



-power in control

POWER & CONTROL TECHNOLOGY: CRITICAL POWER

For These Customers, Down-time Is Simply Not An Option

DEIF has a strong track record in developing emergency, standby and backup power solutions for mission-critical facilities and businesses including life safety, medical, industrial process control, data centres, telecommunications, and television and radio broadcast systems.

Resilient turnkey packages, DEIF's solutions incorporate intelligent power distribution and controls, switchgear, and generator and grid protection to guarantee uninterrupted power supplies in cases of mains failure.

We design and integrate system architecture with unique standby capacities and can deliver record start-up from an impressive six seconds for multiple gensets in parallel, redundant control systems, or even an entire redundant power plant.

DEIF has the technology and the capability to install rock solid critical power solutions without interrupting or bringing risk to your current systems.

This too sets us apart from our competitors.



Florent Simon
Product Manager
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Critical Applications Include:

Data



Medical



Telecom



Financial

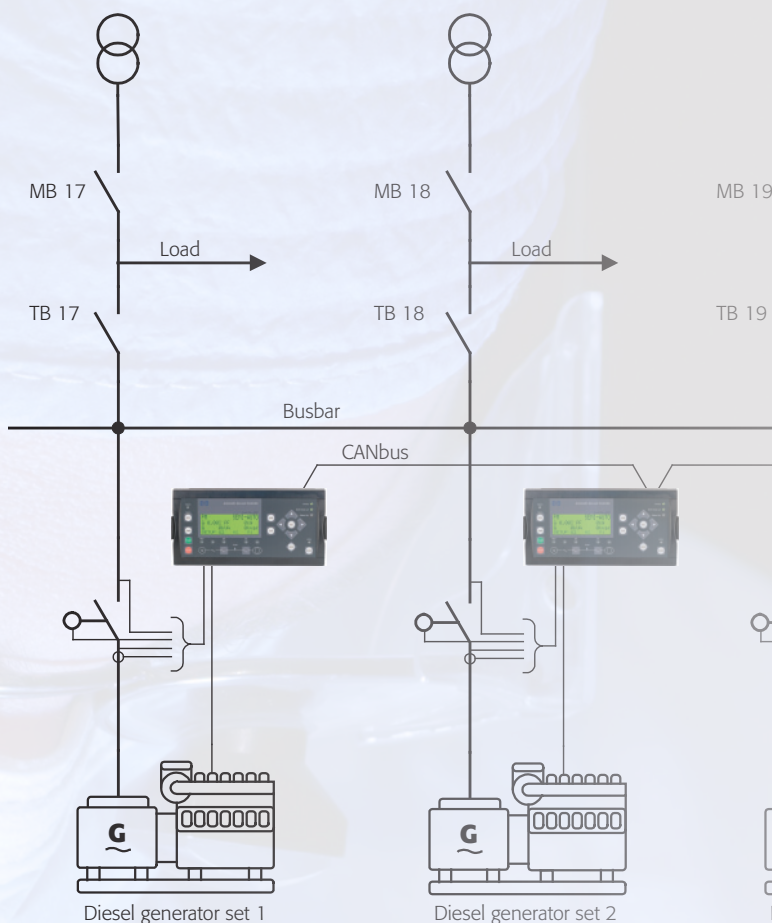
20.00	23.93	28.0	21.38	0.34%	-0.65
21.25	24.96	5	29.47	-0.13%	+0.65
22.48	26.47	272	266.06	0.47%	-0.06
23.68	288.19	3	117.02	-0.29%	-0.18
117.00	117.52	5	28.84	-0.84%	-0.58
28.80	28.84	370	21.31	-1.59%	-0.58
1.23	21.32	126	21.85	-1.59%	-0.58
1.23	21.81	126	21.85	0.64%	+0.22
1.51	34.51	19	34.51	1.03%	+0.36
1.51	29.44	35	33.43	-1.55%	-0.47
1.51	29.82	13	29.79	-0.47%	-0.10
1.51	21.87	3	21.35	-0.47%	-0.10
1.51	35.87	17	35.87	-1.86%	-0.68
1.51	35.75	3	35.75	0.70%	0.25

Best in Class

- ✓ Hot Standby – Change to backup genset controller on the fly
- ✓ Multiple master – Extra security with master backup
- ✓ Multiple communication – Double CANbus, analogue & droop
- ✓ Lifetime event log – For close analysis and monitoring

