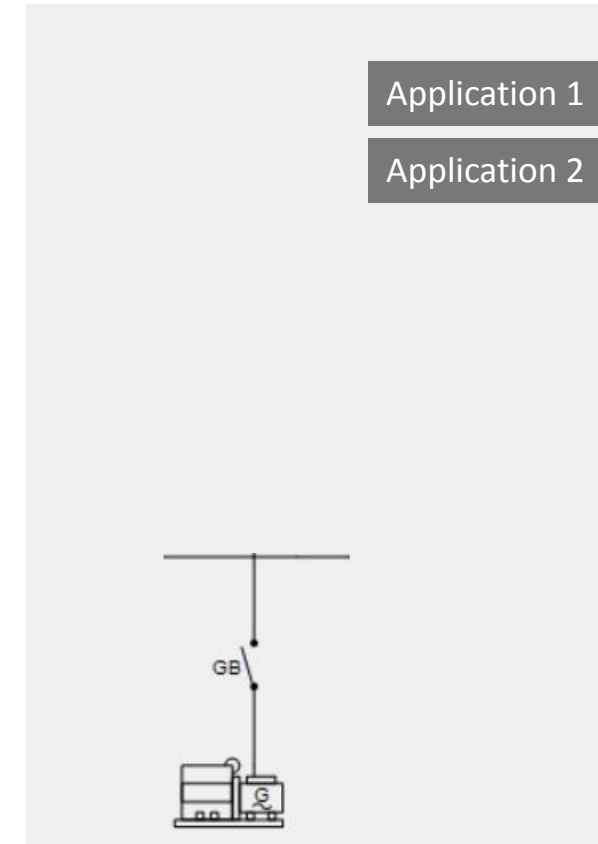
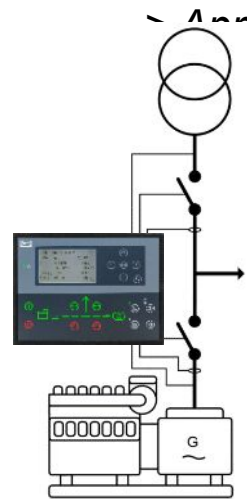
Alternative setup:*

Access from AGC 150 display:

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

Application select > Active Application

Use active application from [1] to [2]

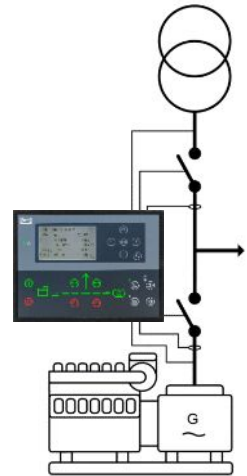


*Only works if application 2 in default factory setting

Single Genset

Select Genset Mode

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

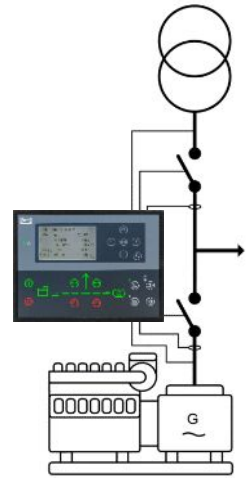


The screenshot shows the DEIF control interface. The left sidebar contains navigation icons for Device, Alarms, Trending, Advanced Protection, and Parameters. The main area displays a tree view of settings under 'Basic settings' > 'Application type' > 'Genset type' > 'Genset/plant mode'. The 'Genset/plant mode' section is expanded, showing a 'Description: Generator running mode' and a 'Set point:' dropdown menu. The dropdown menu is open, showing 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 top right of the interface shows 'View mode: Tree' and 'List'.

Single Genset

Enable Back Synchronising

Parameter > Synchronisation > *Mains parallel settings*



The screenshot shows the DEIF control interface. The left sidebar contains navigation icons for Device, Alarms, Trending, and a gear icon. The main area displays a tree view of settings. The 'Synchronisation' folder is expanded, and 'Mains parallel settings' is selected. The right pane shows the configuration for 'Mains parallel settings'.

