# DEEP SEA ELECTRONICS

## DSE4610 / DSE4620
## Configuration Suite PC Software Manual

**Document Number 057-201**

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**DSE4600 Series Configuration Suite Software Manual**



**Amendments List**

| Issue | Comments | Minimum Module version required |
|---|---|---|
| 1 | Initial release | V1.0.0 |
| 2 | Updated for V1.3 | V1.3.76 |
| 3 | Updated for V1.4 | V1.4.1 |

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.

# 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:

## 1.1 INSTALLATION INSTRUCTIONS

| DSE PART | DESCRIPTION |
|---|---|
| 053-156 | 4600 Installation Instructions Sheet |

## 1.2 MANUALS

| DSE PART | DESCRIPTION |
|---|---|
| 057-151 | DSE Configuration Suite PC Software Installation & Operation Manual |
| 057-200 | DSE4610 / DSE4620 Operator Manual |

## 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 |

# 2 DESCRIPTION

The **DSE4600 Series configuration suite** allows the 4600 family of modules to be connected to a PC via USB 'A –USB B' cable. Once connected the various operating parameters within the module can be viewed or edited as required by the engineer. This software allows easy controlled access to these values.

**This manual details the configuration of the DSE46XX 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).

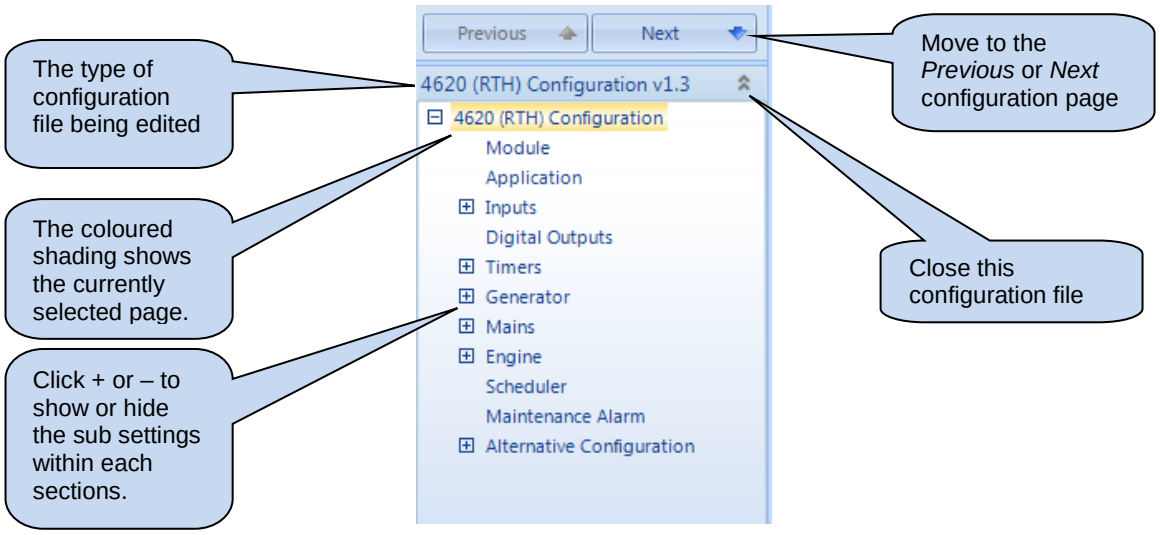
# 3 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

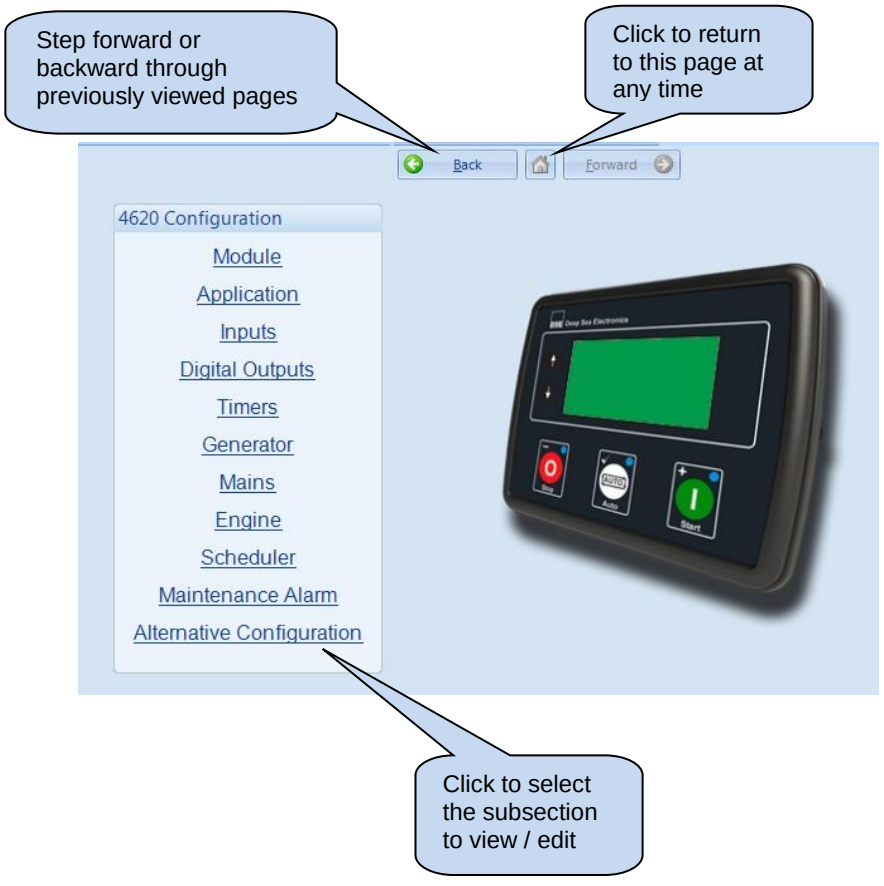
For information in regards to instating and using the DSE Configuration Suite Software please refer to DSE publication: ***057-151 DSE Configuration Suite PC Software Installation & Operation Manual*** which can be found on our website: ***www.deepseaplc.com***

# 4 EDIT CONFIG

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.

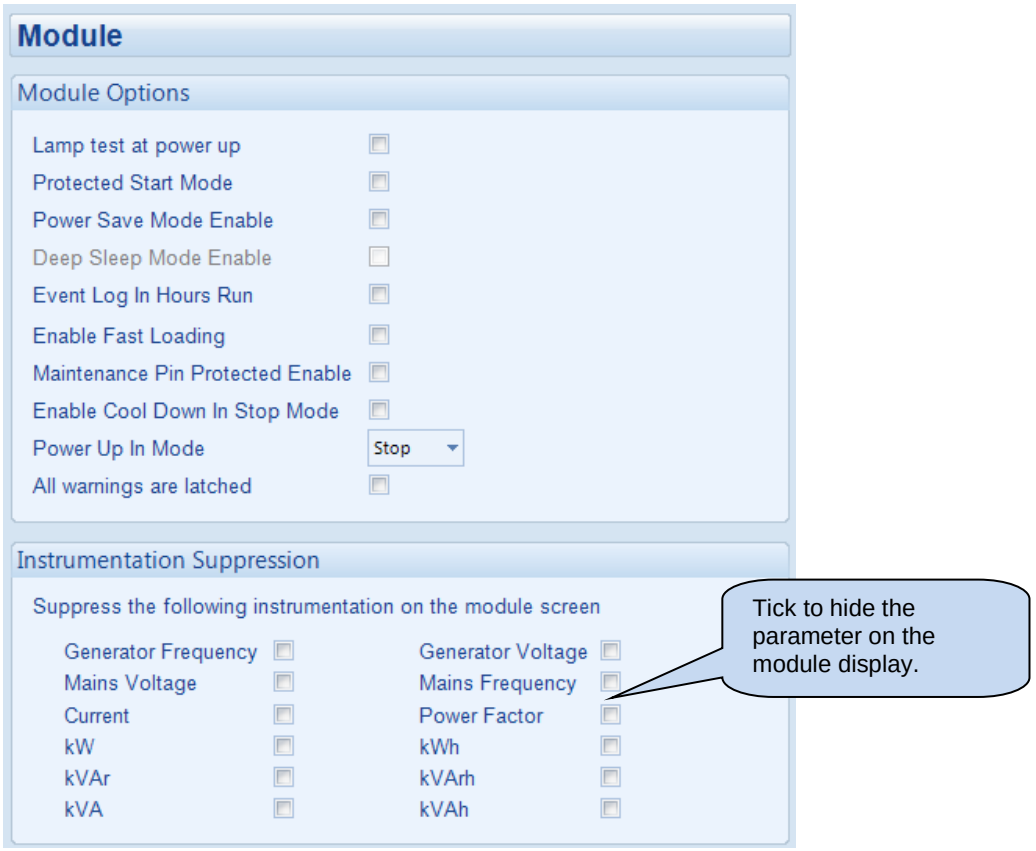
## 4.1 SCREEN LAYOUT



## 4.2 MODULE

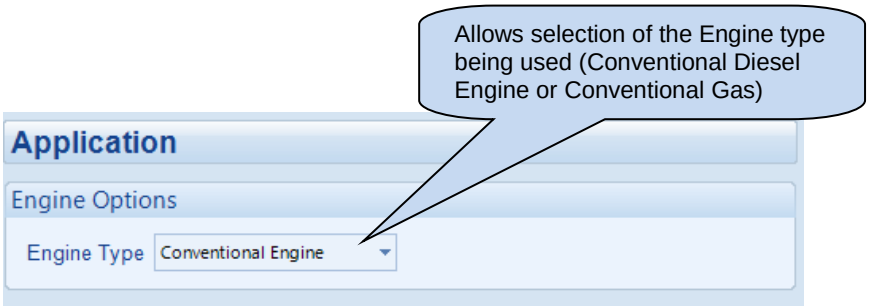
This section allows the user to change the options related to the module itself.




Parameters detailed overleaf...

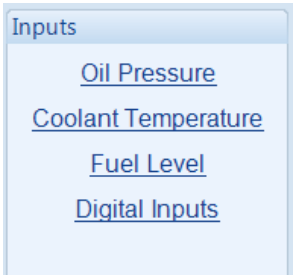
| **Miscellaneous Options** | |
|---|---|
| Lamp Test At Power Up | ☐ = Feature disabled<br>☑ = The LEDs on the module's fascia all illuminate when the DC power is applied as a 'lamp test' feature. |
| Protected Start Mode | If enabled, the start button must be pressed twice to confirm manual start request |
| Power Save Mode Enable | ☐ =Normal operation<br>☑ = Module goes into power save (low current) mode after 1m of inactivity in STOP mode. Press any button to 'wake' the module. |
| Deep Sleep Mode Enable | **(Available only if Power Save Mode is Enabled)**<br>When enabled, the module goes into a deeper sleep state with maximum power saving |
| Event log in Hours Run | ☑ = The engine run hours is added to the recorded event in the event log |
| Enable Fast Loading | ☐ = 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 can lead to overspeed alarms on start up.<br>☑ = 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.<br>**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.<br>☐ =if the engine is running on load and the stop button is pressed, the module opens the breaker and directly shutdown the engine.<br>☑ = 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.<br>**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.<br>Available modes to select from: Auto, Manual, Stop mode |
| All Warnings Are Latched | ☐ = Normal Operation, the warnings and pre-alarms automatically reset once the triggering condition has cleared.<br>☑ = 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). |

## 4.3 APPLICATION



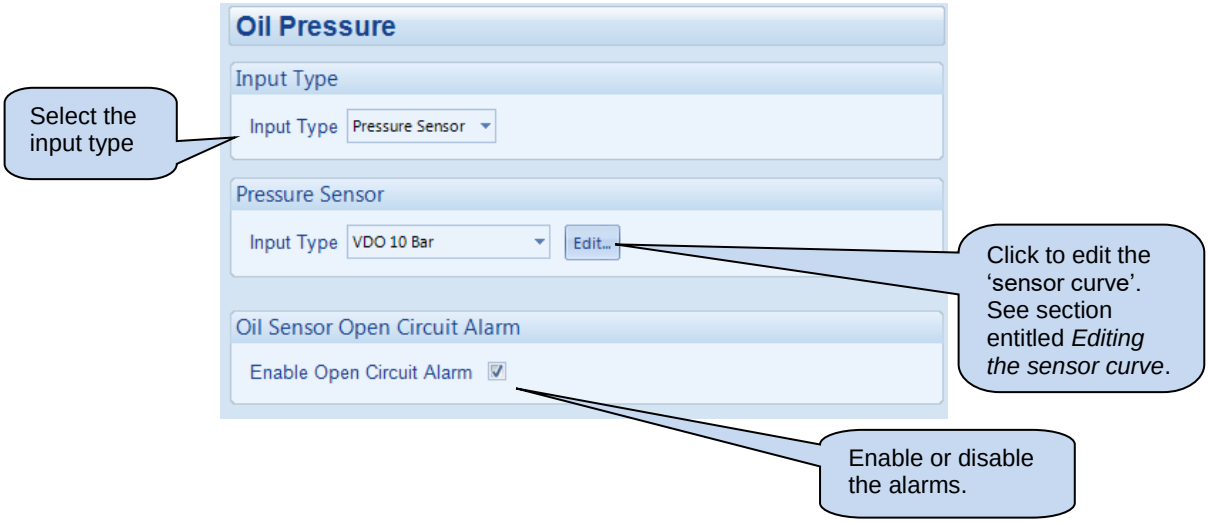
## 4.4 INPUTS

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



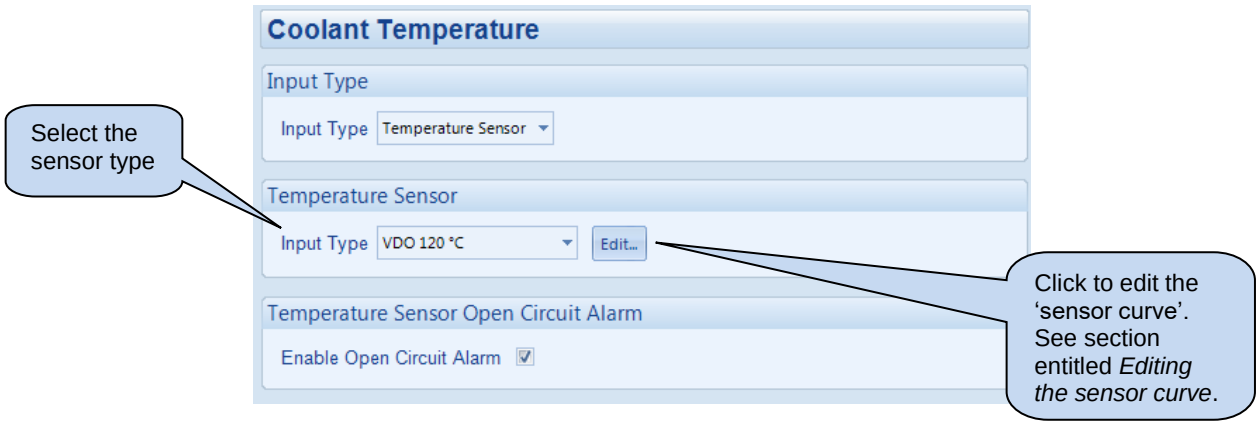

### 4.4.1 OIL PRESSURE

This section allows the configuration of the oil pressure input.



