DSEControl®

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DEEP SEA ELECTRONICS

DSEE100 Configuration Suite
PC Software Manual

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CULTURE OF QUALITY

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DSEE100 Configuration Suite PC Software Manual

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Amendments Since Last Publication

Issue	Comments
1	Initial release
2	Updates for V1.1 of the DSEE100 (Protections Disable, Remote Stop, Crank Disconnect on Charge Alternator, pulse pickup configuration change).
3	Addition of speed calibration.
4	Update for version 1.3. Document layout update to latest version

Typeface: The typeface used in this document is *Arial*. Care must 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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SECTION PAGE

1 INTRODUCTION

This document details the use of the *DSE Configuration Suite PC Software* with the DSEE100 module, which is part of the DSEControl® range of products.

The manual forms part of the product and should be kept for the entire life of the product. If the product is passed or supplied to another party, ensure that this document is passed to them for reference purposes.

This is not a *controlled document.* DSE do not automatically inform on updates. Any future updates of this document are included on the DSE website at www.deepseaelectronics.com

The *DSE Configuration Suite PC Software* allows the DSEE100 module to be connected to a PC via USB A to USB B cable (USB printer cable). Once connected, the software allows easy, controlled access to various operating parameters within the module which can then be viewed and edited as required.

The *DSE Configuration Suite PC Software* must 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 engine provider.

The information contained in this manual must 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. Separate manuals deal with the operation of the individual module and its ancillaries, refer to section entitled *Bibliography* elsewhere in this document for further information.

1.1 CLARIFICATION OF NOTATION

Clarification of notation used within this publication.

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

1.2 GLOSSARY OF TERMS

Term	Description
DSEE100	All modules in the DSEE100
CAN	Controller Area Network Vehicle standard to allow digital devices to communicate to one another.
BMS	Building Management System A digital/computer based control system for a building's infrastructure.
DEF	Diesel Exhaust Fluid (AdBlue) A liquid used as a consumable in the SCR process to lower nitric oxide and nitrogen dioxide concentration in engine exhaust emissions.
DM1	Diagnostic Message 1 A DTC that is currently active on the engine ECU.
DM2	Diagnostic Message 2 A DTC that was previously active on the engine ECU and has been stored in the ECU's internal memory.
DPF	Diesel Particulate Filter A filter fitted to the exhaust of an engine to remove diesel particulate matter or soot from the exhaust gas.
DPTC	Diesel Particulate Temperature Controlled Filter A filter fitted to the exhaust of an engine to remove diesel particulate matter or soot from the exhaust gas which is temperature controlled.
DTC	Diagnostic Trouble Code The name for the entire fault code sent by an engine ECU.
ECU/ECM	Engine Control Unit/Management An electronic device that monitors engine parameters and regulates the fuelling.
FMI	Failure Mode Indicator A part of DTC that indicates the type of failure, e.g. high, low, open circuit etc.
Fuel Tank Bund	An external tank used to collect fuel that may leak or overflow from the fuel tank. This tank may also be integral to the main fuel tank. A level switch is usually located within the Bund to indicate the presence of the leak or overflow condition. May be called Retention Tank in some locales.
GSM	Global System for Mobile communications. Cell phone technology used in most of the World.
HEST	High Exhaust System Temperature Initiates when DPF filter is full in conjunction with an extra fuel injector in the exhaust system to burn off accumulated diesel particulate matter or soot.

Term	Description
HMI	Human Machine Interface A device that provides a control and visualisation interface between a human and a process or machine.
IEEE	Institute of Electrical and Electronics Engineers
LED	Light Emitting Diode
OC	Occurrence Count A part of DTC that indicates the number of times that failure has occurred.
PGN	Parameter Group Number A CANbus address for a set of parameters that relate to the same topic and share the same transmission rate.
PLC	Programmable Logic Controller A programmable digital device used to create logic for a specific purpose.
SCADA	Supervisory Control And Data Acquisition A system that operates with coded signals over communication channels to provide control and monitoring of remote equipment
SCR	Selective Catalytic Reduction A process that uses DEF with the aid of a catalyst to convert nitric oxide and nitrogen dioxide into nitrogen and water to reduce engine exhaust emission.
SPN	Suspect Parameter Number A part of DTC that indicates what the failure is, e.g. oil pressure, coolant temperature, turbo pressure etc.

1.3 BIBLIOGRAPHY

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

1.3.1 INSTALLATION INSTRUCTIONS

DSE PART	DESCRIPTION
053-225	DSEE100 Installation Instructions Sheet

1.3.2 MANUALS

DSE PART	DESCRIPTION
057-151	DSE Configuration Suite PC Software Installation & Operation Manual
057-273	DSEE100 Operator Manual

1.3.3 TRAINING GUIDES

Training guides are provided as 'hand-out' sheets on specific subjects during training sessions and contain specific information regarding to that subject.

DSE Part	Description
056-006	Introduction to Comms
056-023	Adding New CAN Files
056-029	Smoke Limiting
056-030	Module PIN Codes
056-051	Sending DSEGencomm Control Keys
056-069	Firmware Update
056-076	Reading DSEGencomm Alarms
056-079	Reading DSEGencomm Status
056-080	MODBUS
056-091	Equipotential Earth Bonding
056-092	Best Practices for Wiring Restive Sensors
056-095	Remote Start Input Functions
056-097	USB Earth Loops and Isolation

1.3.4 THIRD PARTY DOCUMENTS

The following third party documents are also referred to:

Reference	Description
ISBN 1-55937-879-4	IEEE Std C37.2-1996 IEEE Standard Electrical Power System Device Function Numbers and Contact Designations. Institute of Electrical and Electronics Engineers Inc
ISBN 0-7506-1147-2	Diesel engine handbook. L.L.J. Mahon
ISBN 0-9625949-3-8	On-Site Power Generation. EGSA Education Committee.

