



DEEP SEA ELECTRONICS

DSE6010 MKII / DSE6020 MKII

Configuration Suite PC Software Manual

Document Number: 057-223

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DSE6010 MKII / DSE6020 MKII Configuration Suite PC Software Manual

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Amendments List

Issue	Comments	Minimum Module version required	Minimum Configuration Suite Version required
1	Initial release	V1.0.0	2014.57 v1.180.4

Typeface: The typeface used in this document is *Arial*. Care should be taken not to mistake the upper case letter I with the numeral 1. The numeral 1 has a top serif to avoid this confusion.

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1 INTRODUCTION

The **DSE Configuration Suite PC Software** allows the DSE60xx MKII family of modules to be connected to a PC via USB 'A –USB B' cable. Once connected, the various operating parameters within the module are viewed or edited as required by the engineer. This software allows easy controlled access to these values.

This manual details the configuration of the DSE6010 MKII / DSE6020 MKII series controllers

The configuration suite should only be used by competent, qualified personnel, as changes to the operation of the module may have safety implications on the panel / generating set to which it is fitted. Access to critical operational sequences and settings for use by qualified engineers, may be barred by a security code set by the generator provider.

The information contained in this manual should be read in conjunction with the information contained in the appropriate module documentation. This manual only details which settings are available and how they may be used. A separate manual deals with the operation of the individual module (See section entitled *Bibliography* elsewhere in this document).

1.1 BIBLIOGRAPHY

This document refers to and is referred to by the following DSE publications which is available on the DSE website www.deepseapl.com:

1.1.1 INSTALLATION INSTRUCTIONS

DSE PART	DESCRIPTION
053-174	6010 MKII / 6020 MKII installation instructions sheet

1.1.2 MANUALS

DSE PART	DESCRIPTION
057-151	DSE Configuration Suite PC Software Installation & Operation Manual
057-004	Electronic Engines and DSE wiring
057-206	DSE6010 MKII / DSE6020 MKII Operator Manual

1.1.3 OTHER

The following third party documents are also referred to:

ISBN	DESCRIPTION
1-55937-879-4	IEEE Std C37.2-1996 IEEE Standard Electrical Power System Device Function Numbers and Contact Designations. Published by Institute of Electrical and Electronics Engineers Inc

1.2 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

For information in regards to instating and using the DSE Configuration Suite Software please refer to DSE publication: **057-151 DSE Configuration Suite PC Software Installation & Operation Manual** which is found on our website: www.deepseapl.com

1.3 MODULE CONFIGURATION TYPE

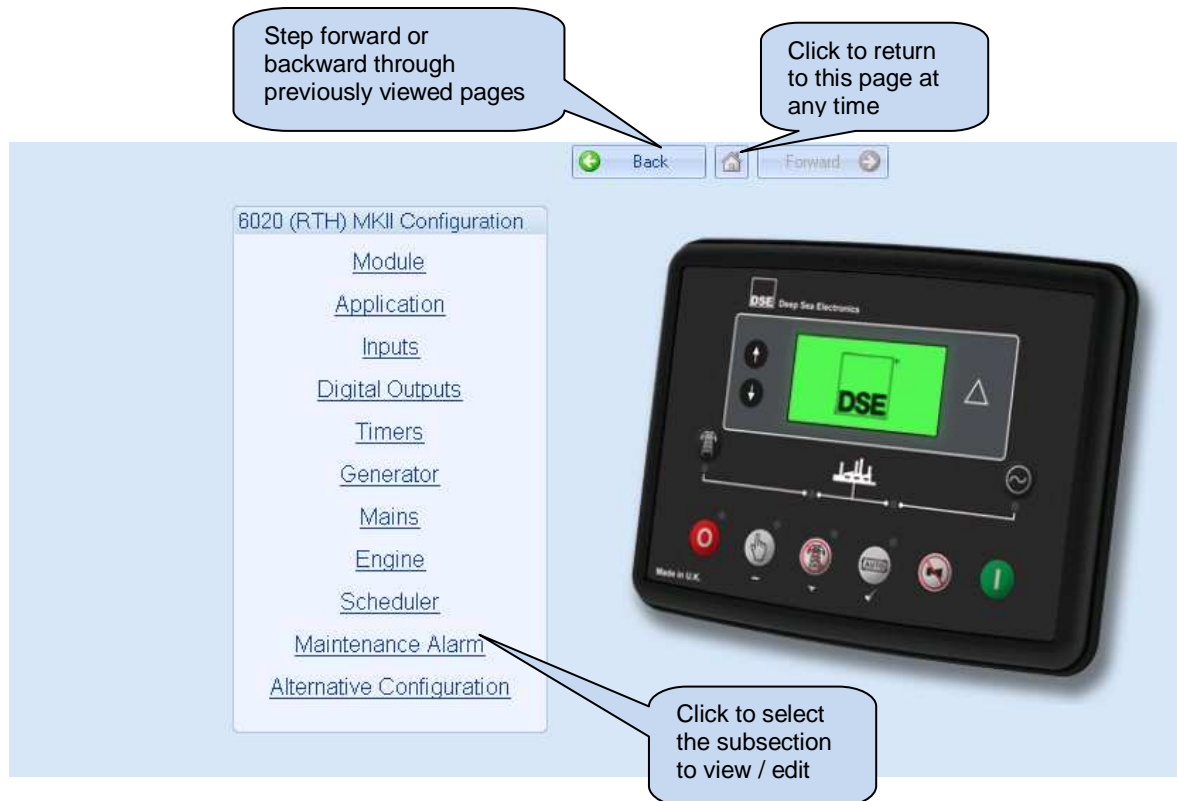
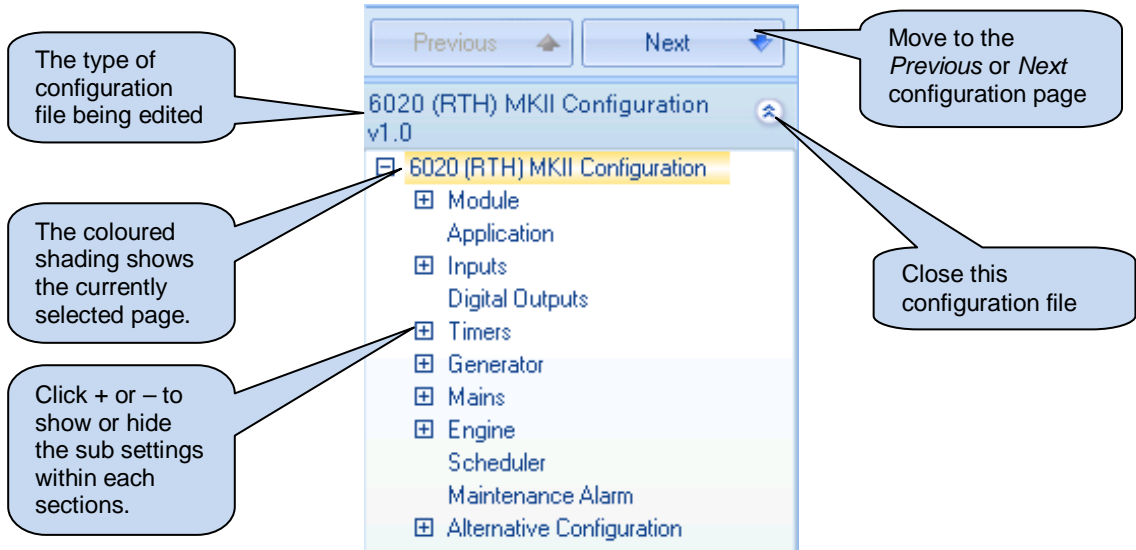
The following table shows the configuration type to select based on the module part number and description.

DESCRIPTION	MODEL PART NUMBER	CONFIGURATION
DSE6010 MKII with Real Time Clock	6010-003-03	6010 MKII RTH
DSE6010 MKII with Real Time Clock and Display Heater	6010-003-04	6010 MKII RTH
DSE6020 MKII with Real Time Clock	6020-003-03	6020 MKII RTH
DSE6020 MKII with Real Time Clock and Display Heater	6020-003-04	6020 MKII RTH

2 EDITING THE CONFIGURATION

This menu allows module configuration, to change the function of Inputs, Outputs and LED's, system timers and level settings to suit a particular application.

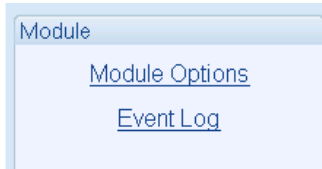
2.1 SCREEN LAYOUT



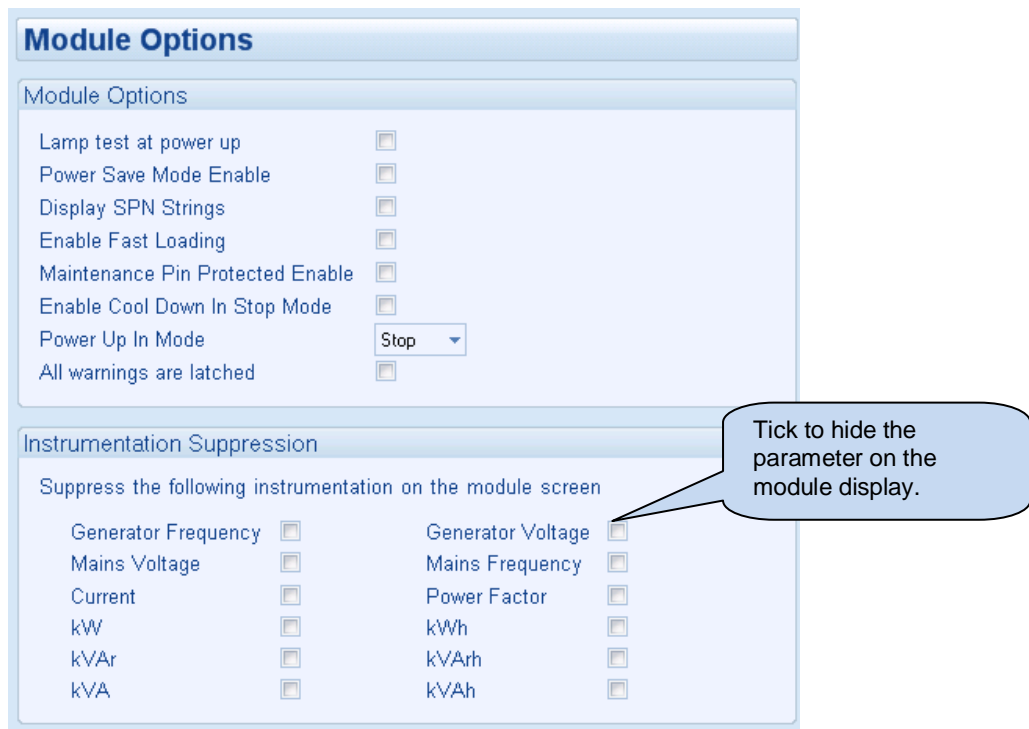
2.2 MODULE

The module section is subdivided into smaller sections. Select the required section with the mouse.



This section allows the user to change the options related to the module itself.



2.2.1 MODULE OPTIONS



Parameters detailed overleaf...

Parameter	Description
Lamp Test At Power Up	<input type="checkbox"/> = Feature disabled <input checked="" type="checkbox"/> = The LEDs on the module's fascia all illuminate when the DC power is applied as a 'lamp test' feature.
Power Save Mode Enable	<input type="checkbox"/> =Normal operation <input checked="" type="checkbox"/> = Module goes into power save (low current) mode after 1m of inactivity in STOP mode. Press any button to 'wake' the module.
Display SPN Strings	<input type="checkbox"/> =The module displays CAN messages in manufacturer numerical code. <input checked="" type="checkbox"/> = The module displays CAN messages in ENGLISH text alongside the manufacturer numerical code.
Enable Fast Loading	<input type="checkbox"/> = Normal Operation, the safety on timer is observed in full. This feature is useful if the module is to be used with some small engines where pre-mature termination of the delay timer leads to overspeed alarms on start up. <input checked="" type="checkbox"/> = The module terminates the safety on timer once all monitored parameters have reached their normal settings. This feature is useful if the module is to be used as a standby controller as it allows the generator to start and go on load in the shortest possible time.
	 NOTE: Enabling Fast Loading is only recommended where steps have been taken to ensure rapid start up of the engine is possible. (For example when fitted with engine heaters, electronic governors etc.)
Maintenance PIN Protected Enable	Maintenance alarm reset through the front panel editor, is PIN protected
Enable Cool Down In Stop Mode	Changes the way the module reacts to the Stop button. <input type="checkbox"/> =if the engine is running on load and the stop button is pressed, the module opens the breaker and directly shutdown the engine. <input checked="" type="checkbox"/> = if the engine is running and the breaker is closed, the module opens the breaker, wait for the cool down timer to expire, then shutdown the engine.
	 NOTE: If the engine is running with the breaker open, the module always shutdown the engine directly even if this option is enabled.
Power Up in Mode	Select the mode that the module enters when DC power is applied. Available modes to select from: Auto, Manual, Stop mode
All Warnings Are Latched	<input type="checkbox"/> = Normal Operation, the warnings and pre-alarms automatically reset once the triggering condition has cleared. <input checked="" type="checkbox"/> = Warnings and pre-alarms latch when triggered. Resetting the alarm is performed by either an external reset applied to one of the inputs or, the 'Stop/Reset' pushbutton must be operated (once the triggering condition has been cleared).