View mode: Tree List

DEIF

> 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

Mains parallel settings

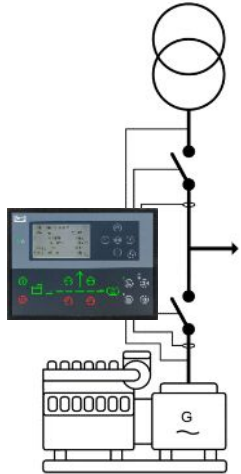
Back Synchronising
 Description: synchronising ON/OFF

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

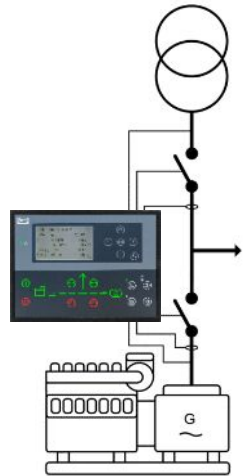
Mains Ok delay

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

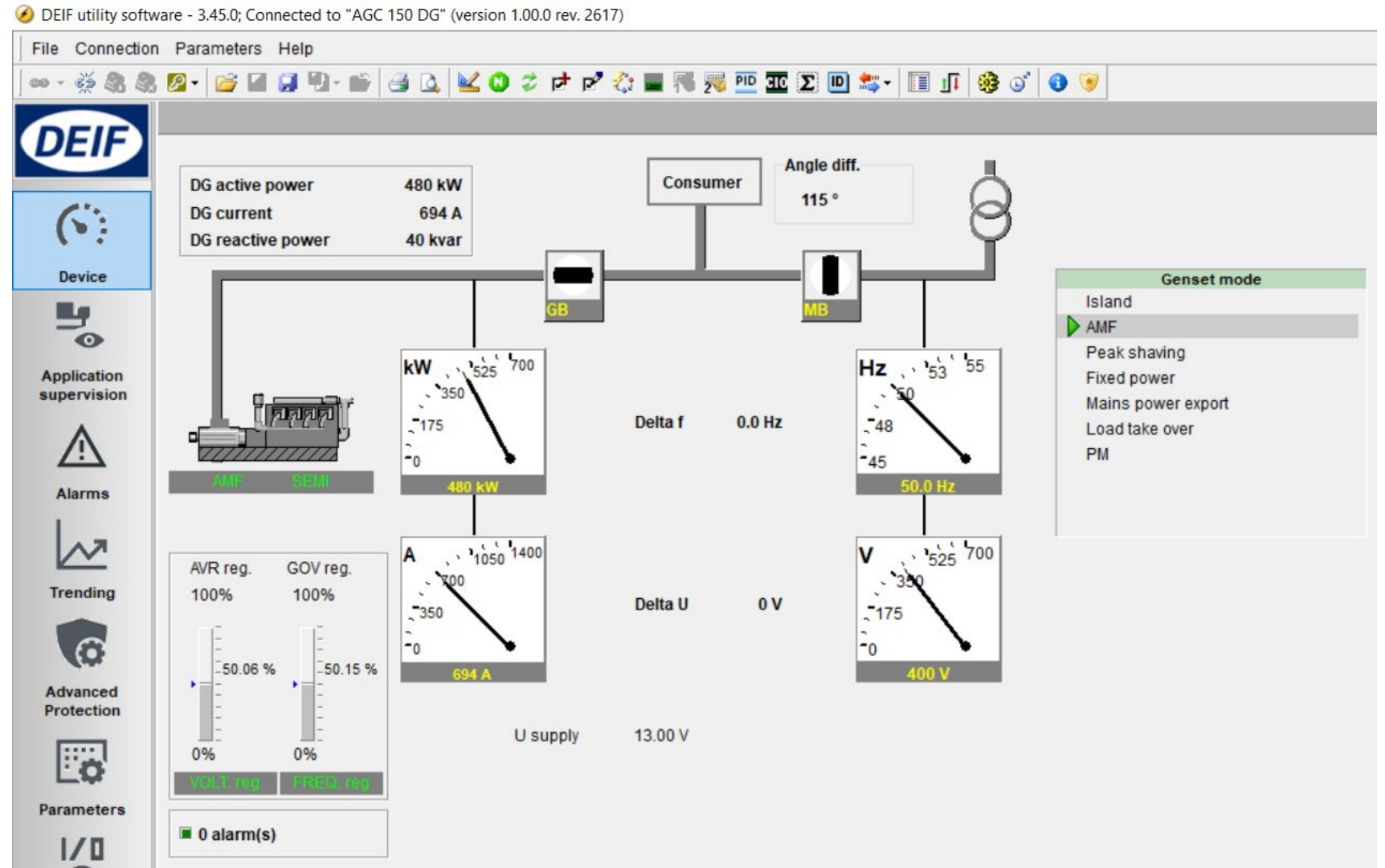
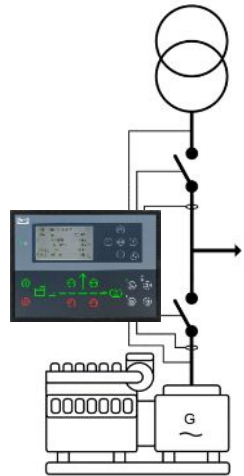
Description: set point for mains voltage range high

