DEIF

-power in control

CE

OPERATOR'S MANUAL

AGC PM

Automatic Genset Controller, Plant Management

- Display readings
- Push-button functions
- Alarm handling
- Log list

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1. General information

1.1 Warnings, legal information and safety

1.1.1 Warnings and notes

Throughout this document, a number of warnings and notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted as follows in order to separate them from the general text.

Warnings

Warnings indicate a potentially dangerous situation, which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

Notes

Notes provide general information, which will be helpful for the reader to bear in mind.

1.1.2 Legal information and disclaimer

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the engine/generator controlled by the Multi-line 2 unit, the company responsible for the installation or the operation of the set must be contacted.

The Multi-line 2 unit is not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.

1.1.3 Safety issues

Installing and operating the Multi-line 2 unit may imply work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

1.1.4 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminal against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

1.1.5 Factory settings

The Multi-line 2 unit is delivered from factory with certain factory settings. These are based on average values and are not necessarily the correct settings for matching the engine/generator set in question. Precautions must be taken to check the settings before running the engine/generator set.

1.2 About the Operator's Manual

1.2.1 General purpose

This Operator's Manual mainly includes general product information, display readings, push-button and LED functions, alarm handling descriptions and presentation of the log list.

The general purpose of this document is to give the operator important information to be used in the daily operation of the unit.

Please make sure to read this document before starting to work with the Multi-line 2 unit and the generator set to be controlled. Failure to do this could result in human injury or damage to the equipment.

1.2.2 Intended users

This Operator's Manual is mainly intended for the daily user. On the basis of this document, the operator will be able to carry out simple procedures such as start/stop and control of the generator set.

1.2.3 Contents and overall structure

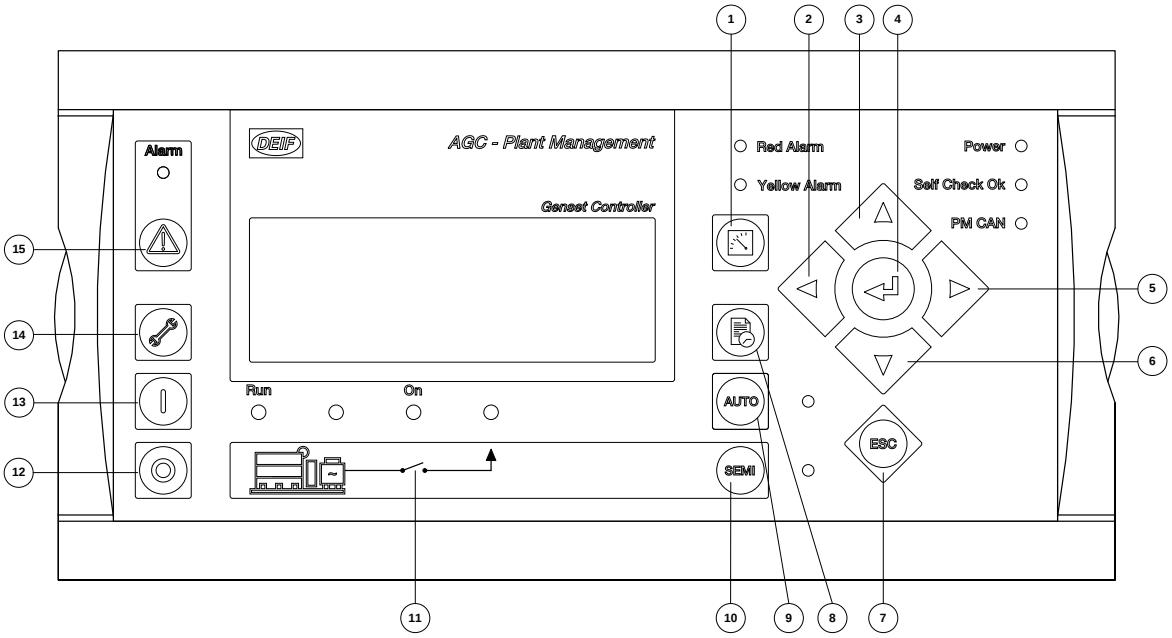
This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.

2. Display push-buttons and LEDs

2.1 Push-button functions

2.1.1 Genset display

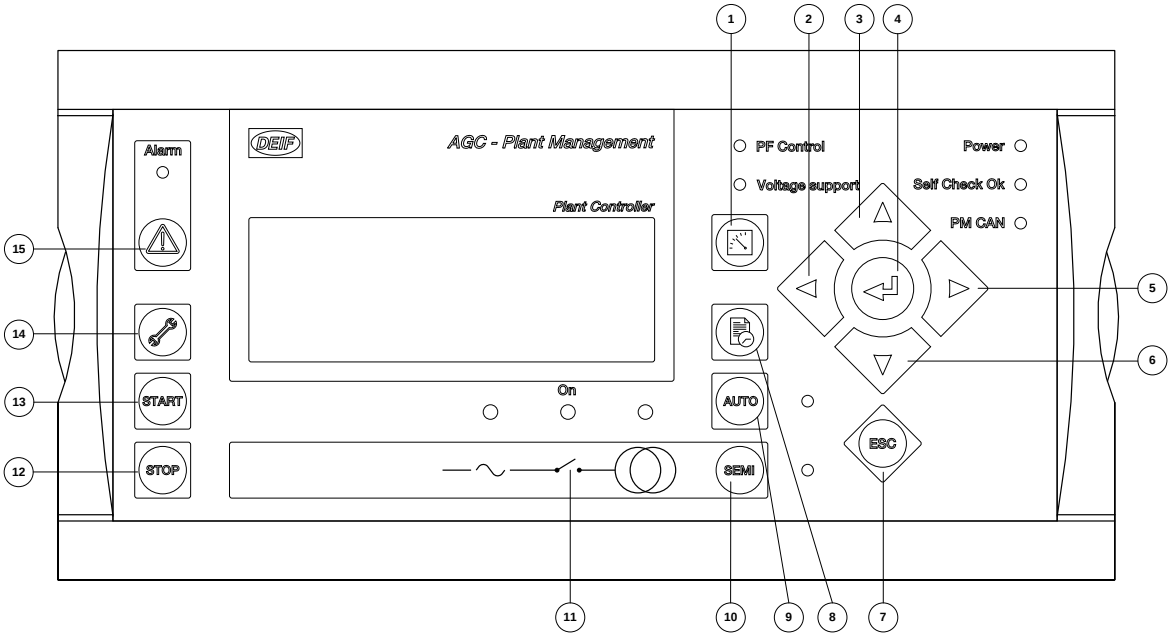
The display unit holds a number of push-button functions which are described below:



1. Shifts the first line displaying in the setup menus. Push two seconds to switch to master display in case more than one display is connected.
2. Moves the cursor left for manoeuvring in the menus.
3. Increases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
4. Selects the underscored entry in the fourth line of the display.
5. Moves the cursor right for manoeuvring in the menus.
6. Decreases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
7. Jumps one step backwards in the menu (to previous display or to the entry window).
8. Shifts the display three lower lines to show the event and alarm list.
9. Selects AUTO mode for remote or automatic operation.
10. Selects SEMI AUTOMATIC mode for local control.
11. Manual activation of close breaker and open breaker sequence if "SEMI-AUTO" is selected.
12. Stop of the genset if "SEMI-AUTO" is selected.
13. Start of the genset if "SEMI-AUTO" is selected.
14. Enters a specific menu number selection. All settings have a specific number attached to them. The JUMP button enables the user to select and display any setting without having to navigate through the menus (see later).
15. Shifts the display three lower lines to show the alarm list.

2.1.2 Plant display

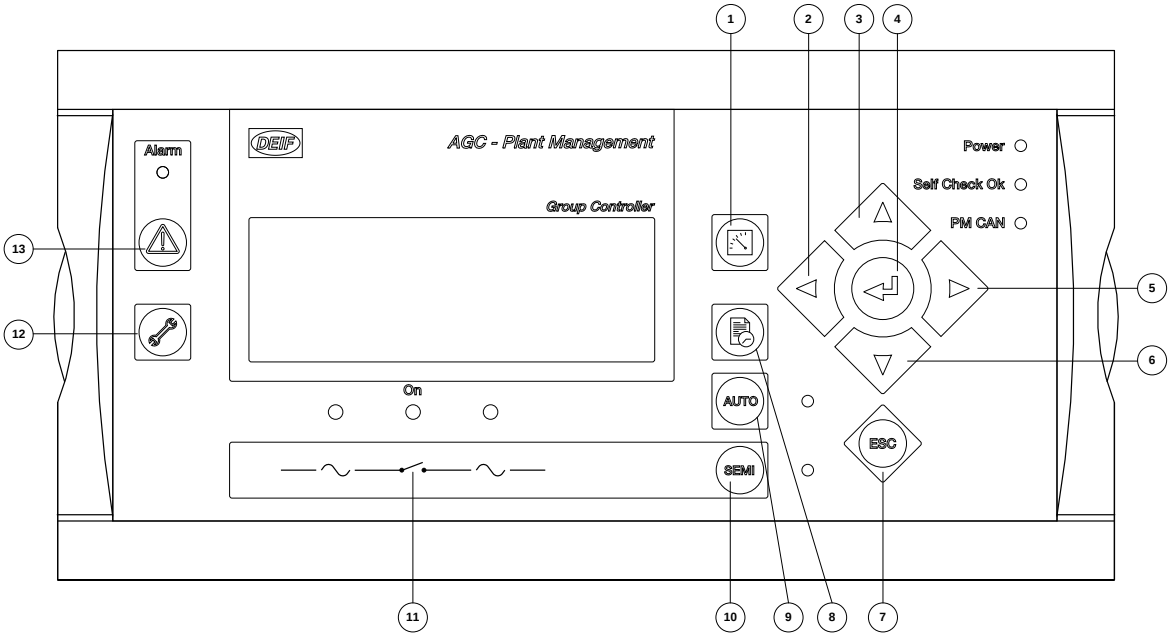
The display unit holds a number of push-button functions which are described below:



1. Shifts the first line displaying in the setup menus. Push two seconds to switch to master display in case more than one display is connected.
2. Moves the cursor left for manoeuvring in the menus.
3. Increases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
4. Selects the underscored entry in the fourth line of the display.
5. Moves the cursor right for manoeuvring in the menus.
6. Decreases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
7. Jumps one step backwards in the menu (to previous display or to the entry window).
8. Shifts the display three lower lines to show the event and alarm list.
9. Selects AUTO mode for remote or automatic operation.
10. Selects SEMI AUTOMATIC mode for local control.
11. Manual activation of close breaker and open breaker sequence if "SEMI-AUTO" is selected.
12. Stop of the plant if "AUTO" is selected.
13. Start of the plant if "AUTO" is selected.
14. Enters a specific menu number selection. All settings have a specific number attached to them. The JUMP button enables the user to select and display any setting without having to navigate through the menus (see later).
15. Shifts the display three lower lines to show the alarm list.