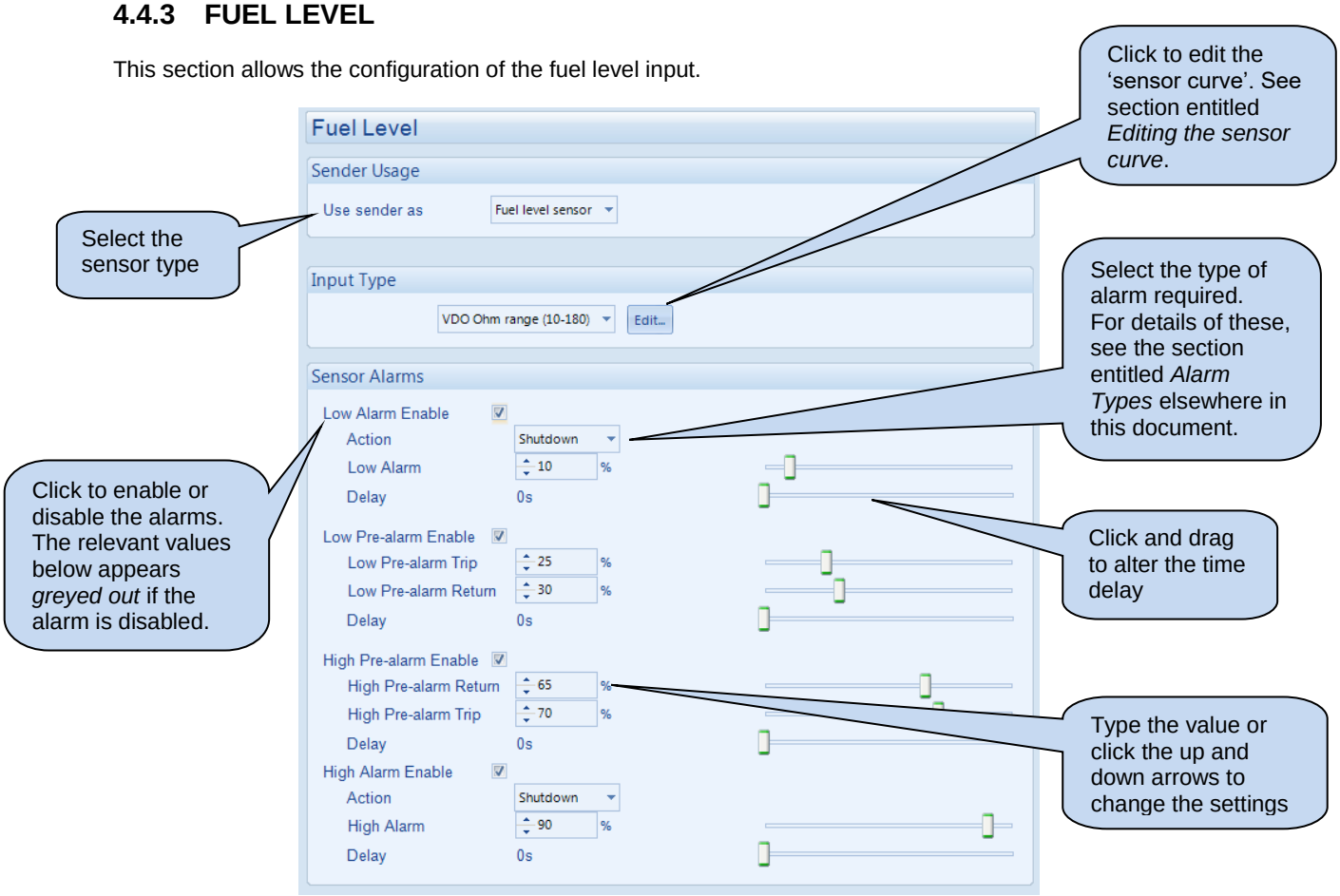

### 4.4.2 COOLANT TEMPERATURE

This section allows the configuration of the coolant temperature input.



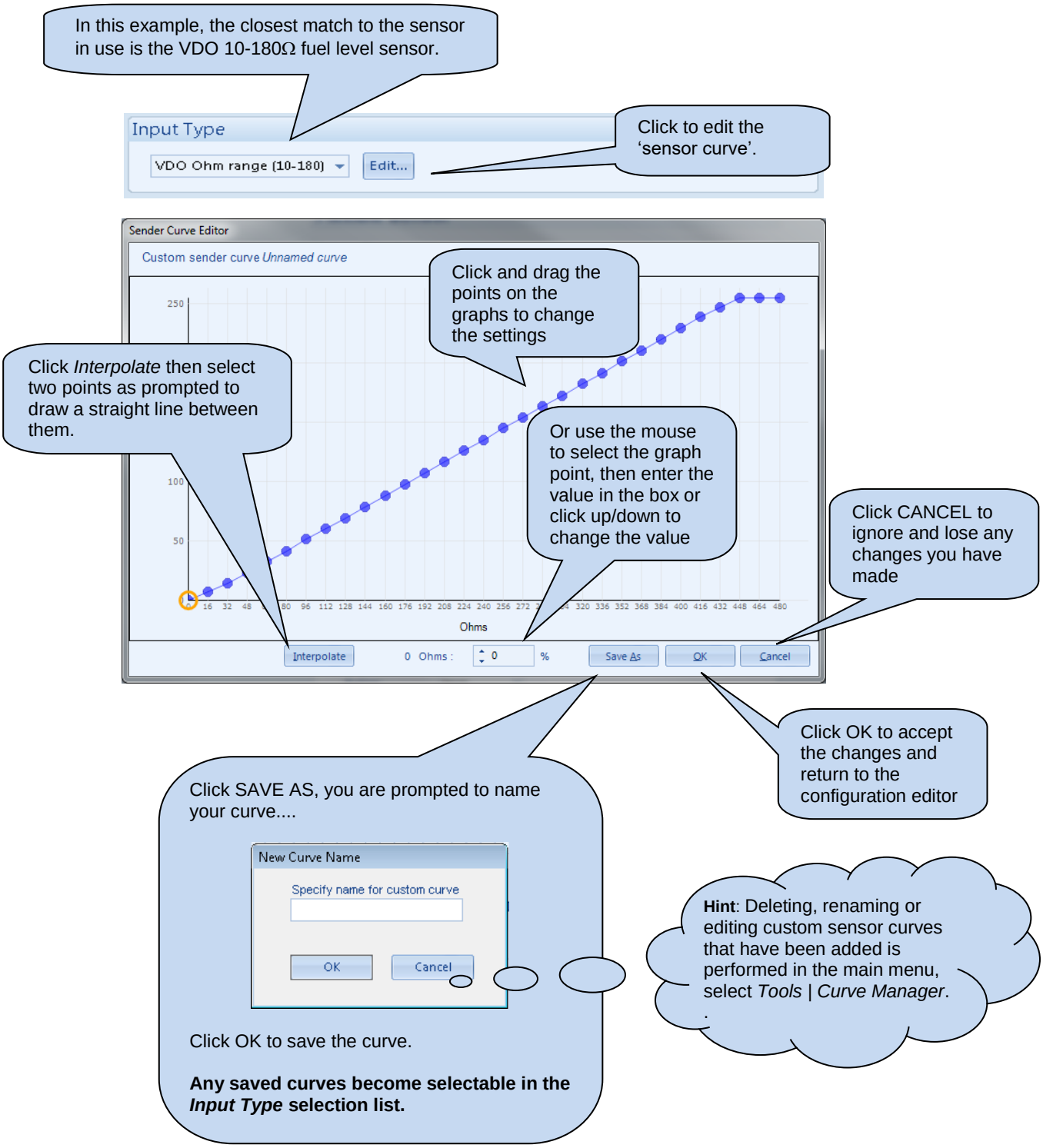
### 4.4.3 FUEL LEVEL

This section allows the configuration of the fuel level input.



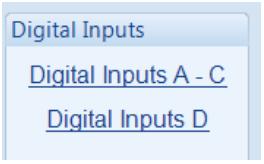
### 4.4.4 EDITING THE SENSOR CURVE

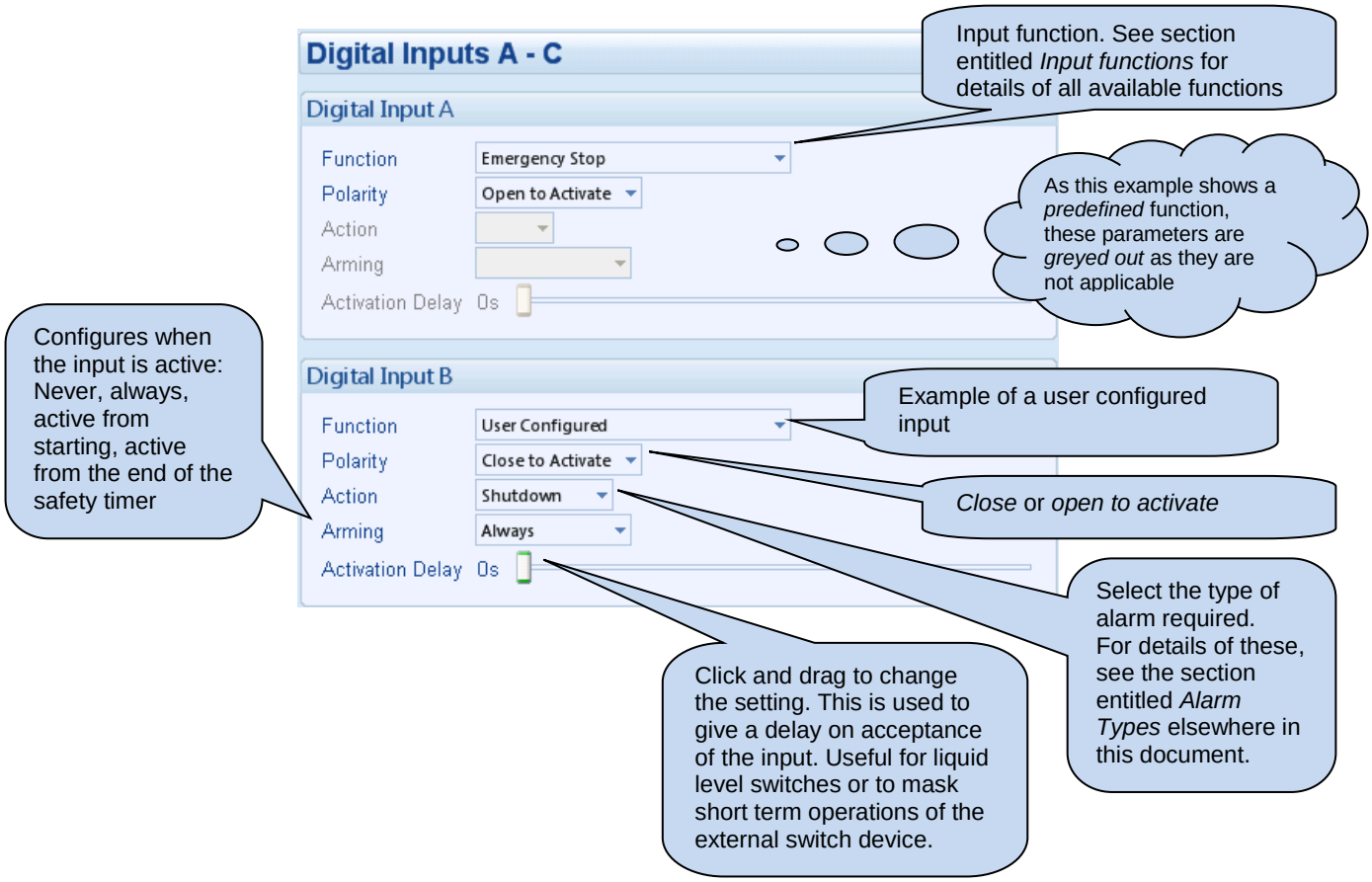
While the *configuration suite* holds sensor specification for the most commonly used resistive sensors, occasionally it is required that the module be connected to a sensor not listed by the *configuration suite*. To aid this process, a sensor editor has been provided.



### 4.4.5 DIGITAL INPUTS

The *digital inputs* page is subdivided into smaller sections.
Select the required section with the mouse.



### 4.4.6 INPUT FUNCTIONS

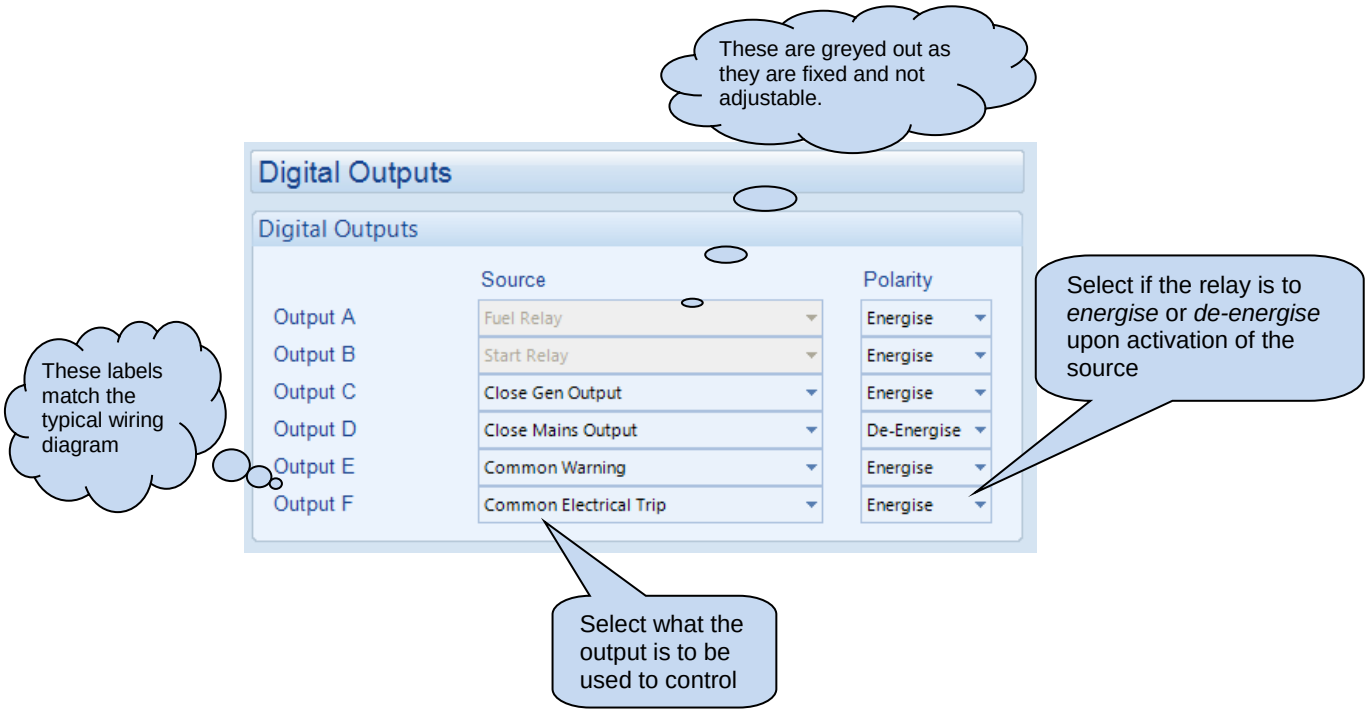
Where a digital input is NOT configured as “user configured”, a selection can be made from a list of predefined functions. The selections are as follows:

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

| 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 *alternative* configuration settings instead of the *main* configuration settings. |
| Auto Restore Inhibit<br>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 *Auto Restore Inhibit* 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<br>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 can be 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. |
| Coolant Temperature Switch | This input is used to give a *Coolant Temperature High* shutdown from a digital normally open or closed switch. It allows coolant temperature protection. |
| Emergency Stop | Provides an immediate engine hot shutdown, used in emergency situations |
| External Panel Lock | Locks the mode buttons on the module front fascia. |

| Function | Description |
|---|---|
| Generator Load Inhibit<br>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.<br>**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.** |
| 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<br>IEEE 37.2 - 3 checking or interlocking relay | 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.<br>**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.** |
| 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. |
| 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 can be 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 activate all configured Light Outputs. |
| Simulate Auto Button | **NOTE: - If a call to start is present when AUTO MODE is entered, the starting sequence begins. Call to Start can come 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.**<br>This input mimic's the operation of the 'Auto' button and is used to provide a remotely located Auto mode push button. |
| 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 Start Button | This input mimic's the operation of the 'Start' button and is used to provide a remotely located start push button. |
| Simulate Stop Button | This input mimic's the operation of the 'Stop' button and is used to provide a remotely located stop/reset push button. |
| Smoke Limiting<br>IEEE 37.2 – 18 accelerating or decelerating device | This input instructs the module to give a *run at idle speed* command to the engine either via an output configured to *smoke limit* or by data commands when used with supported electronic engines. |
| Transfer to generator/Open Mains<br>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<br>IEEE 37.2-52 AC circuit breaker | This input is used to transfer the load to the mains supply (AMF module) when running in MANUAL MODE or provide the 'Open Generator' signal in a non AMF Module.) |