2.2.2 EVENT LOG

Event Log

Display Options

Module display Date and time Engine hours run

Logging Options

Log the following events to the event log

Power up	<input checked="" type="checkbox"/>	Shutdown alarms	<input checked="" type="checkbox"/>
Mains return	<input checked="" type="checkbox"/>	Electrical trip alarms	<input checked="" type="checkbox"/>
Mains fail	<input checked="" type="checkbox"/>	Latched warnings	<input checked="" type="checkbox"/>
ECU Shutdown alarms	<input checked="" type="checkbox"/>	Unlatched warnings	<input checked="" type="checkbox"/>
		Maintenance alarms	<input checked="" type="checkbox"/>

Event logging options,
Tick to enable the type
of event to be logged.

2.3 APPLICATION

The screenshot displays the 'Application' configuration window, which is divided into two main sections: 'ECU (ECM) Options' and 'CAN Data Fail Alarm'. The 'ECU (ECM) Options' section includes a dropdown menu for 'Engine Type' (set to 'Conventional Engine') and a checkbox for 'Alternative Engine Speed'. The 'CAN Data Fail Alarm' section includes dropdown menus for 'Action' (set to 'Shutdown') and 'Arming' (set to 'From Safety On'), and a slider for 'Activation Delay' (set to '0s'). Three callout boxes provide detailed explanations for these settings.

Application

ECU (ECM) Options

Engine Type: Conventional Engine

Alternative Engine Speed:

CAN Data Fail Alarm

Action: Shutdown

Arming: From Safety On

Activation Delay: 0s

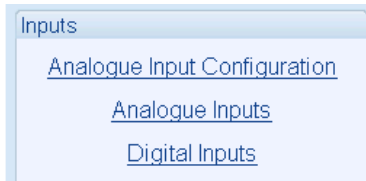
Allows selection of the Engine type being used (ie Conventional Diesel Engine, Conventional Gas Engine or Electronic Engine)

Instructs electronic engines to run at their 'alternative speed' (supported CAN engines only)

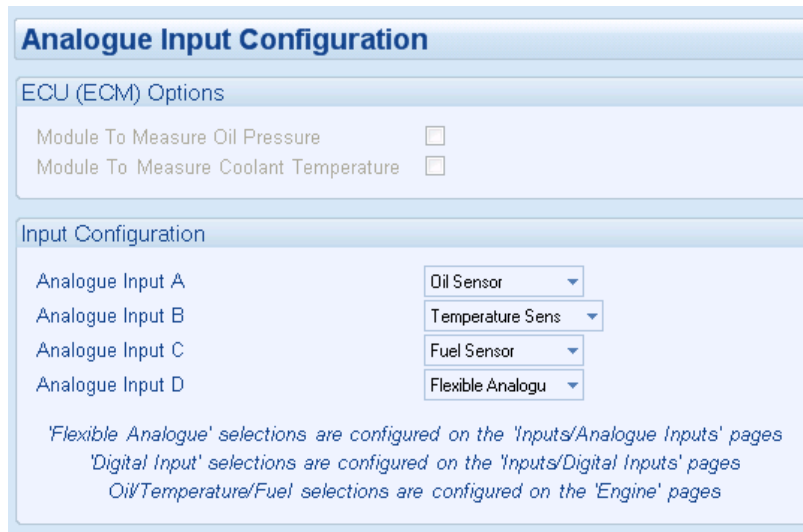
Configuration of the CAN data fail alarm, providing protection against the failure of the engine ECU data link.

2.4 INPUTS

The *Inputs* section is subdivided into smaller sections.
Select the required section with the mouse.



2.4.1 ANALOGUE INPUT CONFIGURATION



Parameter	Description
Module To Measure Oil Pressure	(Available only when the module is configured for connection to a CAN engine.) <input type="checkbox"/> = The measurements are taken from the ECU. <input checked="" type="checkbox"/> = The module ignores the CAN measurement and uses the analogue sender input.
Module To Measure Coolant Temperature	(Available only when the module is configured for connection to a CAN engine.) <input type="checkbox"/> = The measurements are taken from the ECU. <input checked="" type="checkbox"/> = The module ignores the CAN measurement and uses the analogue sender input.
Analogue Input A	Select what the analogue input is to be used for: <i>Digital Input</i> <i>Flexible Analogue</i> <i>Not Used</i> <i>Oil Sensor</i>
Analogue Input B	Select what the analogue input is to be used for: <i>Digital Input</i> <i>Temperature Sensor</i> <i>Not Used</i>
Analogue Input C	Select what the analogue input is to be used for: <i>Digital Input</i> <i>Flexible Analogue</i> <i>Fuel Sensor</i> <i>Not Used</i>
Analogue Input D	Select what the analogue input is to be used for: <i>Digital Input</i> <i>Flexible Analogue</i> <i>Not Used</i> <i>Oil Sensor</i>

2.4.2 ANALOGUE INPUTS

The screenshot shows the configuration interface for 'Flexible Sensor A'. It is divided into three main sections: Sensor Description, Input Type, and Sensor Alarms. Callouts provide additional information:

- Sensor Description:** The 'Sensor Type' is set to 'Percentage Sensor'.
- Input Type:** Set to 'User defined'. A callout points to the 'Edit...' button, stating: 'Click to edit the 'sensor curve'. See section entitled *Editing the Sensor Curve*.'
- Sensor Alarms:**
 - Alarm Arming:** Set to 'Always'. A callout states: 'Select the type of alarm required. For details of these, see the section entitled *Alarm Types* elsewhere in this document.'
 - Low Alarm Enable:** Checked. Action is 'Shutdown'. Low Alarm is set to 25%. A callout points to the checkbox: 'Click to enable or disable the alarms. The relevant values below appears *greyed out* if the alarm is disabled.'
 - Low Pre-alarm Enable:** Checked. Low Pre-alarm Trip is 30%. Low Pre-alarm Return is 40%.
 - High Pre-alarm Enable:** Checked. High Pre-alarm Return is 50%. High Pre-alarm Trip is 60%.
 - High Alarm Enable:** Checked. Action is 'Shutdown'. High Alarm is set to 75%. A callout points to the input field: 'Type the value or click the up and down arrows to change the settings'

Parameter	Description
Sensor Type	Select the sensor type: Pressure: The input is configured as a pressure sensor Percentage: The input is configured as a percentage sensor Temperature: The input is configured as a temperature sensor
Input Type	Select the sender curve from a pre-defined list or create a user-defined curve
Alarm Arming	Select when the input becomes active: Always: The input state is always monitored From Starting: The state of the input is only monitored from engaging the crank From Safety On: The state of the input is monitored from the end of the <i>Safety On Delay</i> timer
Low Alarm Enable	<input type="checkbox"/> = The Alarm is disabled. <input checked="" type="checkbox"/> = The <i>Low Alarm</i> is active when the measured quantity drops below the <i>Low Alarm</i> setting.
Low Pre-Alarm Enable	<input type="checkbox"/> = The Pre-Alarm is disabled. <input checked="" type="checkbox"/> = The <i>Low Pre-Alarm</i> is active when the measured quantity drops below the <i>Low Pre-Alarm</i> setting. The <i>Low Pre-Alarm</i> is automatically reset when the measured quantity rises above the configured <i>Low Pre-Alarm Return</i> level.
High Pre-Alarm Enable	<input type="checkbox"/> = The Pre-Alarm is disabled. <input checked="" type="checkbox"/> = The <i>High Pre-Alarm</i> is active when the measured quantity rises above the <i>High Pre-Alarm</i> setting. The <i>High Pre-Alarm</i> is automatically reset when the measured quantity falls below the configured <i>High Pre-Alarm Return</i> level.
High Alarm Enable	<input type="checkbox"/> = The Alarm is disabled. <input checked="" type="checkbox"/> = The <i>High Alarm</i> is active when the measured quantity rises above the <i>High Alarm</i> setting.

2.4.2.1 FLEXIBLE SENSOR D

Parameter	Description
Sensor Type	Select the sensor type: Pressure: The input is configured as a pressure sensor Percentage: The input is configured as a percentage sensor Temperature: The input is configured as a temperature sensor
Measured Quantity	Select the sensor signal: Current Resistive Voltage
Input Type	Select the sender curve from a pre-defined list or create a user-defined curve
Alarm Arming	Select when the input becomes active: Always: The input state is always monitored From Safety On: The state of the input is monitored from the end of the <i>Safety On Delay</i> timer From Starting: The state of the input is only monitored from engaging the crank
Low Alarm Enable	<input type="checkbox"/> = The Alarm is disabled. <input checked="" type="checkbox"/> = The <i>Low Alarm</i> is active when the measured quantity drops below the <i>Low Alarm</i> setting.
Low Pre-Alarm Enable	<input type="checkbox"/> = The Pre-Alarm is disabled. <input checked="" type="checkbox"/> = The <i>Low Pre-Alarm</i> is active when the measured quantity drops below the <i>Low Pre-Alarm</i> setting. The <i>Low Pre-Alarm</i> is automatically reset when the measured quantity rises above the configured <i>Low Pre-Alarm Return</i> level.
High Pre-Alarm Enable	<input type="checkbox"/> = The Pre-Alarm is disabled. <input checked="" type="checkbox"/> = The <i>High Pre-Alarm</i> is active when the measured quantity rises above the <i>High Pre-Alarm</i> setting. The <i>High Pre-Alarm</i> is automatically reset when the measured quantity falls below the configured <i>High Pre-Alarm Return</i> level.
High Alarm Enable	<input type="checkbox"/> = The Alarm is disabled. <input checked="" type="checkbox"/> = The <i>High Alarm</i> is active when the measured quantity rises above the <i>High Alarm</i> setting.

2.4.3 EDITING THE SENSOR CURVE

While the *DSE Configuration Suite* holds sensor specification for the most commonly used resistive sensors, occasionally it is required that the module be connected to a sensor not listed by the *configuration suite*. To aid this process, a sensor editor has been provided.

In this example, the closest match to the sensor in use is the VDO 10-180Ω fuel level sensor.

Click to edit the 'sensor curve'.

Click *Interpolate* then select two points as prompted to draw a straight line between them.

Click and drag the points on the graphs to change the settings

Use the mouse to select the graph point, then enter the value in the box or click up/down to change the value

Click CANCEL to ignore and lose any changes you have made

Click OK to accept the changes and return to the configuration editor

Click SAVE AS, you are prompted to name your curve....

Specify name for custom curve

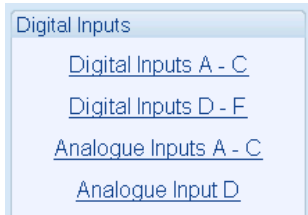
Click OK to save the curve.

Any saved curves become selectable in the *Input Type* selection list.

Hint: Deleting, renaming or editing custom sensor curves that have been added is performed in the main menu, select *Tools | Curve Manager*.

2.4.4 DIGITAL INPUTS

The *Digital Inputs* section is subdivided into smaller sections. Select the required section with the mouse.



2.4.4.1 DIGITAL INPUTS

Digital Inputs A - C

Digital Input A

Function: Remote Start On Load

Polarity: Close to Activat

Action: [Greyed out]

Arming: [Greyed out]

Activation Delay: 0s

Digital Input B

Function: User Configured

Polarity: Close to Activat

Action: Shutdown

Arming: Always

Activation Delay: 0s

Configures when the input is active: Never, Always, From Starting, From Safety On

Input function. See section entitled *Input functions* for details of all available functions

As this example shows a predefined function, these parameters are greyed out as they are not applicable

Example of a user configured input

Close or open to activate

Select the type of alarm required. For details of these, see the section entitled *Alarm Types* elsewhere in this document.