2.1.3 Group display

The display unit holds a number of push-button functions which are described below:

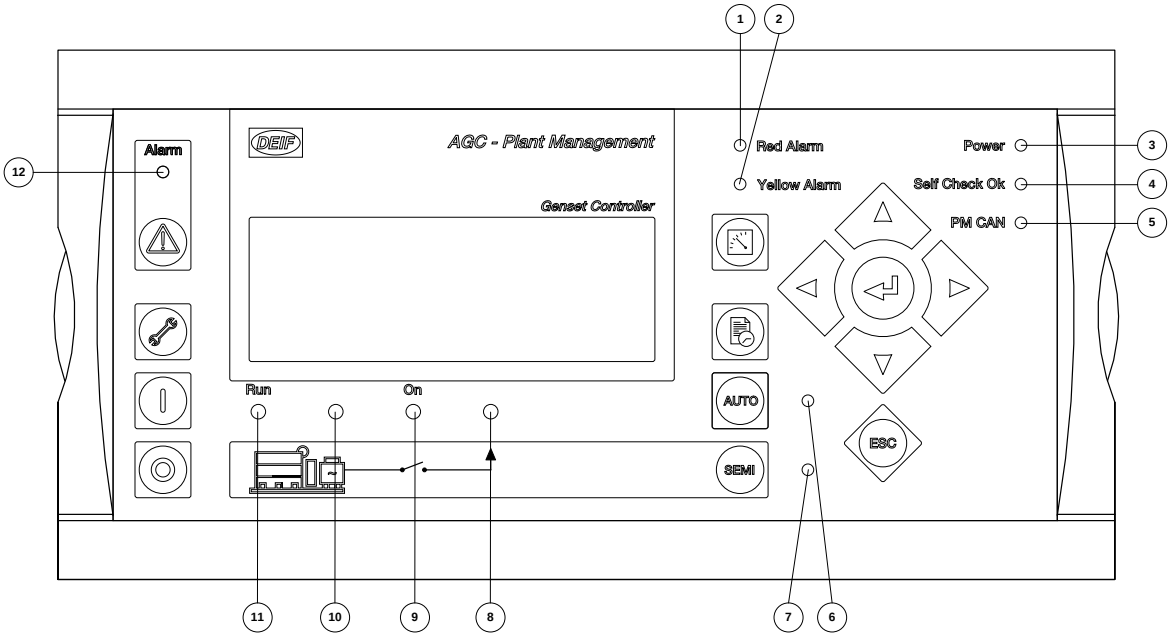


1. Shifts the first line displaying in the setup menus. Push two seconds to switch to master display in case more than one display is connected.
2. Moves the cursor left for manoeuvring in the menus.
3. Increases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
4. Selects the underscored entry in the fourth line of the display.
5. Moves the cursor right for manoeuvring in the menus.
6. Decreases the value of the selected set point (in the setup menu). In the daily use display, this button function is used for scrolling the second line displaying of generator values.
7. Jumps one step backwards in the menu (to previous display or to the entry window).
8. Shifts the display three lower lines to show the event and alarm list.
9. Selects AUTO mode for automatic operation in its own plant mode.
10. Selects SEMI AUTOMATIC mode for local control.
11. Manual activation of close breaker and open breaker sequence if "SEMI-AUTO" is selected.
12. Enters a specific menu number selection. All settings have a specific number attached to them. The JUMP button enables the user to select and display any setting without having to navigate through the menus (see later).
13. Shifts the display three lower lines to show the alarm list.

2.2 LED functions

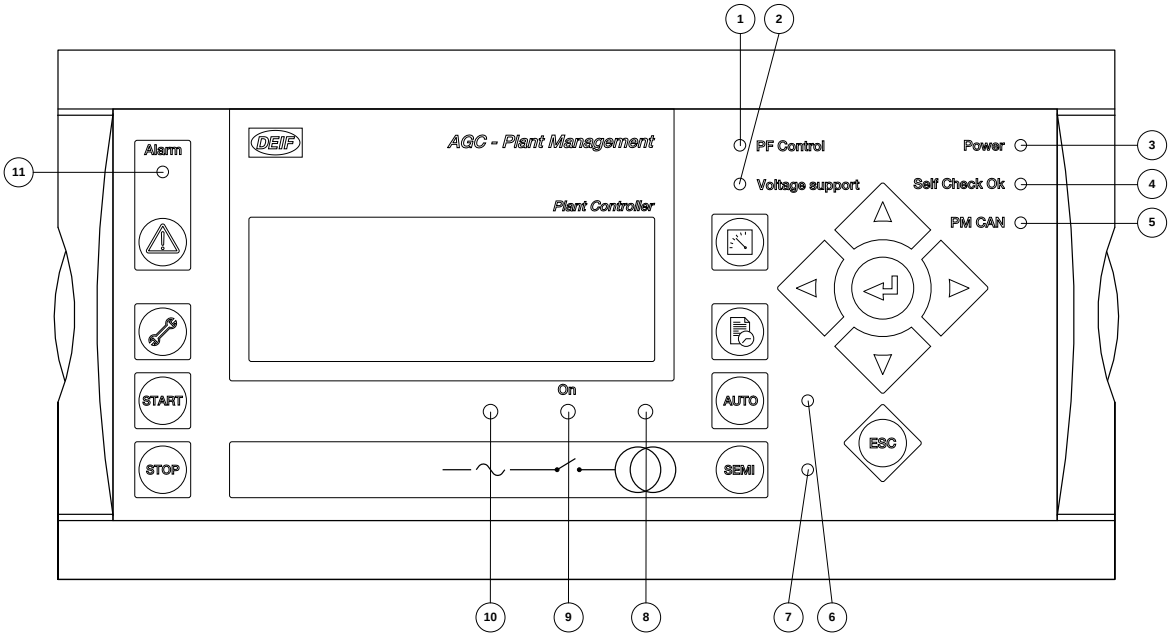
2.2.1 Genset display

The display unit holds 10 LED functions. The colour is green or red or a combination in different situations. The display LEDs are indicating as follows:



1. LED indicates a red alarm shutdown in the ECU.
2. LED indicates a yellow alarm in the ECU.
3. LED indicates that the auxiliary supply is switched on.
4. LED indicates that the unit is OK.
5. LED indicates that the communication of the plant management is functioning.
6. LED indicates that AUTO mode is selected.
7. LED indicates that SEMI mode is selected.
8. LED green light indicates that the voltage/frequency of the busbar is present and OK.
9. LED indicates that the generator breaker is closed.
10. LED green light indicates that the voltage/frequency of the generator is present and OK.
11. LED indicates that the generator is running.
12. LED flashing indicates that unacknowledged alarms are present. LED fixed light indicates that ALL alarms are acknowledged, but some are still present.

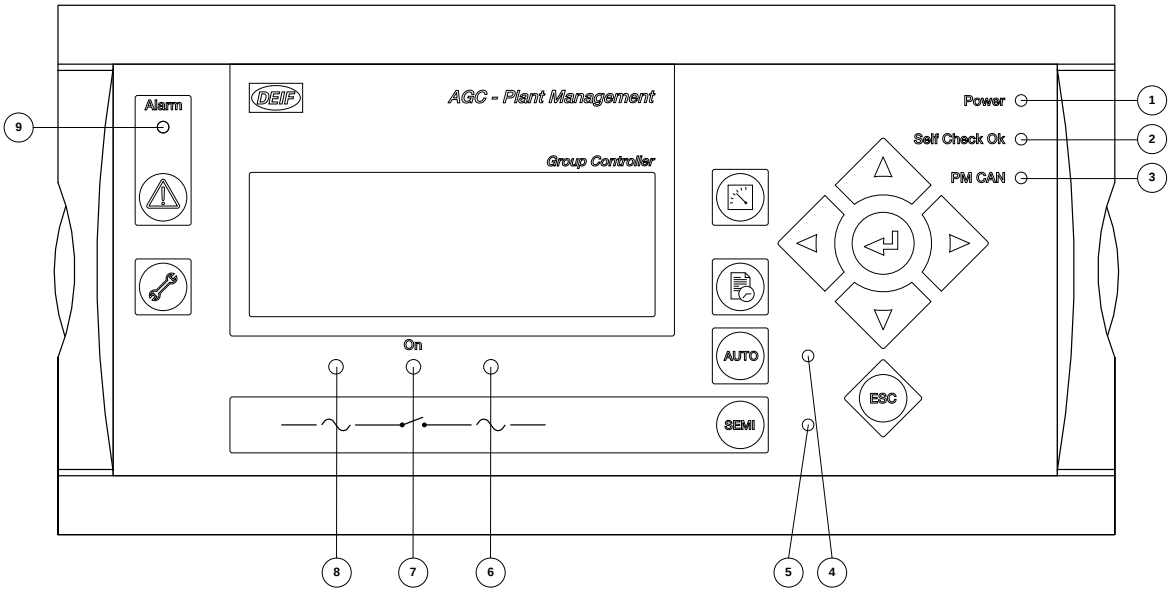
2.2.2 Plant display



1. LED indicates common PF control (yellow = Fixed for DG) (green = Fixed for import/export).
2. LED indicates that voltage support is activated.
3. LED indicates that the auxiliary supply is switched on.
4. LED indicates that the unit is OK.
5. LED indicates that the communication of the plant management is functioning.
6. LED indicates that AUTO mode is selected.
7. LED indicates that SEMI mode is selected.
8. LED is green if the mains is present and OK. LED is red at a mains failure.
9. LED indicates that the mains breaker is closed.
10. LED green light indicates that the voltage/frequency of the busbar is present and OK.
11. LED flashing indicates that unacknowledged alarms are present. LED fixed light indicates that ALL alarms are acknowledged, but some are still present.

The breaker symbol will be green if the AGC Plant Management does not control any breaker.

2.2.3 Group display



1. LED indicates that the auxiliary supply is switched on.
2. LED indicates that the unit is OK.
3. LED indicates that the communication of the plant management is functioning.
4. LED indicates that AUTO mode is selected.
5. LED indicates that SEMI mode is selected.
6. LED green light indicates that the voltage/frequency of the mains side busbar is present and OK.
7. LED indicates that the group tie breaker is closed.
8. LED green light indicates that the voltage/frequency of the genset side busbar is present and OK.
9. LED flashing indicates that unacknowledged alarms are present. LED fixed light indicates that ALL alarms are acknowledged, but some are still present.

The breaker symbol will be green if the AGC Plant Management does not control any breaker.