Specialist Critical Power Solutions

Unique Standby Capacity With Start-up From An Impressive Six Seconds



Less Than 10 Seconds of Downtime

Close Before Excitation



No Loss of Generators

Redundant Communication, Hot Standby



Safe & Complete Solution Test

Patent-pending DEIF Emulation



Fast Energy Backup

- ✓ Close Before Excitation – Synchronisation in less than 10 sec
- ✓ Digital AVR communication – Increased performance
- ✓ Fast power source switch

Fast Planning & Commissioning

- ✓ Record time commissioning with DEIF Emulation
- ✓ High level of customisation, incl. onsite
- ✓ Reduced need for FAT test



Power in Control

The following pages feature a selection of case studies for a number of different applications that successfully run DEIF units and solutions.

DEIF has become a preferred control solution supplier to some of the biggest operators in the market, not just because of our innovative, safe and reliable technology but because of our commitment in guiding you through all phases of your project, from specification to installation or configuration. DEIF's flexible product platform covers the full range of application possibilities.

Most customers are able to install and commission our standard products working from data sheets only. But in cases of doubt, DEIF's far-reaching network of sales and competence centres, distributors, customer care teams, and technical support teams is available to assist you and ensure you invest in and implement the best controller for your application.

DEIF realises how space is always in demand. Saving you time and cost, our standard controllers require limited room for mounting and installation in switchboard cabinets.

Basic installation information can be found in the product quick start guide, and application setup is made easy with DEIF's Utility Software.

For greater detail, we refer you to the product installation instructions, just as you are invited to attend training courses on how to install and operate DEIF's standard controllers.

Covering a 4 km area, the distance between generators was an unusual challenge solved using DEIF's AGC-4.

Great Britain's Gateway to Europe, the Port of Dover is recognised as one of the busiest passenger ferry ports in the world with over 12 million passengers and 4.5 million vehicles per annum requiring a passage to France for onward travel throughout the continent. The Port of Dover also handles £80 billion of trade each year.

Being a major transport hub, the requirement for a secure power supply at the port is essential. The risk of potential power outages lead to the decision to upgrade the existing embedded generation system to provide full generator cover for all areas of the ferry terminal with additional ability to export power on demand into the Local Distribution Network, benefitting other users of the STOR (Stand by Operating Reserve) scheme.

DEIF assisted with the application requirements, supplying AGC-4 Advanced Generator Controllers for local and remote control of mains connection, island operation, mains synchronisation and export control.

Honouring Unusual Challenges

The Eastern Docks site required a fibre optic communication connection between generators over an extensive 4 km area for remote monitoring and generator functionality. Using DEIF's patent-pending Emulation Solution, the project was fully factory-tested to comply with these distances prior to installation.

The distance between generators was another unusual challenge that DEIF was also able to honour thanks to the company's state of the art R&D and test centres at its manufacturing facility in Denmark. Although the solution was a DEIF standard, for the Port of Dover it was a more secure system, guaranteeing a safer supply for its power demands.

DEIF's AGC-4 features proven technology for a wide range of generation systems in critical power applications, including synchronisation to the grid, mains power export, and load take over where load is transferred from the mains to the generator as well as serial communication protocol via TCP/IP.

As opposed to more conventional master-slave configurations, DEIF uses its own Power Management Systems including a powerful M-Logic configurator tool for logic relay customisation.