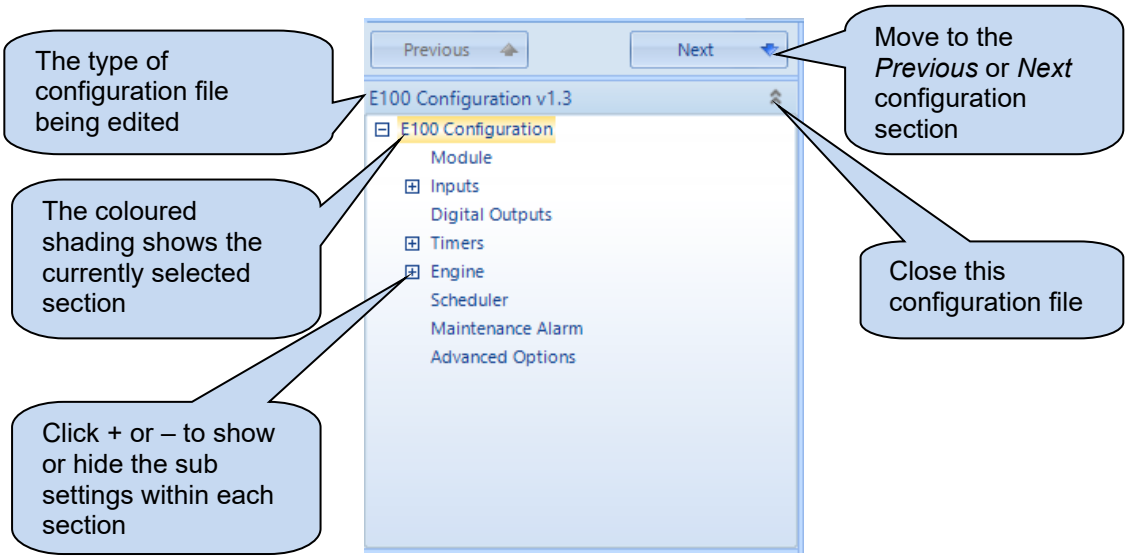
1.4 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

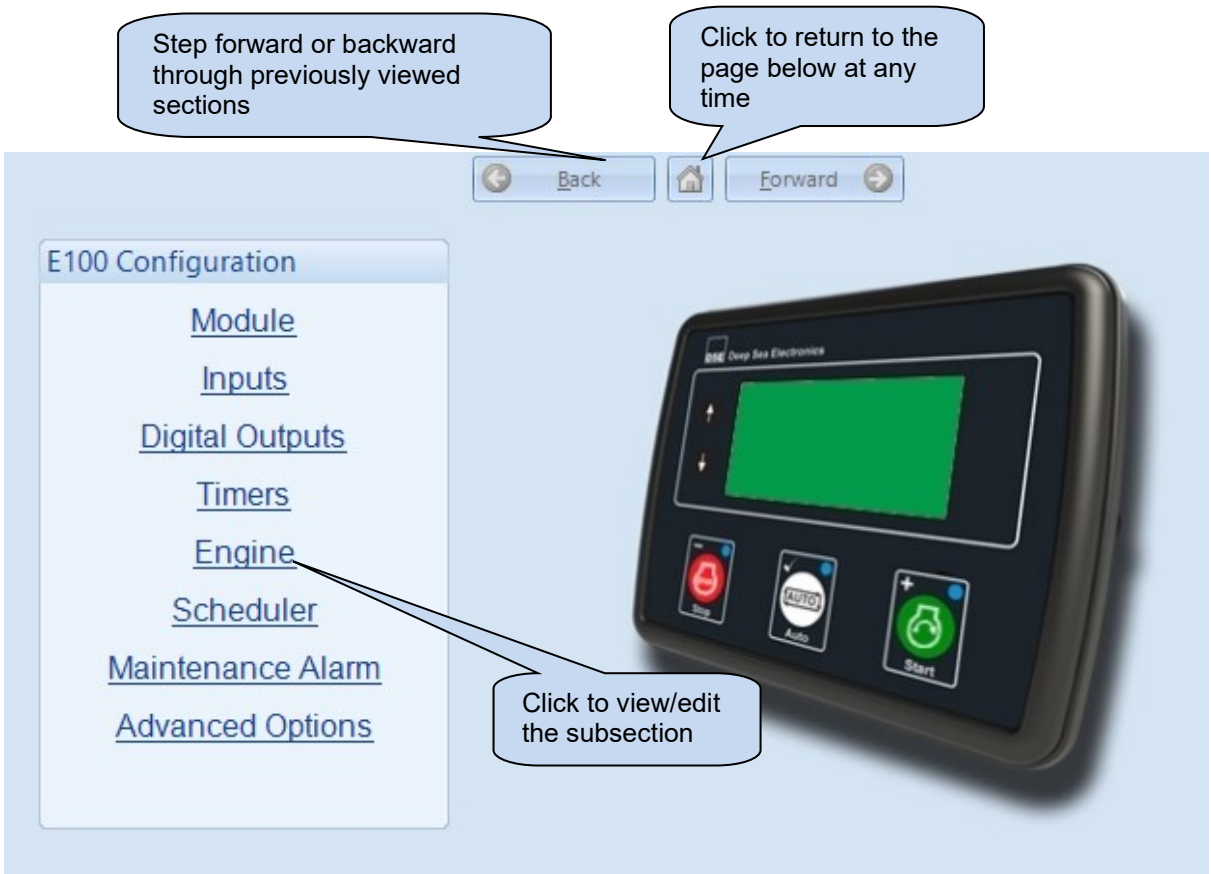
For information in regards to installing and using the *DSE Configuration Suite PC Software,* refer to DSE publication: ***057-151 DSE Configuration Suite PC Software Installation & Operation Manual*** which is found on the DSE website: www.deepseaelectronics.com