Click and drag to change the setting. This is used to give a delay on acceptance of the input. Useful for liquid level switches or to mask short term operations of the external switch device.

2.4.5 ANALOGUE INPUTS

Analogue Inputs A - C

Analogue Input A (Digital)
The Analogue Input is not configured as a Digital Input
To reconfigure, use the 'Analogue Input Configuration' page

Analogue Input B (Digital)

Function	User Configured
Polarity	Close to Activat
Action	Shutdown
Arming	Never
Activation Delay	0s

Example of an analogue input configured as digital.

Analogue Input C (Digital)
The Analogue Input is not configured as a Digital Input
To reconfigure, use the 'Analogue Input Configuration' page




2.4.6 INPUT FUNCTIONS





Where a digital input is NOT configured as “user configured”, a selection is made from a list of predefined functions. The selections are as follows:

Under the scope of IEEE 37.2, function numbers are also used to represent functions in microprocessor devices and software programs. Where the DSE input functions are represented by IEEE 37.2, the function number is listed below.



= Only applicable to DSE6020 MKII AMF Modules

Function	Description
Alarm Mute	This input is used to silence the audible alarm from an external source, such as a remote mute switch.
Alarm Reset	This input is used to reset any latched alarms from a remote location. It is also used to clear any latched warnings which may have occurred (if configured) without having to stop the generator.
Alternative Configuration	These inputs are used to instruct the module to follow the <i>alternative</i> configuration settings instead of the <i>main</i> configuration settings.
Auto Restore Inhibit  IEEE 37.2 - 3 checking or interlocking relay	In the event of a remote start/mains failure, the generator is instructed to start and take load. On removal of the remote start signal/mains return the module continues to run the generator on load until the <i>Auto Restore Inhibit</i> input is removed. This input allows the controller to be fitted as part of a system where the restoration to mains is controlled remotely or by an automated system.
Auto Start Inhibit IEEE 37.2 - 3 checking or interlocking relay	This input is used to provide an over-ride function to prevent the controller from starting the generator in the event of a remote start/mains out of limits condition occurring. If this input is active and a remote start signal/mains failure occurs the module does not give a start command to the generator. If this input signal is then removed, the controller operates as if a remote start/mains failure has occurred, starting and loading the generator. This function is used to give an ‘AND’ function so that a generator is only called to start if the mains fails and another condition exists which requires the generator to run. If the ‘Auto start Inhibit’ signal becomes active once more it is ignored until the module has returned the mains supply on load and shutdown. This input does not prevent starting of the engine in MANUAL mode.
Auxiliary Mains Fail 	The module monitors the incoming single or three phase supply for Over voltage, Under Voltage, Over Frequency or Under frequency. It may be required to monitor a different mains supply or some aspect of the incoming mains not monitored by the controller. If the devices providing this additional monitoring are connected to operate this input, the controller operates as if the incoming mains supply has fallen outside of limits, the generator is instructed to start and take the load. Removal of the input signal causes the module to act if the mains has returned to within limits providing that the mains sensing also indicates that the mains is within limits.
Close Generator (6010 MKII only)	This input is used to close the generator breaker when running in Manual mode.
Coolant Temperature Switch	This input is used to give a <i>Coolant Temperature High</i> shutdown from a digital normally open or closed switch. It allows coolant temperature protection.
External Panel Lock	Locks the mode buttons on the module front fascia.
Generator Load Inhibit IEEE 37.2 - 52 AC circuit breaker	This input is used to prevent the module from loading the generator. If the generator is already on load, activating this input causes the module to unload the generator. Removing the input allows the generator to be loaded again.
<p> NOTE: This input only operates to control the generator-switching device if the module load switching logic is attempting to load the generator. It does not control the generator switching device when the mains supply is on load.</p>	

Function	Description
Lamp Test	This input is used to provide a test facility for the front panel indicators fitted to the module. When the input is activated all LED's should illuminate.
Low Fuel Level Switch	Used to give a digital input function to provide a low fuel level alarm
Mains Load Inhibit IEEE 37.2 - 3 Checking or Interlocking Relay 	<p>This input is used to prevent the module from loading the mains supply. If the mains supply is already on load activating this input causes the module to unload the mains supply. Removing the input allows the mains to be loaded again.</p> <div style="border: 2px solid black; padding: 5px;"> <p>NOTE: -This input only operates to control the mains switching device if the module load switching logic is attempting to load the mains. It does <u>not</u> control the mains switching device when the generator is on load.</p> </div>
Maintenance Reset Alarm Air	Provides an external digital input to reset the maintenance alarm
Maintenance Reset Alarm Fuel	Provides an external digital input to reset the maintenance alarm
Maintenance Reset Alarm Oil	Provides an external digital input to reset the maintenance alarm
Oil Pressure Switch	A digital normally open or closed oil pressure switch gives this input. It allows low oil pressure protection.
Open Generator (6010 MKII only)	This input is used to open the generator breaker when running in Manual mode.
Remote Start Off Load	If this input is active, operation is similar to the 'Remote Start on load' function except that the generator is not instructed to take the load. This function is used where an engine only run is required e.g. for exercise.
Remote Start On Load	When in auto mode, the module performs the start sequence and transfer load to the generator. In Manual mode, the load is transferred to the generator if the engine is already running, however in manual mode, this input does not generate start/stop requests of the engine.
Simulate Auto Button	<div style="border: 2px solid black; padding: 5px;"> <p>NOTE: - If a call to start is present when AUTO MODE is entered, the starting sequence begins. Call to Start comes from a number of sources depending upon module type and configuration and includes (but is not limited to) : Remote start input present, Mains failure, Scheduled run, Auxiliary mains failure input present, Telemetry start signal from remote locations.</p> </div> <p>This input mimics the operation of the 'Auto' button and is used to provide a remotely located Auto mode push button.</p>
Simulate Mains Available 	This function is provided to override the module's internal monitoring function. If this input is active, the module does not respond to the state of the incoming AC mains supply.
Simulate Manual Button	This input mimics the operation of the 'Manual' button and is used to provide a remotely located Manual mode push button.
Simulate Manual Start Button	This input mimics the operation of the 'Start' button and is used to provide a remotely located start push button.
Simulate Stop Button	This input mimics the operation of the 'Stop' button and is used to provide a remotely located stop/reset push button.
Simulate Test on load button	This input mimics the operation of the 'Test' button and is used to provide a remotely located Test on load mode push button.
Smoke Limiting IEEE 37.2 – 18 Accelerating or Decelerating Device	This input instructs the module to give a <i>run at idle speed</i> command to the engine either via an output configured to <i>smoke limit</i> or by data commands when used with supported electronic engines.
Transfer To Generator/Open Mains IEEE 37.2 - 52 AC Circuit Breaker 	This input is used to transfer the load to the generator when running in MANUAL MODE
Transfer To Mains/ Open Generator IEEE 37.2-52 AC Circuit Breaker 	This input is used to transfer the load to the mains supply when running in MANUAL MODE

2.5 DIGITAL OUTPUTS

The screenshot shows a configuration window titled "Digital Outputs" with two sections: "Relay Outputs (Supplied From Emergency Stop Input)" and "Relay Outputs (DC Supply Out)".

- Relay Outputs (Supplied From Emergency Stop Input):** Contains Output A (Fuel Relay) and Output B (Start Relay). Both have a "Polarity" dropdown set to "Energise".
- Relay Outputs (DC Supply Out):** Contains Output C (Close Gen Output), Output D (Close Mains Output), Output E (Common Warning), and Output F (Common Electrical Trip). All have a "Polarity" dropdown set to "Energise".

Callouts provide the following information:

- A cloud callout points to the greyed-out "Polarity" dropdowns in the first section: "These are greyed out as they are fixed and not adjustable."
- A rectangular callout points to the "Source" dropdowns in the second section: "Select what the output is to control"
- A rectangular callout points to the "Polarity" dropdowns in the second section: "Select if the relay is to *energise* or *de-energise* upon activation of the source"
- A cloud callout at the bottom: "These labels match the typical wiring diagram"

2.5.1 OUTPUT SOURCES




The list of output sources available for configuration of the module relay.



Under the scope of IEEE 37.2, *function numbers* is also used to represent functions in microprocessor devices and software programs. Where the DSE output functions is represented by IEEE 37.2, the function number is listed below.


The outputs are in alphabetical order with the *parameter* first. For instance for overspeed output, it's listed as *Engine Overspeed*.

 = Only available on DSE6020 MKII AMF Modules

Output Source	Activates...	Is Not Active....
Not Used	The output does not change state (Unused)	
Air Filter Maintenance	Indicates that the air filter maintenance alarm is due	
Air Flap Relay	Normally used to control an air flap, this output becomes active upon an Emergency Stop or Over-speed situation.	Inactive when the set has come to rest
Analogue Input A, B, C & D (Digital)	Active when the relevant analogue input, configured as digital input, is active	
Audible Alarm IEEE 37.2 – 74 alarm relay	Use this output to activate an external sounder or external alarm indicator. Operation of the Mute pushbutton resets this output once activated.	Inactive if no alarm condition is active or if the Mute pushbutton was pressed.
Battery High Voltage IEEE 37.2 – 59DC overvoltage relay	This output indicates that a Battery Over voltage alarm has occurred.	Inactive when battery voltage is not High
Battery Low Voltage IEEE 37.2 – 27DC undervoltage relay	This output indicates that a Battery Under Voltage alarm has occurred.	Inactive when battery voltage is not Low

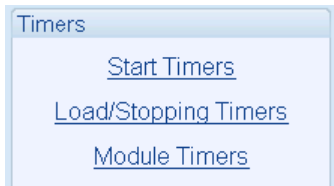
Output Source	Activates...	Is Not Active....
CAN ECU Data Fail	Becomes active when no CAN data is received from the ECU after the safety delay timer has expired	Inactive when: <ul style="list-style-type: none"> CAN data is being received The set is at rest During the starting sequence before the safety delay timer has expired
CAN ECU Error	Becomes active when a 'Yellow lamp' – Warning alarm is signalled by the CAN ECU	
CAN ECU Fail	Becomes active when a 'Red lamp' – Shutdown alarm is signalled by the CAN ECU	
CAN ECU Power	Used to switch an external relay to power the CAN ECU. Exact timing of this output is dependent upon the type of the engine ECU	
CAN ECU Stop	Active when the DSE controller is requesting that the CAN ECU stops the engine.	
Charge Alternator Warning/Shutdown	Active when the charge alternator alarm is active	
Close Gen Output IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects the generator to be on load this control source is activated.	Inactive whenever the generator is not required to be on load
Close Gen Output Pulse IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects the generator to be on load this control source is activated for the duration of the Breaker Close Pulse timer, after which it becomes inactive again.	
Close Mains Output IEEE 37.2 – 52 ac circuit breaker 	Used to control the load switching device. Whenever the module selects the mains to be on load this control source is activated.	The output is inactive whenever the mains is not required to be on load
Close Mains Output Pulse IEEE 37.2 – 52 ac circuit breaker 	Used to control the load switching device. Whenever the module selects the mains to be on load this control source is activated for the duration of the Breaker Close Pulse timer, after which it becomes inactive again.	
Combined Mains Failure 	Active when the mains supply is out of limits OR the input for Auxiliary Mains Failure is active	
Common Alarm	Active when one or more alarms (of any type) are active	The output is inactive when no alarms are present
Common Electrical Trip	Active when one or more <i>Electrical Trip</i> alarms are active	The output is inactive when no shutdown alarms are present
Common Shutdown	Active when one or more <i>Shutdown</i> alarms are active	The output is inactive when no shutdown alarms are present
Common Warning	Active when one or more <i>Warning</i> alarms are active	The output is inactive when no warning alarms are present
Cooling Down	Active when the Cooling timer is in progress	The output is inactive at all other times
Delayed Load Output 1, 2, 3 & 4	Provide delayed outputs for controlling load switching devices	
Digital Input A, B, C, D, E & F	Active when the relevant digital input is active	
Display Heater On	Active when the display heater is on	
Emergency Stop	Active when the Emergency Stop alarm is active.	
Energise To Stop	Normally used to control an <i>Energise to Stop</i> solenoid, this output becomes active when the controller wants the set to stop running.	Becomes inactive a configurable amount of time after the set has stopped. This is the <i>ETS hold time</i> .
Fail To Start IEEE 37.2 - 48 Incomplete Sequence Relay	Becomes active if the set is not seen to be running after the configurable number of start attempts	
Fail To Stop IEEE 37.2 - 48 Incomplete Sequence Relay	If the set is still running a configurable amount of time after it has been given the stop command, the output becomes active. This configurable amount of time is the <i>Fail to Stop Timer</i> .	
Flexible Sensor C & D Low/High – Alarm/Pre- Alarm	Active when the relevant flexible sensor alarm is active	
Fuel Filter Maintenance	Indicates that the fuel filter maintenance alarm is due	
Fuel Level Low/High – Alarm/Pre-Alarm	Active when the relevant fuel level alarm is active	