Port of Dover: Dover, United Kingdom

Providing Full Generator Cover for the Entire Ferry Terminal

Data

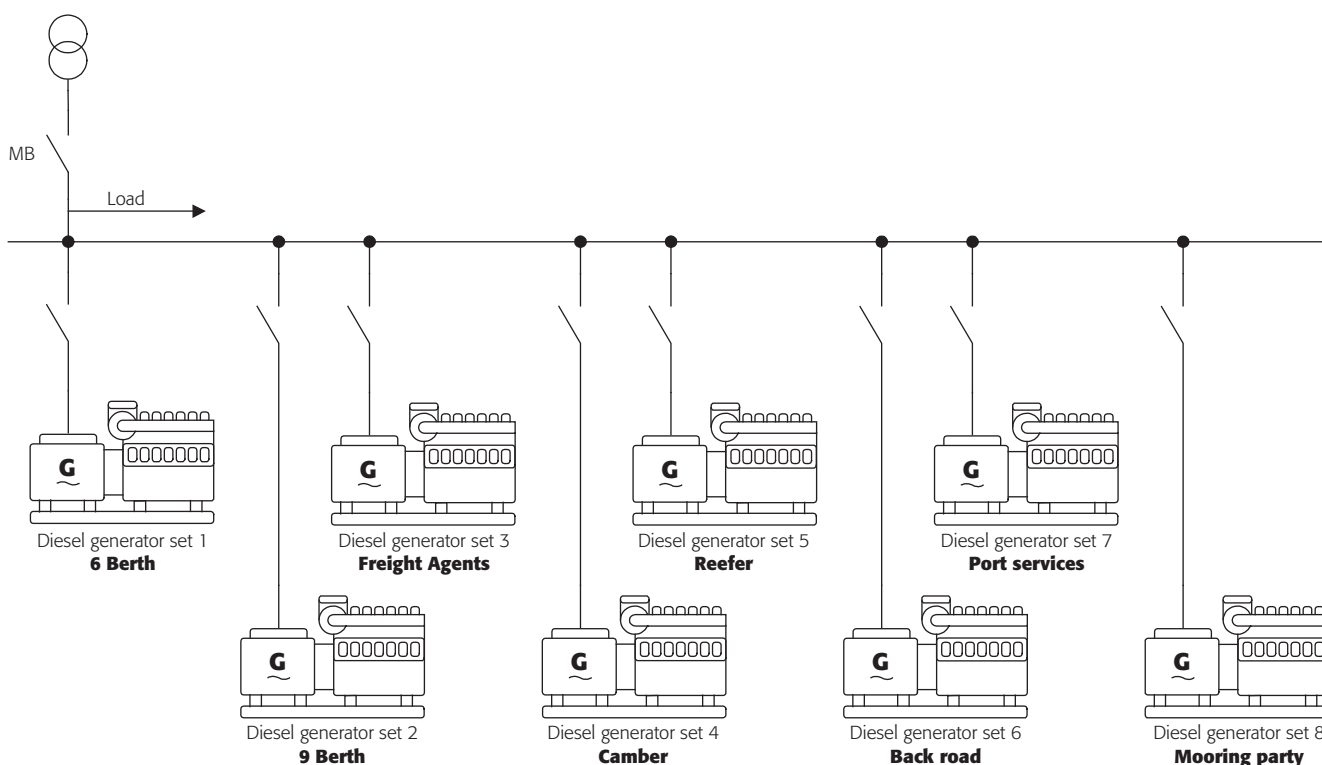
- ✓ Backup power solution with dual CAN lines for Port of Dover
- ✓ Remote HMI interface to optimise daily operations of widely scattered generators
- ✓ Shift operational modes from island to power export for safe supply & revenue generation
- ✓ Fast onsite installation and commissioning using DEIF Emulation
- ✓ Close Before Excitation – get online in less than 10 seconds
- ✓ Hot Standby – Change to backup genset controller on the fly
- ✓ Multi-master system (system does not rely on just one controller)
- ✓ Compliance with G59/2 requirements

Product



Automatic Genset Controller, AGC-4

Diagram From Case



The operation of the generators play an important part in providing a reliable fast response enabling a must have secure generation system to safeguard data centres.



DEIF UK Ltd is pleased to have supported Ark Data Centres, a leading Data Centre Provider, with AGC-4 Advanced Generator Controllers at its dedicated data centre campus locations in the South of England, Spring Park and Cody Park.

With the prominent news coverage of imminent power outages the operation of the generators play an important part in providing a reliable fast response enabling a must have secure generation system to safeguard data center sites. DEIF controllers are also used for retrofitting existing systems to bring operating sites up to today's high standards for 100% reliable functionality.

The DEIF AGC-4 Advanced Generator Controller has many advantages over existing controllers out in the field with a number of new and proven high-end technological functions.

DEIF Features

Dual CANbus redundancy communication is installed within the controllers as a standard for Power Management Systems. This enables the system to still operate in Auto with full functionality if one of the CANbus lines is broken or damaged. Dual Modbus communication lines are also readily available and beneficial for critical demand applications, be it a data centre, hospital or bank.

Add to the Dual CANbus and Dual Modbus lines, there is also the option for a redundant Hot Standby controller to take over the operation and assume control even in running conditions if a problem occurs on the master controller. The redundant controller is connected to the Power Management System CAN lines at all times.