2 EDITING THE CONFIGURATION

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

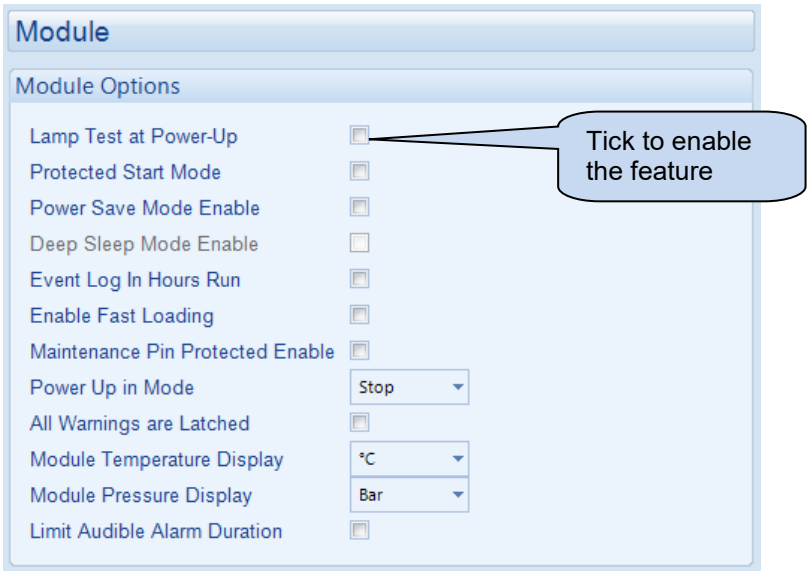
2.1 SCREEN LAYOUT





2.2 MODULE OPTIONS

This section allows the user to configure options related to the module.



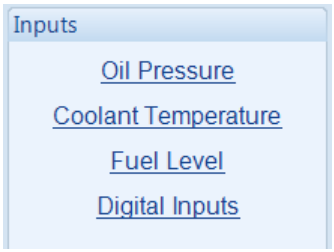
Setting	Description
Lamp Test At Power Up	☐ = Feature disabled ☑ = All the LEDs on the module's fascia illuminate when the DC power is applied as a 'lamp test' feature.
Protected Start Mode	☐ = Pressing the Start button on the module initiates the starting sequence. ☑ = The start button must be pressed twice to confirm a manual start request.
Power Save Mode Enable	**NOTE: For further details on configuring the *Power Save Mode Delay* timer see section entitled *Module Timers* described elsewhere in this manual** ☐ = Normal Operation. ☑ = The DSE module's backlight turns off after the *Power Save Mode Delay* timer expires. This is used to save power when in *Stop Mode*
Deep Sleep Mode Enable	**NOTE: Available only when *Power Save Mode* is enabled** **NOTE: For further details on configuring the *Deep Sleep Delay* timer see section entitled *Module Timers* described elsewhere in this manual** ☐ = Normal operation ☑ = The module goes into a deeper sleep state with maximum power saving after inactivity in *Power Save Mode* and upon completion of the *Deep Sleep Delay* timer.
Event Log In Hours Run	☐ = Recorded events in the module's event log include the date/time stamp ☑ = The engine run hours is added to the recorded event in the event log

Continued overleaf…

Setting	Description
Enable Fast Loading	**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.)** ☐ = 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. ☑ = 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 engine to become available in the shortest possible time.
Maintenance PIN Protected Enable	☐ = PIN is not required to reset maintenance alarms through the front panel. ☑ = Maintenance alarm reset through the front panel is PIN protected.
Limit Audible Alarm Duration	**NOTE: For further details on configuring the *Audible Alarm* timer see section entitled *Module Timers* described elsewhere in this manual** ☐ = Audible Alarm Output continues until the alarm is muted. ☑ = Audible Alarm Output automatically ceases after the duration of the Audible Alarm Timer.
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	☐ = Normal Operation, the warnings and pre-alarms automatically reset once the triggering condition has cleared. ☑ = 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 operated (once the triggering condition has been cleared).
Module Temperature Display	Select the temperature unit that the module displays for the engine coolant temperature. Available units to select from: *ºC* *ºF*
Module Pressure Display	Select the pressure unit that the module displays for the oil pressure... Available units to select from: *Bar* *kPa* *PSI*
Limit Alarm Duration	☐ = Audible Alarm Output continues until the alarm is muted. ☑ = Audible Alarm Output automatically ceases after the duration of the Audible Alarm Timer.

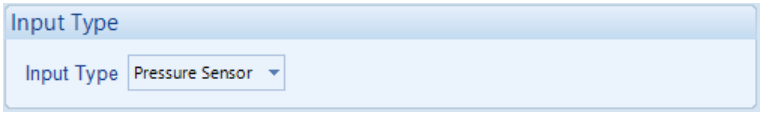
2.3 INPUTS

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



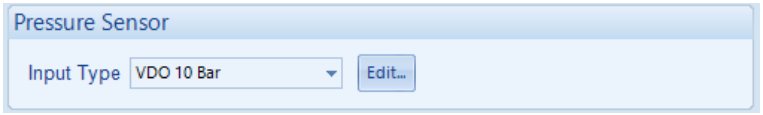
2.3.1 OIL PRESSURE

Input Type



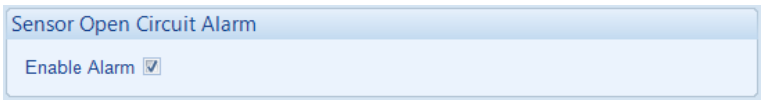
Parameter	Description
Input Type	Select what the analogue input is to be used for: ***Digital Input*** ***Pressure Sensor***