Set point: % (100 .. 120)

Single Genset

Or **Device**

For detailed monitoring

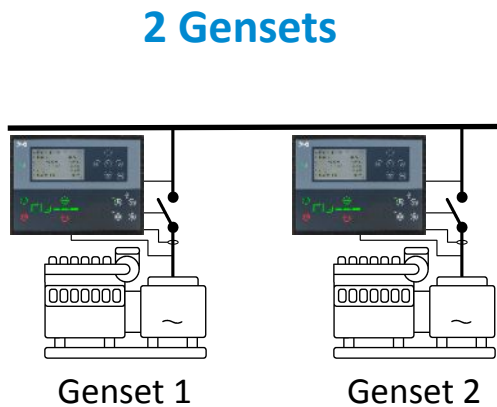


Application

MULTIPLE GENSETS

Multiple Gensets

- *Application configuration*
- *New plant configuration*



File Connection Parameters Help

Area control Plant totals

Area 1 of 1

Area configuration - Top

Source None

ID 0

Bottom

Source Diesel gen

ID 0

Redundant controller

GB Pulse

< Add Delete Add >

Application 1: Standard plant

GS1 GS2

Plant options

Product AGC 15 "Standard"

Plant type Standard

Single DG

Standard

Gen-set group

Name:

Bus Tie options

Wrap bus bar

Power management CAN

Primary CAN

Secondary CAN

Primary and Secondary CAN

CAN bus off (stand-alone application)

Application emulation

Off

Breaker and engine cmd. active

Breaker and engine cmd. inactive

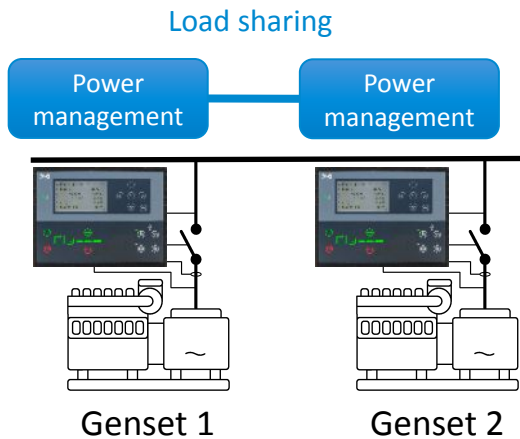
OK Cancel

Not connected

Multiple Gensets

Select Genset Mode

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

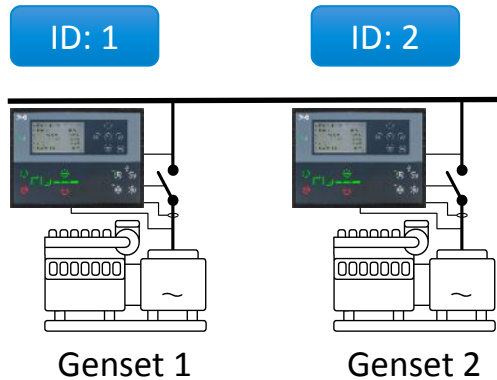


The screenshot shows the DEIF control interface. The left sidebar contains navigation icons for Device, Alarms, Trending, Advanced Protection, and Parameters. The main area displays a tree view of settings under 'Basic settings' > 'Application type' > 'Genset type' > 'Genset/plant mode'. The right pane shows the 'Genset/plant mode' configuration with a 'Set point' dropdown menu open, listing 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 in the dropdown with the text 'select power management'. The 'View mode' is set to 'Tree'.