Output Source	Activates...	Is Not Active...
Fuel Pump Control IEEE 37.2 – 71 Level Switch	Becomes active when the <i>Fuel level</i> falls below the <i>Fuel Pump Control ON</i> setting and is normally used to transfer fuel from the bulk tank to the day tank.	If the output is already active it becomes inactive when the <i>Fuel level</i> is above the <i>Fuel Pump Control OFF</i> settings.
Fuel Relay	Becomes active when the controller requires the governor/fuel system to be active.	Becomes inactive whenever the set should be stopped, including between crank attempts, upon controlled stops and upon fault shutdowns.
Gen Over Frequency Overshoot Alarm	Becomes active when the over frequency overshoot alarm is active	
Generator Available	Becomes active when the generator is available to take load.	Inactive when <ul style="list-style-type: none"> • <i>Loading voltage</i> and <i>loading frequency</i> have not been reached • After <i>electrical trip</i> alarm • During the starting sequence before the end of the warming timer.
Generator High Voltage Alarm	Active when the generator voltage exceeds the shutdown level.	
Generator Low Voltage Alarm	Active when the generator voltage falls below the shutdown level during normal running.	
Generator Over Frequency Shutdown	Becomes active when the over frequency shutdown alarm is active	
Generator Under Frequency Shutdown	Becomes active when the under frequency shutdown alarm is active	
High Coolant Temperature Shutdown	Active when the high coolant temperature shutdown alarm is active	
kW Overload Alarm	Active when the measured kW are above the setting of the kW overload alarm. Used to give alarms on overload, control a dummy load breaker or for load shedding functionality.	
Loss of Mag Pickup Signal	Active when the controller senses the loss of signal from the magnetic pickup probe	
Low Oil Pressure Shutdown	Active when the Low Oil Pressure Shutdown alarm is activate	
Mains Low/High Frequency	Active when the relevant Mains Frequency trip level has been pased	
Mains Low/High Voltage	Active when the relevant Mains Voltage trip level has been pased	
MPU open circuit	This output indicates that the module has detected an open circuit failure in the Magnetic Pickup transducer circuit.	
Oil Filter Maintenance	Indicates that the oil filter maintenance alarm is due	
Oil Pressure Sender Open Circuit	Active when the Oil Pressure Sensor is detected as being open circuit.	
Open Gen Output IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects the generator to be off load this control source is activated.	Inactive whenever the generator is required to be on load
Open Gen Output Pulse IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects the generator to be off load this control source is activated for the duration of the Breaker Open Pulse timer, after which it becomes inactive again.	
Open Mains Output IEEE 37.2 – 52 ac circuit breaker 	Used to control the load switching device. Whenever the module selects the mains to be off load this control source is activated.	The output is inactive whenever the mains is required to be on load
Open Mains Output Pulse IEEE 37.2 – 52 ac circuit breaker 	Used to control the load switching device. Whenever the module selects the mains to be off load this control source is activated for the duration of the Breaker Open Pulse timer, after which it becomes inactive again.	
Over Current Delayed Alarm	Active when an overcurrent condition has caused the Overcurrent Delayed alarm to trigger	
Over Current Immediate Warning IEEE 37.2 – 50 instantaneous overcurrent relay	Active when an overcurrent condition exceeds the Overcurrent alarm Trip setting. At the same time, the controller begins following the IDMT curve. If the overload condition exists for an excess time, the Overcurrent IDMT alarm is activated.	
Over Speed Shutdown IEEE 37.2 – 12 over speed device	Active if the engine speed exceeds the Over Speed Shutdown setting	
Over Speed Overshoot Alarm	Active if the engine speed exceeds the Over Speed Overshoot alarm setting	

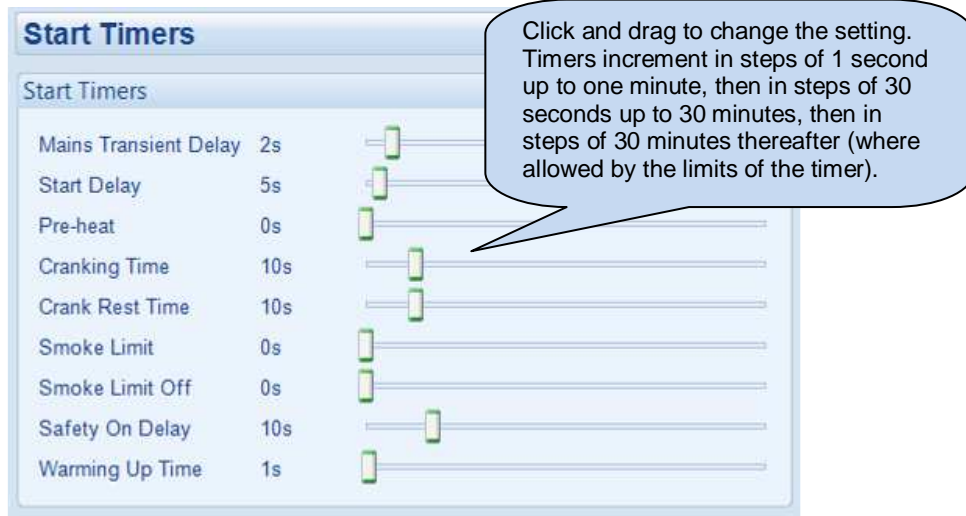
Output Source	Activates...	Is Not Active....
Preheat During Preheat Timer	Becomes active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : <ul style="list-style-type: none"> • The set is stopped • The preheat timer has expired
Preheat Until End Of Cranking	Becomes active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : <ul style="list-style-type: none"> • The set is stopped • The set has reached <i>crank disconnect</i> conditions
Preheat Until End Of Safety Timer	Becomes active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : <ul style="list-style-type: none"> • The set is stopped • The set has reached the end of the <i>safety delay</i> timer
Preheat Until End of Warming Timer	Becomes active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : <ul style="list-style-type: none"> • The set is stopped • The set has reached the end of the <i>warming</i> timer
Smoke Limiting	Becomes active when the controller requests that the engine runs at idle speed. As an output, this is used to give a signal to the <i>Idle input</i> of an engine speed governor (if available)	Becomes inactive when the controller requests that the engine runs at rated speed.
Start Relay IEEE 37.2 – 54 Turning Gear Engaging Device	Active when the controller requires the cranking of the engine.	
System in Auto Mode	Active when Auto mode is selected	
System in Manual Mode	Active when Manual mode is selected	
System in Stop Mode	Active when Stop mode is selected	
System in Test Mode	Active when Test On Load mode is selected	
Temperature Sensor Open Circuit	Active when the Temperature Sensor is detected as being open circuit.	
Under Speed Shutdown	Active when the engine speed falls below the configured under speed shutdown setting	
Waiting For Manual Restore 	Becomes active when the generator is on load and the mains supply is healthy but an input configured to Manual Restore is active. This is used to signal to an operator that action is required before the set transfers back to the mains supply.	

2.6 TIMERS


Many timers are associated with alarms. Where this occurs, the timer for the alarm is located on the same page as the alarm setting. Timers not associated with an alarm are located on the timers page. The *Timers* page is subdivided into smaller sections. Select the required section with the mouse.



2.6.1 START TIMERS



= Only available on DSE6020 MKII AMF Modules

Timer	Description
 Mains Transient Delay	Used to give a delay between sensing mains failure and acting upon it. This is used to prevent dropouts of the mains breaker and operation of the system due to mains supply transient conditions.
Start Delay	Used to give a delay before starting in AUTO mode. This timer is activated upon a remote start signal being applied, or upon a start due to mains failure, scheduled run or any other <i>automatic</i> start. Typically this timer is applied to prevent starting upon fleeting remote start signals or short term mains failures.
Pre-heat	Give a 'pre start' time during which the <i>Preheat</i> output is activated (if configured)
Cranking Time	The length of each crank attempt
Crank Rest Time	The time between multiple crank attempts.
Smoke Limit	The amount of time that the engine is requested to run at <i>idle</i> speed upon starting. This is typically used to limit emissions at startup.
Smoke Limit Off	This should be set to a little longer than the amount of time that the set takes to run up to rated speed after removal of the command to run at <i>idle</i> speed. If this time is too short, the set is stopped due to <i>underspeed</i> failure. If the time is too long, <i>underspeed</i> protection is disabled until the <i>Smoke limit time off</i> time has expired.
Safety On Delay	The amount of time at startup that the controller ignores oil pressure, engine speed, alternator voltage and other <i>delayed</i> alarms. This is used to allow the engine to run up to speed before protections are activated.
Warming Up Time	The amount of time that the set runs BEFORE being allowed to take load. This is used to warm the engine to prevent excessive wear.

2.6.2 LOAD / STOPPING TIMERS

Load/Stopping Timers

Load Control Timers

Transfer Time	0.7s
Breaker Trip Pulse	0.5s
Breaker Close Pulse	0.5s

Load Delay Timers

Delay Load Output 1	0s
Delay Load Output 2	0s
Delay Load Output 3	0s
Delay Load Output 4	0s

Stopping Timers

Return Delay	30s
Cooling Time	1m
Cooling Time At Idle	0s
ETS Solenoid Hold	0s
Fail to Stop Delay	30s
Generator Transient Delay	0.0s

Click and drag to change the setting. Timers increment in steps of 1second up to one minute, then in steps of 30 seconds up to 30 minutes, then in steps of 30 minutes thereafter (where allowed by the limits of the timer).

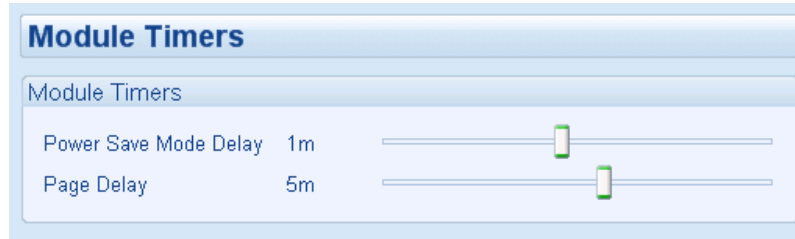
Respective digital outputs, if configured, becomes energised after a load delay timer expires.



= Only available on DSE6020 MKII AMF Modules

Timer	Description
Transfer Time	The time between one load switch opening and the other closing. Used during transfer to and from the generator.
Breaker Close Pulse	The amount of time that <i>Breaker Close Pulse</i> signal is present when the request to close a breaker is given.
Breaker Trip Pulse	The amount of time that <i>Breaker Open Pulse</i> signal is present when the request to open a breaker is given.
Load Delay Timers	Delay Load Output 1, 2, 3 & 4 Determine the time delay before energising the configured “Delayed Load” outputs. These outputs are used to control additional load breakers to provide five stage loading. After the generator load switch is closed, the remaining four outputs are closed after the configurable time delay. This allows for additional loads to be energised in sequence, minimising the size of step loading of the generator
Return Delay	A delay, used in auto mode only, that allows for short term removal of the request to stop the set before action is taken. This is usually used to ensure the set remains on load before accepting that the start request has been removed.
Cooling Time	The amount of time that the set is made to run OFF LOAD before being stopped. This is to allow the set to cool down and is particularly important for engines with turbo chargers.
Cooling Time At Idle	After the Cooling Time, the module instructs the set to run at idle speed for this amount of time before stop.
ETS Solenoid Hold	The amount of time the <i>Energise to stop</i> solenoid is kept energised after the engine has come to rest. This is used to ensure the set has fully stopped before removal of the stop solenoid control signal.
Fail To Stop Delay	If the set is called to stop and is still running after the <i>fail to stop</i> delay, a <i>Fail to Stop</i> alarm is generated.
Generator Transient Delay	Used to delay the generator under/over volts/frequency alarms. Typically this is used to prevent spurious shutdown alarms caused by large changes in load levels.