Pressure Sensor



Parameter	Description
Input Type	Select the sensor type from a pre-defined list or create a user-defined curve with maximum range of 0 Ω to 240 Ω

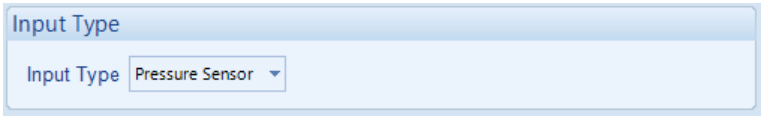
Sensor Open Circuit Alarm



Parameter	Description
Enable Alarm	☐ = Alarm is disabled. ☑ = The *Low Oil Pressure Open Circuit Alarm* is active when the module detects an open circuit when the sensor is disconnected

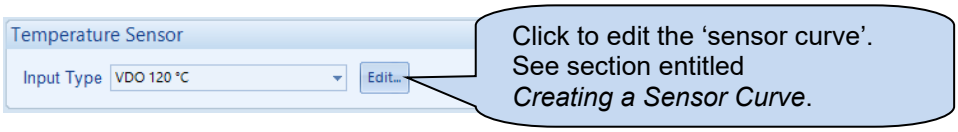
2.3.2 COOLANT TEMPERATURE

Input Type



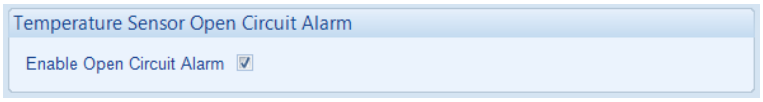
Parameter	Description
Input Type	Select what the analogue input is to be used for: ***Digital Input*** ***Temperature Sensor***

Temperature Sensor



Parameter	Description
Input Type	Select the sensor type from a pre-defined list or create a user-defined curve with maximum range of 0 Ω to 240 Ω

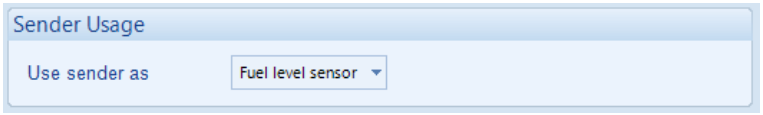
Temperature Sensor Open Circuit Alarm



Parameter	Description
Enable Open Circuit Alarm	☐ = Alarm is disabled. ☑ = The *Coolant Temperature Open Circuit Alarm* is active when the module detects an open circuit when the sender is disconnected

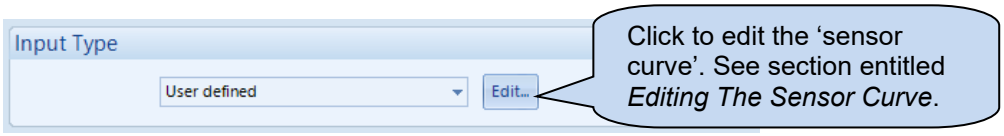
2.3.3 FUEL LEVEL

Sender Usage



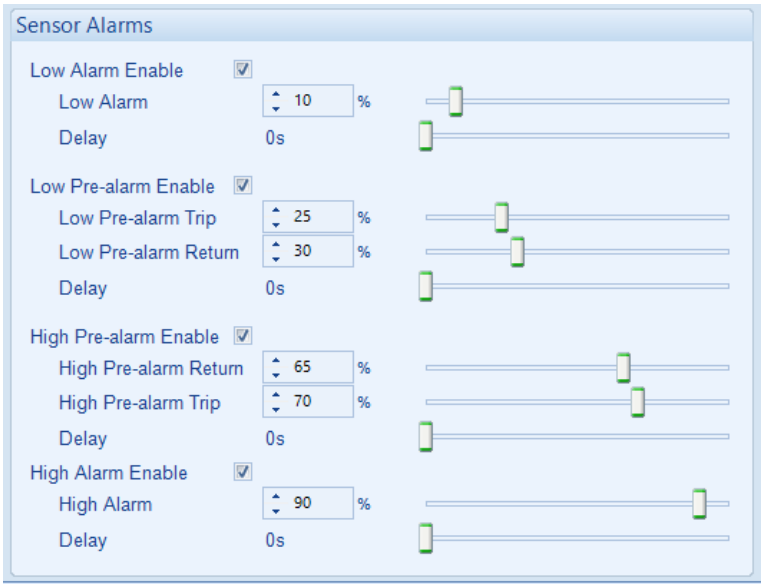
Parameter	Description
Use Sender As	Select what the analogue input is to be used for: ***Fuel Level Sensor*** ***Flexible sensor***

Input Type



Parameter	Description
Input Type	Select the sender curve from a pre-defined list or create a user-defined curve with a maximum range of 0 Ω to 240 Ω