## 4.5 DIGITAL OUTPUTS




### 4.5.1 OUTPUT SOURCES

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

Under the scope of IEEE 37.2, *function numbers can also be used to represent functions in microprocessor devices and software programs*. Where the DSE output functions can be 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 DSE4620 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 (Digital) | Active when the relevant analogue input, configured as digital input, is active | |
| Audible Alarm<br>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<br>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<br>IEEE 37.2 – 27DC undervoltage relay | This output indicates that a Battery Under Voltage alarm has occurred. | Inactive when battery voltage is not Low |

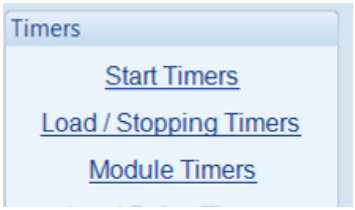
| Output source | Activates… | Is not active…. |
|---|---|---|
| Charge Alternator Warning/Shutdown | Active when the charge alternator alarm is active | |
| Close Gen Output<br>IEEE 37.2 – 52 ac circuit breaker | Used to control the load switching device. Whenever the 4500 module selects the generator to be on load this control source is active. | Inactive whenever the generator is not required to be on load |
| Close Gen Output Pulse<br>IEEE 37.2 – 52 ac circuit breaker | Used to control the load switching device. Whenever the 4500 module selects the generator to be on load this control source is active for the duration of the Breaker Close Pulse timer, after which it becomes inactive again. | |
| Close Mains Output<br>IEEE 37.2 – 52 ac circuit breaker<br>  | Used to control the load switching device. Whenever the 4500 module selects the mains to be on load this control source is active. | The output is inactive whenever the mains is not required to be on load |
| Close Mains Output Pulse<br>IEEE 37.2 – 52 ac circuit breaker<br>  | Used to control the load switching device. Whenever the 4500 module selects the mains to be on load this control source is active for the duration of the Breaker Close Pulse timer, after which it becomes inactive again. | |
| Combined Mains Failure<br>  | 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 *Electrical Trip* alarms are active | The output is inactive when no shutdown alarms are present |
| Common Shutdown | Active when one or more *Shutdown* alarms are active | The output is inactive when no shutdown alarms are present |
| Common Warning | Active when one or more *Warning* 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 | Active when the relevant digital input is active | |
| Display Heater Fitted and ON | Active when the internal LCD heater is switched on | |
| Emergency Stop | Active when the Emergency Stop alarm is active. | |
| Energise To Stop | Normally used to control an *Energise to Stop* 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 *ETS hold time*. |
| Fail To Start<br>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<br>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.<br>This configurable amount of time is the *Fail to Stop Timer*. | |
| Flexible Sensor 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 High Alarm | The level detected by the fuel level sensor has risen above the high fuel level alarm setting. | |
| Fuel Level High Pre-Alarm | The level detected by the fuel level sensor has risen above the high fuel level pre-alarm setting. | |
| Fuel Level Low Alarm | The level detected by the fuel level sensor has fallen below the low fuel level alarm setting. | |
| Fuel Level Low Pre-Alarm | The level detected by the fuel level sensor has fallen below the low fuel level pre-alarm setting. | |

| Output source | Activates… | Is not active…. |
|---|---|---|
| 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<br>• *Loading voltage* and *loading frequency* have not been reached<br>• After *electrical trip* alarm<br>• 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 has risen above the configured trip level for a configured duration. | |
| 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 High Frequency | Active when the measured mains frequency has risen above the configured trip level. | |
| Mains High Voltage | Active when the measured mains voltage has risen above the configured trip level. | |
| Mains Low Frequency | Active when the measured mains frequency has fallen below the configured trip level. | |
| Mains Low Voltage | Active when the measured mains voltage has fallen below the configured trip level. | |
| 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<br>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 active. | Inactive whenever the generator is required to be on load |
| Open Gen Output Pulse<br>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 active for the duration of the Breaker Open Pulse timer, after which it becomes inactive again. | |
| Open Mains Output<br>IEEE 37.2 – 52 ac circuit breaker<br>  | Used to control the load switching device. Whenever the module selects the mains to be off load this control source is active. | The output is inactive whenever the mains is required to be on load |
| Open Mains Output Pulse<br>IEEE 37.2 – 52 ac circuit breaker<br>  | Used to control the load switching device. Whenever the module selects the mains to be off load this control source is active for the duration of the Breaker Open Pulse timer, after which it becomes inactive again. | |

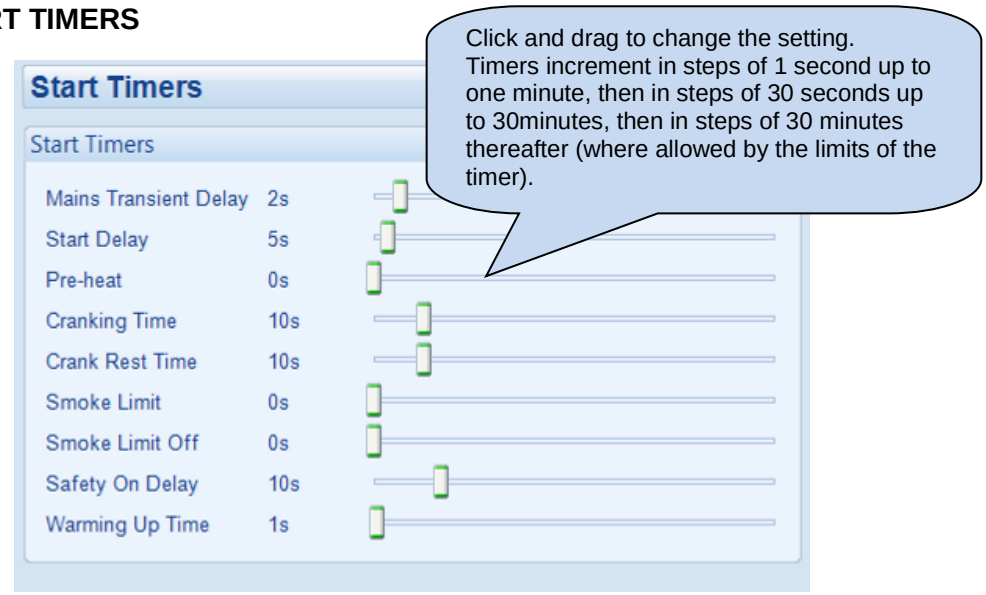
| Output source | Activates… | Is not active…. |
|---|---|---|
| Over Current Delayed Alarm | Active when an overcurrent condition has caused the Overcurrent Delayed alarm to trigger | |
| Over Current Immediate Warning<br>IEEE 37.2 – 50 instantaneous overcurrent relay | Active when an overcurrent condition 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 activates. | |
| Over Speed Shutdown<br>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 | |
| Preheat During Preheat Timer | Becomes active when the preheat timer begins.<br>Normally used to control the engine preheat glow-plugs. | Inactive when :<br>• The set is stopped<br>• The preheat timer has expired |
| Preheat Until End Of Cranking | Becomes active when the preheat timer begins.<br>Normally used to control the engine preheat glow-plugs. | Inactive when :<br>• The set is stopped<br>• The set has reached *crank disconnect* conditions |
| Preheat Until End Of Safety Timer | Becomes active when the preheat timer begins.<br>Normally used to control the engine preheat glow-plugs. | Inactive when :<br>• The set is stopped<br>• The set has reached the end of the *safety delay* timer |
| Preheat Until End of Warming Timer | Becomes active when the preheat timer begins.<br>Normally used to control the engine preheat glow-plugs. | Inactive when :<br>• The set is stopped<br>• The set has reached the end of the *warming* timer |
| Smoke Limiting | Becomes active when the controller requests that the engine runs at idle speed.<br>As an output, this can be used to give a signal to the *Idle input* of an engine speed governor (if available) | Becomes inactive when the controller requests that the engine runs at rated speed. |
| Start Relay<br>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 | |
| 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 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.<br>This can be used to signal to an operator that action is required before the set can transfer back to the mains supply. | |

## 4.6 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.



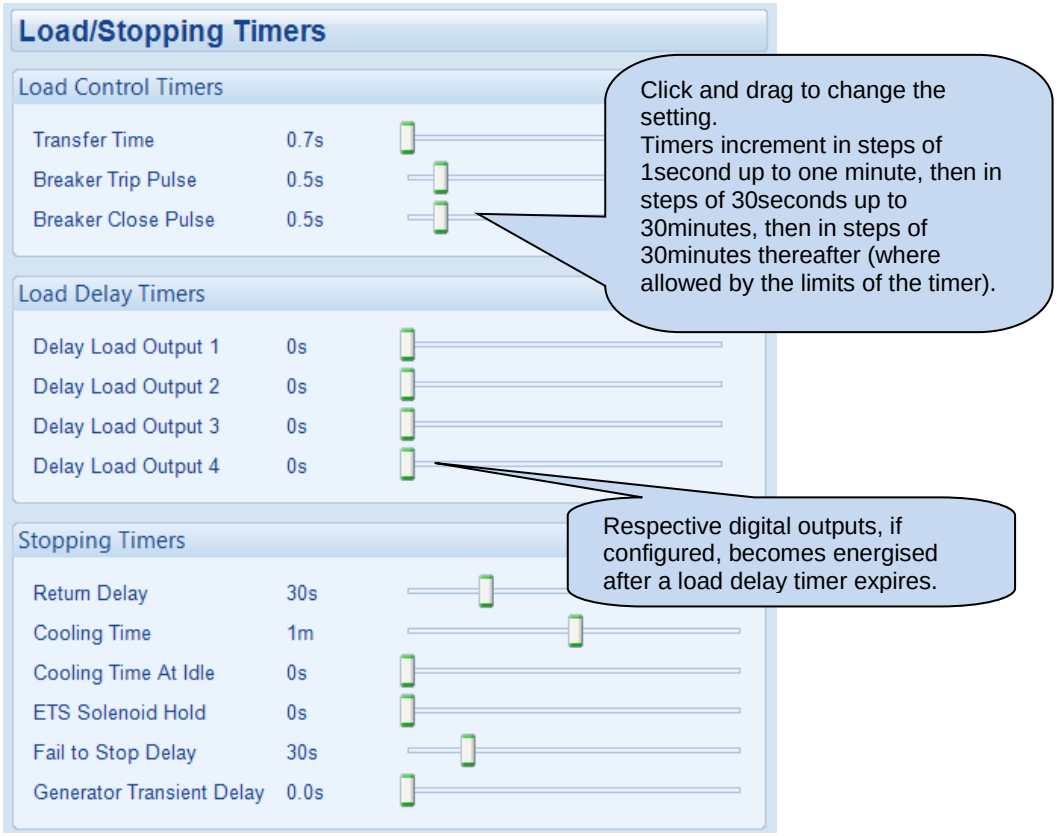

### 4.6.1 START TIMERS




**= Only available on DSE4620 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 *automatic* start.<br>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 *Preheat* output becomes active (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 *idle* 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 amout of time that the set takes to run up to rated speed after removal of the command to run at *idle* speed. If this time is too short, the set could be stopped due to *underspeed* failure. If the time is too long, *underspeed* protection is disabled until the *Smoke limit time off* time has expired. |
| Safety on delay | The amount of time at startup that the controller ignores oil pressure, engine speed, alternator voltage and other *delayed* 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. |

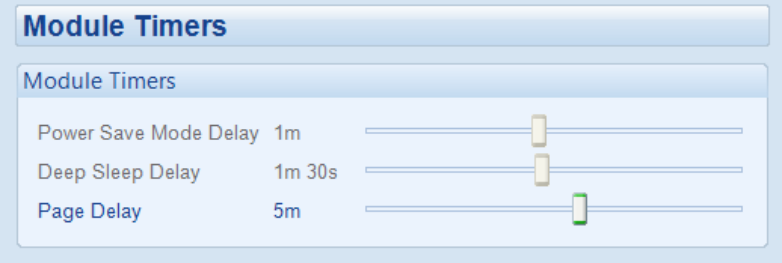
### 4.6.2 LOAD / STOPPING TIMERS




**= Only available on DSE4620 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 *Breaker Close Pulse* signals is present when the request to close a breaker is given. |
| Breaker Trip pulse | The amount of time that *Breaker Open Pulse* signals is present when the request to open a breaker is given. |
| Load Delay Timers | Delay Load Output 1, 2, 3 & 4<br>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 *Energise to stop* 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 *fail to stop* delay, a *Fail to Stop* 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. |

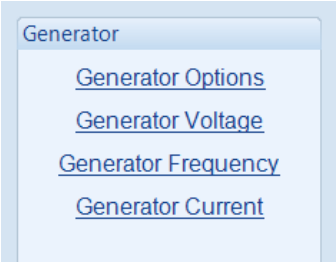
### 4.6.3 MODULE TIMERS



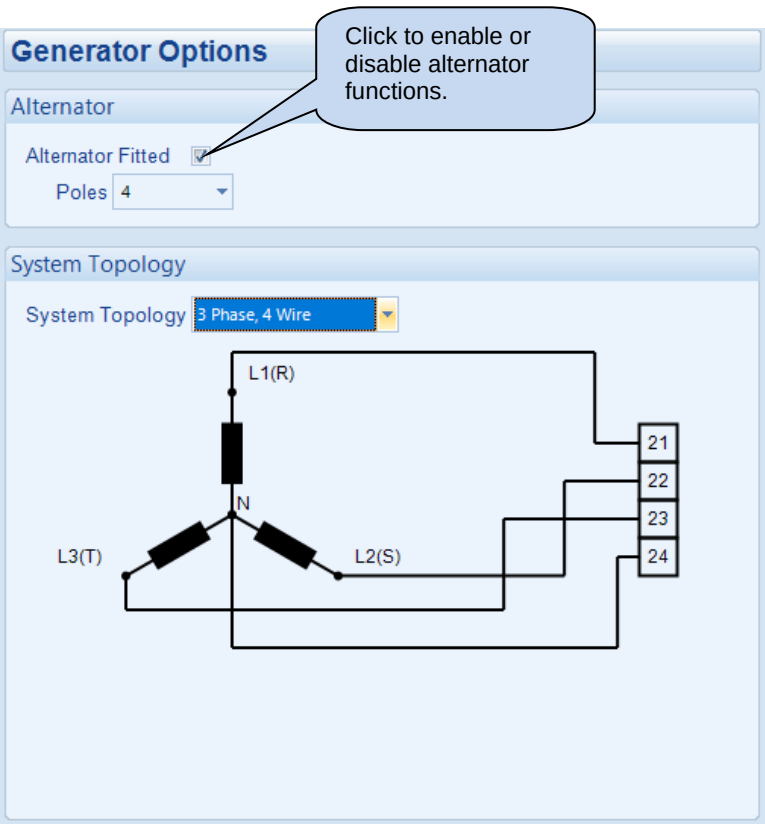

| Timer | Description |
|---|---|
| Power Save Mode Delay | If the module is left unattended in Stop mode for the duration of the *Power Save Mode Delay,* it enters low power consumption mode (Power Save Mode). |
| Deep Sleep Delay | When the module is in Power Save Mode, if left unattended for the duration of the *Deep Sleep Mode Delay* timer, it enters a lower power consumption mode (Deep Sleep Mode) |
| Page Delay | If the module is left unattended for the duration of the *Page Delay Timer,* it reverts to show the Status page. |