Multiple Gensets

Setup ID Number

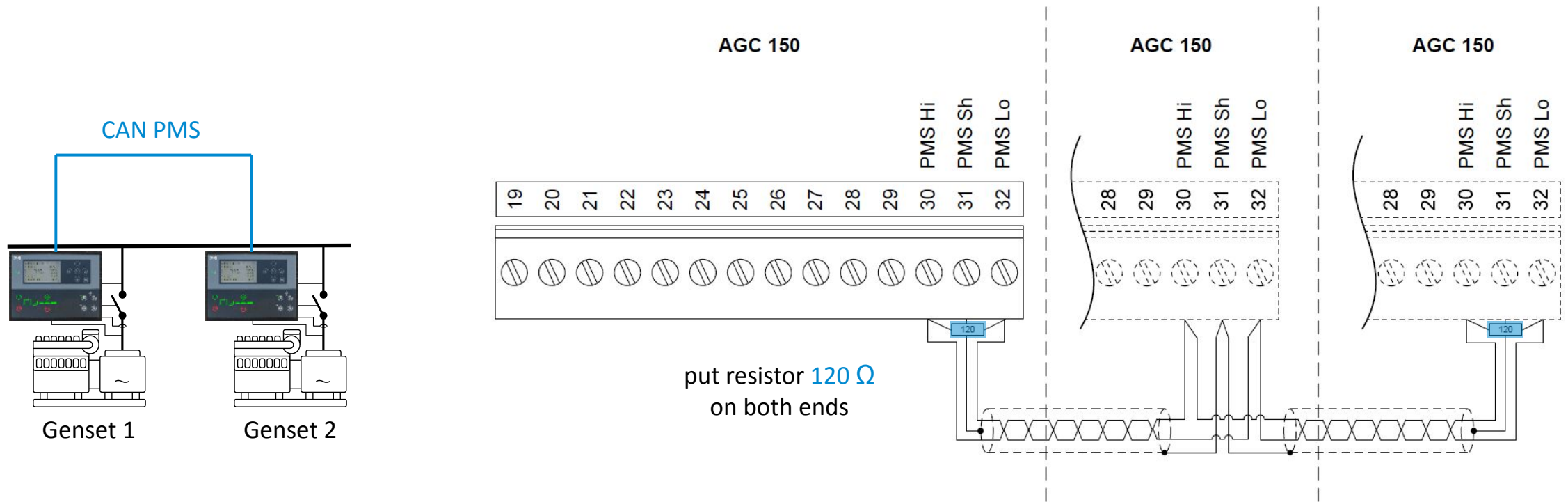
Parameter > Communication > *Power management ID*



The screenshot shows the DEIF control interface. The left sidebar contains the DEIF logo and navigation icons for Device, Alarms, Trending, and a gear icon. The main area is titled 'View mode: Tree' and 'List'. The navigation tree on the left includes 'Basic settings', 'Communication' (expanded), 'RS485', 'CAN protocols', 'Ethernet comm. error', 'Engine', 'Generator', 'Busbar', 'Mains', 'Breakers', 'Synchronisation', 'Power set points', 'Power management', 'I/O settings', 'Functions', 'Alternative configuration', and 'USW specific parameters'. The 'Power management ID' parameter is selected, showing a description of 'Internal communication ID number' and a set point of '1' (range 1..32). A blue callout box with the text 'add ID on every genset' is overlaid on the interface.

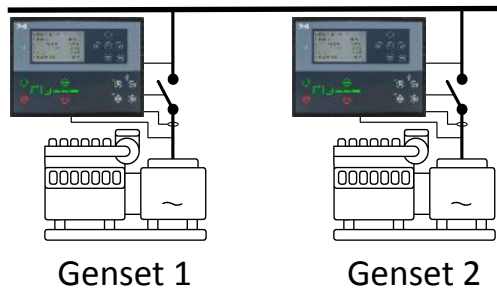
Multiple Gensets

CANbus wiring



Multiple Gensets

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

- Gen-sets
- NotRunning Ready to autostart
- NotRunning Not ready to autostart
- Running Hz/V blackout
- Running Hz/V Ok
- Running Hz/V not Ok
- Symbols
- Alarm
- No info