3. Display and menu structure

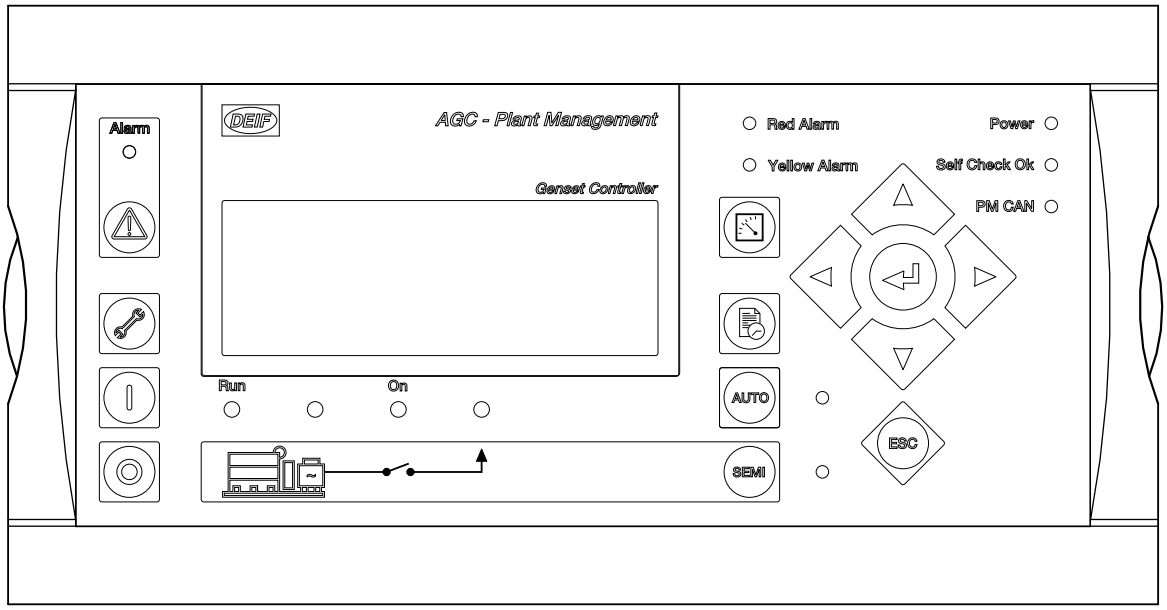
3.1 General

This chapter deals with the display unit including the push-button and LED functions. In addition, the unit menu structure will be presented.

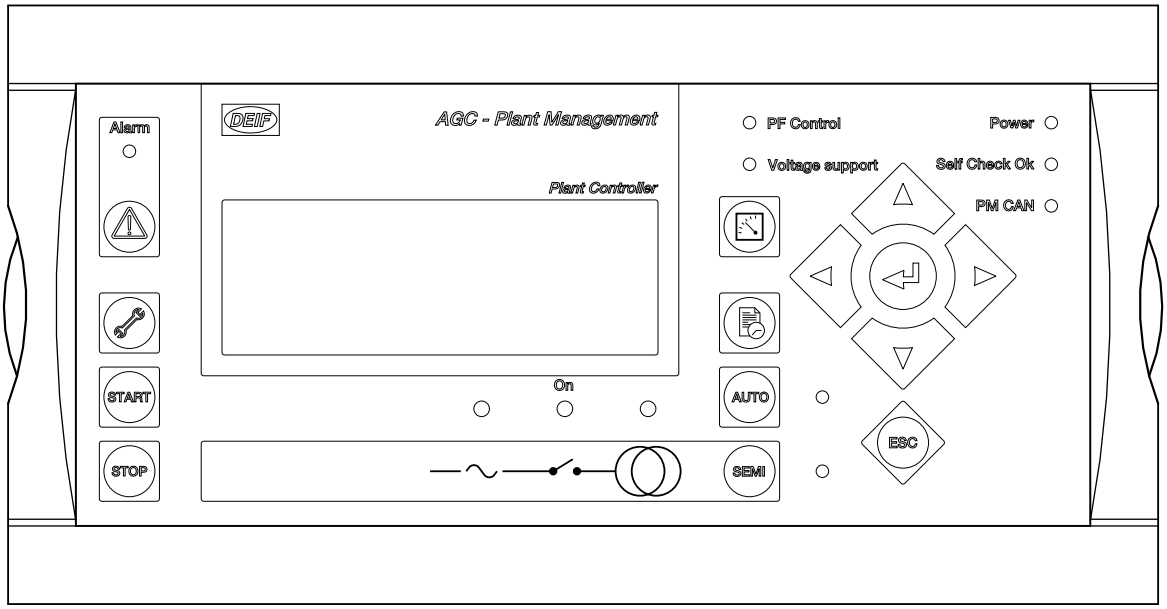
3.2 Display layouts for AGC Plant Management

The display dimensions are H × W = 115 × 220 mm (4.528” × 8.661”).