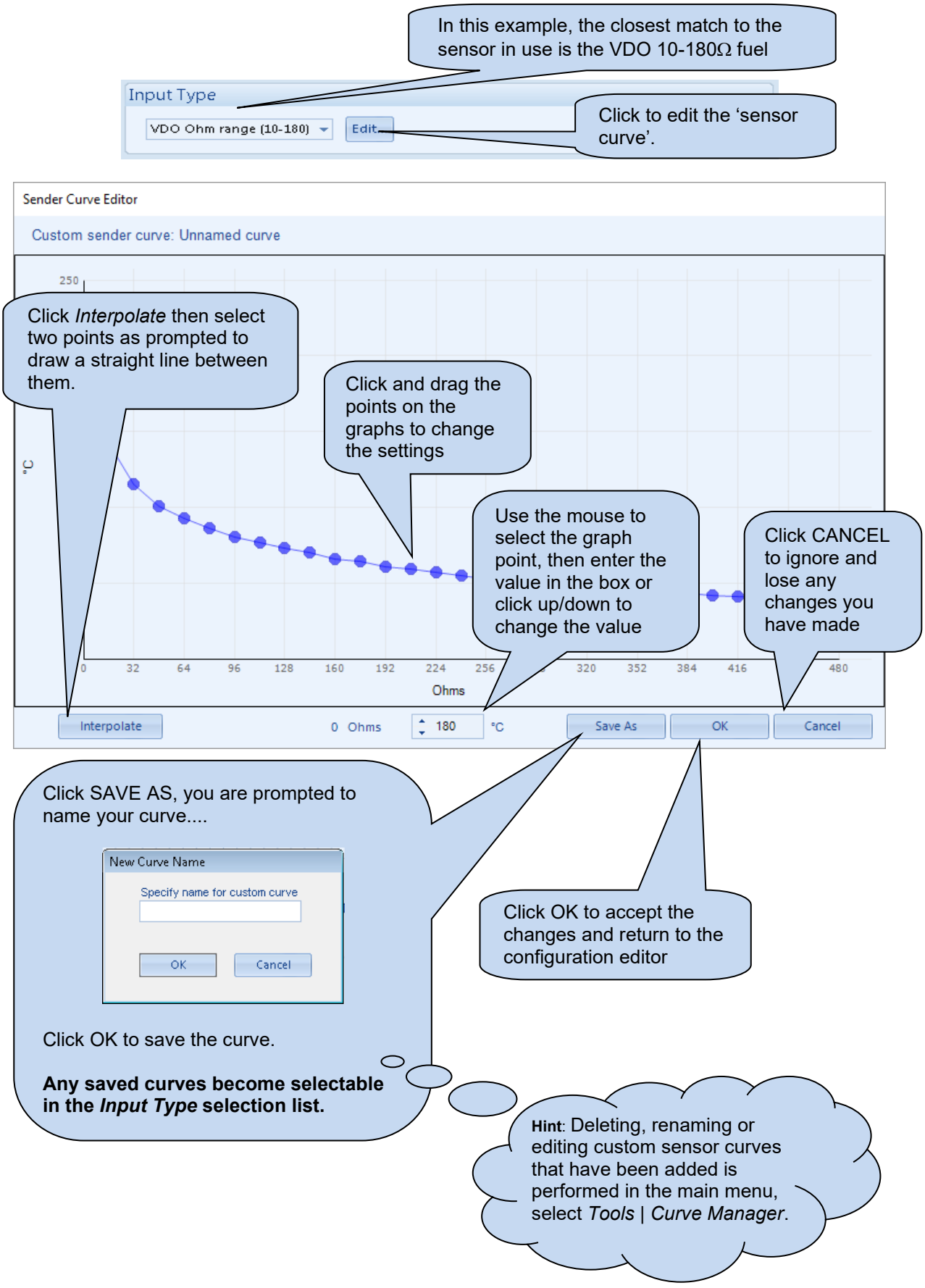
Sensor Alarms



Parameter	Description
Use Sender As	Select what the analogue input is to be used for: ***Fuel Level Sensor*** ***Flexible sensor***
Input Type	Select the sensor curve from a pre-defined list or create a user-defined curve.
Low Alarm Enable	☐ = Alarm is disabled. ☑ = The *Low Fuel Level Alarm* is active when the measured fuel level drops below the *Low Alarm* setting for the configured *Delay* time.
Low Pre-Alarm Enable	☐ = Alarm is disabled. ☑ = The *Low Fuel Level Pre-Alarm* is active when the measured fuel level drops below the *Low Pre-Alarm Trip* setting for the configured *Delay* time. The pre-alarm is automatically reset when the fuel level exceeds the configured *Low Pre-Alarm Return* setting.
High Pre-Alarm Enable	☐ = Alarm is disabled. ☑ = The *High Fuel Level Pre-Alarm* is active when the measured fuel level rises above the *High Pre-Alarm Trip* setting for the configured *Delay* time. The pre-alarm is automatically reset when the fuel level drops below the configured *High Pre-Alarm Return* setting.
High Alarm Enable	☐ = Alarm is disabled. ☑ = The *High Fuel Level Alarm* is active when the measured fuel level rises above the *High Alarm* setting for the configured *Delay* time.

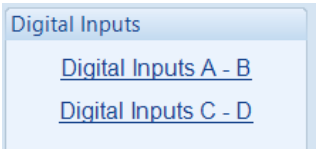
2.3.4 CREATING A SENSOR CURVE

While the *DSE Configuration Suite* holds sensor specifications 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 is provided.