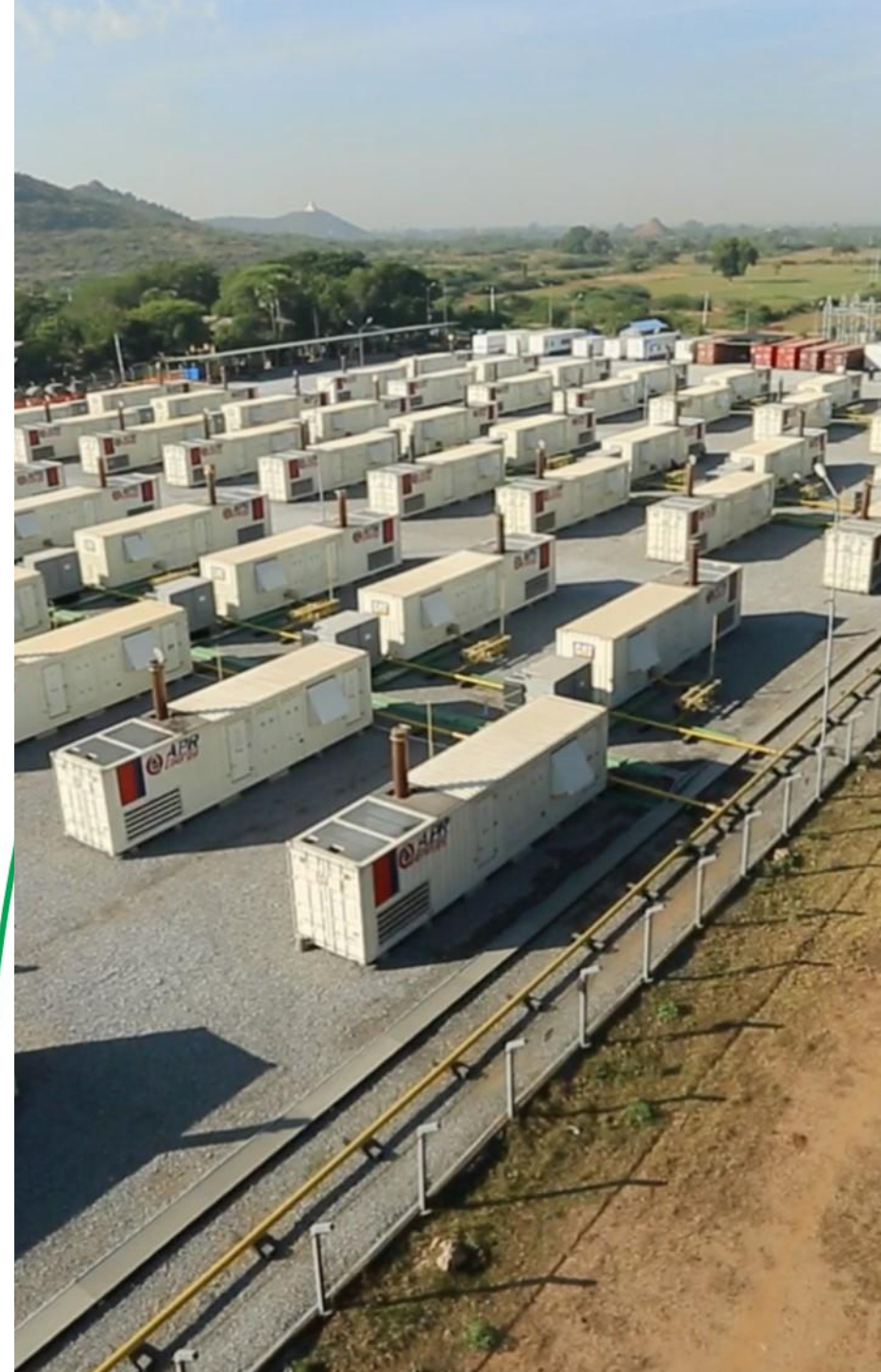
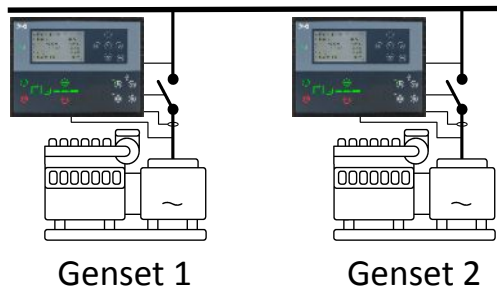
Communication active Connected to "AGC 150 DG" (version 1.00.0 rev. 2617) COM3 (ID 1)