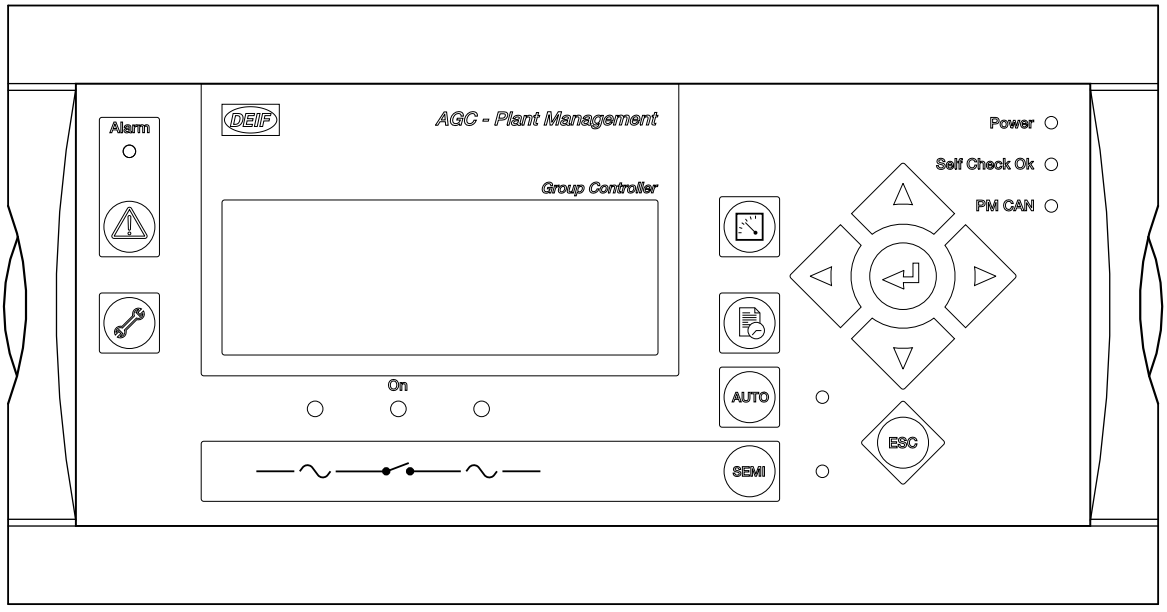
Engine and generator breaker control (island)



Plant and mains breaker control



Group tie breaker control



3.3 LCD display

The display is a backlit LCD text display containing four lines with 20 characters in each line. There is a backlight dimmer function that can be used from the display unit push-buttons. (Jumt to menu 9150 and press UP or DOWN). Basically, all measured and calculated values can be read in the display. These may be selected via the PC utility software (USW).

For selection of values, see the Designer's Reference Handbook.

3.4 Menu structure

The display includes two menu systems which can be used without password entry:

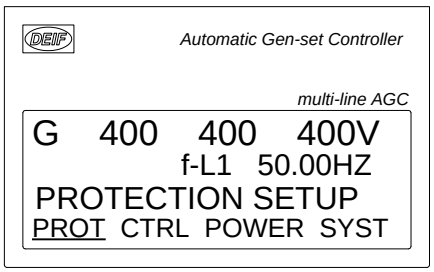
View menu system:
This is the commonly used menu system. 20 windows are configurable and can be entered by using the arrow push-buttons.

Setup menu system (not commonly used by the operator):
This menu system is used for setting up the unit, and if the operator needs detailed information that is not available in the view menu system.
Changing of parameter settings is password-protected.

3.4.1 Entry window

When the unit is powered up, an entry window appears. The entry window is the turning point in the menu structure and as such the gateway to the other menus. It can always be reached by pushing the BACK push-button three times.

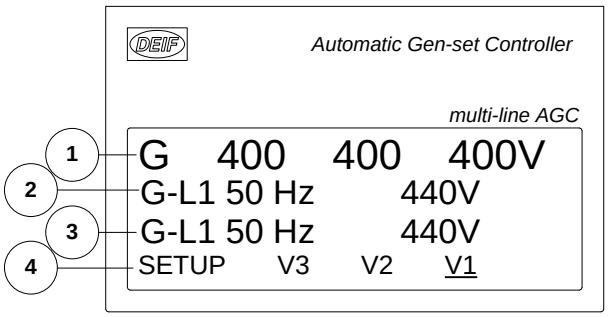
The event and alarm list will appear at power up if an alarm is present.



3.4.2 View menu

The view menus (V1, V2 and V3) are the daily use menus for the operator.

In the view menus, various measured values are on display.



1. First display line: operational status or measurements
2. Second display line: measurements relating to operational status
3. Third display line: measurements relating to operational status
4. Fourth display line: selection of setup and view menus

3.4.3 View menu navigation

The readings, etc., are all selected by moving the cursor (fourth display line (note the underscore of V1 in the drawing above - this is the cursor)):

The cursor is moved using the and push-buttons on the right side of the display.

3.4.4 View window 1 and view window 2

Display of measured values according to the selections made during configuration.

For detailed information about configuration, please see the Designer's Reference Handbook.

V1 contains up to 20 different windows which can be selected using the △ and ▽ push-buttons located on the right hand side of the display.

Windows	V1
View 1	Manual selection with △ or ▽ push-buttons.
View 2	
View 3	
View 4	
View 5	
View 6	
View 7	
View 8	
View 9	
View 10	
View 11	
View 12	
View 13	
View 14	
View 15	
View 16	
View 17	
View 18	
View 19	
View 20	
EIC view	EIC views will be shown if EIC AUTO VIEW is enabled when the ECU is powered. EIC AUTO VIEW = 7564 Maximum 14 additional lines (depends on type).
EIC view	
EIC view	
EIC view	
EIC view	
EIC view	
EIC view	
EIC view	
EIC view	

3.4.5 View window 3

Display of measured values according to the selections made during configuration.

The V3 display changes with running modes:

First display line indicates running status of the unit. The messages shown in the table at the end of this chapter can be displayed.

Second and third display lines display measured values.

Fourth display line displays the selection line.

Display V3 follows the selection in V1 as follows:

1: View 1: (Stopped)
2: View 2: (Synchronising)
3: View 3: (Genset in normal operation)

Windows	**V 3**
View 1	Changes automatically between the three first views: 1. View 1 (Stopped) 2. View 2 (Sync.) 3. View 3 (Normal run) No manual selection. Line 1 shows a status text. Line 2 and line 3 show measurements.
View 2	
View 3	

3.5 Status line text

This table explains the different messages (master language selected).

