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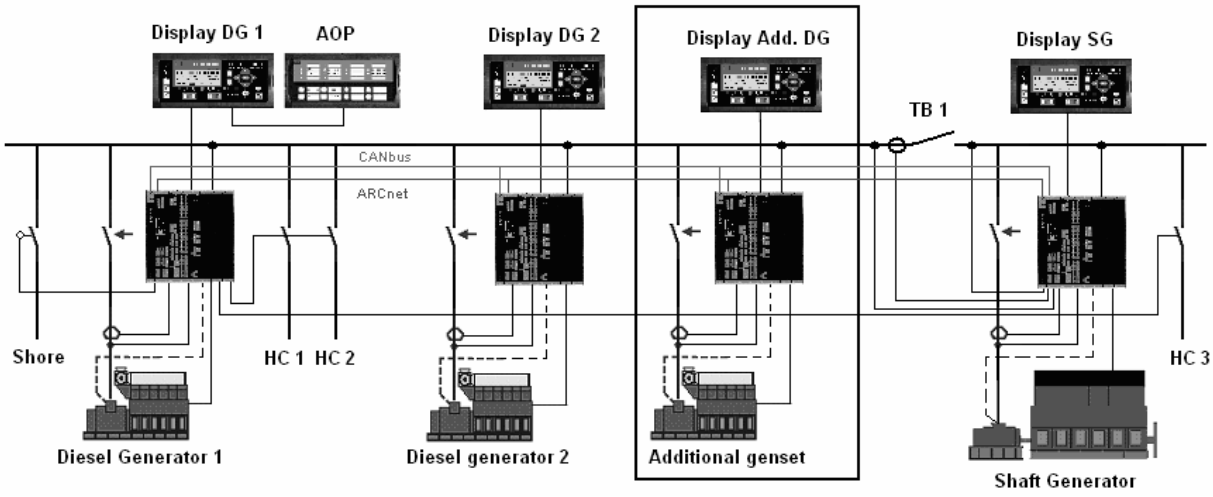
# 11. The DELOMATIC system in general

The DELOMATIC system has been designed for control and protection of up to 15 parallel running generators and can also carry out engine control and protection. The DELOMATIC system can perform a wide variety of the functions needed on board a ship or in power stations.

- Power Management System (PMS) functions
- Control of generator set(s)
- Control of shaft generator
- Supervision of tie breaker
- An extensive number of integrated protective functions
- Measurement of all relevant AC values
- System logic
- Serial communication interface