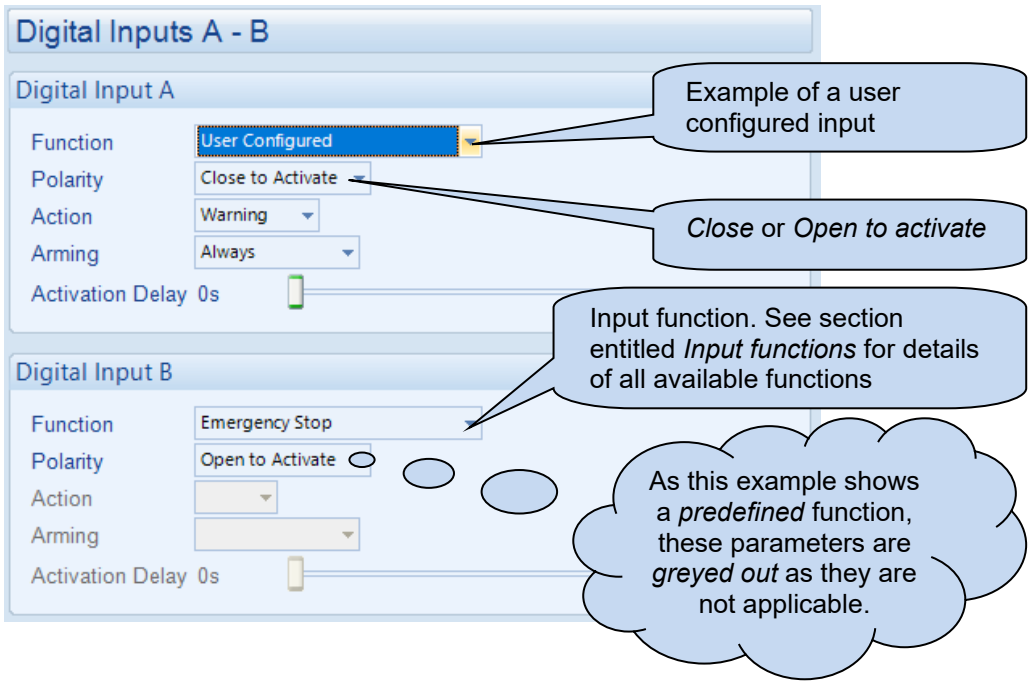


2.3.5 DIGITAL INPUTS

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



2.3.5.1 DIGITAL INPUTS



Parameter	Description
Function	Select the input function to activate when the relevant terminal is energised. See section entitled *Input functions* for details of all available functions
Polarity	Select the digital input polarity: ***Close to Activate:*** the input function is activated when the relevant terminal is connected. ***Open to Activate:*** the input function is activated when the relevant terminal is disconnected.
Action	Select the type of alarm required from the list: ***Shutdown*** ***Warning*** For details of these, see the section entitled *Alarm Types* elsewhere in this document.
Arming	Select when the input becomes active: ***Always:*** The input state is always monitored ***Active From Safety On:*** The state of the input is monitored from the end of the *Safety On Delay* timer ***Active From Starting:*** The state of the input is only monitored from engaging the crank ***Never:*** The input is disabled
Activation Delay	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.

2.3.6 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 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.

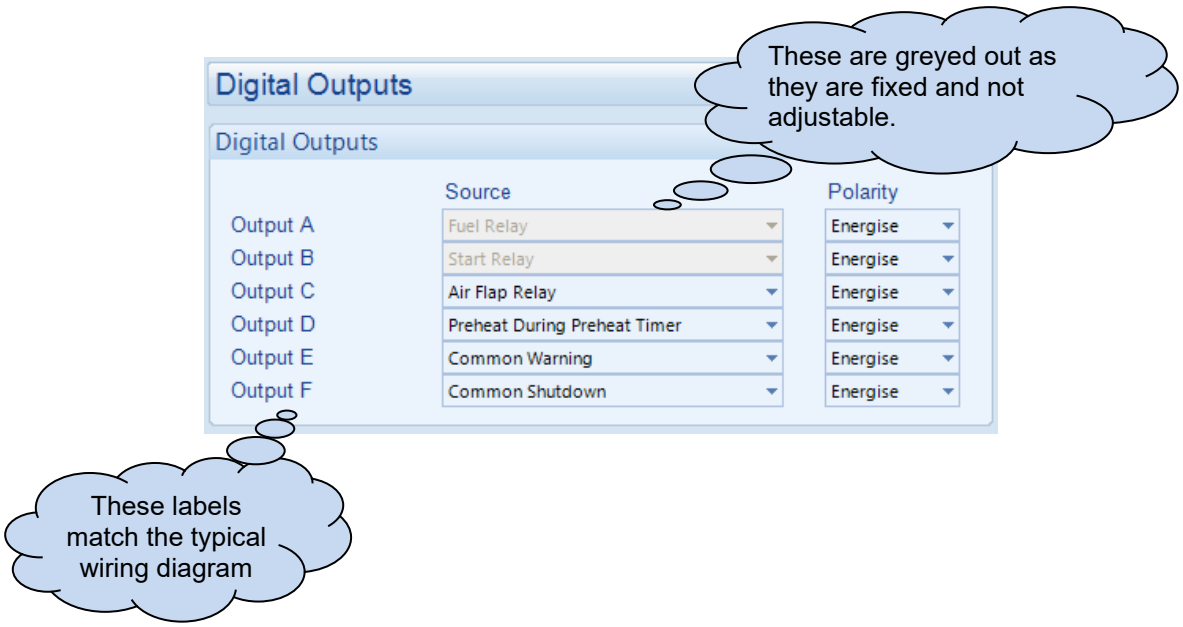
Input Function	Description
Alarm Mute	This input is used to silence the audible alarm from an external source such as a remote mute switch.
Alarm Reset	This input is used to reset any latched alarms from a remote location. It is also used to clear any latched warnings which may have occurred (if configured) without having to stop the engine.
Auto Start Inhibit IEEE 37.2 - 3 Checking Or Interlocking Relay	**NOTE: This input does not prevent starting of the engine in Manual mode.** This input is used to provide an over-ride function to prevent the controller from starting the engine in the event of a start request in auto mode. If this input is active and a start signal occurs, the module does not give a start command to the engine. If this input signal is then removed, the controller operates as if a start request has occurred, thus starting the engine.
Coolant Temperature Switch	This input is used to give a *Coolant Temperature High* shutdown from a digital normally open or normally closed switch.
Disable Protections	The system designer provides this switch (not DSE) so its location varies depending upon manufacturer, however it normally takes the form of a key operated switch to prevent inadvertent activation. Depending upon configuration, a warning alarm is generated when the switch is operated. When active, and the module is suitably configured (see section entitled ‘Advanced’) this prevents the engine being stopped upon critical alarm (Sometimes called Battle-Short Mode, War Mode or Run to Destruction)
Emergency Stop	Provides an immediate engine hot shutdown, used in emergency situations
External Panel Lock	**NOTE: External control sources (i.e. Simulate Start Button) are not affected by the external panel lock input and continues to operate normally.** This input is used to provide security to the installation. If the External Panel lock input is active, the module does not respond to operation of the Mode select or start buttons. This allows the module to be placed into a specific mode (such as Auto) and then secured. The operation of the module is not affected, and the operator is still able to view the various instrumentation pages etc. (*Front panel configuration access is still possible while the system lock is active*).
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 LEDs illuminate.
Low Fuel Level Switch	This input is used to give a *Low Fuel Level Switch* shutdown from a digital normally open or normally closed switch.
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