Incorrect communication
will be shown

Power Management

LOAD DEPENDENT START/STOP

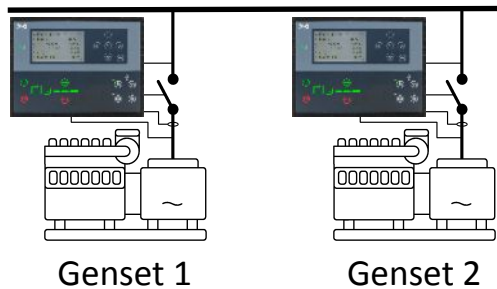
MULTI START



Load dependent start/stop

Configure Start/stop based on load Percentage

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

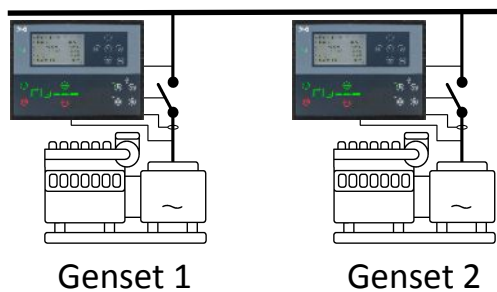


The screenshot shows the DEIF control interface. On the left is a navigation tree with categories: Basic settings, Communication, Engine, Generator, Busbar, Mains, Breakers, Synchronisation, Power set points, and Power management. Under 'Power management', 'Load dependent Start/stop configuration' is selected. The main panel is titled 'Load dependent Start/stop' and contains two sections: 'Ld. start/stop unit' and 'Ld. start/stop type'. The 'Ld. start/stop unit' section has a description: 'Selection of either kW or kVA for calculation of the Load dependent Start and Stop values' and a 'Set point' dropdown menu currently set to 'kW'. The 'Ld. start/stop type' section has a description: 'Selection of either Percentage or Value for calculation of the Load dependent Start and Stop values' and a 'Set point' dropdown menu with three options: 'Value', 'Value', and 'Percentage'. A green arrow points to the 'Percentage' option with the text 'Set as Percentage'.

Load dependent start/stop

Start percentage setpoint

Parameter > Power management > *Load dependent start 1*



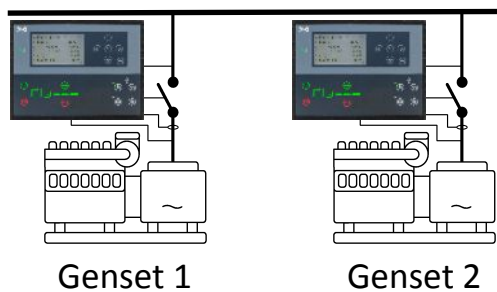
The screenshot displays the 'Parameters' menu in a control interface. The 'Power management' section is expanded, and 'Load dependent start 1' is selected. The configuration page for this parameter is shown on the right, titled 'Load dependent start 1'. It includes the following settings:

- 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*



Advanced Protection

Parameters

- > 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
 - Load dependent start 1
 - Load dependent start 2
 - Load dependent stop 1**
 - Load dependent stop 2
 - Multi start set
 - > Priority
 - Available power
 - Communication failures
 - Busbar alarms
 - Additional power management settings
- > I/O settings
- > Functions
- > Alternative configuration
- > USW specific parameters

Inputs/Outputs

Multi Input

Options

Load dependent stop 1

Ld. stop limit P
Description: Setting for Load dependent Stop in kW
Set point: 200 kW (1 .. 20000)

Ld. stop limit S
Description: Setting for Load dependent Stop in KVA
Set point: 200 kVA (1 .. 20000)

Ld. stop limit %
Description: Setting for Load dependent Stop in Percentage % capacity after 1 genset removed
Set point: 70 % (1 .. 100)

Ld. stop timer
Description: Setup of Load dependent Stop limits Stopping delay
Timer: 30 sec (5 .. 990)

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. 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'.

Questions?



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