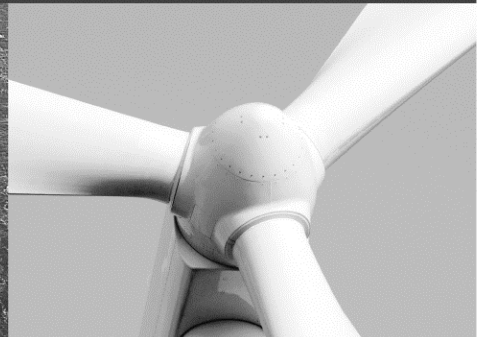
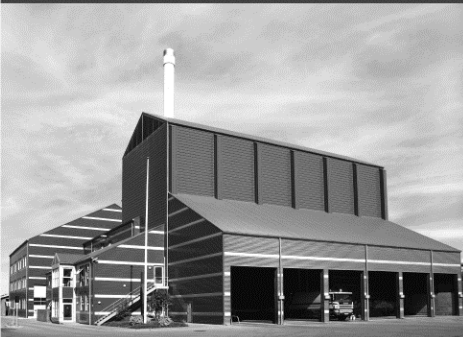




-power in control



## Delomatic 4 DM-4 Land/DM-4 Marine



## General introduction Part 2, chapter 11



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Document no.: 4189232111C

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## 11. The Delomatic system in general

The documentation for the Delomatic 4 system consists of two separate parts called "Part 1" and "Part 2".

Part 1 is unique for each Delomatic 4 system. This part contains specified data and documentation about the single system. Part 1 refers to a project number which is unique for each project. The project number is a 6-digit number, for example 430000. The project number does always start with 43xxxx.

Part 2 is a general description of the Delomatic 4 system. There are no specified data and documentation about the single system in this part. For more specified data and documentation about each project, please see part 1.

If there are any differences between the data and documentation in the two parts, it is always the data and documentation in part 1 which is valid.

Below is listed some of the different abbreviations that are used in part 1 and part 2.

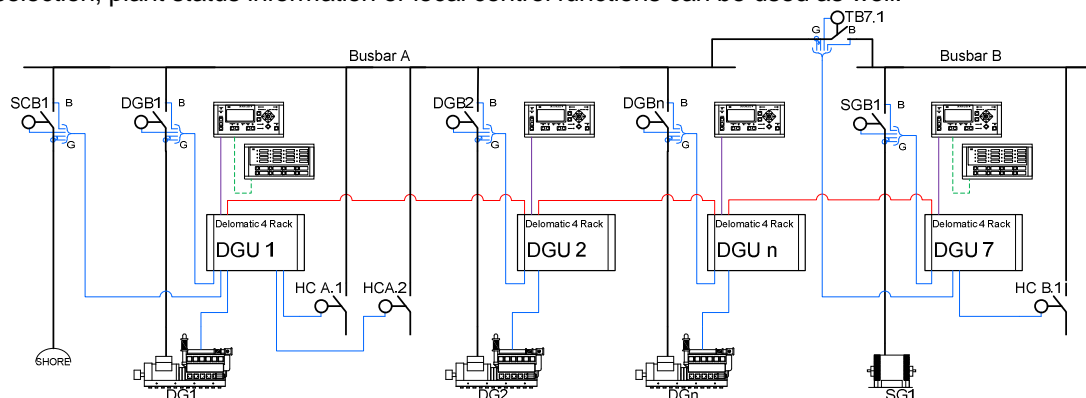
<b>AC</b>	Alternating current	<b>GOV</b>	Governor
<b>ACK</b>	Acknowledged	<b>HC</b>	Heavy consumer
<b>AOP</b>	Additional operator panel	<b>IOM</b>	Input/output module
<b>AVR</b>	Automatic voltage regulator	<b>Main DGU</b>	Master DEIF generator unit
<b>BB</b>	Busbar	<b>MAVR</b>	Mechanical AVR
<b>CB</b>	Circuit breaker	<b>MSG</b>	Mechanical speed governor
<b>CC</b>	Closed contact	<b>NEL</b>	Non essential load
<b>CT</b>	Current transformer	<b>OC</b>	Open contact
<b>DEIF</b>	Danish electronic instrument factory	<b>PMS</b>	Power management system
<b>DG</b>	Diesel generator	<b>SC</b>	Shore connection
<b>DGB</b>	Diesel generator breaker	<b>SCB</b>	Shore connection breaker
<b>DGU</b>	DEIF generator unit	<b>SCM</b>	Syncronisation, control and measuring module
<b>DM-4</b>	Delomatic 4	<b>SG</b>	Shaft generator
<b>DM-4 LAN</b>	Delomatic 4 Local Area Network	<b>SGB</b>	Shaft generator breaker
<b>DU</b>	Display unit	<b>SWBD</b>	Switchboard
<b>EAVR</b>	Electronic AVR	<b>TB</b>	Tie breaker
<b>ESG</b>	Electronic speed governor	<b>U-ACK</b>	Un-acknowledged
<b>GB</b>	Generator breaker	<b>VT</b>	Voltage transformer