Status text	Condition	Comment
BLOCK	Block mode is activated	
SIMPLE TEST	Test mode is activated	
LOAD TEST		
FULL TEST		
SIMPLE TEST ###.#min	Test mode activated and test timer counting down	
LOAD TEST ###.#min		
FULL TEST ###.#min		
ISLAND MAN	Genset stopped or running and no other action taking place	
ISLAND SEMI		
READY ISLAND AUTO	Genset stopped in Auto	
ISLAND ACTIVE	Genset running in Auto	
AMF MAN	Genset stopped or running and no other action taking place	
AMF SEMI		
READY AMF AUTO	Genset stopped in Auto	
AMF ACTIVE	Genset running in Auto	
FIXED POWER MAN	Genset stopped or running and no other action taking place	
FIXED POWER SEMI		
READY FIXED P AUTO	Genset stopped in Auto	
FIXED POWER ACTIVE	Genset running in Auto	
PEAK SHAVING MAN	Genset stopped or running and no other action taking place	
PEAK SHAVING SEMI		
READY PEAK SHAV AUTO	Genset stopped in Auto	
PEAK SHAVING ACTIVE	Genset running in Auto	
LOAD TAKEOVER MAN	Genset stopped or running and no other action taking place	
LOAD TAKEOVER SEMI		
READY LTO AUTO	Genset stopped in Auto	
LTO ACTIVE	Genset running in Auto	
MAINS P EXPORT MAN	Genset stopped or running and no other action taking place	
MAINS P EXPORT SEMI		
READY MPE AUTO	Genset stopped in Auto	
MPE ACTIVE	Genset running in mains power export mode	
DG BLOCKED FOR START	Generator stopped and active alarm(s) on the generator	

Status text	Condition	Comment
GB ON BLOCKED	Generator running, GB open and an active "Trip GB" alarm	
SHUTDOWN OVERRIDE	The configurable input is active	
ACCESS LOCK	The configurable input is activated, and the operator tries to activate one of the blocked keys	
GB TRIP EXTERNALLY	Some external equipment has tripped the breaker	An external trip is logged in the event log
MB TRIP EXTERNALLY	Some external equipment has tripped the breaker	An external trip is logged in the event log
IDLE RUN	The "Idle run" function is active. The genset will not stop, until a timer has expired	
IDLE RUN ###.#min	The timer in the "Idle run" function is active	
DELOAD	Decreasing the load of the genset in order to open the breaker	
START DG(s) IN ###s	The start genset set point is exceeded	
STOP DG(s) IN ###s	The stop genset set point is exceeded	
START PREPARE	The start prepare relay is activated	
START RELAY ON	The start relay is activated	
START RELAY OFF	The start relay is deactivated during the start sequence	
MAINS FAILURE	Mains failure and mains failure timer expired	
MAINS FAILURE IN ###s	Frequency or voltage measurement is outside the limits	The timer shown is the mains failure delay. Text in mains units
MAINS U OK DEL ####s	Mains voltage is OK after a mains failure	The timer shown is the mains OK delay
MAINS f OK DEL ####s	Mains frequency is OK after a mains failure	The timer shown is the mains OK delay
Hz/V OK IN ###s	The voltage and frequency on the genset is OK	When the timer runs out it is allowed to operate the generator breaker
COOLING DOWN ###s	Cooling down period is activated	
GEN-SET STOPPING	This info is shown when cool down has finished	
EXT. STOP TIME ###s		

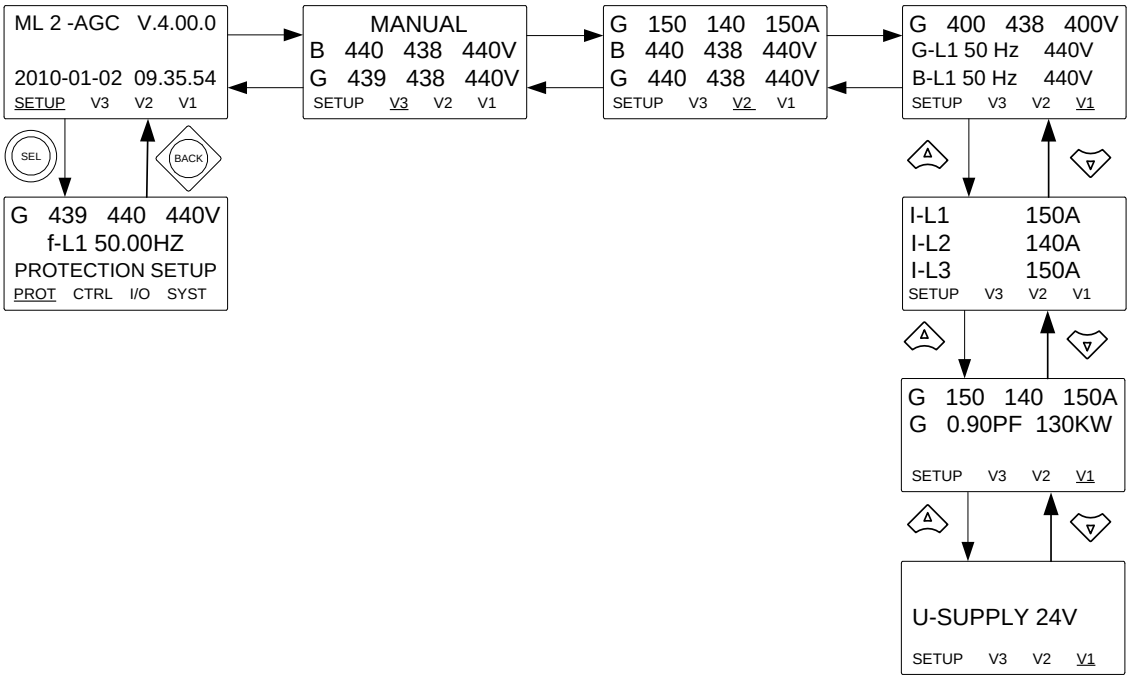
Status text	Condition	Comment
PROGRAMMING LANGUAGE	This info is shown if the language file is downloaded from the PC utility software	
TOO SLOW 00<----------	Generator running too slow during synchronising	
----------> 00 TOO FAST	Generator running too fast during synchronising	
SELECT GEN-SET MODE	Power management has been de-activated and no other genset mode has been selected	
RAMP TO #####kW	The power ramp is ramping in steps, and the next step that will be reached after the timer has expired will be displayed	
DERATED TO #####kW	Displays the ramp down set point	
PREPARING ETHERNET	Initialising the Modbus TCP/IP	
PREPARING ENGINE IF	Preparing engine IF	
PROGRAMMING MLOGIC		