## 4.7 GENERATOR

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

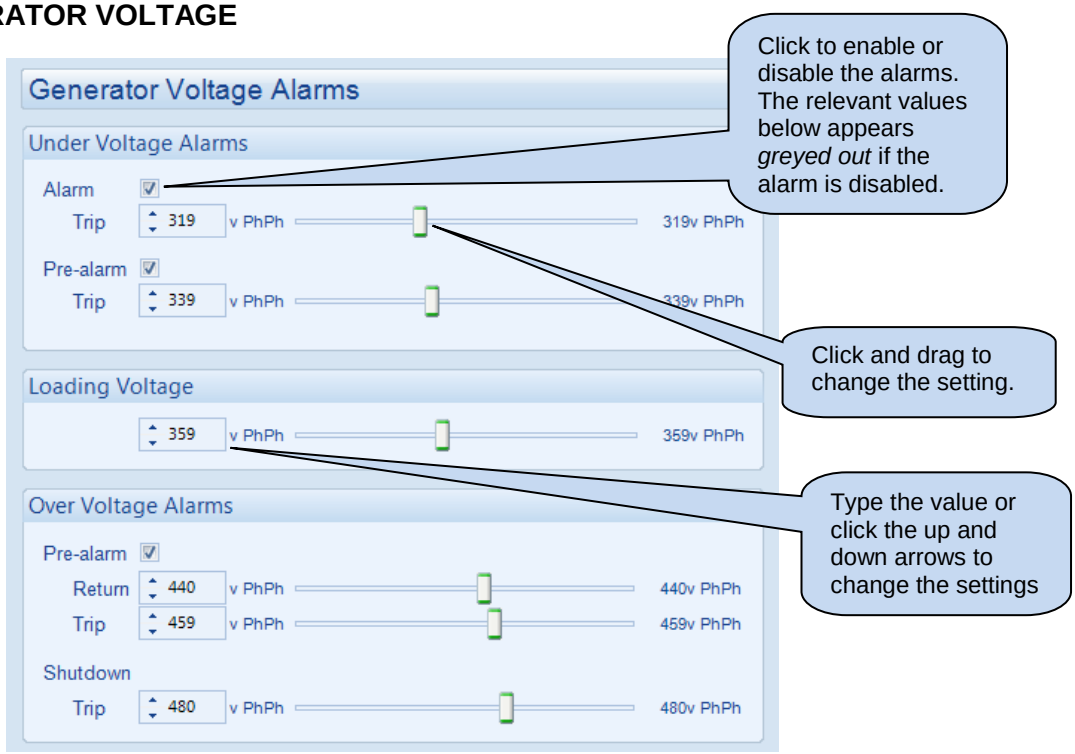



### 4.7.1 GENERATOR OPTIONS



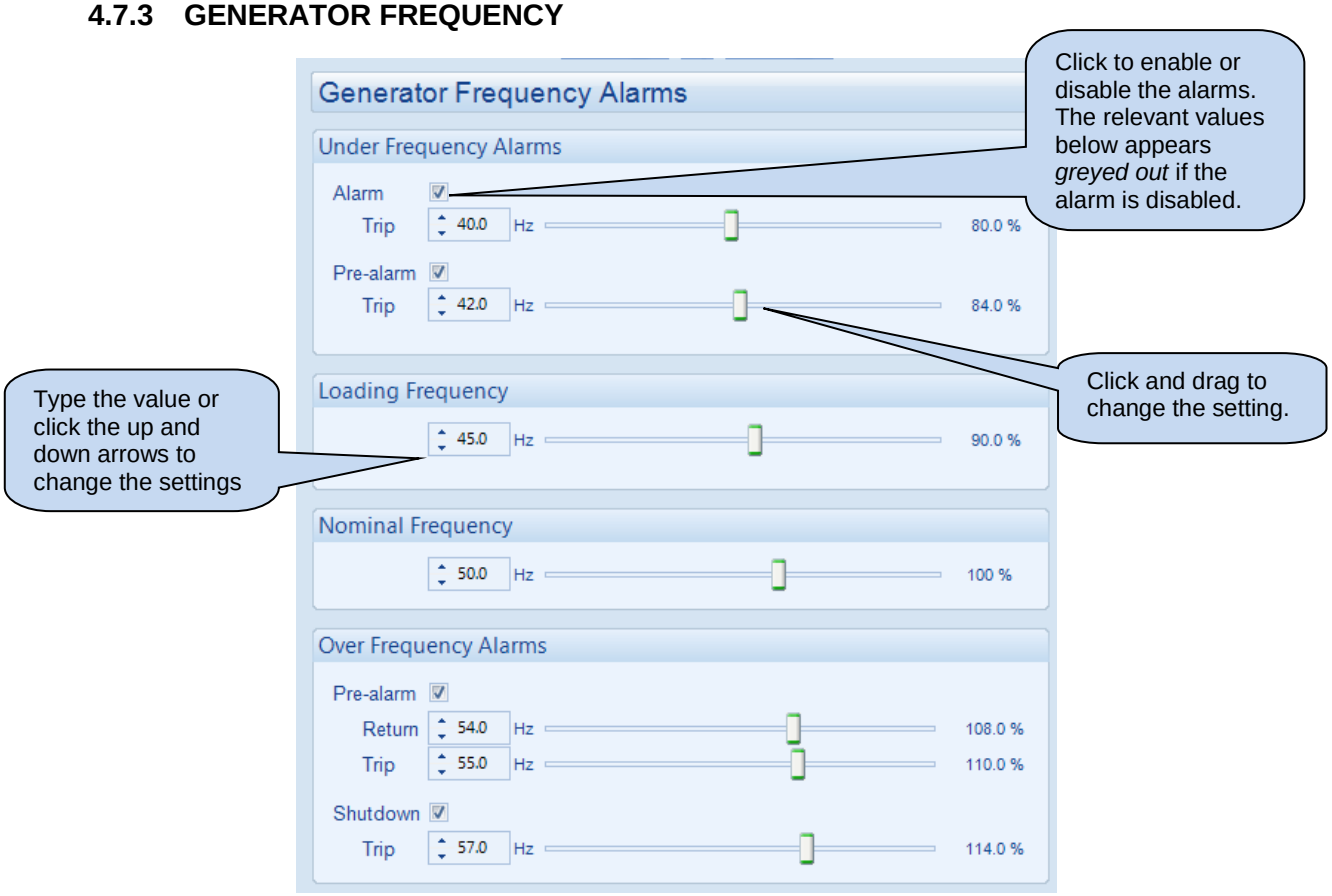

| Parameter | Description |
|---|---|
| Alternator Fitted | ☐ = There is no alternator in the system, it is an *engine only* application<br>☑ = An alternator is fitted to the engine, it is a generator application. |
| System Topology | Allows a number of Topology's to be catered for.<br><br>Selecting the *System Topology* shows the connections required for that particular system, along with the relevant connection numbers on the controller. |

### 4.7.2 GENERATOR VOLTAGE



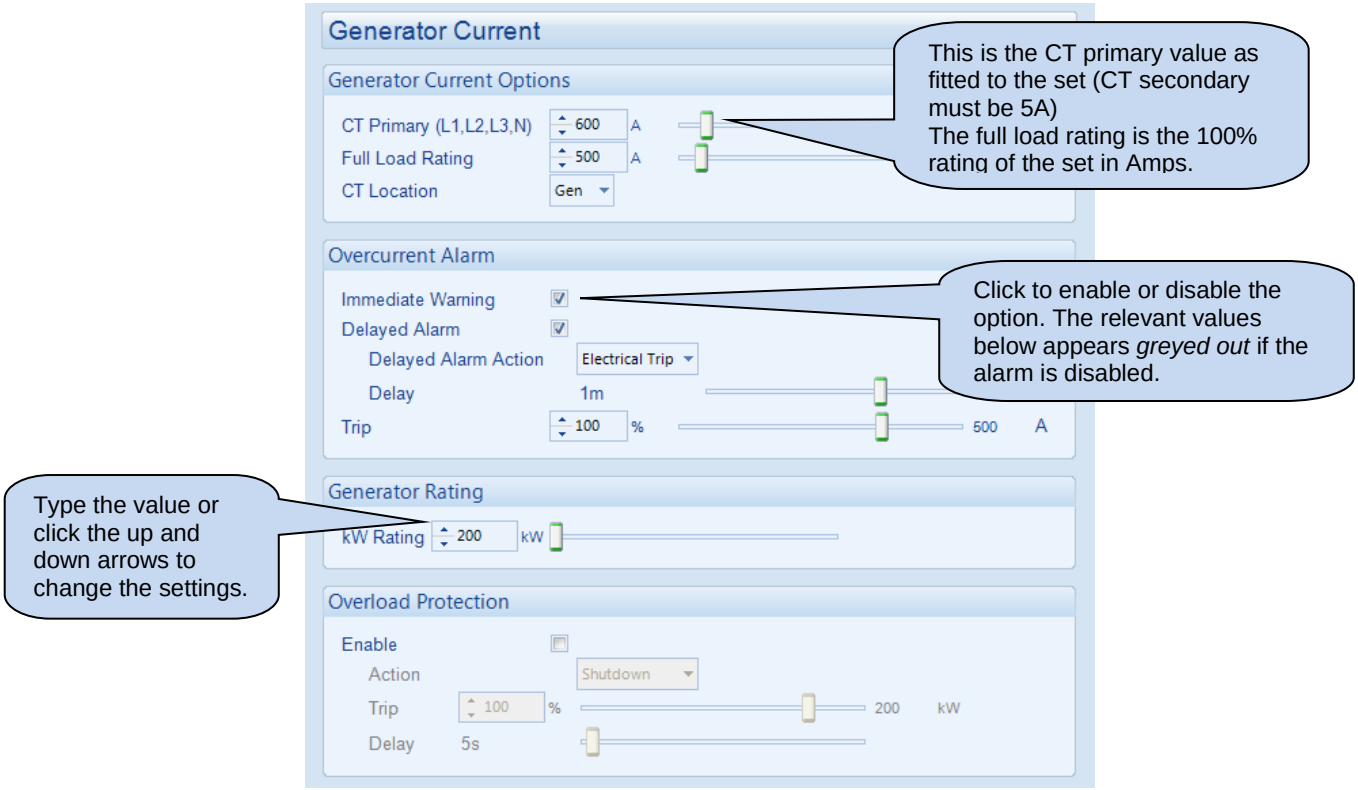

| Alarm | IEEE designation |
|---|---|
| Generator Under voltage | IEEE 37.2 - 27AC Undervoltage relay |
| Loading Voltage | Determines the alternator voltage at which the generator becomes available and ready to take load |
| Generator Over voltage | IEEE 37.2 - 59AC Overvoltage relay |

### 4.7.3 GENERATOR FREQUENCY




| 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 |

### 4.7.4 GENERATOR CURRENT




#### 4.7.4.1 OVERCURRENT ALARM

| Setting | Description |
|---|---|
| Immediate Warning | When enabled, if the current exceeds the *Trip* level the *Immediate Warning* activates. Any output or LCD display set to *Over Current Immediate Warning* is energised. The current load must fall below the *Trip* level in order to cancel the output source. |
| Delayed Alarm | When enabled, if the current exceeds the *Trip* level the *Delayed Alarm* activates. |
| Delayed Alarm Action | *Electrical Trip:* The generator is taken off load and the set stopped after the *Cooling timer*. Any output or LCD display set to *Over Current Delayed Alarm* 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 *Over Current Delayed Alarm* is energised. The current load must fall below the *Trip* 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 |

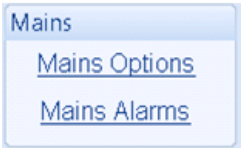
#### 4.7.4.2 OVERLOAD PROTECTION

| Setting | Description |
|---|---|
| Enable | ☐ = Overload Protection function is disabled.<br>☑ = The module monitors the kW load level and provide an alarm function if the level exceeds the *Trip* setting for the configured amount of time in the *Delay* setting. |
| Action | *Electrical Trip:* The generator is taken off load and the set stopped after the *Cooling timer*. Any output or LCD display set to *kW Overload Protection* is energised. *Shutdown:* 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 |

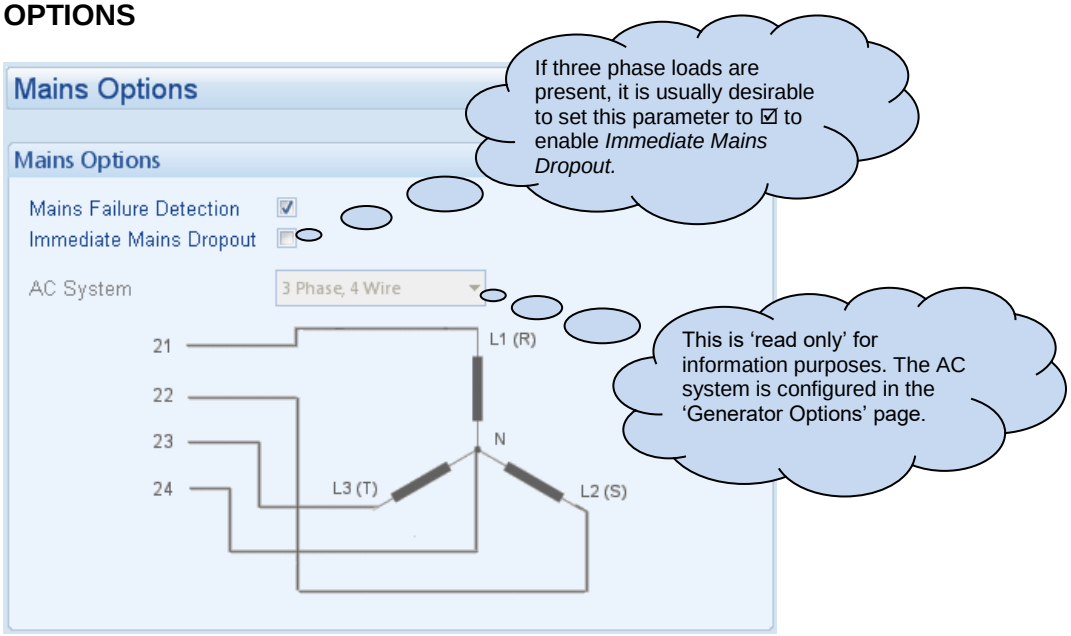
## 4.8 MAINS

**= Only available on DSE4620 AMF Modules**

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

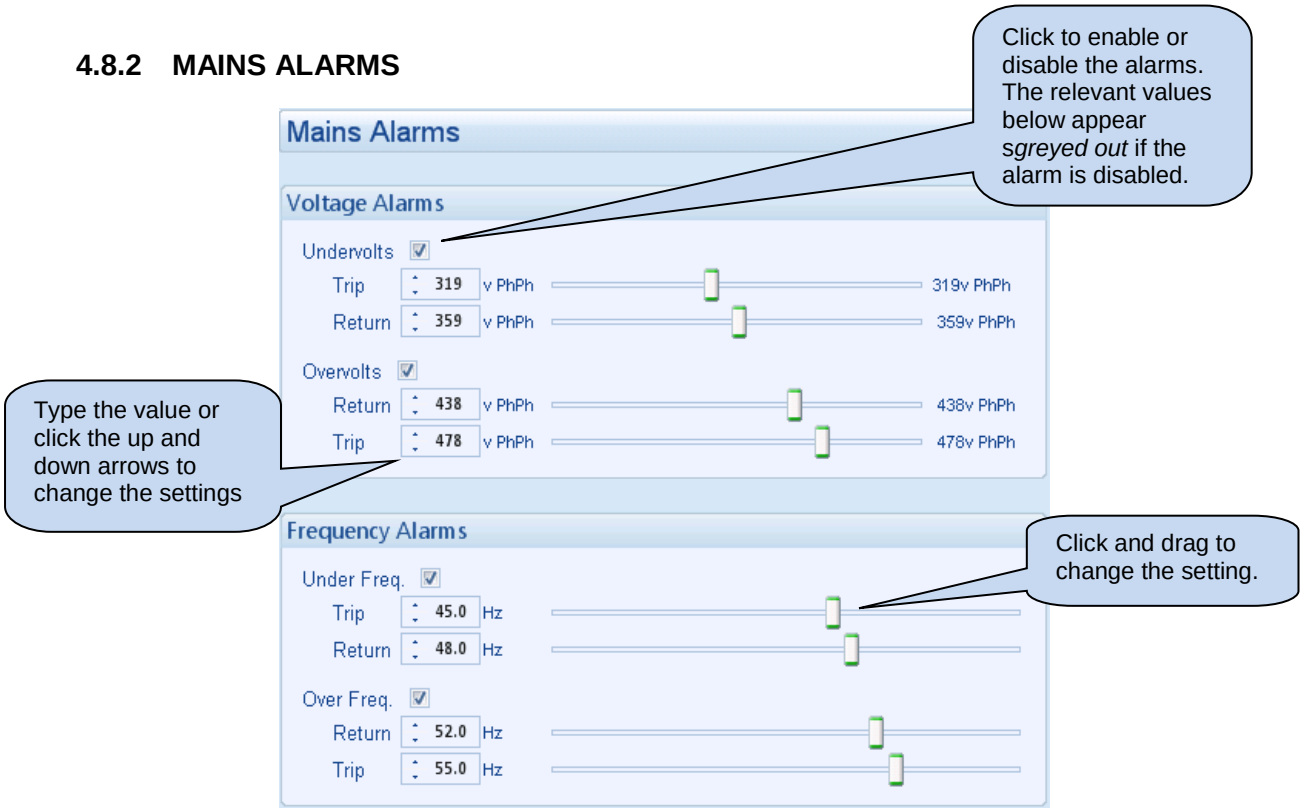



### 4.8.1 MAINS OPTIONS




| Timer | Description |
|---|---|
| Mains failure detection | ☐ = The module ignores the status of the mains supply.<br>☑ = The module monitors the mains supply and use this status for automatically starting and stopping the set in auto mode. |
| Immediate Mains Dropout | ☐ = Upon mains failure, the mains load switch is kept closed until the generator is up to speed and volts.<br>☑ = Upon mains failure, the mains load switch is opened immediately, subject to the setting of the *mains transient* 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<br><br>This list is not exhaustive. DSE reserve the right to add to this list as part of our policy of continual development |