## General introduction

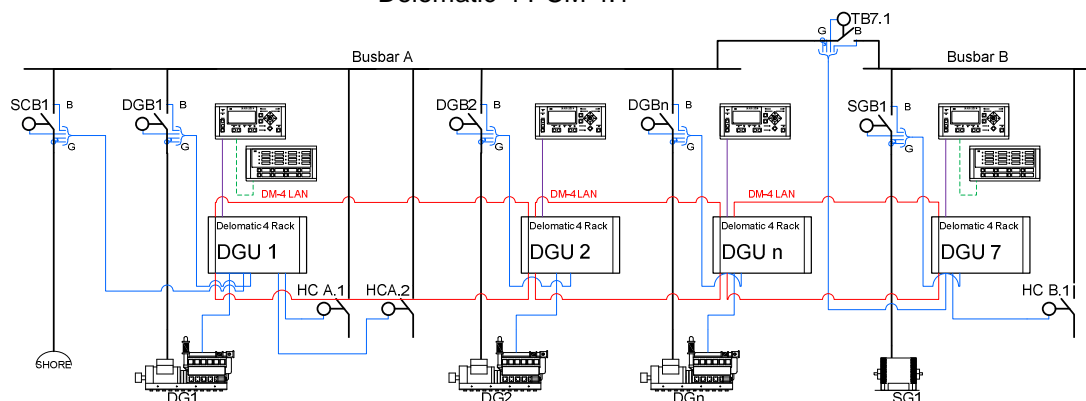
The Delomatic system has been designed for control and protection of generators and can also carry out engine control and protection. The Delomatic system can perform a wide variety of the functions needed on board a ship or in power stations.

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

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 information or local control functions can be used as well.



Delomatic-4 PCM 4.1



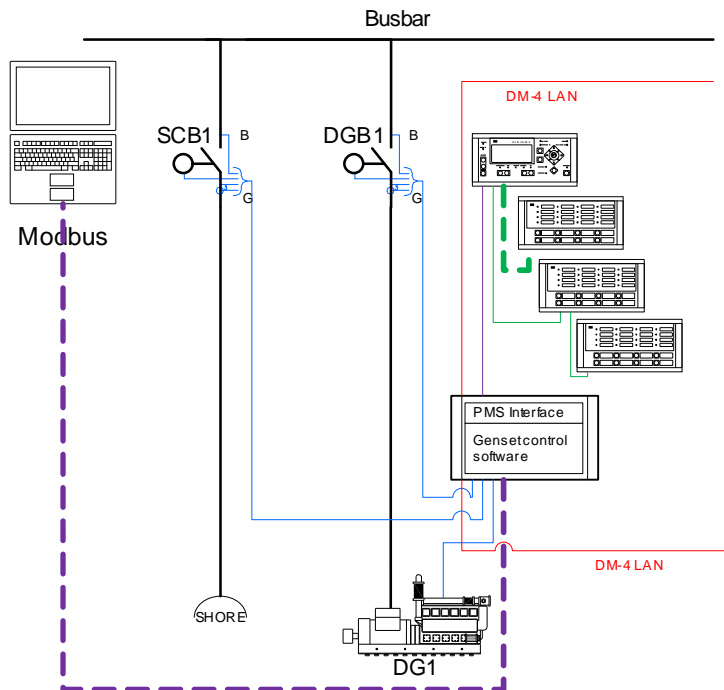
Delomatic-4 PCM 4.5

The internal communication between the DGUs is based on ARC net (twisted pair). By using a network for communication between the DGUs, a very high transmission rate and a maximum flexibility regarding placement of the DGUs is achieved with PCM 4.1. For redundancy issues, an additional cable connection can be placed between the DGUs to perform a redundant ARC-net connection by use of PCM 4.5. This extra connection secures a continuous communication in case

of short circuit or open connection in the ordinary communication network.

