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DSE3000 Series Control Module

057-104

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DSE Model 3000 series Control and Instrumentation System Operators Manual

Amendments since last publication

Amd. No.	Comments

Clarification of notation used within this publication.

NOTE:	Highlights an essential element of a procedure to ensure correctness.
CAUTION!	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
WARNING!	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

TABLE OF CONTENTS

1 BIBLIOGRAPHY

This document refers to and is referred to by the following DSE publications which can be obtained from the DSE website www.deepseaplc.com

DSE PART	DESCRIPTION
053-050	3110 installation instructions
057-004	Electronic Engines and DSE wiring manual
057-087	3000 Series Configuration Suite manual

2 INTRODUCTION

This document details the installation and operation requirements of the DSE3000 Series modules, part of the DSEUltra® range of products.
The manual forms part of the product and should be kept for the entire life of the product. If the product is passed or supplied to another party, ensure that this document is passed to them for reference purposes.
This is not a *controlled document.* You will not be automatically informed of updates. Any future updates of this document will be included on the DSE website at www.deepseaplc.com

The **DSE 3000 series** module has been designed to allow the operator to start and stop the engine/generator, and if required, transfer the load.
The user also has the facility to view the system operating parameters via the LCD display.

The **DSE 3000** module monitors the engine, indicating the operational status and fault conditions, automatically shutting down the engine and giving a true first up fault condition of an engine failure. The LCD display indicates the fault.

The powerful microprocessor contained within the module allows for incorporation of a range of enhanced features:

- *Text based LCD display*
- ***True RMS** Voltage monitoring.*
- *Engine parameter monitoring.*
- *Fully configurable inputs for use as alarms or a range of different functions.*
- *Engine ECU interface to **electronic engines** (specify on ordering)*
- *Magnetic pickup interface for engine only applications (specify on ordering)*

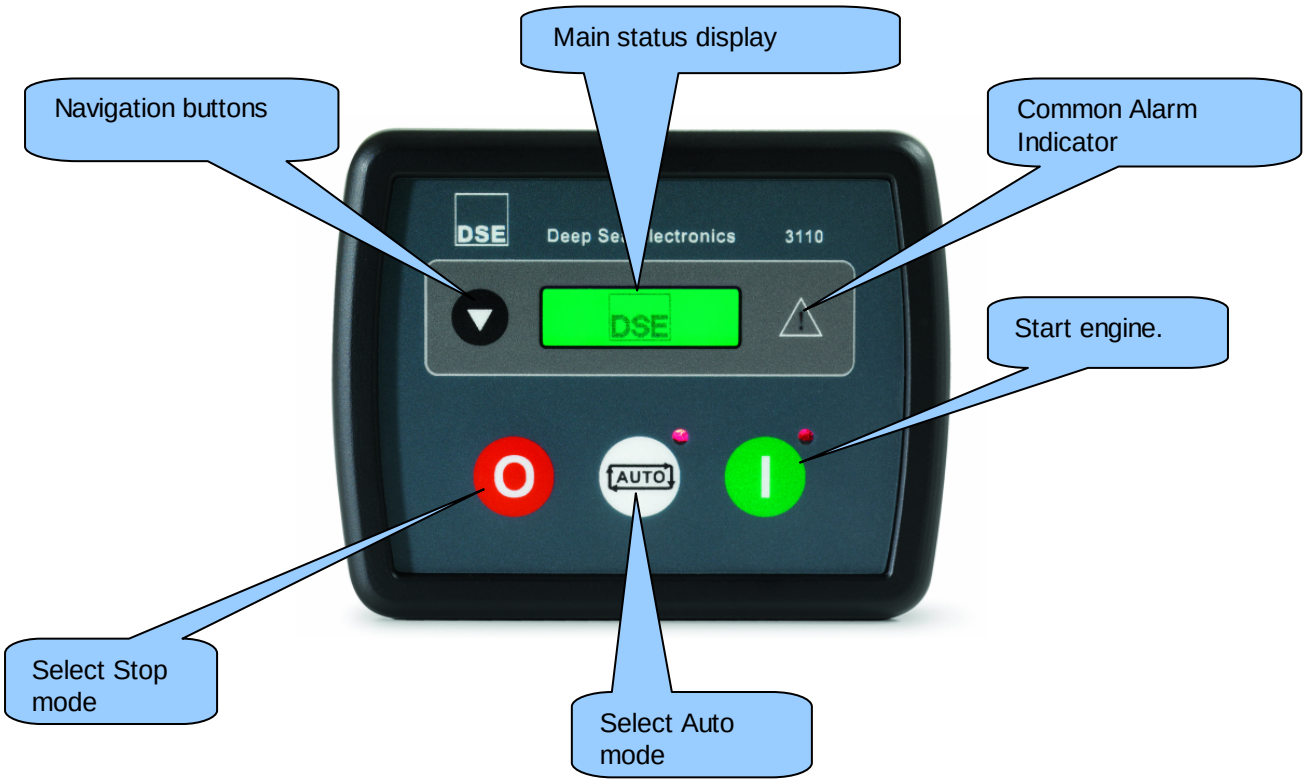
Using a PC and the 3000 series configuration software allows alteration of selected operational sequences, timers and alarm trips.