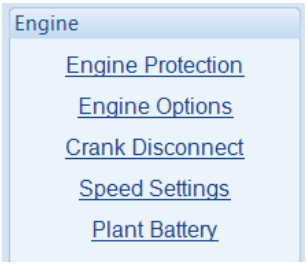
### 4.8.2 MAINS ALARMS



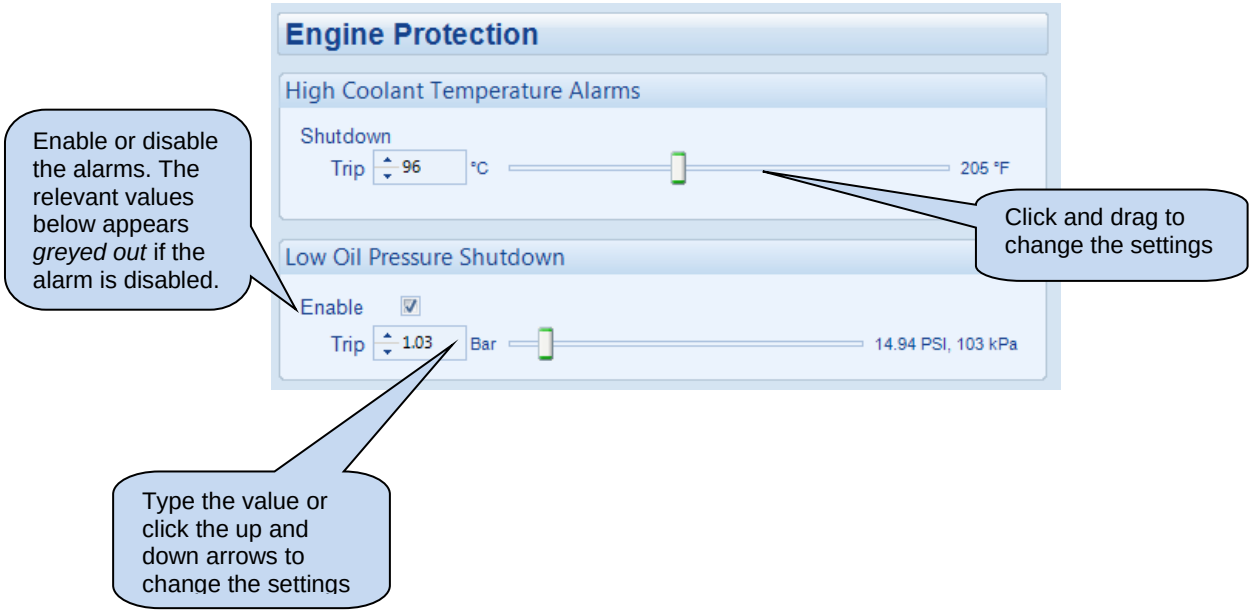

| Alarm | IEEE designation |
|---|---|
| Mains Under voltage | IEEE 37.2 - 27AC Undervoltage relay |
| Mains Over voltage | IEEE 37.2 - 59AC Overvoltage relay |
| Mains Under Frequency | IEEE 37.2 -81 Frequency relay |
| Mains Over Frequency | IEEE 37.2 -81 Frequency relay |

## 4.9 ENGINE

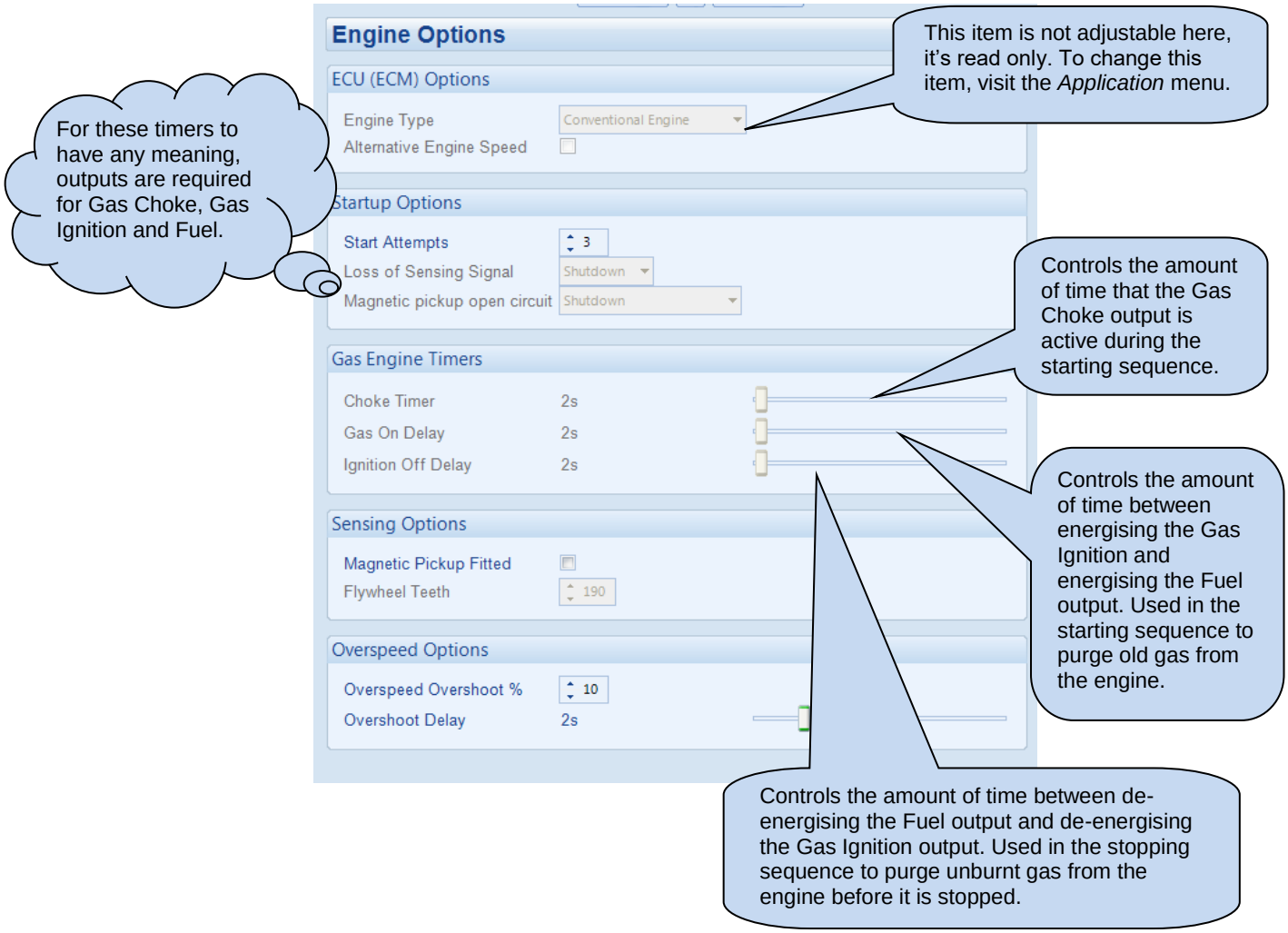
The *engine* page is subdivided into smaller sections.
Select the required section with the mouse.




### 4.9.1 ENGINE PROTECTION



### 4.9.2 ENGINE OPTIONS




Parameters detailed overleaf...

### 4.9.2.1 STARTUP OPTIONS

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

### 4.9.2.2 SENSING OPTIONS

| Parameter | Description |
|---|---|
| Magnetic pickup fitted | ☐ = Magnetic pickup device is not fitted to the DSE module.<br>☑ = A low impedance magnetic pickup device is fitted to the DSE module to measure engine speed. Specifications of the DSE module Magnetic Pickup Input are contained within DSE publication 057-200 4600 Series Operator Manual. |
| Flywheel teeth | The number of teeth on the engine flywheel. This is read by the magnetic pickup device. |

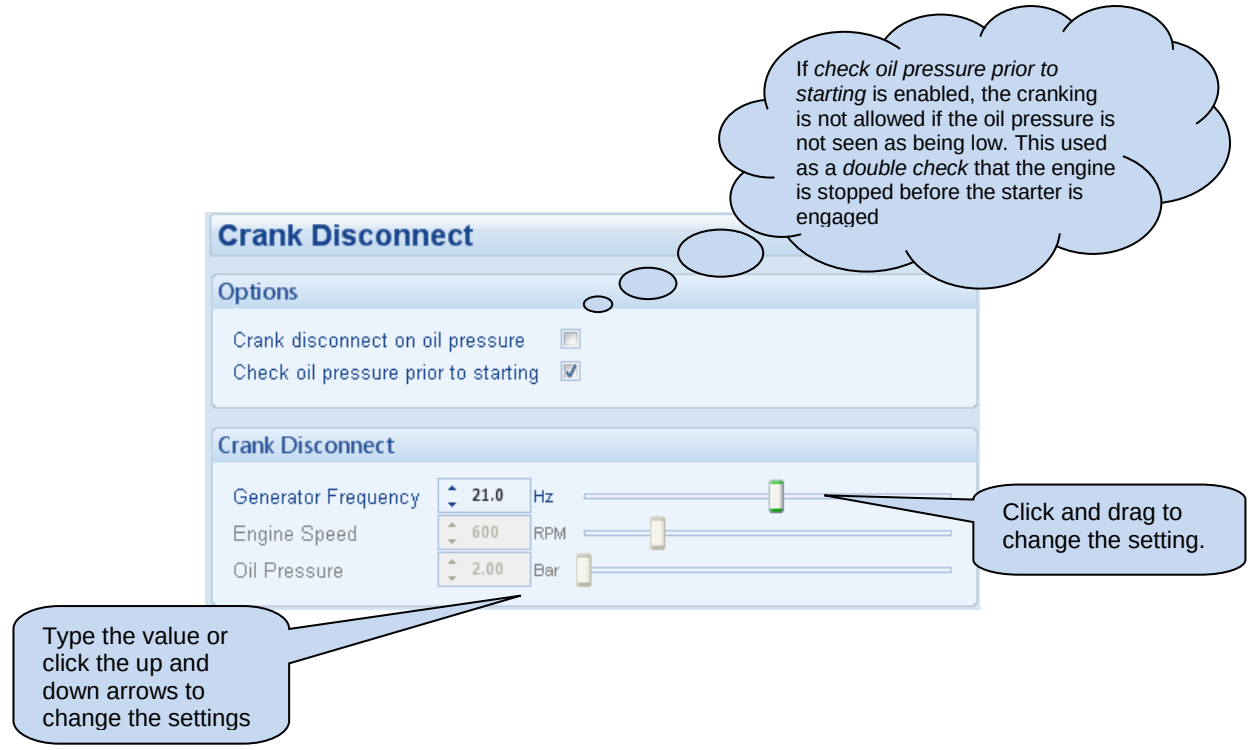
### 4.9.2.3 OVERSPEED OPTIONS

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

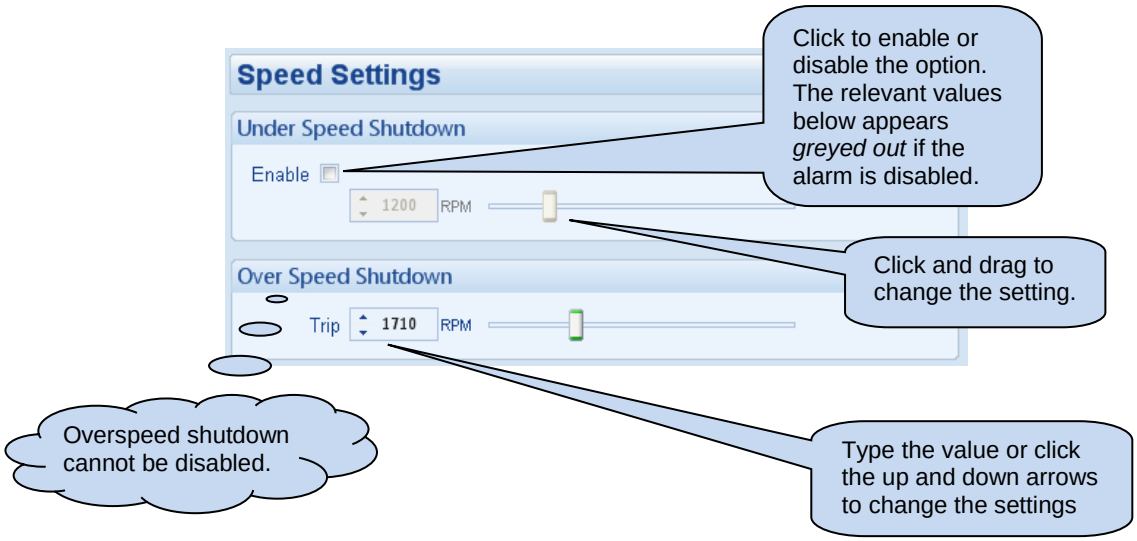
### 4.9.3 CRANK DISCONNECT

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.