The DEIF Emulation software (patent pending) is the perfect tool for planning and pre-commissioning applications before installation. The unique software can be tailored exactly to the required number of generator controllers needed and set-up prior to installation for a fast client positive response. Eliminating the need for valuable downtime to demonstrate the system, DEIF Emulation saves time and money.

Ark noted that DEIF not only manufactures and supplies the generator controllers but also operates a strong worldwide support network enabling a 24/7 response providing a fail-safe service to the power industry.

Ark Data Centres: South West England, United Kingdom

Providing 100% Reliable Functionality

Data

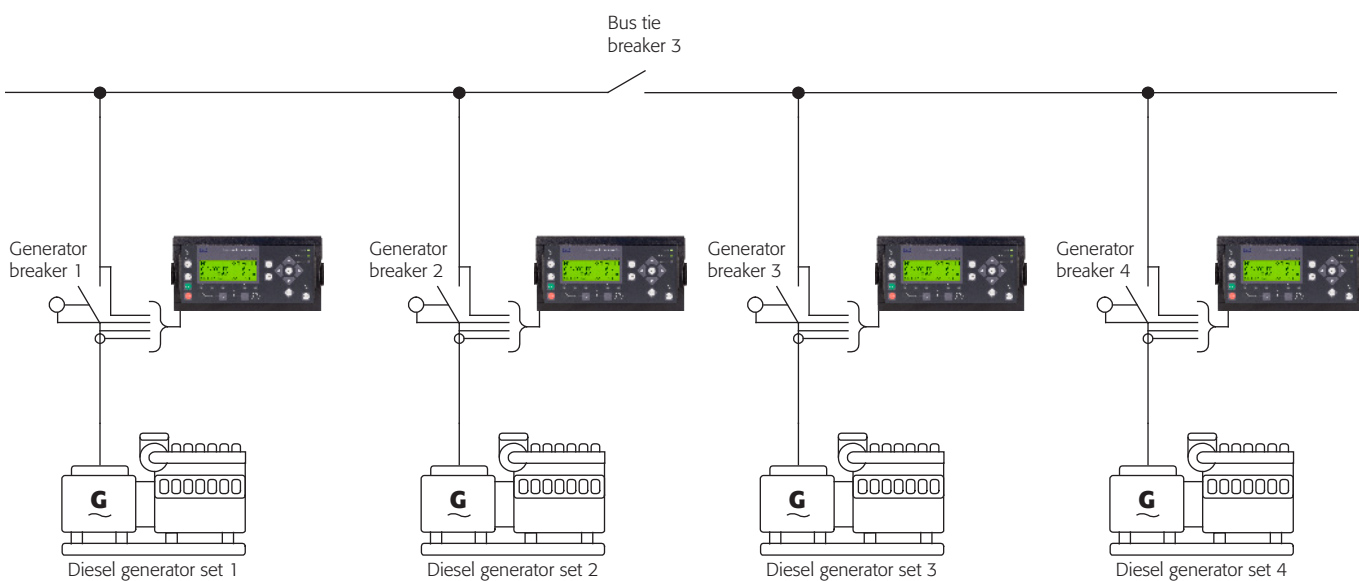
- ✓ Backup power solution with dual CAN lines for security of supply
- ✓ Dual Modbus communication
- ✓ Reduced "single point of failures" (SPF)
- ✓ Fast onsite installation and commissioning using DEIF Emulation
- ✓ Close Before Excitation – get online in less than 10 seconds
- ✓ Multi-master system (system does not rely on just one controller)

Product



Automatic Genset Controller, AGC-4

Diagram From Case





DEIF Diesel Control Technology's award-winning and innovative controllers are some of the most comprehensive on the market today, ranging from cost-effective single and advanced multi-function controller platforms to units suitable for innovative, engineered Power Management System solutions.

As a rule, DEIF's control concepts eliminate the need for external controllers and are user-friendly alternatives to standard controllers.

Working with DEIF, you benefit from the advantages of collaborating with one qualified supplier.

We also offer outstanding product quality, expert support engineers for standard support, consultant application engineers to check specifications, and project managers ready to assume responsibility for turnkey power management solutions.

Generator Protection Unit, GPU-3

Controller for PLC-based Power Management System



Easy to operate and configure, DEIF's Generator Protection Unit GPU-3 is an ideal controller for PLC-based power management systems.