Continued overleaf…

Input Function	Description
Oil Pressure Switch IEEE 37.2 – 63 Pressure Switch	This input is used to give *Oil Pressure Switch* shutdown from a digital normally open or normally closed switch.
Remote Start	When in auto mode, this input is used to perform the start sequence.
Remote Stop	When in auto mode, this input is used to perform the stop sequence.
Simulate Auto Button	**NOTE: If a start request is present when Auto mode is entered, the starting sequence begins. Start requests are generated from a number of sources depending upon module type and configuration and includes (but is not limited to): *Remote Start* input present, *Scheduled Run* and *Telemetry Start* signal from remote locations.** This input mimics the operation of the 'Auto' button and is used to provide a remotely located Auto mode push button.
Simulate 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.
Smoke Limiting IEEE 37.2 – 18 Accelerating Or Decelerating Device	This input instructs the module to issue a *Run At Idle Speed* command to the engine via an output configured to *Smoke Limit*.

2.4 DIGITAL OUTPUTS

Digital Outputs



Parameter	Description
Source	Select the output source to control the state of the output See section entitled *Output Sources* for details of all available functions
Polarity	Select the digital output polarity: ***De-Energise:*** When the output source is true, the output deactivates. ***Energise:*** When the output source is true, the output activates.

2.4.1 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.

Output Source	Active	Inactive
Not Used	The output does not change state (Unused)	
Air Filter Maintenance	Active when the *Air Filter Maintenance Alarm* is due.	
Air Flap Relay	Used to control an air flap, this output becomes active upon an Emergency Stop or Overspeed shutdown alarm.	Inactive when the set has come to rest
Analogue Input A,B,C (Digital)	Active when the analogue input A,B,C configured to digital is active.	
Audible Alarm IEEE 37.2 – 74 Alarm Relay	Active when an alarm condition becomes active. Use this output to activate an external sounder or external alarm indicator.	Inactive if no alarm condition is active or if the Mute pushbutton was pressed.
Battery High Voltage IEEE 37.2 – 59DC Overvoltage Relay	Active when the *Battery High Voltage Alarm* becomes active	Inactive when the *Battery High Voltage Alarm* is not active
Battery Low Voltage IEEE 37.2 – 27DC Undervoltage Relay	Active when the *Battery Low Voltage Alarm* becomes active	Inactive when the *Battery Low Voltage* Alarm is not active
Charge Alternator Warning/Shutdown	Active when the charge alternator warning/shutdown alarm is active	
Common Alarm IEEE 37.2 – 74 Alarm Relay	Active when one or more alarms (of any type) are active	The output is inactive when no alarms are active
Common Shutdown IEEE 37.2 – 74 Alarm Relay	Active when one or more *Shutdown* alarms are active	The output is inactive when no shutdown alarms are active
Common Warning IEEE 37.2 – 74 Alarm Relay	Active when one or more *Warning* alarms are active	The output is inactive when no warning alarms are active
Digital Input A to D	Active when the relevant digital input is active	
Emergency Stop	Active when the Emergency Stop alarm is active.	
Energise To Stop	Active when the controller wants the set to stop running. Normally used to control an *Energise to Stop* solenoid.	Inactive when the *ETS Solenoid Hold* timer expires after the engine stops.”
Engine Available	Active when the engine becomes available and the *Safety On Delay* and *Warming* timers have expired.	Inactive when • After a *Shutdown* or *Controlled Shutdown* alarm • During the starting sequence before the end of the *Warming Timer*.
Fail To Start IEEE 37.2 - 48 Incomplete Sequence Relay	Active when 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	Active when the set is still running after the *Fail to Stop Timer* has expired.	