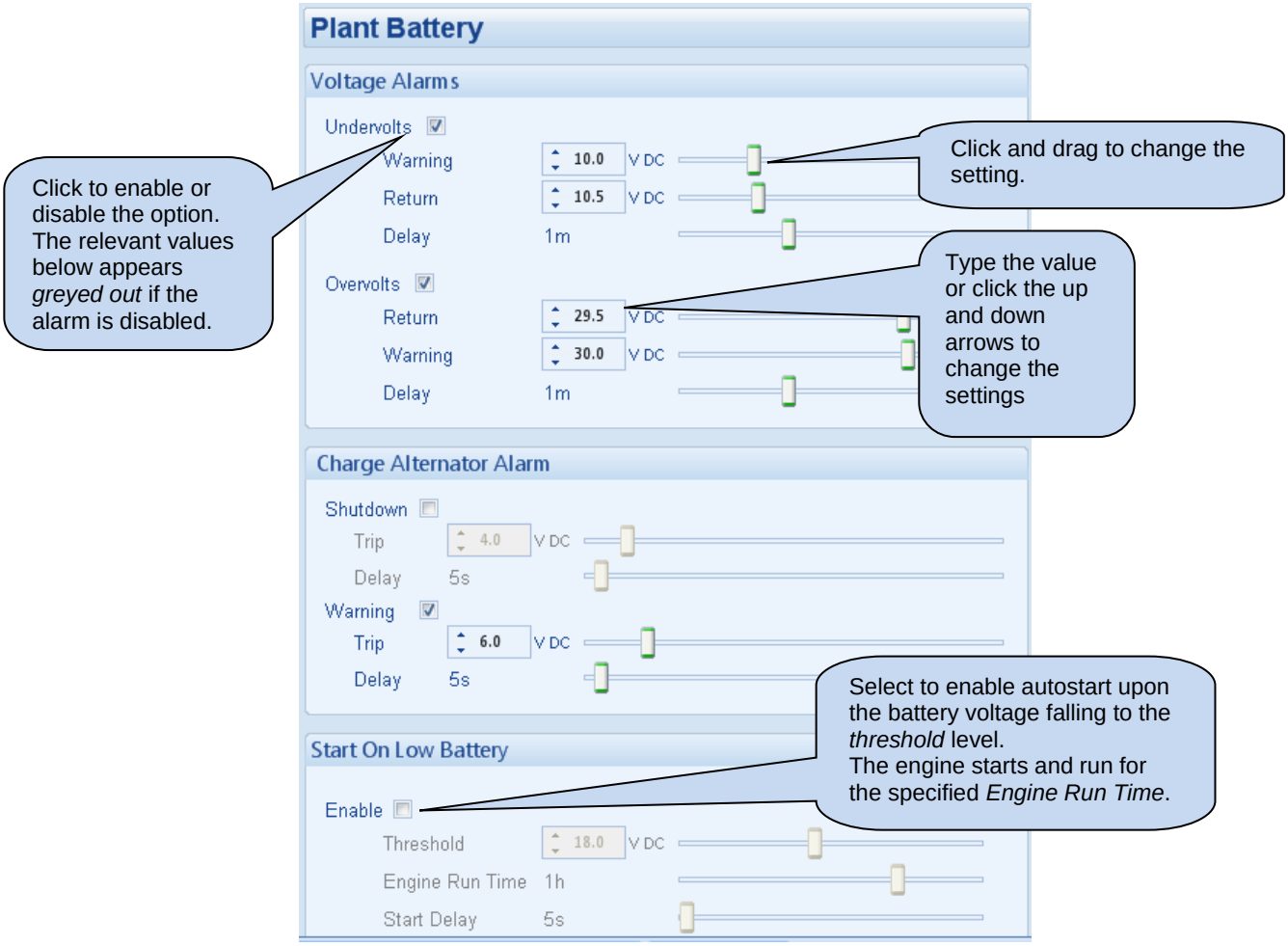
Having more than one *crank disconnect* source allows for a much faster crank disconnect response leading to less wear on the engine and starter components, and provides added safety in case one source is lost, by a blown or tripped fuse for example.




### 4.9.4 SPEED SETTINGS



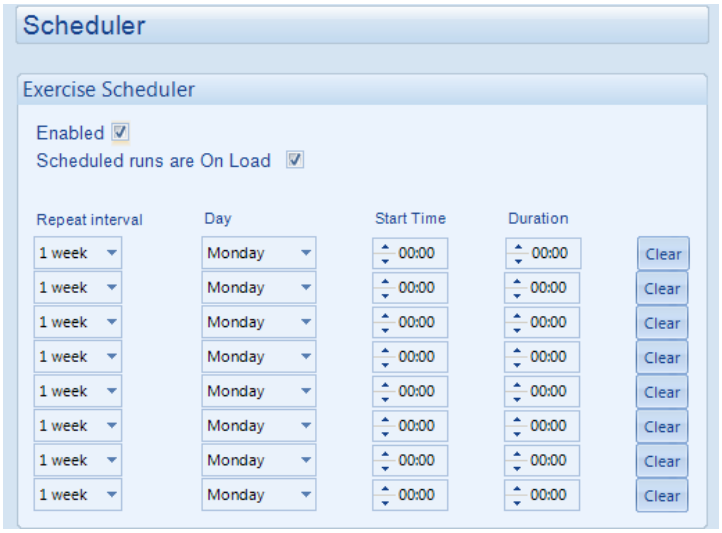
### 4.9.5 PLANT BATTERY




| 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 | ☐ = Start on Low Battery is disabled.<br>☑ = Select to enable autostart upon the battery voltage falling to the *threshold* level. The engine starts and run for the specified *Engine Run Time*. 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. |

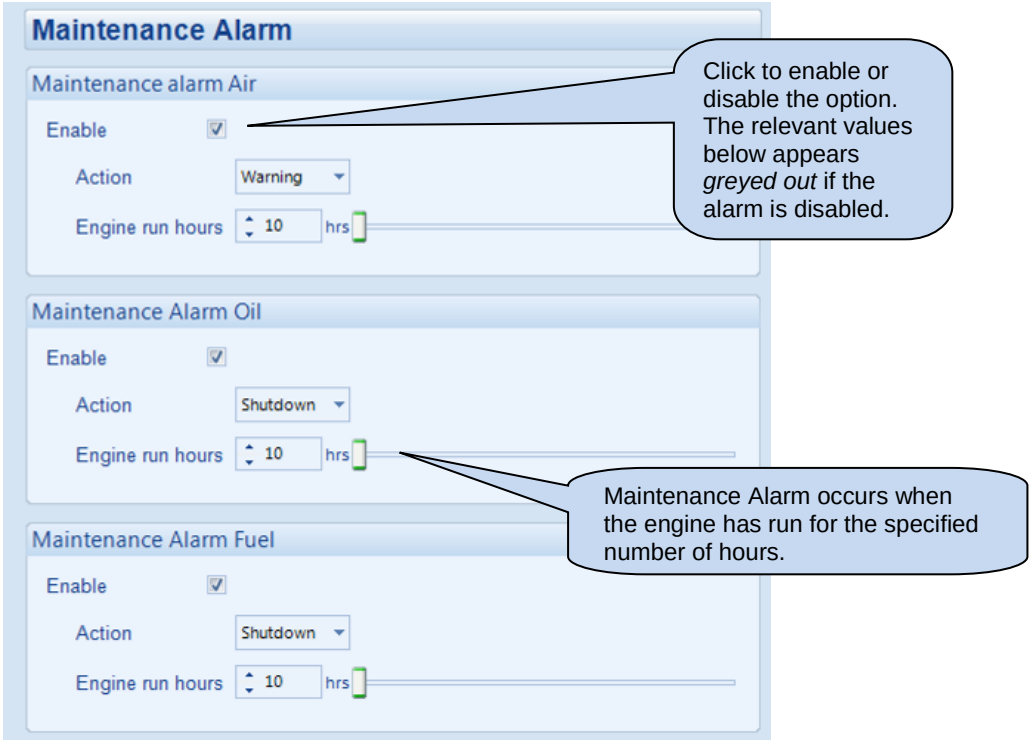
## 4.10 SCHEDULER

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 | ☐ = Scheduled runs are disabled<br>☑ = Enables the Scheduler |
| Scheduled run is On Load | ☐ = The module runs the generator on schedule with the breaker open<br>☑ = The module runs the generator on schedule and closes the breaker |
| Repeat Interval | Determines the repeat interval for the scheduled run.<br>Options available are: repeat every 1 week, 2 weeks, 3 weeks or 4 weeks |
| 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 for the scheduled run |
| Clear | Resets the values for the Day, Start Time and Duration to defaults |

## 4.11 MAINTENANCE ALARM




There are three ways to reset the maintenance alarm:

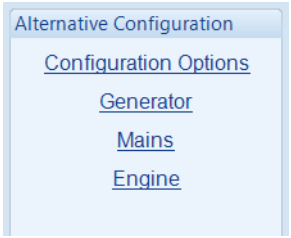
1) Activate a digital input configured to “Maintenance Reset Alarm”.
2) Use the SCADA | Maintenance | Maintenance Alarm section of this PC Software.
3) Through the Front Panel Editor of the module

## 4.12 ALTERNATIVE CONFIGURATION

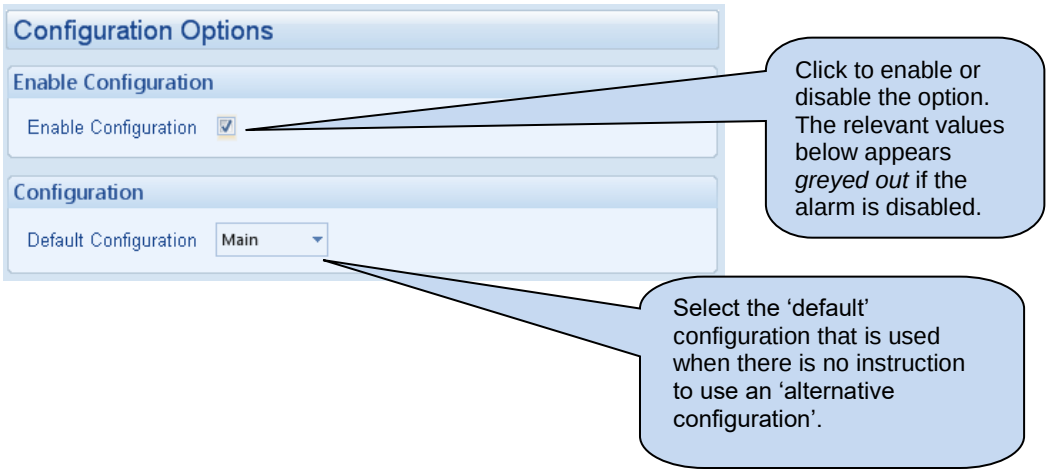
An Alternative Configuration is provided to allow the system designer to cater for different AC requirements utilising the same generator system. Typically this feature is used by Rental Set Manufacturers where the set is capable of being operated at (for instance) 120V 50Hz and 240V 50Hz using a selector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

The Alternative Configuration can be selected using either:

- Configuration Suite Software (Selection for 'Default Configuration')
- DSE4600 Series Front Panel Editor
- Via external signal to the DSE4600 Series module input configured to "Alternative Configuration" select.

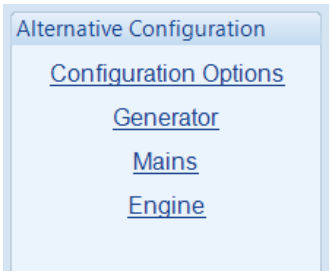



### 4.12.1 CONFIGURATION OPTIONS

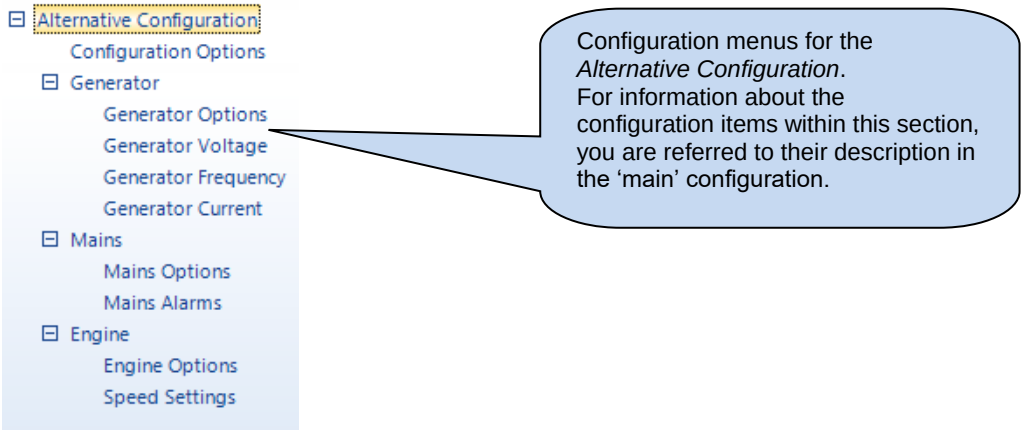


## 4.12.2 ALTERNATIVE CONFIGURATIONS EDITOR

The Alternative Configurations Editor allows for editing of the parameters that are to be changed when an Alternative Configuration is selected.

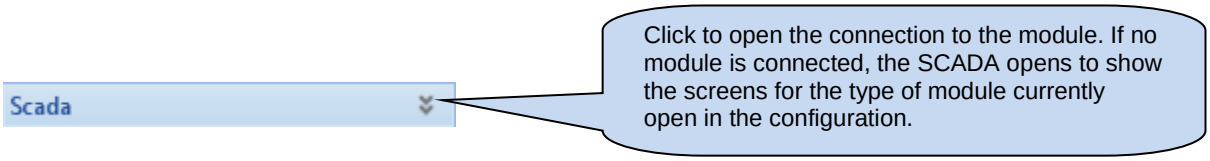



Alternative configuration options contain a subset of the main configuration. The adjustable parameters are not discussed here as they are identical to the main configuration options :

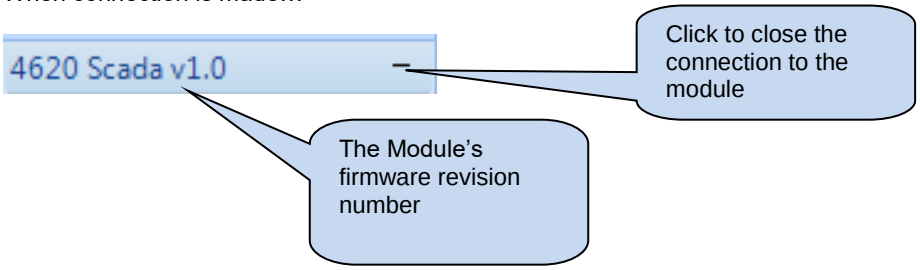


# 5 SCADA

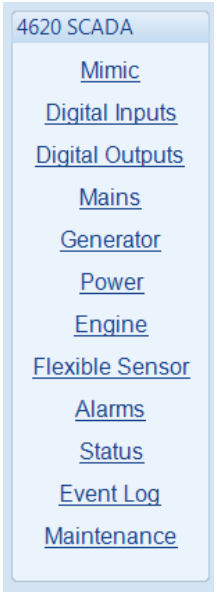
SCADA stands for **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition and is provided both as a service tool and also as a means of monitoring / controlling the generator set.
As a service tool, the SCADA pages are to check the operation of the controller's inputs and outputs as well as checking the generators operating parameters.