The GPU-3 offers comprehensive generator protection and synchronisation. Serial communication enables easy interfacing with PLCs, SCADA systems and more, and the unit features all necessary 3-phase measuring circuits and displays all values and alarms on a quality LCD screen.

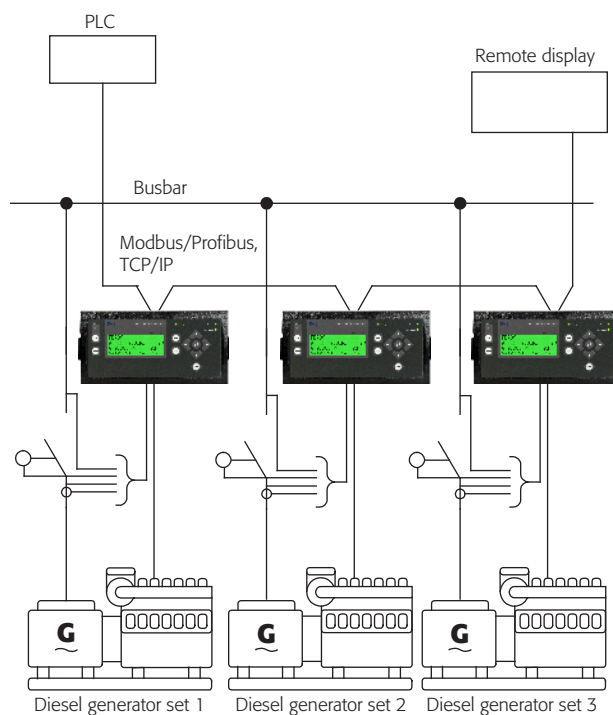
Turning the GPU-3 into an engine control unit featuring start/stop and protection functionalities, the optional engine interface card also has a separate power supply and an independent microprocessor. In cases of GPU-3 processor break-downs, the engine interface card will enter into back-up mode and ensure uninterrupted engine supervision. In cases of shutdown alarms, the engine shuts down automatically, making it a reliable solution for control and supervision of gensets.

With free software download and upgrade at www.deif.com, it is possible to customise the application to suit your needs exactly: dedicate specific functions or logic conditions to different inputs and outputs and tune all sequences according to your requirements.

GPU-3 Features

- ✓ Generator/busbar protection
- ✓ Synchronisation
- ✓ Multiple display units and operator panels possible
- ✓ Engine protection with back-up on shut-down channels
- ✓ Engine control and communication

GPU-3 Application Example



GPU-3 Type Approvals



Generator Paralleling Controller, GPC-3

Versatile Unit For Application Programming In PLC



The GPC-3 is a highly versatile and compact generator paralleling controller designed for engineers who prefer to carry out application programming in a PLC.

A multi-function component, the GPC-3 features protection, measurements, engine control and engine protection and communicates with all PLC and SCADA systems. Values and alarms are displayed on a large LCD screen.

Its simplicity and logic makes it the ideal controller for PLC-based power management systems.

The M-Logic configuration tool makes it possible to customise the application and dedicate specific functions or logic conditions to different inputs and outputs.

GPC-3 is easily compatible with additional display units and Additional Operator Panels (AOPs) for remote control, supervision and status indication.