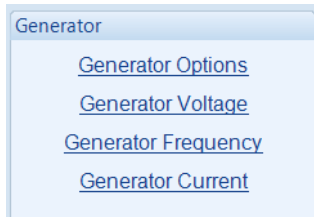
2.6.3 MODULE TIMERS



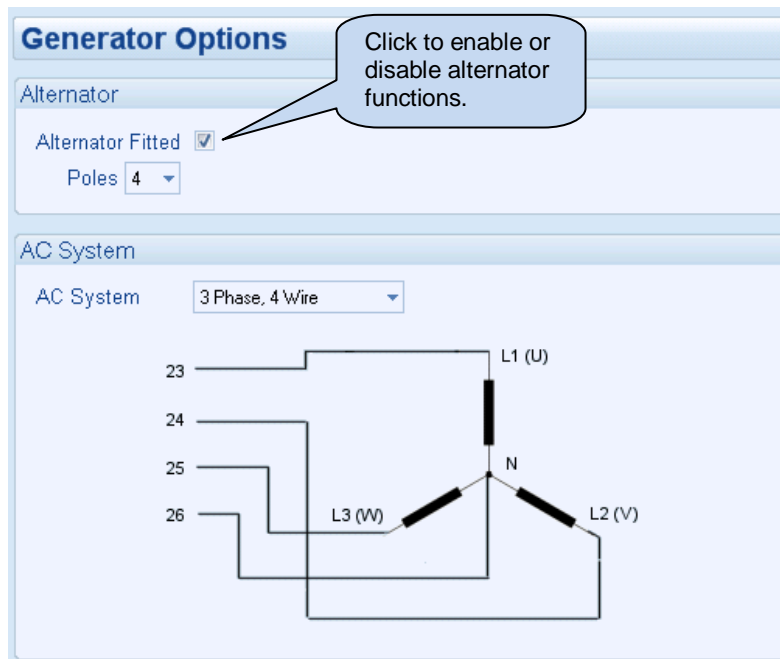
Timer	Description
Power Save Mode Delay	If the module is left unattended in STOP mode for the duration of the <i>Power Save Mode Delay</i> it enters low power consumption mode (Power Save Mode).
Page Delay	If the module is left unattended for the duration of the Page Delay Timer it reverts to show the Status page.

2.7 GENERATOR

The *Generator* section is subdivided into smaller sections. Select the required section with the mouse.



2.7.1 GENERATOR OPTIONS



Parameter	Description
Alternator Fitted	<input type="checkbox"/> = There is no alternator in the system, it is an <i>engine only</i> application <input checked="" type="checkbox"/> = An alternator is fitted to the engine, it is a generator application.
AC System	Allows a number of AC systems to be catered for. Selecting the AC system shows the connections required for that particular system, along with the relevant connection numbers on the controller.

2.7.2 GENERATOR VOLTAGE

Generator Voltage Alarms

Under Voltage Alarms

Alarm Trip 319 v PhPh 319v PhPh

Pre-alarm Trip 339 v PhPh 339v PhPh

Loading Voltage

359 v PhPh 359v PhPh

Over Voltage Alarms

Pre-alarm

Return 440 v PhPh 440v PhPh

Trip 459 v PhPh 459v PhPh

Shutdown

Trip 480 v PhPh 480v PhPh

Click to enable or disable the alarms. The relevant values below appears *greyed out* if the alarm is disabled.

Click and drag to change the setting.

Type the value or click the up and down arrows to change the settings

Alarm	IEEE designation
Generator Under voltage	IEEE 37.2 – 27 AC Undervoltage relay
Loading Voltage	Determines the alternator voltage at which the generator becomes available and ready to take load
Generator Over voltage	IEEE 37.2 – 59 AC Overvoltage relay

2.7.3 GENERATOR FREQUENCY

Generator Frequency Alarms

Under Frequency Alarms

Alarm

Trip 40.0 Hz 80.0 %

Pre-alarm

Trip 42.0 Hz 84.0 %

Loading Frequency

45.0 Hz 90.0 %

Nominal Frequency

50.0 Hz 100 %

Over Frequency Alarms

Pre-alarm

Return 54.0 Hz 108.0 %

Trip 55.0 Hz 110.0 %

Shutdown

Trip 57.0 Hz 114.0 %

Click to enable or disable the alarms. The relevant values below appears *greyed out* if the alarm is disabled.

Type the value or click the up and down arrows to change the settings

Click and drag to change the setting.

Alarm	IEEE designation
Generator Under Frequency	IEEE 37.2 - 81 Frequency relay
Loading Voltage	Determines the alternator frequency at which the generator becomes available and ready to take load
Generator Over Frequency	IEEE 37.2 - 81 Frequency relay

2.7.4 GENERATOR CURRENT

The screenshot shows the 'Generator Current' configuration window. It is divided into several sections: 'Generator Current Options', 'Overcurrent Alarm', 'Generator Rating', and 'Overload Protection'. Callouts provide the following explanations:

- CT Primary (L1,L2,L3,N):** This is the CT primary value as fitted to the set (CT secondary must be 5A). The full load rating is the 100% rating of the set in Amps.
- Overcurrent Alarm:** Click to enable or disable the option. The relevant values below appears *greyed out* if the alarm is disabled.
- Generator Rating:** Type the value or click the up and down arrows to change the settings.

2.7.4.1 GENERATOR CURRENT OPTIONS

Parameter	Description
CT Primary	Primary rating of the Current Transformers
CT Secondary	Secondary rating of the Current Transformers
CT Location	Gen: The CTs are in the feed from the generator, the module shows only generator load Load: The CTs are in the feed to the load, the module then displays load current, provided by the mains supply or the generator.

2.7.4.2 OVERCURRENT ALARM

Parameter	Description
Immediate Warning	When enabled, if the current exceeds the <i>Trip</i> level the <i>Immediate Warning</i> activates. Any output or LCD display set to <i>Over Current Immediate Warning</i> is energised. The current load must fall below the <i>Trip</i> level in order to cancel the output source.
Delayed Alarm	When enabled, if the current exceeds the <i>Trip</i> level the <i>Delayed Alarm</i> activates.
Delayed Alarm Action	Electrical Trip: The generator is taken off load and the set stopped after the <i>Cooling timer</i> . Any output or LCD display set to <i>Over Current Delayed Alarm</i> is energised. Shutdown: The generator is taken off load and the set stopped immediately. Warning: An alarm is generated but the set continues to run. Any output or LCD display set to <i>Over Current Delayed Alarm</i> is energised. The current load must fall below the <i>Trip</i> level in order to cancel the output source.
Delay	A time delay starts before the alarm action is executed
Trip	The current value at which the warning or alarm is activated

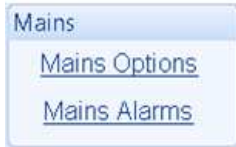
2.7.4.3 OVERLOAD PROTECTION

Parameter	Description
Enable	<input type="checkbox"/> = Overload Protection function is disabled. <input checked="" type="checkbox"/> = The module monitors the kW load level and provide an alarm function if the level exceeds the <i>Trip</i> setting for the configured amount of time in the <i>Delay</i> setting.
Action	<i>Electrical Trip</i> : The generator is taken off load and the set stopped after the <i>Cooling timer</i> . Any output or LCD display set to <i>kW Overload Protection</i> is energised. <i>Shutdown</i> : The generator is taken off load and the set stopped immediately.
Trip	The kW value at which the alarm is activated
Delay	A time delay starts before the alarm action is executed

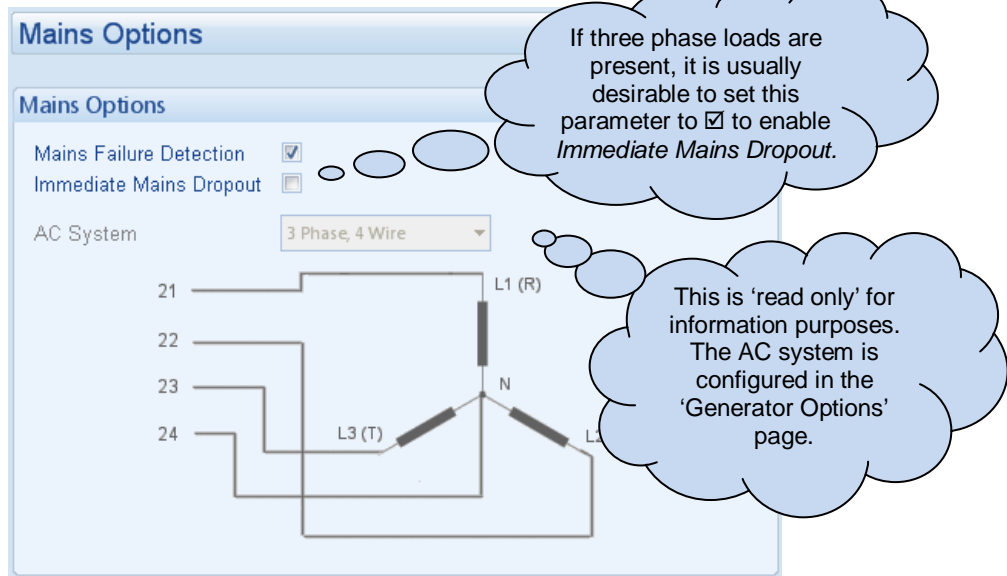
2.8 MAINS




 = Only available on DSE6020 MKII AMF Modules

The *Mains* section is subdivided into smaller sections. Select the required section with the mouse.



2.8.1 MAINS OPTIONS



Timer	Description
 Mains Failure Detection	<input type="checkbox"/> = The module ignores the status of the mains supply. <input checked="" type="checkbox"/> = The module monitors the mains supply and use this status for automatically starting and stopping the set in auto mode.
 Immediate Mains Dropout	<input type="checkbox"/> = Upon mains failure, the mains load switch is kept closed until the generator is up to speed and volts. <input checked="" type="checkbox"/> = Upon mains failure, the mains load switch is opened immediately, subject to the setting of the <i>mains transient</i> timer.
 AC System	These settings are used to detail the type of AC system to which the module is connected: 3 phase 4 wire, 1 phase 2 wire, 2 phase 3 wire – L1-L2, 2 phase 3 wire – L1-L3, 3 phase 3 wire, 3 phase 4 wire delta This list is not exhaustive. DSE reserve the right to add to this list as part of our policy of continual development

2.8.2 MAINS ALARMS

Mains Alarms

Voltage Alarms

Undervolts

Trip v PhPh 319v PhPh

Return v PhPh 359v PhPh

Overvolts

Return v PhPh 438v PhPh

Trip v PhPh 478v PhPh

Frequency Alarms

Under Freq.

Trip Hz

Return Hz

Over Freq.





Return Hz

Trip Hz

Click to enable or disable the alarms. The relevant values below appears *greyed out* if the alarm is disabled.

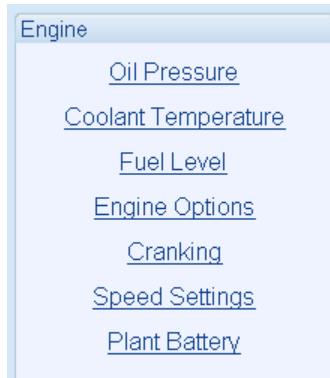
Type the value or click the up and down arrows to change the settings

Click and drag to change the setting.