When connection is made…




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



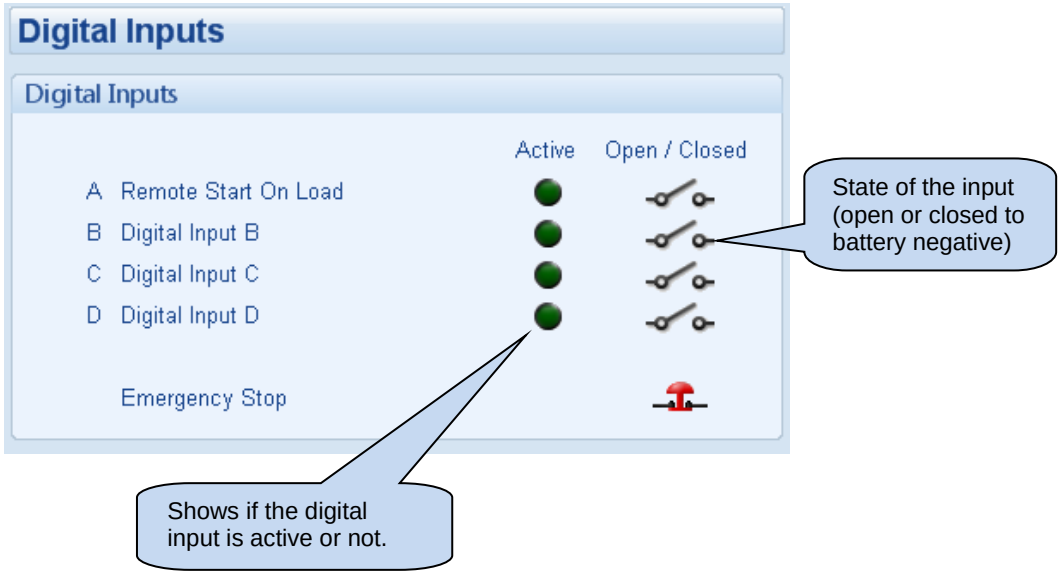
## 5.1 MIMIC

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

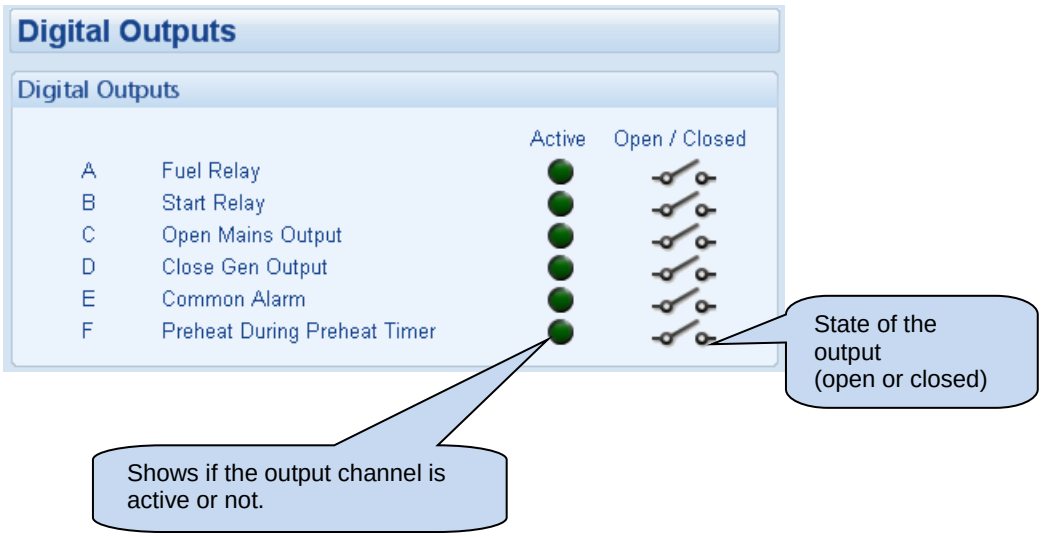

Click the mimic buttons to control the module remotely

**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.

## 5.2 DIGITAL INPUTS



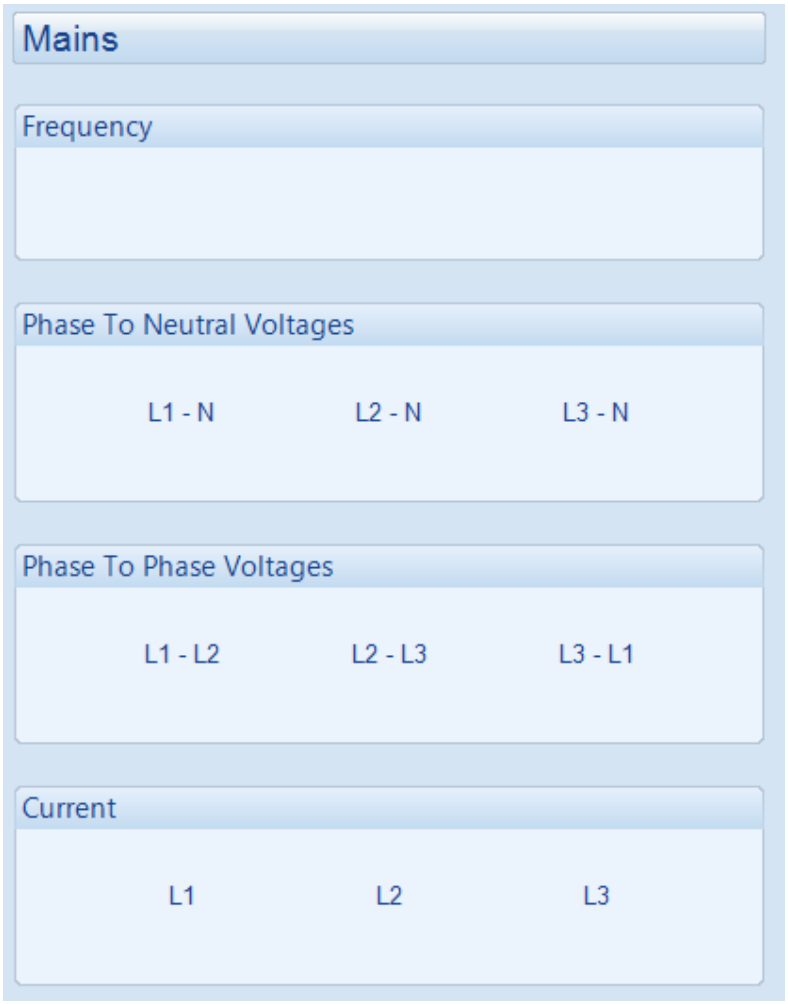

## 5.3 DIGITAL OUTPUTS



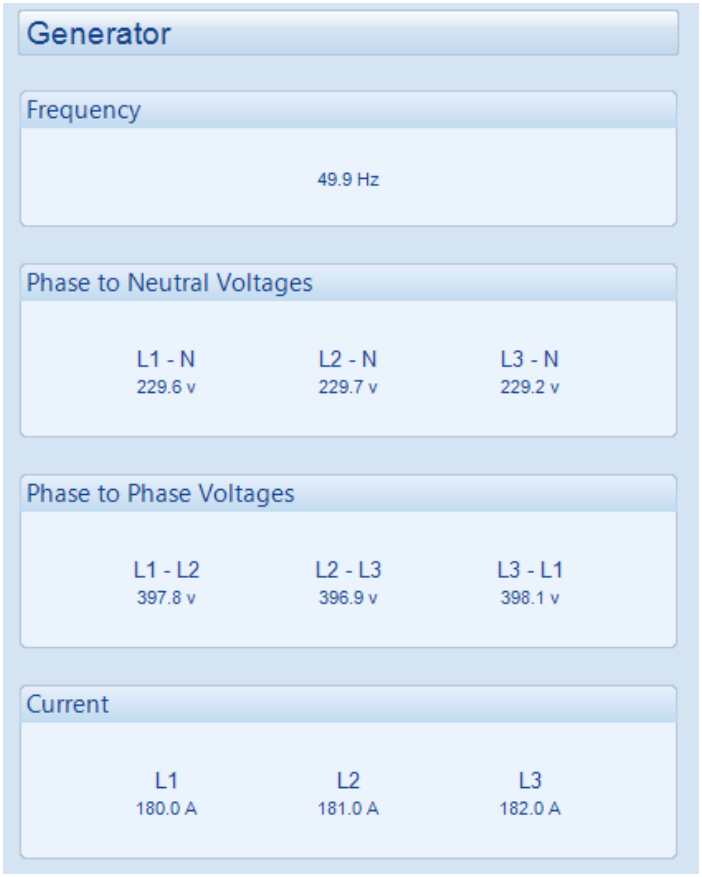
## 5.4 MAINS

**DSE4620 AMF MODULES ONLY**

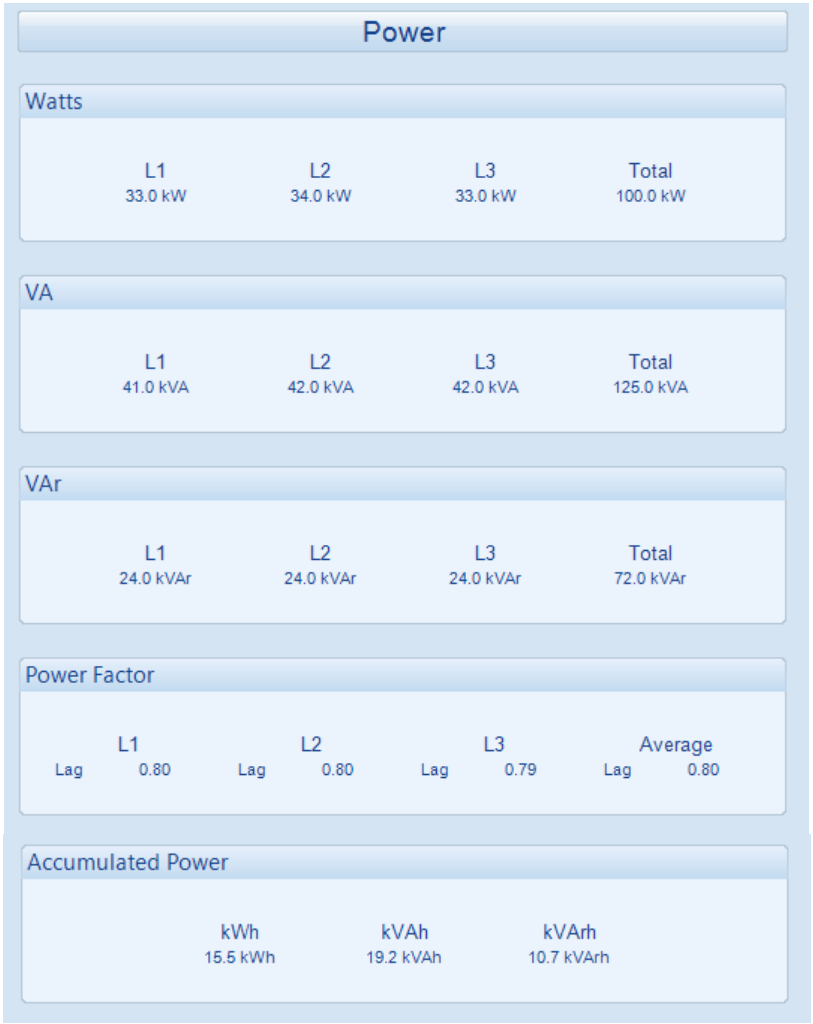
Shows the modules measurements of the mains supply (4620 only).



## 5.5 GENERATOR

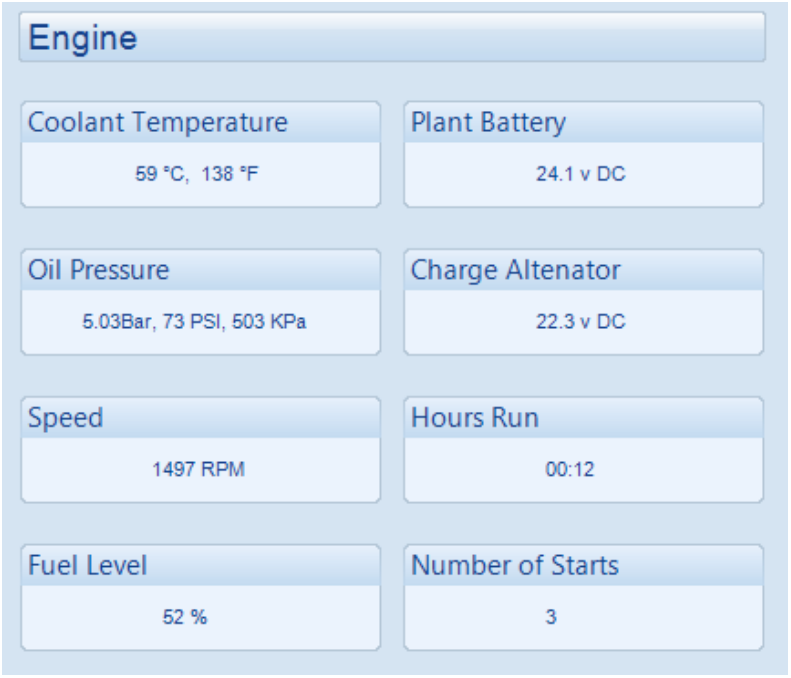


## 5.6 POWER


Power
Watts
L1
33.0 kW
L2
34.0 kW
L3
33.0 kW
Total
100.0 kW
VA
L1
41.0 kVA
L2
42.0 kVA
L3
42.0 kVA
Total
125.0 kVA
VAr
L1
24.0 kVAr
L2
24.0 kVAr
L3
24.0 kVAr
Total
72.0 kVAr
Power Factor
L1
Lag 0.80
L2
Lag 0.80
L3
Lag 0.79
Average
Lag 0.80
Accumulated Power
kWh
15.5 kWh
kVAh
19.2 kVAh
kVArh
10.7 kVArh

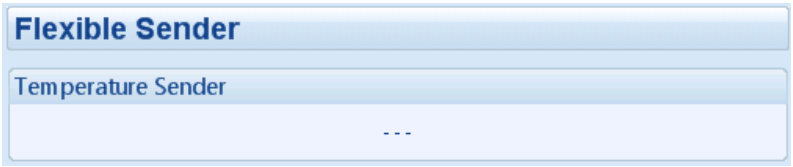
## 5.7 ENGINE

Shows the modules measurements of the engine parameters.



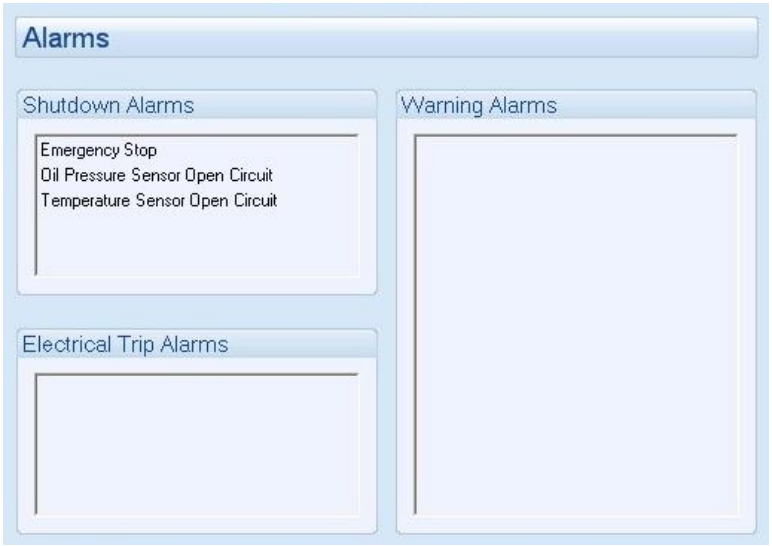

## 5.8 FLEXIBLE SENSOR

Shows the measurement of the Flexible Sensor (If configured)



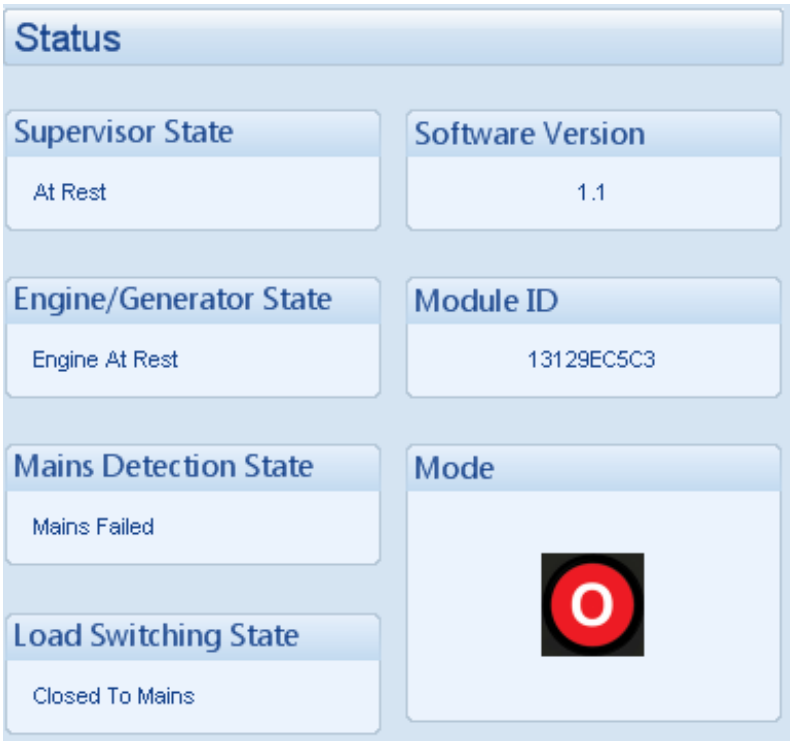

## 5.9 ALARMS

Shows any present alarm conditions.