Additionally, the module's integral fascia configuration editor allows adjustment of this information.

A robust plastic case designed for front panel mounting houses the module. Connections are via locking plug and sockets.

3 DESCRIPTION OF CONTROLS

The following section details the function and meaning of the various controls on the module.



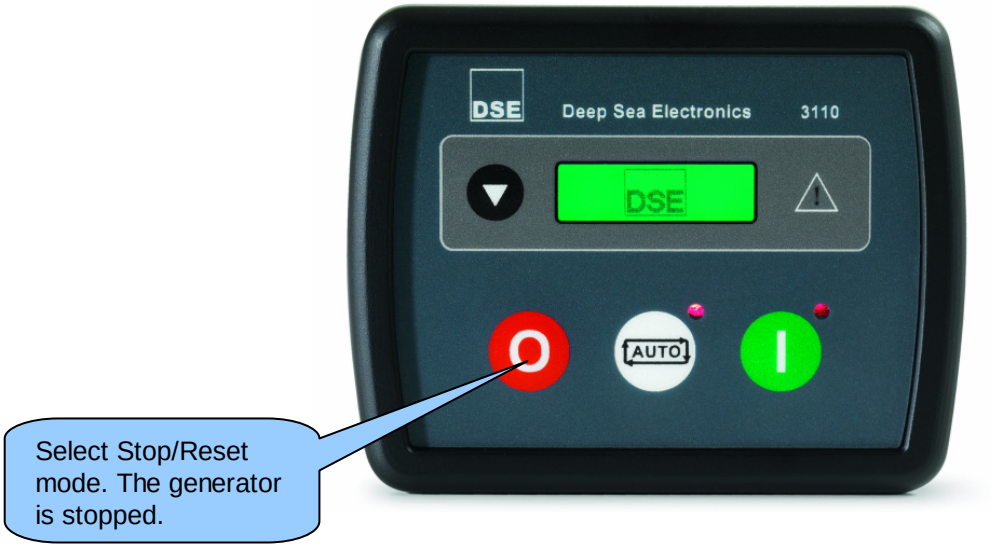
3.1 QUICKSTART GUIDE

This section provides a quick start guide to the module's operation.

3.1.1 STARTING THE ENGINE

NOTE:- For further details, see the section entitled 'OPERATION' elsewhere in this manual.

3.1.2 STOPPING THE ENGINE



NOTE:- For further details, see the section entitled 'OPERATION' elsewhere in this manual.