Alarm	IEEE designation
Mains Under Voltage 	IEEE 37.2 - 27AC Undervoltage relay
Mains Over Voltage 	IEEE 37.2 - 59AC Overvoltage relay
Mains Under Frequency 	IEEE 37.2 -81 Frequency relay
Mains Over Frequency 	IEEE 37.2 -81 Frequency relay

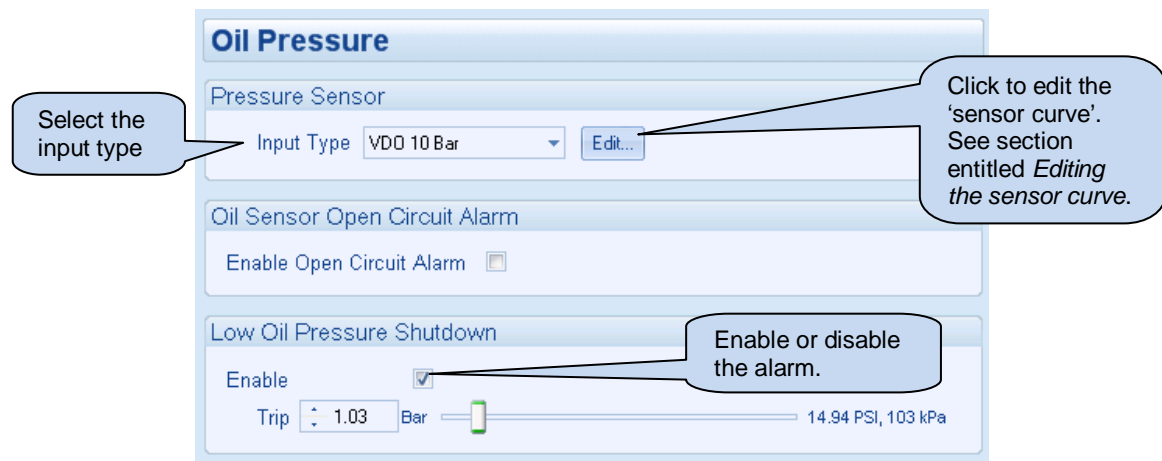
2.9 ENGINE

The *Engine* section is subdivided into smaller sections. Select the required section with the mouse.



2.9.1 OIL PRESSURE

If a CAN Engine File is selected – Most engines give oil pressure from CAN link. In these cases, Analogue Input A is configured as Flexible Analogue or Digital Input. Configuration of Flexible Analogue Inputs and Digital Inputs is detailed elsewhere in this document. Where the CAN engine does not support oil pressure over CAN link, Analogue input A is selectable as either digital input, analogue flexible input, or as analogue oil pressure sensor.



2.9.2 COOLANT TEMPERATURE

If a **CAN Engine File is selected** – Engines give temperature measurements from CAN link. Analogue Input B is configured as Digital Input. Configuration is the same as for Digital Inputs, detailed elsewhere in this document.

The screenshot shows the 'Coolant Temperature' configuration window. It is divided into three main sections: 'Temperature Sensor', 'Temperature Sensor Open Circuit Alarm', and 'High Coolant Temperature Alarms'. The 'Temperature Sensor' section has an 'Input Type' dropdown menu set to 'VDO 120 °C' and an 'Edit...' button. The 'Temperature Sensor Open Circuit Alarm' section has an 'Enable Open Circuit Alarm' checkbox. The 'High Coolant Temperature Alarms' section has a 'Shutdown' section with a 'Trip' value of 96 °C and a slider control ranging from 96 °C to 205 °F. Two callout boxes are present: one pointing to the 'Input Type' dropdown with the text 'Select the sensor type', and another pointing to the 'Edit...' button with the text 'Click to edit the 'sensor curve'. See section entitled *Editing the sensor curve.*

2.9.3 FUEL LEVEL

Fuel Level

Input Type: VDO Ohm range (10-18) Edit...

Sensor Alarms

Low Alarm Enable
 Action: Shutdown
 Low Alarm: 10 %
 Delay: 0s

Low Pre-alarm Enable
 Low Pre-alarm Trip: 25 %
 Low Pre-alarm Return: 30 %
 Delay: 0s

High Pre-alarm Enable
 High Pre-alarm Return: 65 %
 High Pre-alarm Trip: 70 %
 Delay: 0s

High Alarm Enable
 Action:
 High Alarm: 90 %
 Delay: 0s

Fuel Pump Control

Enable
 On: 25 %
 Off: 75 %

Tank

Tank Size: 0
 Units: Litres

Callouts:

- Select the sensor type
- Click to edit the 'sensor curve'. See section entitled *Editing the sensor curve*.
- Select the type of alarm required. For details of these, see the section entitled *Alarm Types* elsewhere in this document.
- Click and drag to alter the time delay
- Click to enable or disable the alarms. The relevant values below appears *greyed out* if the alarm is disabled.
- Type the value or click the up and down arrows to change the settings
- Hint :** Set an output to "Fuel pump control". This can be used to transfer fuel from a bulk tank to the day tank, for example.

2.9.4 ENGINE OPTIONS

Engine Options

ECU (ECM) Options

Engine Type: Deutz EMR3

Alternative Engine Speed:

Module to Record Engine Hours:

Module To Use Engine Speed:

Module To Use Charge Alt Voltage:

Disable ECM Speed Control:

Startup Options

Start Attempts: 3

Loss of Sensing Signal: Shutdown

Magnetic pickup open circuit: Shutdown

Gas Engine Timers

Choke Timer: 2s

Gas On Delay: 2s

Ignition Off Delay: 2s

Sensing Options

Magnetic Pickup Fitted: Engine speed is read from the ECU (ECM)

Flywheel Teeth: 190

Overspeed Options

Overspeed Overshoot %: 10

Overshoot Delay: 2s

These items are read only and not adjustable. To change these items, visit the *Module | Application* menu.

For these timers to have any meaning, outputs are required for Gas Choke, Gas Ignition and Fuel.

2.9.4.1 ECU OPTIONS

Parameter	Description
Module to Record Engine Hours	When enabled, DSE module counts Engine Run Hours. When disabled, Engine ECU provides Run Hours.
Module To Use Engine Speed	When enabled the module frequency measurement determines the engine speed instead of using the speed value measured by the ECU.
Module to Use Charge Alt Voltage	When enabled the charge alternator voltage measured by the module is used instead of the value measured by the ECU
Disable ECM Speed Control	Disables speed control by the DSE module. Useful if an external device (ie remote speed potentiometer) is used to control engine speed.

2.9.4.2 STARTUP OPTIONS

Parameter	Description
Start Attempts	<p>The number of starting attempts the module makes.</p> <p>If the module does not detect that the engine has fired before the end of the <i>Cranking time</i>, then the current start attempt is cancelled and the <i>Crank Rest</i> time takes place before the next crank attempt begins.</p> <p>If, after all configured <i>start attempts</i>, the engine is not detected as running, the <i>Fail to Start</i> shutdown alarm is generated.</p> <p>The engine is detected as running by checking all methods of <i>Crank Disconnect</i>. For further details, see the section entitled <i>Crank Disconnect</i> elsewhere in this document.</p>
Loss of Sensing Signal	<p>If the speed sensing signal is lost during engine running (or not present during cranking when <i>Multiple Engage Attempts</i> is enabled), an alarm is generated :</p> <p><i>Shutdown</i>: The generator is removed from load and the set is immediately stopped.</p> <p><i>Warning</i>: The generator continues to run, however a warning alarm is raised.</p>
Magnetic Pickup Open Circuit	<p>If the magnetic pickup device is not detected, an alarm is generated :</p> <p><i>Shutdown</i>: The generator is removed from load and the set is immediately stopped.</p> <p><i>Warning</i>: The generator continues to run, however a warning alarm is raised.</p>

2.9.4.3 GAS ENGINE TIMERS

Parameter	Description
Choke Timer	Controls the amount of time that the Gas Choke output is activated during the starting sequence.
Gas On Delay	Controls the amount of time between energising the Gas Ignition and energising the Fuel output. Used in the starting sequence to purge old gas from the engine.
Ignition Off Delay	Controls the amount of time between de-energising the Fuel output and de-energising the Gas Ignition output. Used in the stopping sequence to purge unburnt gas from the engine before it is stopped.

2.9.4.4 SENSING OPTIONS

Parameter	Description
Magnetic pickup fitted	<input type="checkbox"/> = Magnetic pickup device is not fitted to the DSE module. <input checked="" type="checkbox"/> = A low impedance magnetic pickup device is fitted to the DSE module to measure engine speed.
Flywheel teeth	The number of teeth on the engine flywheel. This is read by the magnetic pickup device.

2.9.4.5 OVERSPEED OPTIONS

Parameter	Description
Overspeed overshoot %	To prevent spurious overspeed alarms at engine start up, the module includes configurable <i>overspeed overshoot</i> protection.
Overspeed overshoot delay	<p>This allows the engine speed to 'overshoot' the Overspeed / Over frequency setting during the starting process for a short time.</p> <p>Rather than 'inhibiting' the Overspeed / Over frequency alarms, the levels are temporarily raised by the <i>Overspeed Overshoot %</i> for the duration of the <i>Overspeed Overshoot</i> delay.</p>

2.9.5 CRANKING

Crank disconnect settings are used to detect when the set fires during the starting sequence. As the set is cranked, the first parameter that passes its *crank disconnect* setting results in the cessation of the cranking signal.

Having more than one *crank disconnect* source allows for a much faster crank disconnect response leading to less wear on the engine and starter components, and provides added safety in case one source is lost, by a blown or tripped fuse for example.

The screenshot shows the 'Cranking' settings panel with the following sections and callouts:

- Options:**
 - Crank disconnect on oil pressure
 - Check oil pressure prior to starting

Callout: If *Check Oil Pressure Prior to Starting* is enabled, the cranking is not allowed if the oil pressure is not seen as being low. This used as a *double check* that the engine is stopped before the starter is engaged.
- Crank Disconnect:**
 - Generator Frequency: 21.0 Hz
 - Engine Speed: 600 RPM
 - Oil Pressure: 2.00 Bar

Callout: Click and drag to change the setting.
- Manual Crank:**
 - Hold Start Button To Crank
 - Manual Crank Limit: 30s

Callout: Type the value or click the up and down arrows to change the settings

Callout: When enabled, releasing the start button during a manual start also disconnects the crank. Manual Crank Limit is provided to protect the engine from being cranked too long in case of a start failure.

2.9.6 SPEED SETTINGS

Speed Settings

Under Speed Shutdown

Enable 1200 RPM

Over Speed Shutdown

Trip 1710 RPM

Click to enable or disable the option. The relevant values below appears *greyed out* if the alarm is disabled.

Overspeed shutdown cannot be disabled.

2.9.7 PLANT BATTERY

Plant Battery

Voltage Alarms

Undervolts

Warning 10.0 V DC

Return 10.5 V DC

Delay 1m

Overvolts

Return 29.5 V DC

Warning 30.0 V DC

Delay 1m

Charge Alternator Alarm

Shutdown

Trip 4.0 V DC

Delay 5s

Warning

Trip 6.0 V DC

Delay 5s

Start On Low Battery

Enable

Threshold 18.0 V DC

Engine Run Time 1h

Start Delay 5s

Click to enable or disable the option. The relevant values below appears *greyed out* if the alarm is disabled.

Click and drag to change the setting.

Type the value or click the up and down arrows to change the settings

Select to enable autostart upon the battery voltage falling to the *threshold* level. The engine starts and run for the specified *Engine Run Time*.

Alarm	IEEE designation
Plant Battery Undervolts	IEEE 37.2 -27 DC Undervoltage relay
Plant Battery Overvolts	IEEE 37.2 -59 DC Overvoltage relay
Start on Low Battery	<input type="checkbox"/> = Start on Low Battery is disabled. <input checked="" type="checkbox"/> = Select to enable autostart upon the battery voltage falling to the <i>threshold</i> level. The engine starts and runs for the specified <i>Engine Run Time</i> . This occurs only if the module is in AUTO mode
Charge Alternator Alarm	If the voltage measured at the charge alternator output drops below the configured value the respective alarm is triggered.
Start Delay	Start delay timer for the Start on Low Battery function.

2.10 SCHEDULER

The scheduler is used to automatically start the set at a configured day and time and run for the set duration of hours.

The generator is made to run *on load* or *off load* depending upon the configuration :

Function	Description
Enabled	<input type="checkbox"/> = Scheduled runs are disabled <input checked="" type="checkbox"/> = Enables the Scheduler
Schedule Period	Determines the repeat interval for the scheduled run. Options available are: repeat every 1 week, 2 weeks, 3 weeks or 4 weeks
Scheduled Runs are On Load	<input type="checkbox"/> = The module runs the generator on schedule with the breaker open <input checked="" type="checkbox"/> = The module runs the generator on schedule and closes the breaker
Week	Specifies the week of the month, on which the scheduled run should take place
Day	Specifies the day of week, on which the scheduled run should take place
Start Time	Determines at what time of day the scheduled run should start
Duration	Determines the time duration in hours for the scheduled run
Clear	Resets the values for the Day, Start Time and Duration to defaults

2.11 MAINTENANCE ALARM

The screenshot displays the 'Maintenance Alarm' configuration window, which is organized into three distinct sections: 'Maintenance alarm Air', 'Maintenance Alarm Oil', and 'Maintenance Alarm Fuel'. Each section contains the following controls:

- Enable:** A checkbox that is currently checked. A callout box points to this checkbox with the text: "Click to enable or disable the option. The relevant values below appears *greyed out* if the alarm is disabled."
- Action:** A dropdown menu. For 'Air', it is set to 'Warning'; for 'Oil' and 'Fuel', it is set to 'Shutdown'.
- Engine run hours:** A slider control with a numerical input field set to '10' and a unit of 'hrs'. A callout box points to this slider with the text: "Maintenance Alarm occurs when the engine has run for the specified number of hours."