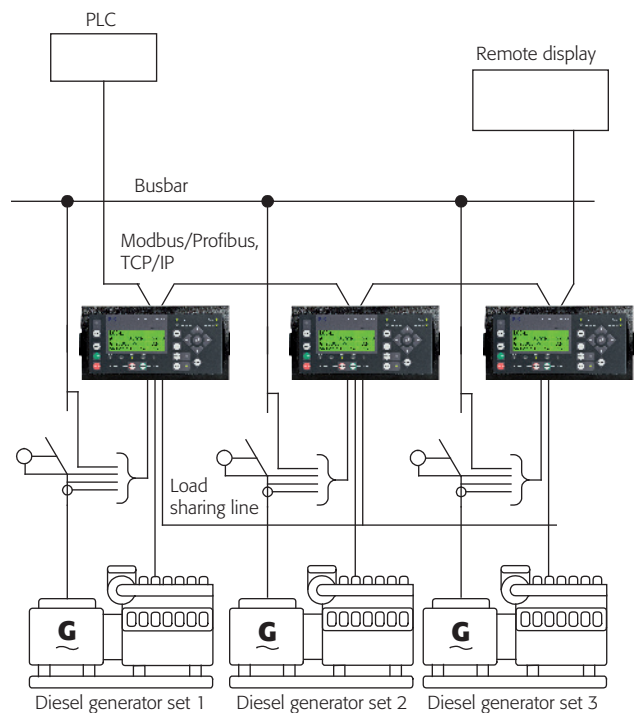
GPC-3 Features

- ✓ Synchronisation/Load Sharing
- ✓ Mains/Generator/Engine Protection
- ✓ Programmable Logic (M-Logic)
- ✓ Engine Protection With Back-up on Shut-down Channels
- ✓ Governor and AVR Control
- ✓ J1939 Engine Com/Mirrored Modbus/Profibus/TCP/IP
- ✓ Multiple Display Units
- ✓ Additional Operator Panels
- ✓ Genset & Busbar Control & Protection

GPC-3 Regulation Modes

- ✓ Load sharing
- ✓ Fixed frequency
- ✓ Fixed power
- ✓ Frequency droop

GPC-3 Application Example



GPC-3 Type Approvals



Advanced Genset Controller, AGC 200

New features include Hot Standby redundancy, communication to digital AVR D510c from Leroy Somer, and droop mode.

DEIF has released a new version of its acclaimed Advanced Genset Controller, AGC 200, to meet and surpass OEM needs for synchronisation. A cost-effective, compact, scalable and all-in-one product, the AGC 200 comes in several variants.



The advanced controller series integrates all necessary functions for superior genset protection and control and stands out for its reliability and operator-friendliness and features patent-pending DEIF Emulation to speed up design, testing and commissioning, saving you man hours and costs.

Applying asymmetric load sharing to ensure optimal load on the genset, the AGC 200 also cuts operating costs and reduces harmful emissions.

With temperature-dependent cooling, the AGC 200 arrests cooling at pre-programmed cool-down temperatures and features automatic priority selection, setting the optimum combination of gensets for optimised fuel consumption.

AGC 200 Options

- AGC 212: single genset in island operation
- AGC 213: single genset for automatic mains failure operation
- AGC 232: multiple genset in island applications with digital load sharing
- AGC 233: single genset for automatic mains failure, peak shaving, load take over and mains power export operation
- AGC 242: multiple genset with advanced power management in plants up to 16 generators
- AGC 243: control of single or multiple gensets
- AGC 244: bus tie breaker
- AGC 245: mains breaker control
- AGC 246: mains and tie breaker
- IOM 200: analogue interface for AGC 200 family