3.2 VIEWING THE INSTRUMENTS

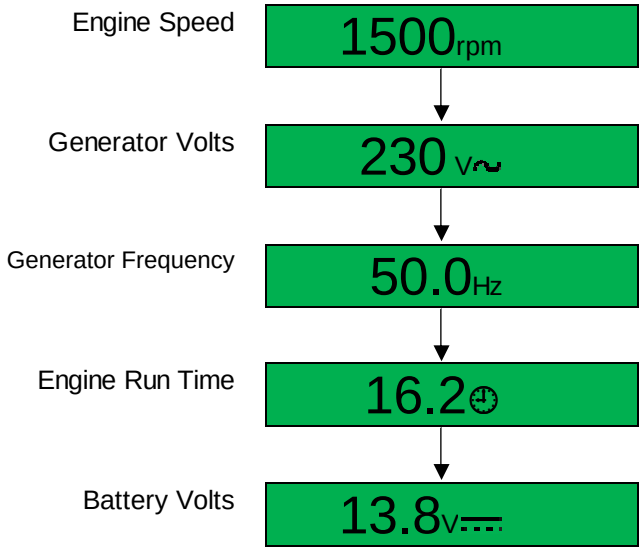
It is possible to scroll to display the different pages of information by repeatedly operating the scroll button

Once selected the page will remain on the LCD display until the user selects a different page or after an extended period of inactivity, the module will revert to the status display.

When scrolling manually, the display will automatically return to the Status page if no buttons are pressed for the duration of the configurable *LCD Page Timer*.

If an alarm becomes active while viewing the status page, the display shows the Alarms page to draw the operator's attention to the alarm condition.

Page order:-



4 OPERATION

4.1 AUTOMATIC MODE OF OPERATION

NOTE:- If a digital input configured to *panel lock* is active, changing module modes will not be possible. Viewing the instruments and event logs is NOT affected by panel lock.

Activate auto mode by pressing the AUTO pushbutton. The icon is displayed to indicate Auto Mode operation if no alarms are present.

Auto mode will allow the generator to operate fully automatically, starting and stopping as required with no user intervention.

4.1.1 WAITING IN AUTO MODE

If a starting request is made, the starting sequence will begin.
Starting requests can be from the following sources :

- Activation of an auxiliary input that has been configured to *remote start*
- Activation of the inbuilt exercise scheduler.

4.1.2 STARTING SEQUENCE

To allow for 'false' start requests, the *start delay* timer begins.

Should all start requests be removed during the *start delay* timer, the unit will return to a stand-by state.

If a start request is still present at the end of the *start delay* timer, the fuel relay is energised and the engine will be cranked.

NOTE:- If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows ***Fail to Start.***

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 3000 series configuration software).

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).

NOTE:- If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

4.1.3 ENGINE RUNNING

Once the engine is running and all starting timers have expired, the animated  icon is displayed.

DSE3110 - The generator will be placed on load if configured to do so.

NOTE:-The load transfer signal remains inactive until the Oil Pressure has risen. This prevents excessive wear on the engine.

If all start requests are removed, the *stopping sequence* will begin.

4.1.4 STOPPING SEQUENCE

The *return delay* timer operates to ensure that the starting request has been permanently removed and isn't just a short term removal. Should another start request be made during the cooling down period, the set will return on load.

If there are no starting requests at the end of the *return delay* timer, the load is removed from the generator to the mains supply and the *cooling* timer is initiated.

The *cooling* timer allows the set to run off load and cool sufficiently before being stopped. This is particularly important where turbo chargers are fitted to the engine.

After the *cooling* timer has expired, the set is stopped.

4.2 MANUAL OPERATION

NOTE:- If a digital input configured to *panel lock* is active, changing module modes will not be possible. Viewing the instruments and event logs is NOT affected by panel lock.

Manual mode allows the operator to start and stop the set manually, and if required change the state of the load switching devices. Module mode is active when the O button is pressed.

4.2.1 WAITING IN MANUAL MODE

To begin the starting sequence, press the I button. If 'protected start' is disabled, the start sequence begins immediately.
If 'Protected Start' is enabled , the ✋ icon is displayed to indicate Manual mode and the manual LED flashes. The I button must be pressed once more to begin the start sequence.

4.2.2 STARTING SEQUENCE

NOTE:- There is no *start delay* in this mode of operation.

The fuel relay is energised and the engine is cranked.

NOTE:- If the unit has been configured for CAN, compatible ECU's will receive the start command via CAN.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the start sequence will be terminated and the display shows ***Fail to Start.***

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to be derived from the main alternator output frequency but can additionally be measured from a Magnetic Pickup mounted on the flywheel (Selected by PC using the 3000 series configuration software).