There are three ways to reset the maintenance alarm:

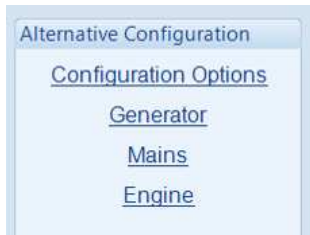
- 1) Activate a digital input configured to "Maintenance Reset Alarm".
- 2) Use the SCADA | Maintenance | Maintenance Alarm section of this PC Software.
- 3) Through the Front Panel Editor of the module

2.12 ALTERNATIVE CONFIGURATION

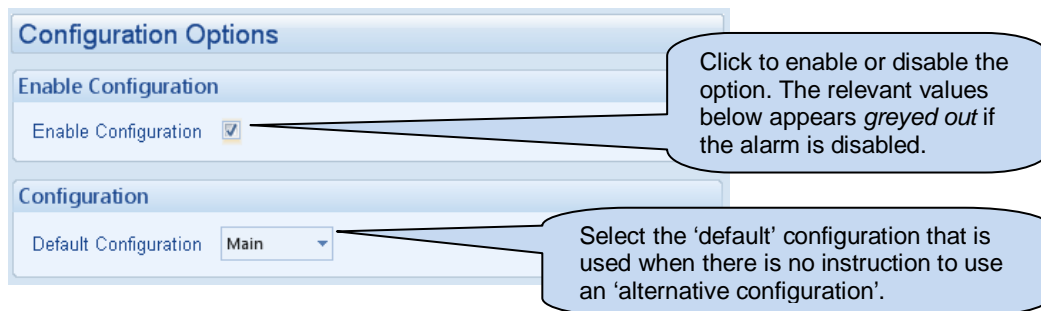
An Alternative Configuration is provided to allow the system designer to cater for different AC requirements utilising the same generator system. Typically this feature is used by Rental Set Manufacturers where the set is capable of being operated at (for instance) 120V 50Hz and 240V 50Hz using a selector switch.

The Alternative Configuration is selected using either:

- Configuration Suite Software (Selection for 'Default Configuration')
- DSE60xx MKII Series Front Panel Editor
- Via external signal to DSE60xx MKII Series module input configured to "Alternative Configuration" select.



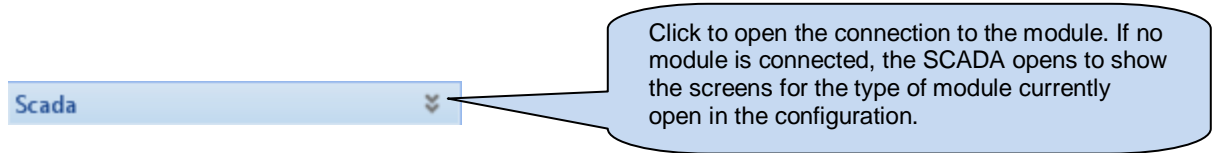
2.12.1 CONFIGURATION OPTIONS



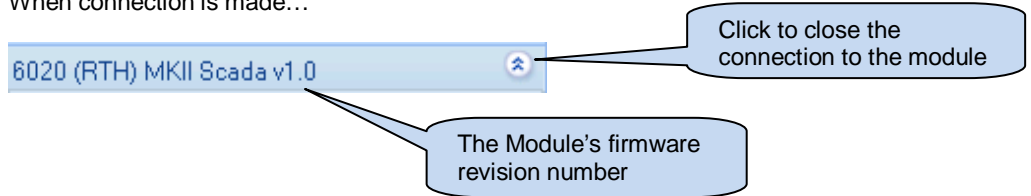
3 SCADA

SCADA stands for **Supervisory Control And Data Acquisition** and is provided both as a service tool and also as a means of monitoring / controlling the generator set.

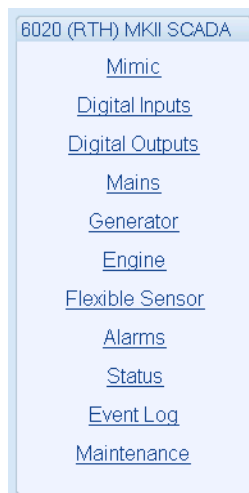
As a service tool, the SCADA pages are to check the operation of the controller's inputs and outputs as well as checking the generators operating parameters.



When connection is made...



The SCADA page is subdivided into smaller sections. Select the required section with the mouse.



3.1 MIMIC

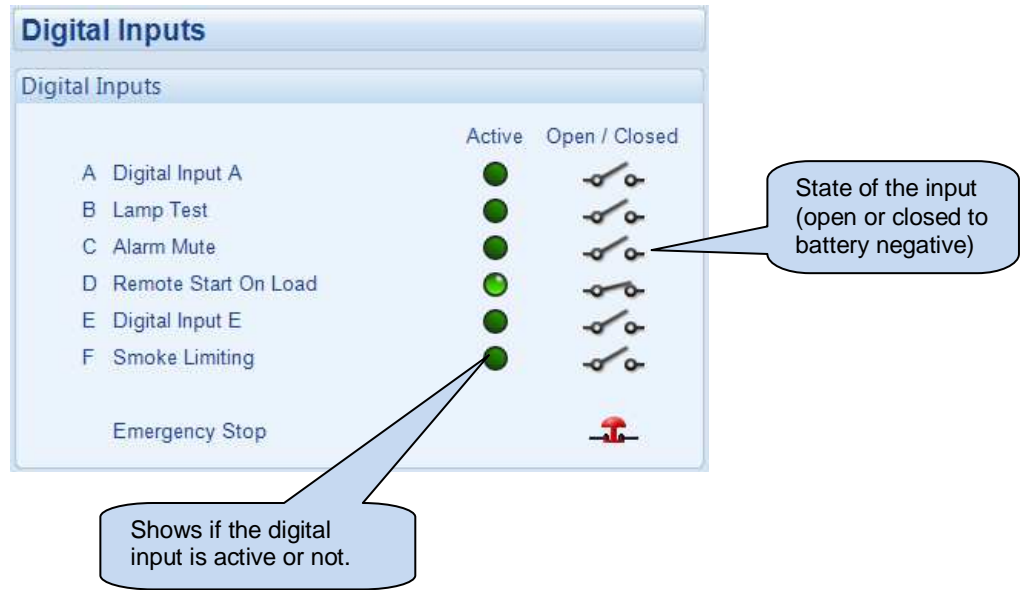
This screen provides a mimic of the control module and allows the operator to change the control mode of the module.



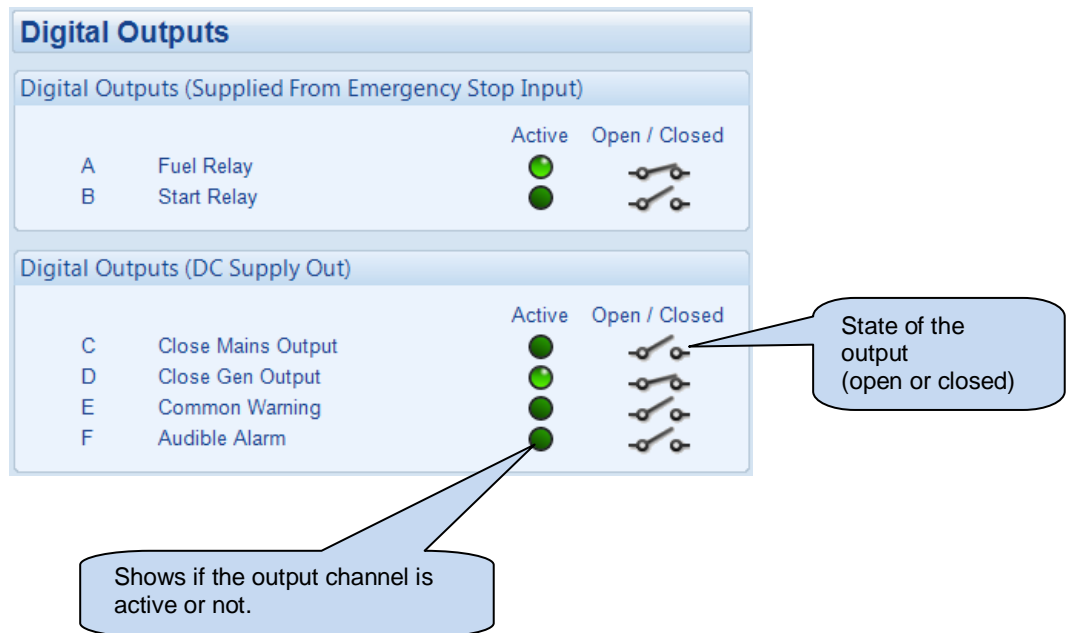
Hint : Buttons may not operate if this has been locked out by the *Access Permissions* security feature of the Configuration Suite Software. Refer to your system supplier for details.

Click the mimic buttons to control the module remotely

3.2 DIGITAL INPUTS



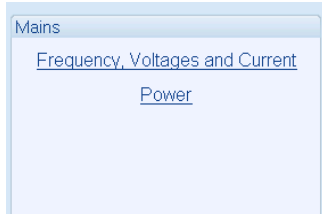
3.3 DIGITAL OUTPUTS



3.4 MAINS

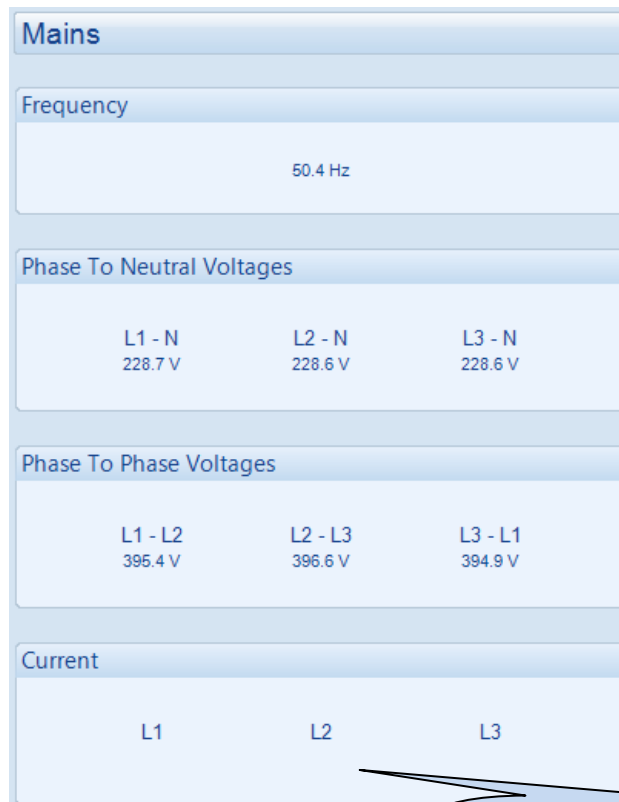
 = Only available on DSE6020 MKII AMF Modules

The *Mains* section is subdivided into smaller sections.
Select the required section with the mouse.



3.4.1 FREQUENCY, VOLTAGES AND CURRENT

Shows the modules measurements of the mains supply (6020 MKII only).



A screenshot of the 'Mains' monitoring page. It displays several sections of data:

- Frequency:** 50.4 Hz
- Phase To Neutral Voltages:**

L1 - N	L2 - N	L3 - N
228.7 V	228.6 V	228.6 V
- Phase To Phase Voltages:**

L1 - L2	L2 - L3	L3 - L1
395.4 V	396.6 V	394.9 V
- Current:**

L1	L2	L3
----	----	----

Mains current is displayed when the CTs are placed in the *load* and the mains is on load.