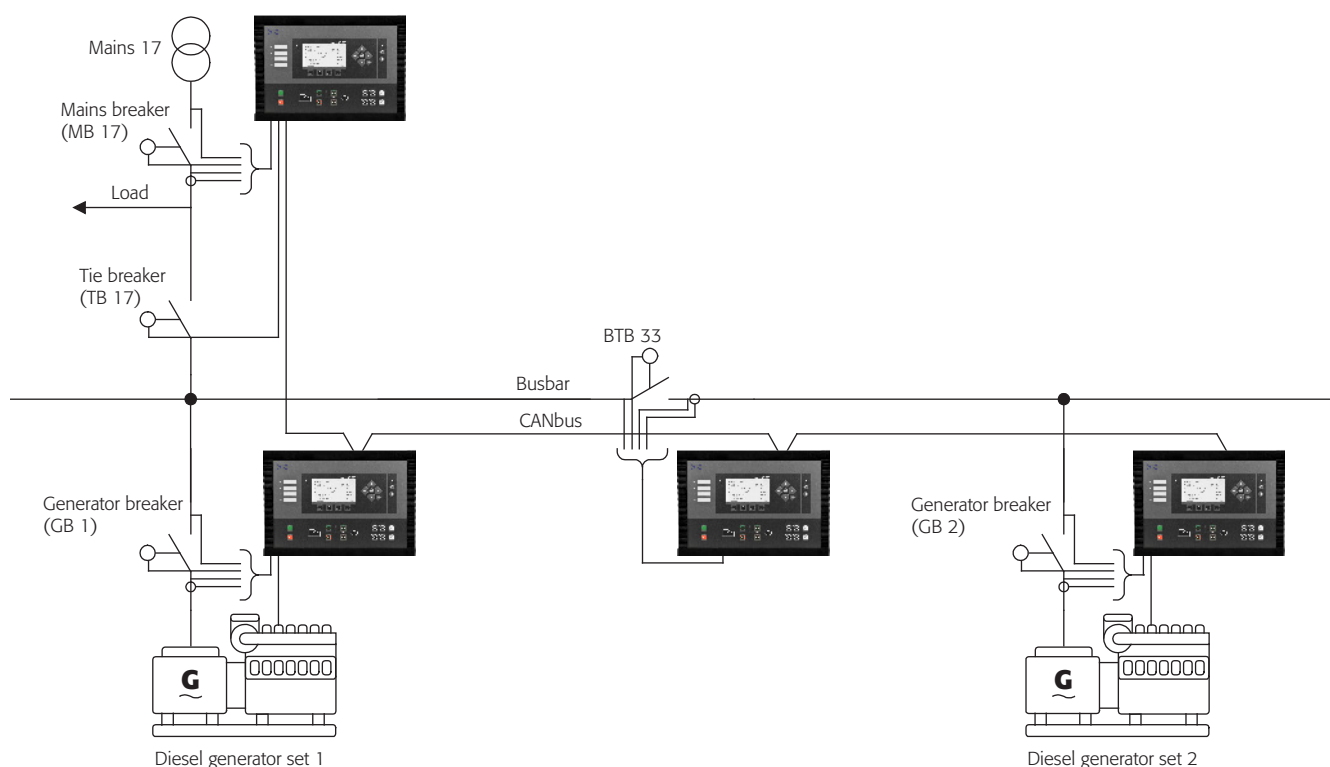
AGC 200 Type Approvals



AGC 200 Features

- ✓ Multiple operating modes in one software
- ✓ Synchronisation of up to 56 breakers in one plant
- ✓ Multi-master power management
- ✓ Load-dependent start and stop
- ✓ Load management
- ✓ Priority selection (manual, relative running hours, absolute running hours, fuel optimisation)
- ✓ Compatible with your existing AGC-3 and AGC-4 gensets
- ✓ User-programmable logic (M-Logic)
- ✓ Configurable inputs/outputs
- ✓ Engine, generator and load protection
- ✓ Voltage measuring range: 50 to 690V AC (UL/cUL Listed 50 to 600V AC)
- ✓ J1939 engine communication, supporting 11 different engine brands with the ability to easily handle other engine brands
- ✓ Readout of engine diagnostics in clear text
- ✓ Remote control via high speed TCP/IP, RS485 Modbus or GSM modem
- ✓ High speed USB connection
- ✓ Multi-language interface
- ✓ -40°C operation temperature
- ✓ IP66 protection
- ✓ Lifetime logging stored on SD card

AGC 200 Application Example



Automatic Genset Controller, AGC-4

AGC-4 offers remote communication and tests your setup prior to commissioning.



DEIF's Automatic Genset Controller (AGC-4) is the most comprehensive and flexible power management and protection unit on the market today. A further development of DEIF's AGC-3, the new generation controller is fully compatible with its predecessor and has been designed to allow for easy, intuitive, and smooth switch-overs for those looking to upgrade.

Suitable for a wide range of applications, the AGC-4's standard sequences include back-up power, start/stop, synchronisation, and load sharing.

The AGC-4 is simple to incorporate into both new and existing designs, customising the application to fit your needs, for instance dedicating specific functions or logic conditions to different inputs and outputs.

Technologically sophisticated, the AGC-4 is also the world's most robust power management controller, successfully tested to maintain reliability and durability in extreme weather and hazardous conditions. Approvals include TÜV and UL.

Patent-pending Emulation

A standard in the Automatic Genset Controller, AGC-4, using DEIF's Emulation Solution, all you need to do to perform a complete test of your Power Management Systems is turn on your controller and connect communications.

The Emulations Solution's focus on exact reproduction of behaviour improves your planning, commissioning and training. It is all done in a safe environment without the costly and excessive need of gensets and switchgear and without the risk of equipment damage and human injury. The innovative solution gives you a critical market advantage and guarantees your customers a cutting-edge, finished result.

Remote Communication and Control

The AGC-4 supports serial communication protocols including Modbus (RS 485, USB, and TCP/IP) and Profibus. This feature allows you to supervise and control your genset/plant from a remote location and minimise downtime or take immediate action on genset alarms or warnings.