Additionally, rising oil pressure can be used disconnect the starter motor (but cannot detect underspeed or overspeed).

NOTE:- If the unit has been configured for CAN, speed sensing is via CAN.

After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

4.2.3 ENGINE RUNNING

In manual mode, the load is not transferred to the generator unless a 'loading request' is made.
A loading request can come from a number of sources.

- Activation of an auxiliary input that has been configured to *remote start on load*
- Activation of the inbuilt exercise scheduler if configured for 'on load' runs.

NOTE:-The load transfer signal remains inactive until the Oil Pressure has risen. This prevents excessive wear on the engine.

Once the load has been transferred to the generator, it will not be automatically removed. To manually transfer the load back to the mains either:

- Press the *auto mode* button to return to automatic mode. The set will observe all auto mode start requests and stopping timers before beginning the *Auto mode stopping sequence*.
-
- Press the *stop button*
- De-activation of an auxiliary input that has been configured to *remote start on load*

4.2.4 STOPPING SEQUENCE

In manual mode the set will continue to run until either :

- The *stop button* is pressed – The set will immediately stop
- The *auto button* is pressed. The set will observe all auto mode start requests and stopping timers before beginning the *Auto mode stopping sequence*.

4.3 FAULT ICONS

ICON	DESCRIPTION	
	**AUXILIARY INPUTS**	Auxiliary inputs can be user configured and will display the message as written by the user.
	**FAIL TO START**	The engine has not fired after the preset number of start attempts
	**FAIL TO STOP**	The module has detected a condition that indicates that the engine is running when it has been instructed to stop. **NOTE:- 'Fail to Stop' could indicate a faulty oil pressure sensor - If engine is at rest check oil sensor wiring and configuration.**
	**LOW OIL PRESSURE**	The module detects that the engine oil pressure has fallen below the low oil pressure pre-alarm setting level after the *Safety On* timer has expired.
	**ENGINE HIGH TEMPERATURE**	The module detects that the engine coolant temperature has exceeded the high engine temperature pre-alarm setting level after the *Safety On* timer has expired.
	**UNDERSPEED**	The engine speed has fallen below the underspeed pre alarm setting
	**OVERSPEED**	The engine speed has risen above the overspeed pre alarm setting
	**CHARGE FAILURE**	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
	**LOW FUEL LEVEL**	The level detected by the fuel level sensor is below the low fuel level setting.
	**BATTERY UNDER VOLTAGE / BATTERY OVER VOLTAGE**	The DC supply has fallen below or risen above the low/high volts setting level.
	**GENERATOR UNDER VOLTAGE**	The generator output voltage has fallen below the pre-set pre-alarm setting after the *Safety On* timer has expired.
	**GENERATOR OVER VOLTAGE**	The generator output voltage has risen above the pre-set pre-alarm setting.
	**GENERATOR UNDER FREQUENCY**	The generator output frequency has fallen below the pre-set pre-alarm setting after the *Safety On* timer has expired.
	**GENERATOR OVER FREQUENCY**	The generator output frequency has risen above the pre-set pre-alarm setting.
	**CAN ECU WARNING** **CAN ECU SHUTDOWN**	The engine ECU has detected an alarm – CHECK ENGINE LIGHT **Contact Engine Manufacturer for support**.
	**CAN DATA FAIL**	The module is configured for CAN operation and does not detect data on the engine Can datalink.
	**EMERGENCY STOP**	The emergency stop button has been depressed. This a failsafe (normally closed to battery positive) input and will immediately stop the set should the signal be removed. Removal of the battery positive supply from the emergency stop input will also remove DC supply from the Fuel and Start outputs of the controller. **NOTE:- The Emergency Stop Positive signal must be present otherwise the unit will shutdown.**
	**MAGNETIC PICKUP FAILURE**	Pulses are no longer being detected from the magnetic pickup probe (3110-xxx-01 magnetic pickup version only)
	**INTERNAL MEMORY ERROR**	Either the configuration file or engine file memory is corrupted. Contact your supplier for assistance.