3.4.2 POWER

Shows the modules measurements of the mains supply power (6020 MKII only).

Power				
Watts				
	L1	L2	L3	Total
	3.0 kW	3.0 kW	3.0 kW	9.0 kW
VA				
	L1	L2	L3	Total
	10.0 kVA	10.0 kVA	10.0 kVA	30.0 kVA
VAr				
	L1	L2	L3	Total
	8.0 kVAr	8.0 kVAr	8.0 kVAr	24.0 kVAr
Power factor				
	L1	L2	L3	Average
Lag	0.32	Lag 0.32	Lag 0.31	Lag 0.30
Accumulated Power				
	kWh	kVAh	kVArh	
	107.7 kWh	174.2 kVAh	75.0 kVArh	

3.5 GENERATOR

The *Generator* section is subdivided into smaller sections. Select the required section with the mouse.



3.5.1 FREQUENCY, VOLTAGES AND CURRENT

Shows the modules measurements of the generator supply.

Generator		
Frequency		
50.4 Hz		
Phase To Neutral Voltages		
L1 - N 227.9 V	L2 - N 226.7 V	L3 - N 228.2 V
Phase To Phase Voltages		
L1 - L2 392.5 V	L2 - L3 394.8 V	L3 - L1 394.0 V
Current		
L1 45.0 A	L2 46.0 A	L3 45.0 A

3.5.2 POWER

Shows the modules measurements of the generator supply power.

Power				
Watts				
	L1	L2	L3	Total
	3.0 kW	3.0 kW	3.0 kW	9.0 kW
VA				
	L1	L2	L3	Total
	10.0 kVA	10.0 kVA	10.0 kVA	30.0 kVA
VAr				
	L1	L2	L3	Total
	8.0 kVAr	8.0 kVAr	8.0 kVAr	24.0 kVAr
Power factor				
	L1	L2	L3	Average
Lag	0.32	Lag 0.32	Lag 0.31	Lag 0.30
Accumulated Power				
	kWh	kVAh	kVArh	
	107.7 kWh	174.2 kVAh	75.0 kVArh	

3.6 ENGINE

Shows the modules measurements of the engine parameters.

Engine	
Coolant Temperature 44 °C, 111 °F	Plant Battery 12.1 v DC
Oil Pressure 9.10Bar, 132 PSI, 910 KPa	Charge Alternator 10.5 v DC
Speed 1494 RPM	Hours Run 00:23
Fuel Level	Number of Starts 20
Fuel Capacity	Fuel Unit

3.7 FLEXIBLE SENSOR

Shows the modules measurements of the flexible sensors parameters.

Flexible Sensor
<i>This page is used when Analogue Inputs are configured as Flexible Sensors</i>
Flexible Sensor A Not Used
Flexible Sensor C Not Used
Flexible Sensor D Not Used

3.8 ALARMS

Shows any present alarm conditions.



3.9 STATUS

Shows the module's current status.

Status	
Supervisor State Alarm Cooldown 00:47	Software Version 1.0
Engine/Generator State Running	Module ID 651948B9DD
Load Switching State Closed To Mains	Mode 
Heater Fitted Heater Fitted	

3.10 EVENT LOG

Shows the contents of the module's event log.

Event Log					
#	Date	Time	Hours Run	Event	Details
1	3/5/2013	9:09 AM	0:10	Shutdown	Oil Pressure Sensor Open Circuit
2	3/5/2013	9:09 AM	0:10	Mains	Mains fail
3	3/5/2013	9:09 AM	0:10	Shutdown	Emergency Stop
4	3/5/2013	9:09 AM	0:10	Shutdown	Temperature Sensor Open Circuit
5	3/5/2013	9:09 AM	0:10	Restart	Restart code 0
6	3/5/2013	9:09 AM	0:10	Shutdown	Oil Pressure Sensor Open Circuit
7	3/5/2013	9:09 AM	0:10	Mains	Mains fail
8	3/5/2013	9:09 AM	0:10	Shutdown	Emergency Stop
9	3/5/2013	9:09 AM	0:10	Shutdown	Temperature Sensor Open Circuit
10	3/5/2013	9:09 AM	0:10	Restart	Restart code 0
11	2/13/2013	4:37 PM	0:10	Warning	Battery Under Volts
12	2/13/2013	4:36 PM	0:10	Shutdown	Oil Pressure Sensor Open Circuit
13	2/13/2013	4:36 PM	0:10	Mains	Mains fail
14	2/13/2013	4:36 PM	0:10	Shutdown	Emergency Stop
15	2/13/2013	4:36 PM	0:10	Shutdown	Temperature Sensor Open Circuit

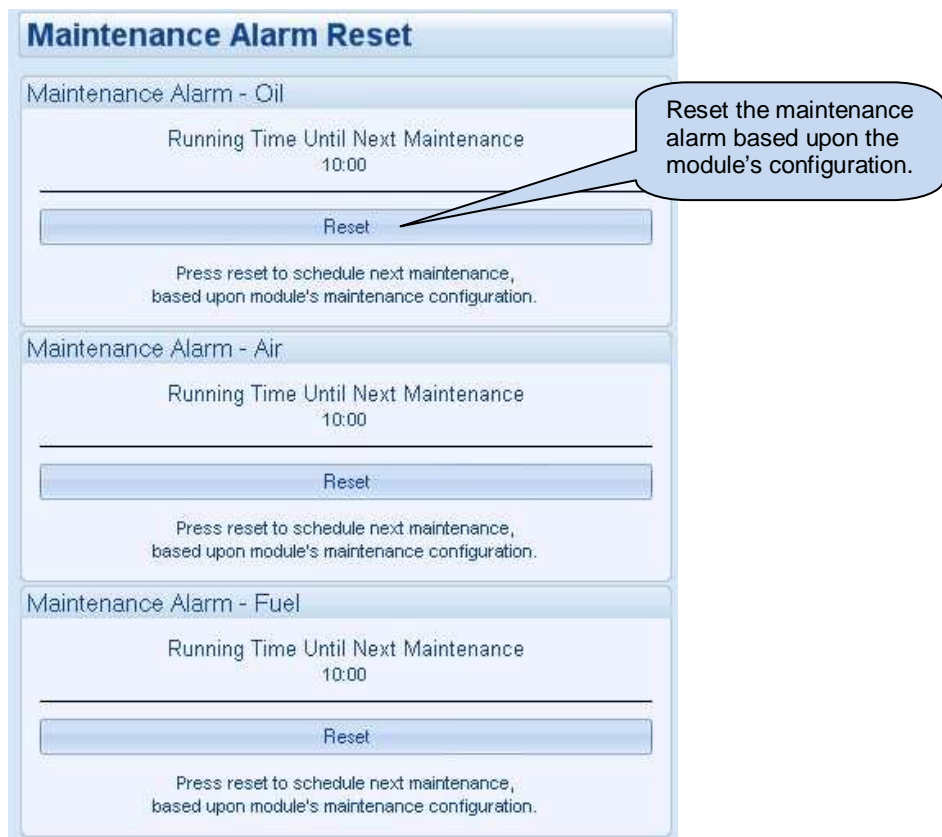
Export to Excel Export to CSV Export to PDF Print event log

3.11 MAINTENANCE

The *Maintenance* section is subdivided into smaller sections. Select the required section with the mouse.



3.11.1 MAINTENANCE ALARM RESET



3.11.2 HOURS RUN AND NUMBER OF STARTS

This section allows the Hours Run and Number of Starts to be customised on the controller. Typically, this is used when fitting a new controller to an older generator so that the controller display matches the amount of work previously done by the system.

The screenshot shows two sections: 'Hours Run' and 'Number of Starts'. Each section has a text input field, a numeric keypad, and a 'Set' button. Callouts provide instructions: 'Type the value or click the up and down arrows to change the settings' for the 'Set' button in the 'Hours Run' section, and 'Click to perform the adjustment in the module. Note that this is not visible on the module itself. It is included in the PC SCADA for diagnostic purposes.' for the 'Set' button in the 'Number of Starts' section.

3.11.3 DAY AND TIME

This section allows the day and time to be set and changed on the controller.

The screenshot shows the 'Date and Time' settings interface. It includes sections for 'Module Date' (displaying 3/5/2013), 'Module Time' (displaying 09:13:44), 'Set Date and Time' (with date and time pickers and a 'Set' button), and 'Set to PC Time' (with date and time pickers and a 'Set to PC Time' button). Callouts explain: 'Display of the module's current date and time' for the 'Module Date' field; 'Type the new date / time or click the up and down arrows to change the settings' for the 'Module Time' field; 'Click Set to adjust the module to the selected date/time.' for the 'Set' button; and 'Click Set to adjust the module to the date/time that your PC is set to.' for the 'Set to PC Time' button.

3.11.4 ACCUMULATED INSTRUMENTATION

The screenshot shows a web interface titled "Accumulated Instrumentation". It contains three main sections:

- kWh:** A label "kWh:" followed by a display showing "75.0 kWh" and a "Set" button.
- kVAh:** A label "kVAh:" followed by a display showing "100.0 kVAh" and a "Set" button.
- kVArh:** A label "kVArh:" followed by a display showing "18.0 kVArh" and a "Set" button.
- Reset:** A section with a button labeled "Reset all values to zero".

3.11.5 MODULE PIN

NOTE : If the PIN is lost or forgotten, it is not possible to access the module!

Allows a PIN (Personal Identification Number) to be set in the controller. This PIN must be entered to either access the front panel configuration editor or before a configuration file is sent to the controller from the PC software.

The screenshot shows a web interface titled "Module PIN". It contains the following elements:

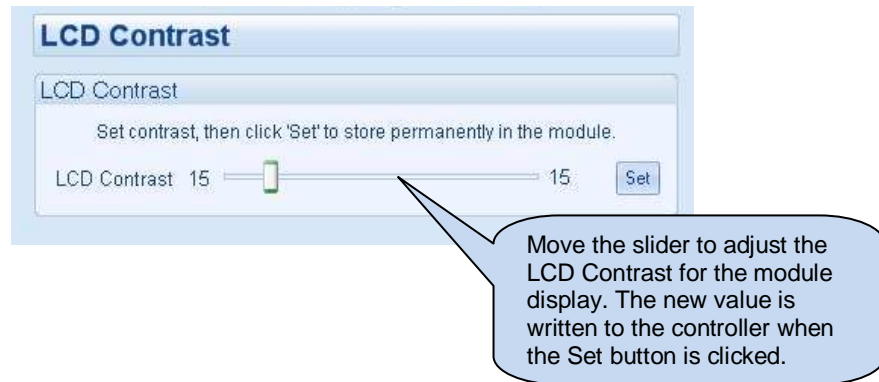
- Module Access Password:** A section header.
- Password:** A label followed by a spinner showing "0" and four individual digit spinners.
- Confirmation:** A label followed by a spinner showing "0" and four individual digit spinners.
- Warning:** A text block stating: "Warning - care should be taken when adjusting these controls. If the password is lost or forgotten, it will not be possible to access the module."
- Set PIN:** A button at the bottom.

Two callout boxes are present:

- One pointing to the digit spinners: "Enter the desired PIN number and reconfirm."
- One pointing to the "Set PIN" button: "Click to set the PIN number in the module."

3.11.6 LCD CONTRAST

The LCD Contrast section allows the adjustment of the module's display contrast level. This is useful when the contrast is configured through the Front Panel Editor and set to a level where the display is no longer visible.



4 ALARM TYPES

The protection included with the DSE control modules provides increasing levels of notification, depending upon the severity of the situation:

Alarm type	Description
Indication	No audible alarm or common warning signal occurs. <i>Indication</i> alarms are only used to illuminate indicators or to activate outputs.
Warning	Audible alarm and common alarm signal is generated. The set continues to run. <i>Warning alarms</i> are used to draw the operator's attention to a minor issue or to a problem that may escalate to an Electrical Trip or Shutdown Alarm if left untreated.
Electrical Trip	Audible alarm and common alarm signal is generated. The set is taken off load and the cooling timer begins, after which the set is stopped. <i>Electrical Trip alarms</i> are series issues that require the set to be taken off load. As the name implies, this is often electrical faults that occur 'after' the load breaker. The set is allowed to cool before stopping.
Shutdown	Audible alarm and common alarm signal is generated. The set is taken off load and immediately stopped. <i>Shutdown alarms</i> are serious issues that demand immediate stopping of the generator. For instance Emergency Stop or Overspeed alarms require immediate shutdown.

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