AGC-4 Type Approvals



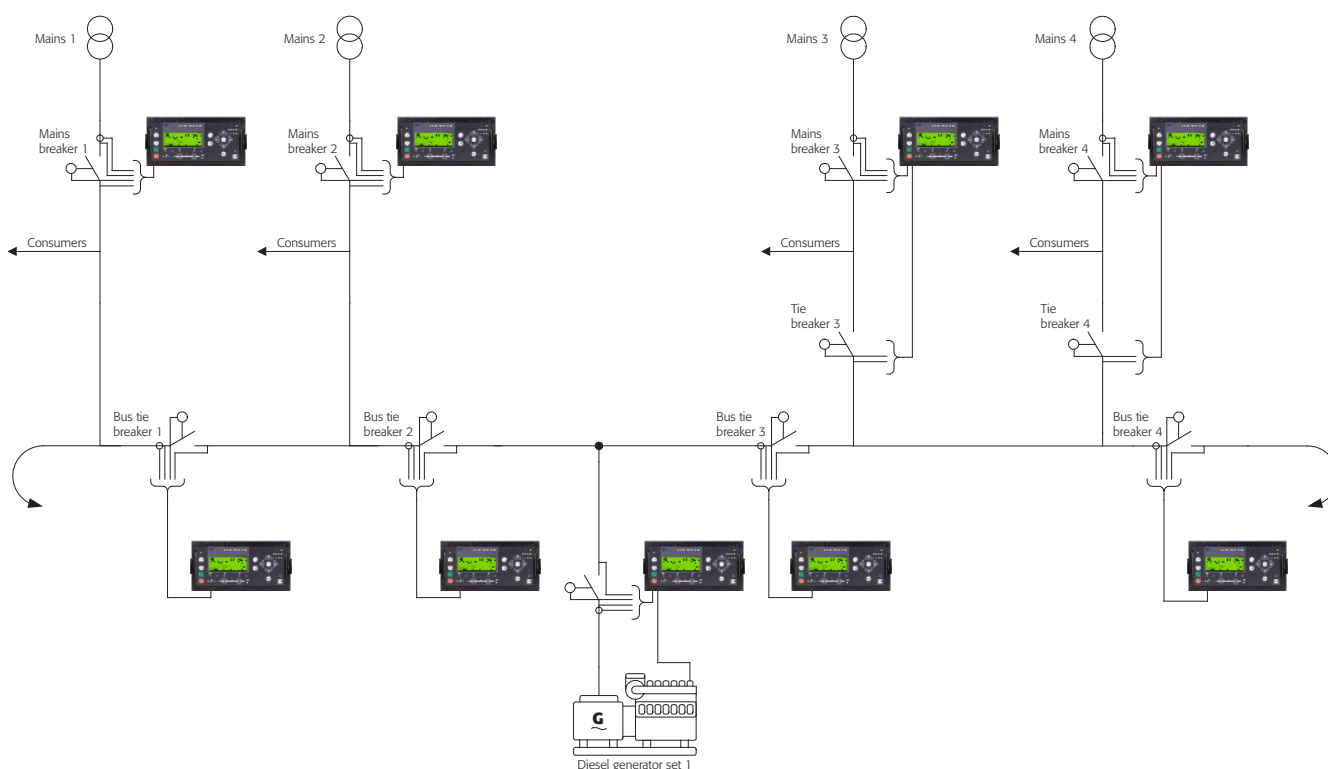
Automatic Genset Controller, AGC-4

The World's Most Comprehensive and Robust Genset Controller

AGC-4 Features

- ✓ Multiple operating modes in one software
- ✓ Synchronisation of up to 56 breakers in one plant
- ✓ Multi-master power management
- ✓ Load-dependent start and stop
- ✓ Load management
- ✓ Emulation for Fast Training & I/O test
- ✓ Hot Standby – Change to backup genset controller on the fly
- ✓ Close Before Excitation – Synchronisation in less than 10 sec

AGC-4 Application Example



DEIF is a market leader with a proven record of more than 80 years of technological achievement and innovation in engine & genset controls, marine bridge instrumentation, switchboard instrumentation and renewable energy controls.

Our goal is to always bring a competitive edge to our customers' businesses by providing green, safe and reliable product lines with flexible features and first class service and support.

The DEIF Group is committed to maintaining and expanding its position as a trusted global supplier of quality solutions.



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