The application software consists of two main software units:

- Generator control software unit
- Power management system (PMS) software unit



The PMS DGU contains the power management system (PMS) software unit. **All** DGUs (incl. 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-dependent 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 units transmit 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 programme the set points and timers by means of the **Delomatic menu system**, which is accessible through the display units or the Delomatic 4 utility software.

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:

- 2 pcs. RS485 standard Modbus RTU as 2-wire (twisted pair)
- 2 pcs. CANbus ports. Protocol to be defined in the project.

## The Display Unit (DU)

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



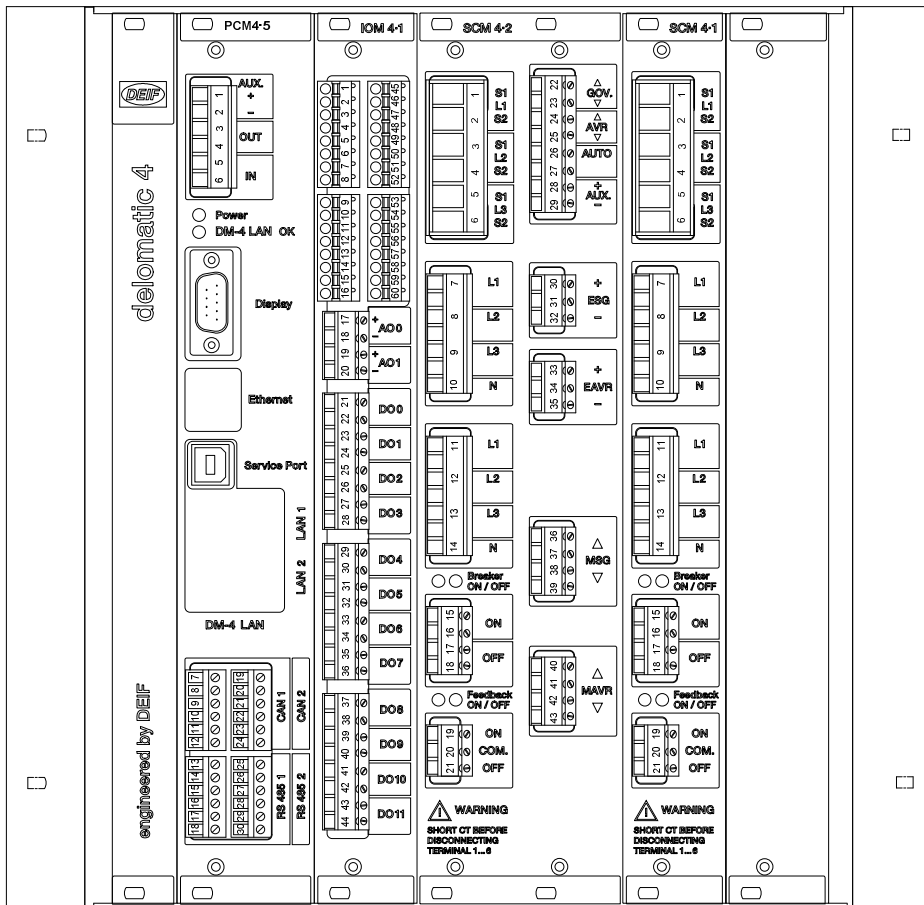
The DU offers:

- 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.

## 42TE



The following hardware modules are available:

- Power supply and control module with communication RS485 (PCM 4-1 and PCM 4-5)
- Input/Output Module (IOM 4.1)
- Synchronising, control and measuring module (incl. genset control) (SCM 4-2)
- Synchronising, control and measuring module (SCM 4-1)

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