**General introduction**

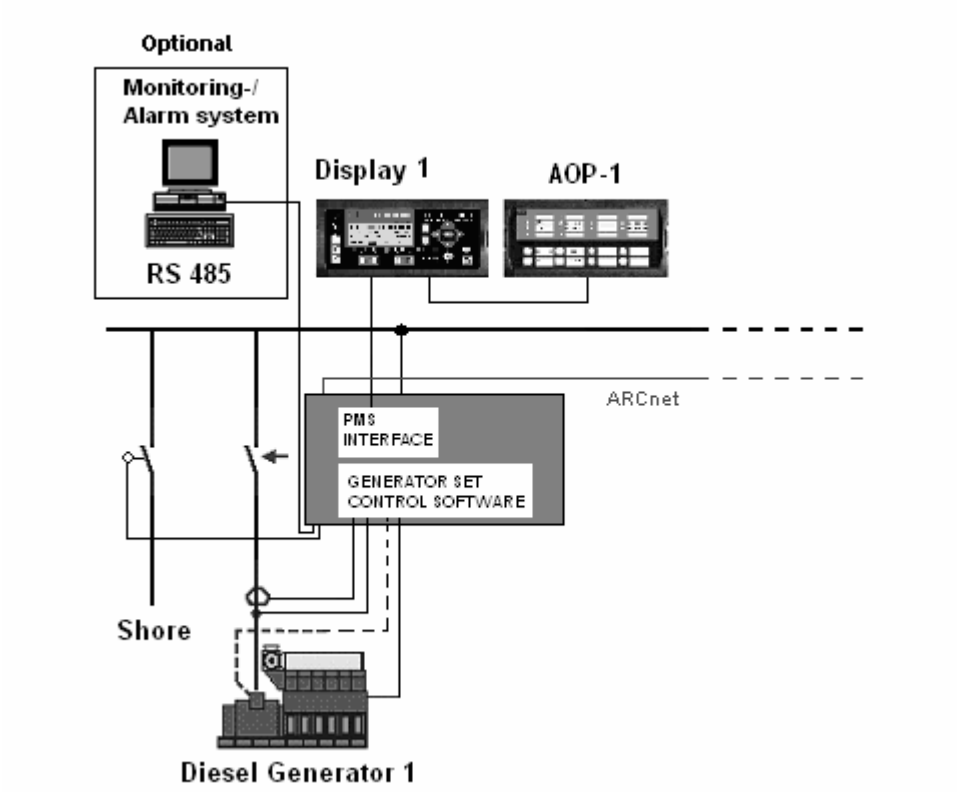
The DELOMATIC system basically consists of a DEIF Generator Unit (called DGU) and a number of Display Units called DU. Basically there is 1 display unit per DGU, but up to 3 DUs can be connected per DGU. This enables the user interface to be placed separately for each generator (e.g. in the engine room and on the bridge). An Additional Operator Panel (AOP) for plant mode selection, plant status informations or local control functions can be used as well.




The internal communication between the DGU´s is carried out by ARC-net (twisted pair). By using a network for communication between the DGU´s, very high transmission rates and maximum flexibility regarding placement of the DGU's is achieved. For redundancy issues an additional CANbus connection can be placed between the DGUs. This CANbus connection can take over in case of ARCnet failure and transfers the most important data to achieve safety running even in a failure condition.

The application software consists of two main software units:

- Generator control software unit
- Power Management System (PMS) software unit




***The DELOMATIC PMS interface and generator control software***

The Main PMS DGU contains the Power Management System (PMS) software unit. *All* DGUs (incl. the Main PMS DGU) in the DELOMATIC system contain the generator control software unit and a *PMS interface*.

**Generator control software unit**

The generator set control software unit controls and supervises all local operations of the generator set. The received PMS commands may initiate e.g. start and stop of the generator set, but the generator set control software unit carries out the actual control, protection and supervision of the generator set.

**PMS software unit**

The PMS software unit controls and supervises all common PMS functions in the DELOMATIC system according to the functionalism of the selected plant mode, e.g. the SEMI-AUTO or the AUTOMATIC plant modes. Common PMS functions may be functions such as the load depending start/stop function and selection of start/stop priority.

The PMS interface forms a bi-directional communication link between the PMS software unit and the generator set control software units. The PMS software unit transmits e.g. PMS start/stop commands and selected plant mode via the PMS interface. The generator set control software unit(s) transmits signals such as the operational status of the generator sets (e.g. running or stand-by), relevant measured and calculated values and status of the selected control mode (PMS control or SWBD control) for the generator set.

**The programmable DELOMATIC set points and timers**

The DELOMATIC system is controlled according to a number of programmable set points and timers called *the system setup*.

The operator may program the set points and timers by means of the *DELOMATIC menu system*, which is accessible through the display units.

The DELOMATIC menu system offers:

- Access to set points and timers used for control of the integrated PMS
- Access to set points and timers used for local operation of the generator sets
- Access to set points and timers used for the supervision and protective functions
- Read-out of measured and calculated values
- System selections
- Alarm handling

The above-mentioned data are furthermore accessible via the PCM (Power Control Module) serial communication interface. This enables the DELOMATIC system to interact directly with other systems or operate as a front-end system.