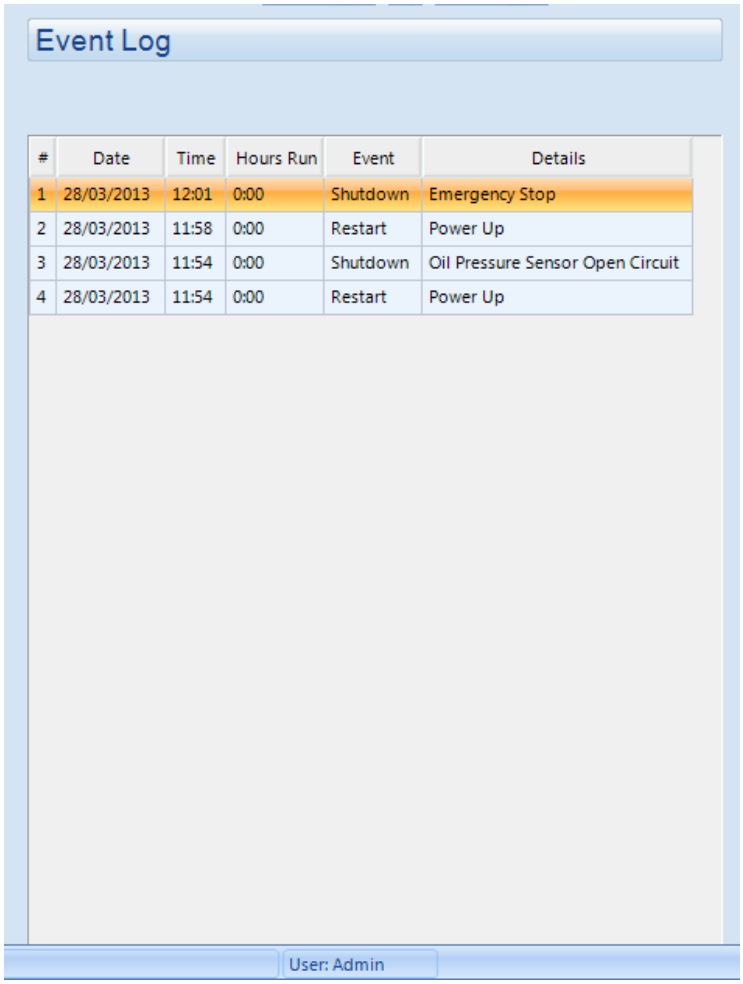
## 5.10 STATUS

Shows the module's current status.



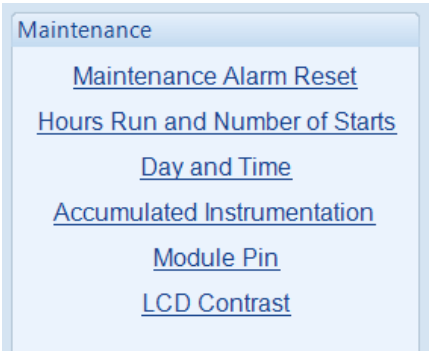
## 5.11 EVENT LOG

Shows the contents of the module's event log.

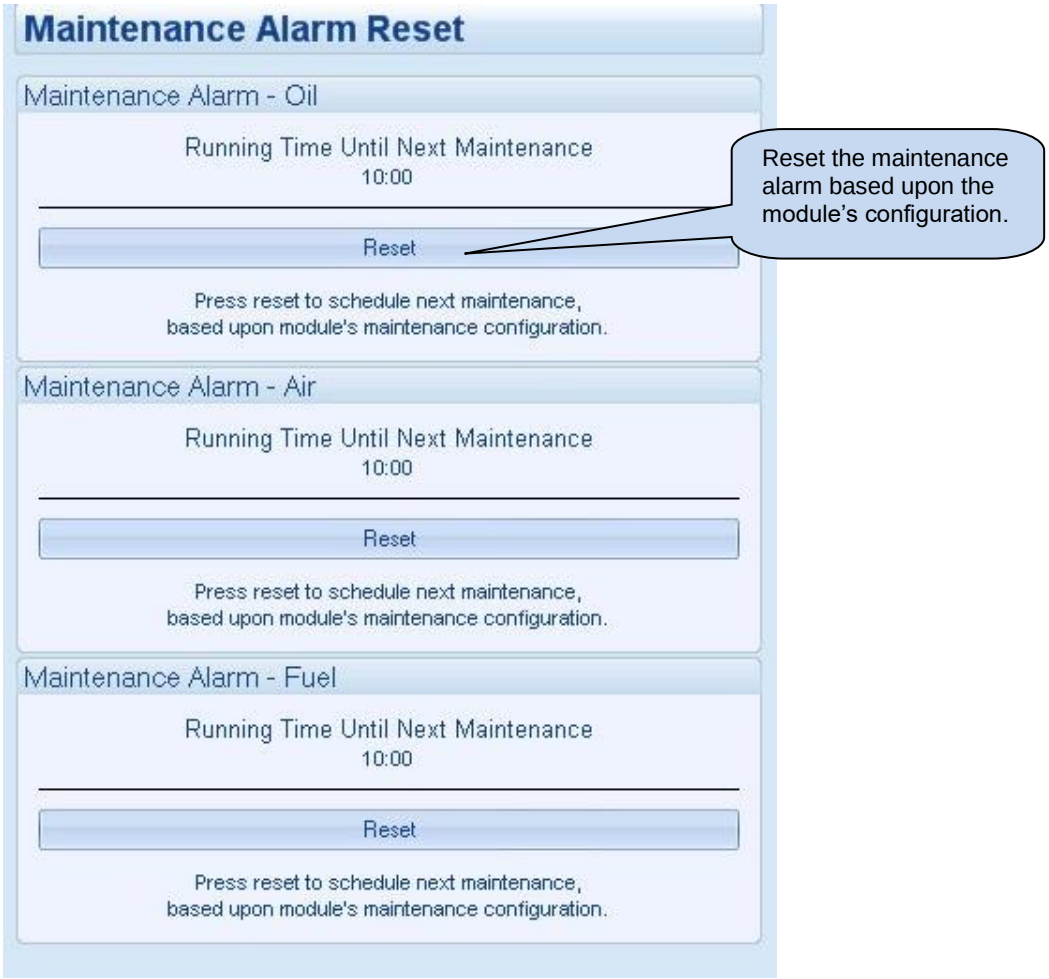


## 5.12 MAINTENANCE

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

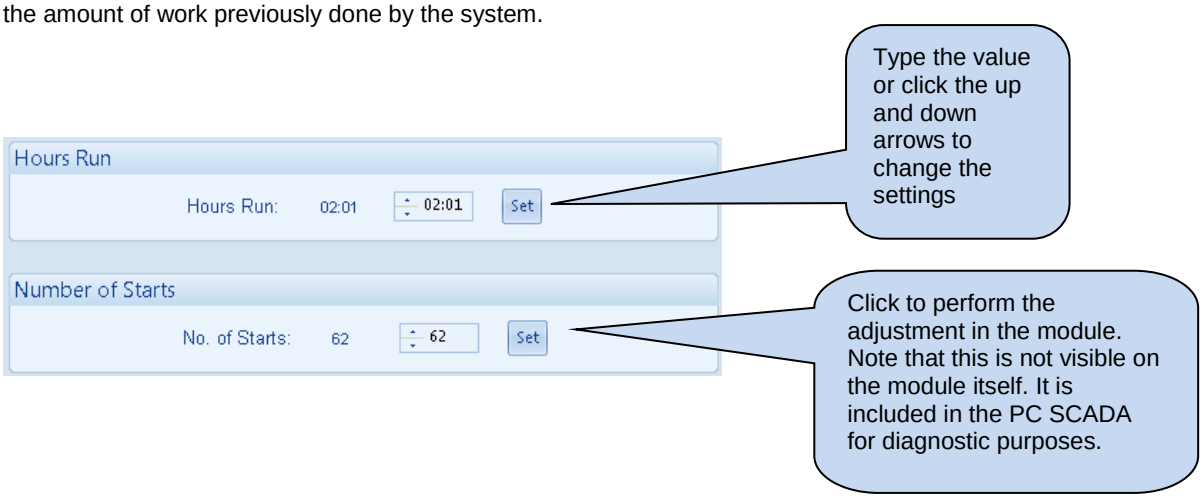



### 5.12.1 MAINTENANCE ALARM RESET



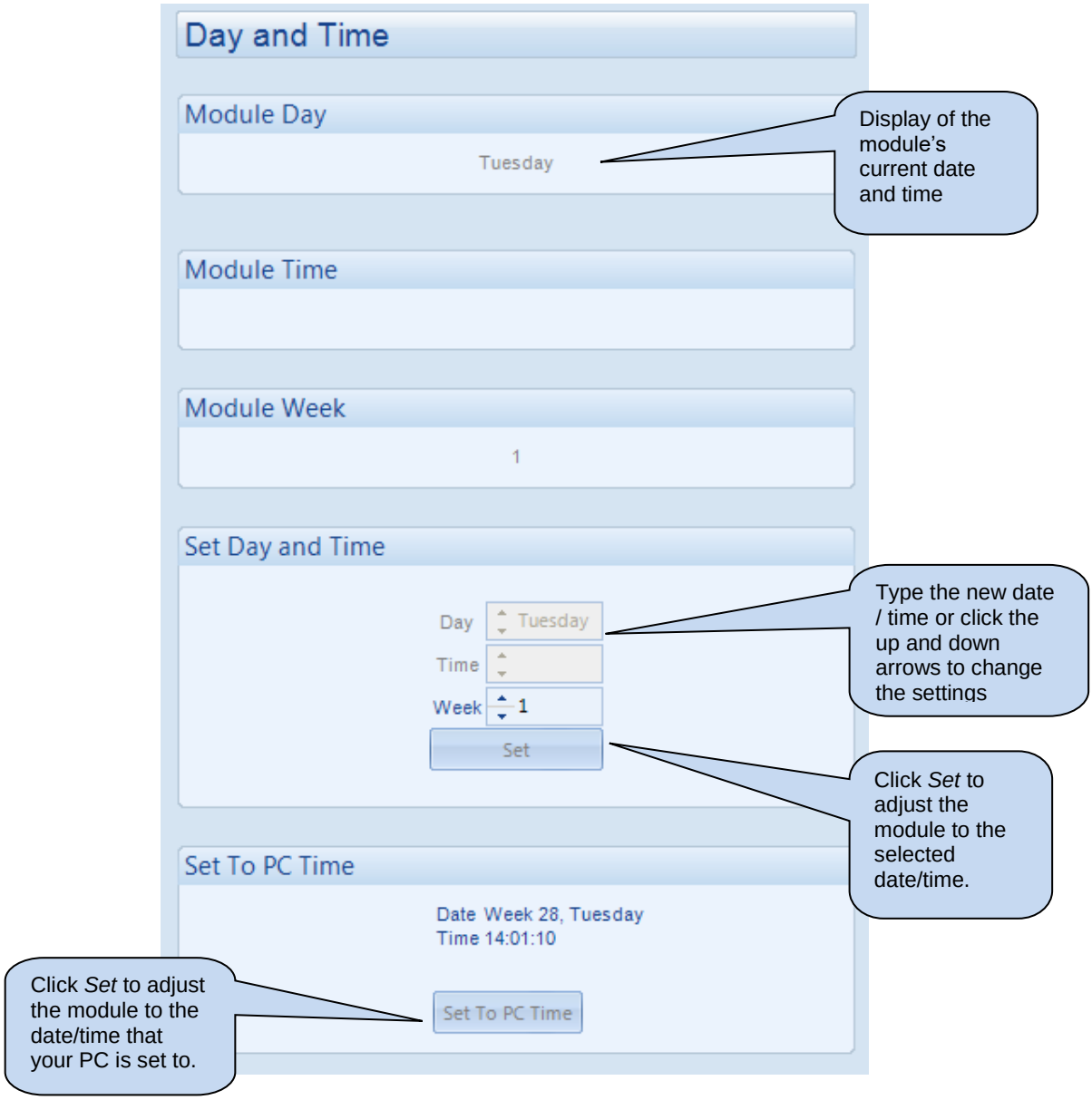
## 5.12.2 HOURS RUN AND NUMBER OF STARTS

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.



### 5.12.3 DATE AND TIME

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

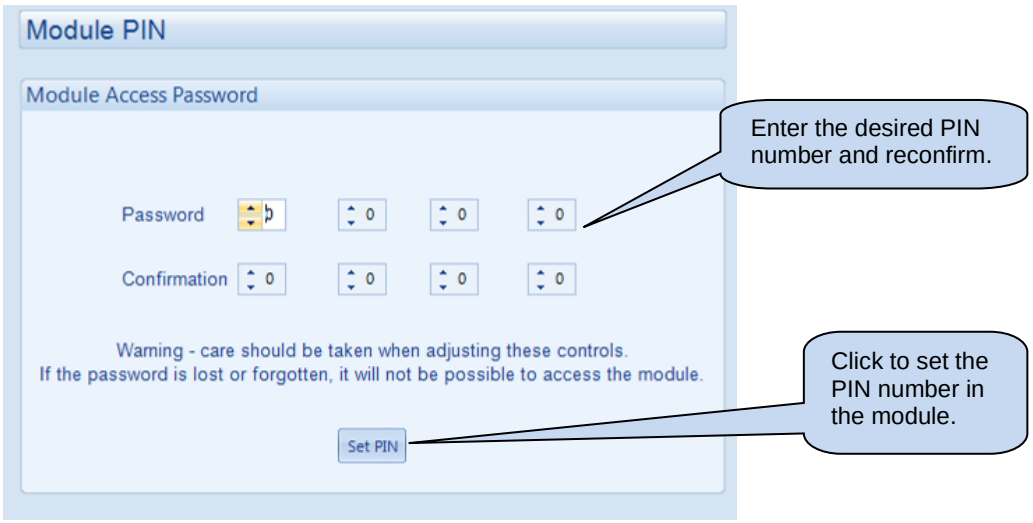


### 5.12.4 ACCUMULATED INSTRUMENTATION

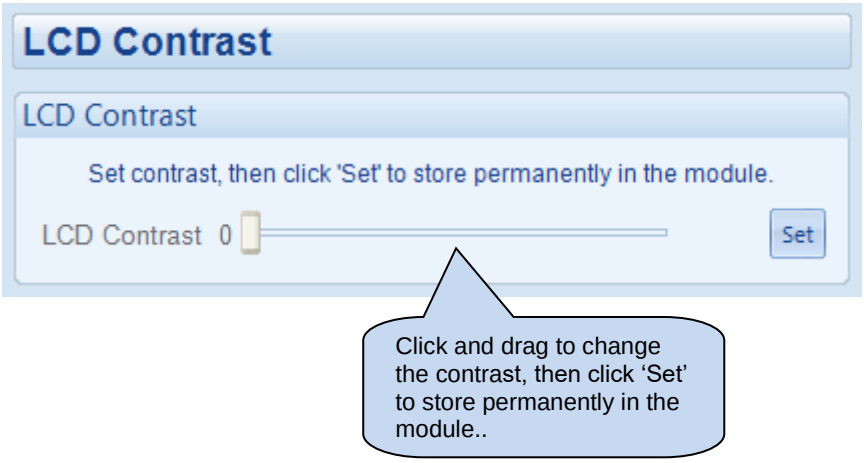

### 5.12.5 MODULE PIN

**NOTE : If the PIN is lost or forgotten, it is no more 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 can be sent to the controller from the PC software.



### 5.12.6 LCD CONTRAST



# 6 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.<br>*Indication* 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.<br>*Warning alarms* 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.<br>*Electrical Trip alarms* 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.<br>*Shutdown alarms* are serious issues that demand immediate stopping of the generator. For instance Emergency Stop or Overspeed alarms require immediate shutdown. |

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