3.5.1 Texts only related to Power Management

Status text	Condition	Comment
DG unit		
BLACKOUT ENABLE	This information is shown if a CAN failure is present in a power management application	
SYNCHRONISING TB XX	TB XX is synchronising	
SYNCHRONISING MB XX	MB XX is synchronising	
Group unit		
TB TRIP EXTERNALLY	Some external equipment has tripped the breaker	An external trip is logged in the event log
All units		
BROADCASTING APPL. #	Broadcast of an application through the CAN line	Broadcasts one of the four applications from one unit to the other AGC PMs in the power management system
RECEIVING APPL. #	AGC receiving an application	
BROADCAST COMPLETED	Successful broadcast of an application	
RECEIVE COMPLETED	Application received successfully	
BROADCAST ABORTED	Broadcast terminated	
RECEIVE ERROR	Application is not received correctly	

3.5.2 View menu example

The following is an example of a configured view menu system. In this example, four of 20 windows have been configured in view 1.



3.6 Mode menu

The modes can be selected using the mode push-buttons on the display unit.

Genset controller

Mode	Description
SEMI	- The display push-buttons (START, STOP, GB ON, GB OFF) are active and can be used by the operator. - The regulators are also active, that is the speed control will bring the generator to nominal speed upon start. - When pushing a breaker button for closing, the AGC PM will synchronise (if allowed) the breaker. When the breaker closes, the controls stop.
AUTO	- The unit will automatically carry out the control type selected (power management, fixed power). - The display control push-buttons (START, STOP, GB ON, GB OFF) are disabled.

Plant controller

Mode	Description
SEMI	● The display push-buttons (START, STOP) are inactive and cannot be used by the operator. ● The display push-buttons (MB ON, MB OFF) are active and can be used by the operator. ● When the plant is dispatching, the set points of MW and PF will be transmitted from the plant unit. ● When pushing the breaker button for closing, the AGC PM will synchronise the breaker.
AUTO	● The unit will automatically carry out the control type selected (for example MPE, fixed power). ● The display control push-buttons (START, STOP) are enabled. ● The display control push-buttons (MB ON, MB OFF) are disabled.

Group controller

Mode	Description
SEMI	● The display push-buttons (TB ON, TB OFF) are active and can be used by the operator. ● When pushing a breaker button for closing, the AGC PM will synchronise the breaker.
AUTO	● The unit will automatically carry out the control type selected (for example MPE, fixed power). ● The display control push-buttons (TB ON, TB OFF) are disabled.

4. Alarm handling and log list

4.1 Alarm handling

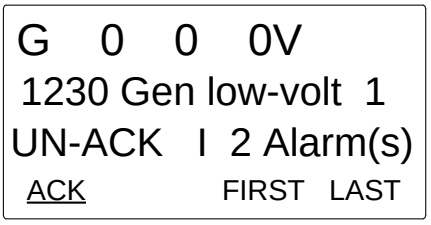
When an alarm occurs, the unit will automatically go to the alarm list for display of the alarm.

If reading of the alarms is not desired, use the BACK push-button to exit the alarm list.

If you decide to enter the alarm list later, use the INFO push-button to jump directly to the alarm list reading.

The alarm list contains both acknowledged and unacknowledged alarms provided that they are still active (that is the alarm condition is still present). Once an alarm is acknowledged and the condition has disappeared, the alarm will no longer be displayed in the alarm list.

This means that if there are no alarms, the alarm list will be empty.



This display example indicates an unacknowledged alarm. The display can show only one alarm at a time. Therefore, all other alarms are hidden.

To see the other alarms, use the  and  push-buttons to scroll in the display.

To acknowledge an alarm, place the cursor (underscore) under "ACK" and then press SEL.

To jump to the first (oldest) or the last (most recent) alarm, place the cursor under the selection (FIRST or LAST) and press SEL.

4.2 Log list

The log is divided into two different lists:
1. Events
2. Alarms

The log list contains up to 500 events (device firmware earlier than 4.40.0: 150 events), and the alarm list contains up to 500 historical alarms (device firmware earlier than 4.40.0: 30 events).

An event is for example closing of breaker and starting of engine. An alarm is for example over-current or high cooling water temperature.

To enter the log list:
1. Press LOG.
2. Select the list which is needed by using the  and  push-buttons and press the SEL push-button.
3. To scroll up and down in the list, use the  and  push-buttons.

It is also possible to go to the first (oldest) logging or the last (most recent) logging by placing the cursor (underscore) under the selection (move the cursor using the  and  push-buttons) and press the SEL push-button.