The PCM supports the following serial communication standards:

- RS485 Standard Modbus RTU as 2- or 4-wire (twisted pair)

**The Display Unit (DU)**

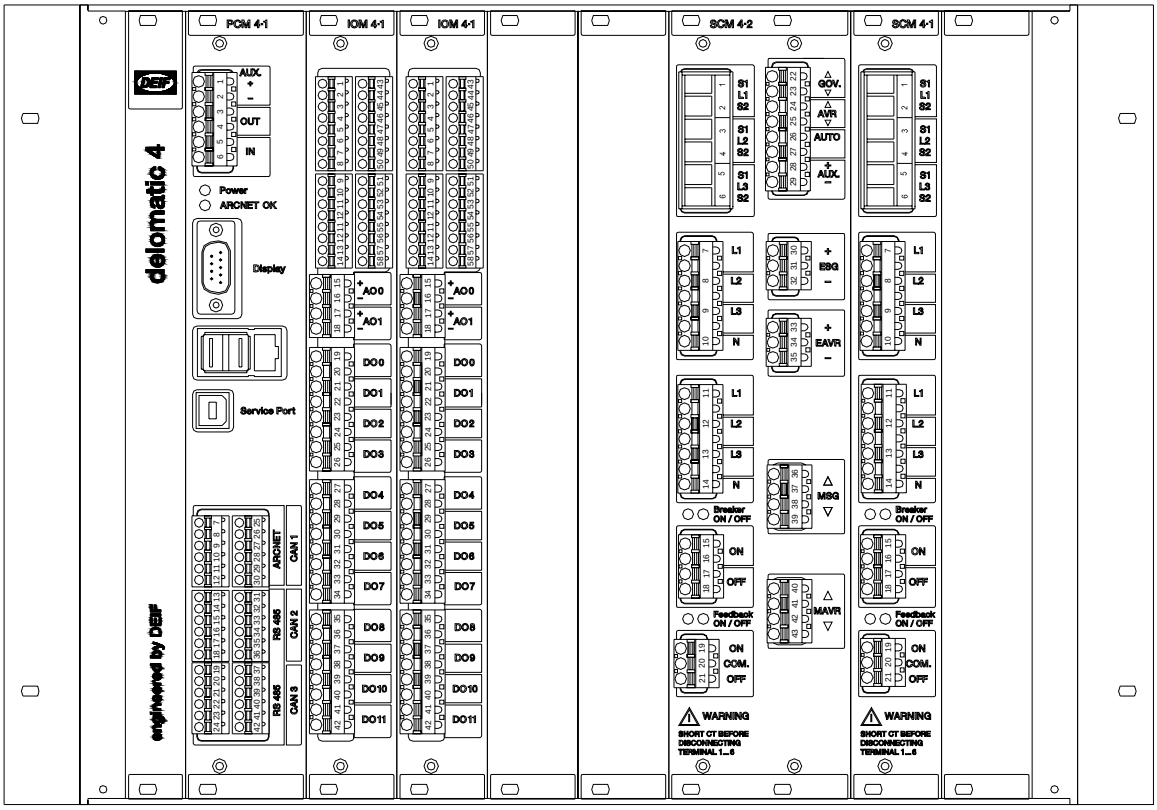
The DU is a slave unit, which receives information from its corresponding DGU. Measured values and programmed system setup are all stored in the corresponding DGU.


The DU offers:

- Display and control of the DELOMATIC menu structure
- Access to set points and timers
- Access to system selections
- Read-out of measured and calculated values
- System status
- Operator alarm handling interface
- Display of alarm messages
- Status indication with LEDs

**DEIF Generator Unit (DGU)**

The DGU is configured with a different number of hardware modules, depending on functions in the DELOMATIC system.




***60TE DGU rack***

The following hardware modules are available:

- Power supply and Control Module with communication RS485 (PCM 4-1)
- Input/Output Module (IOM 4-1)
- Synchronising, Control and Measuring module (incl. gen-set control) (SCM 4-2)
- Synchronising, Control and Measuring module (SCM 4-1)