Continued overleaf…

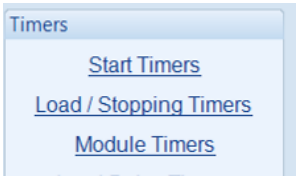
Output Source	Active	Inactive
Flexible Sensor C High Alarm	Active when the relevant flexible sensor high alarm is active	
Flexible Sensor C High Pre-Alarm	Active when the relevant flexible sensor high pre-alarm is active	
Flexible Sensor C Low Alarm	Active when the relevant flexible sensor low alarm is active	
Flexible Sensor C Low Pre-Alarm	Active when the relevant flexible sensor low pre-alarm is active	
Fuel Filter Maintenance	Indicates that the fuel filter maintenance alarm is due	
Fuel Level High Alarm	Active when the level detected by the fuel level sensor has risen above the high fuel level alarm setting.	
Fuel Level High Pre-Alarm	Active when the level detected by the fuel level sensor has risen above the high fuel level pre-alarm setting.	
Fuel Level Low Alarm	Active when the level detected by the fuel level sensor has fallen below the low fuel level alarm setting.	
Fuel Level Low Pre-Alarm	Active when the level detected by the fuel level sensor has fallen below the low fuel level pre-alarm setting.	
Fuel Relay	Active when the controller requires the governor/fuel system to be active.	Inactive whenever the set is to be stopped, including between crank attempts, upon *Controlled Shutdown* and *Shutdown* alarms.
High Coolant Temperature Shutdown	Active when the *Coolant Temperature* exceeds the configured *High Coolant Temperature Shutdown* level	
Loss of Mag Pickup Signal	Active when the controller senses the loss of signal from the magnetic pickup probe	
Low Oil Pressure Shutdown IEEE 37.2 - 63 Pressure Switch	Active when the *Oil Pressure* falls below the *Low Oil Pressure Shutdown* setting	Inactive when • The set is stopped • During starting sequence and safety delay time.
MPU Open Circuit	Active when an open circuit failure is detected in the Magnetic Pickup circuit.	
Oil Filter Maintenance	Active when the relevant maintenance alarm is due.	
Oil Pressure Sender Open Circuit	Active when the Oil Pressure Sensor is detected as being open circuit.	
Over Speed Shutdown IEEE 37.2 – 12 Over Speed Device	Active when the engine speed exceeds the configured *Over Speed Shutdown* setting	
Over Speed Overshoot Alarm	Active when the engine speed exceeds the *Over Speed Overshoot Alarm* setting	
Preheat During Preheat Timer	Active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : • The set is stopped • The preheat timer has expired
Preheat Until End Of Cranking	Active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : • The set is stopped • The set has reached *crank disconnect* conditions
Preheat Until End Of Safety Timer	Active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : • The set is stopped • The set has reached the end of the *safety delay* timer
Preheat Until End of Warming Timer	Active when the preheat timer begins. Normally used to control the engine preheat glow-plugs.	Inactive when : • The set is stopped • The set has reached the end of the *warming* timer

Continued overleaf…

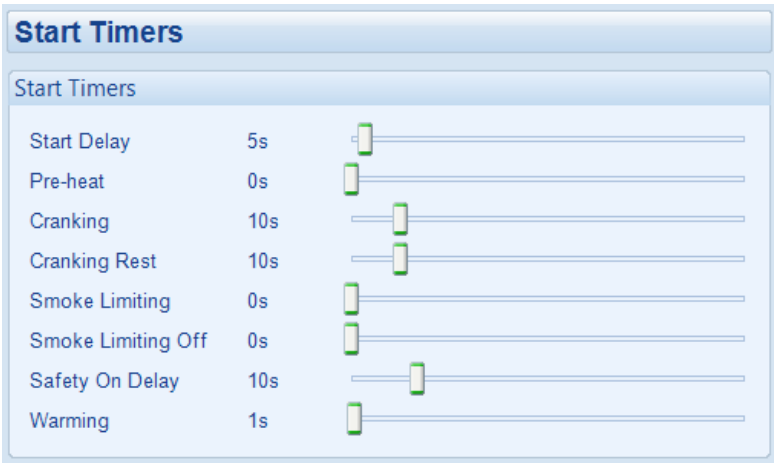
Output Source	Active	Inactive
Protections Disabled	Active when the protections are disabled by the *Protections Disabled* feature (Digital input or Always)	Inactive when protections are not disabled.
Smoke Limiting	Active when the controller requests that the engine runs at idle speed. Used to give a signal to the *Idle input* of an engine speed governor (if available)	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	
Temperature Sensor Open Circuit	Active when the *Temperature Sensor Open Circuit* alarm is active	
Under Speed Shutdown	Active when the engine speed falls below the configured under speed Shutdown setting	

2.5 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 timer's page. The *Timers* section is subdivided into smaller sections. Select the required section with the mouse.



2.5.1 START TIMERS

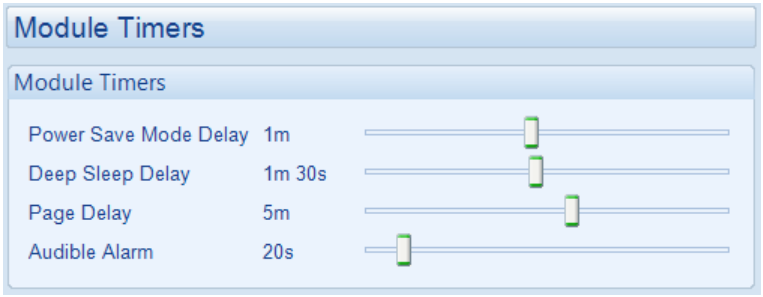


Timer	Description
Start Delay	The amount of time delay before starting in AUTO mode. This timer is activated upon the *Remote Start On Load* command being issued. Typically this timer is applied to prevent starting upon fleeting start signals.
Pre-heat	The amount of 'prestart' time during which the *Preheat* output becomes active (if configured)
Cranking	The amount of time for each crank attempt
Cranking Rest	The amount of time between multiple crank attempts.
Smoke Limiting	The amount of time that the engine is requested to run at idle speed upon starting. This is typically used to limit emissions at start up.
Smoke Limiting Off	The amount of time that the engine takes to run up to rated speed after removal of the command to run at idle speed. If this time is too short, the engine is stopped due to an *Underspeed* alarm. 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 and engine speed and other delayed alarms. This is used to allow the engine to run up to speed before protections are activated.
Warming	The amount of time the engine runs before activating the *Engine Available* output. This is used to warm the engine to prevent excessive wear.

2.5.2 LOAD / STOPPING TIMERS

Timer	Description
Return Delay	The amount of time, in auto mode only, that allows for short term removal of the request to stop the engine before action is taken. This is used to ensure the engine remains on load before accepting that the start request has been removed.
ETS Solenoid Hold	The amount of time the *Energise to Stop* output 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.

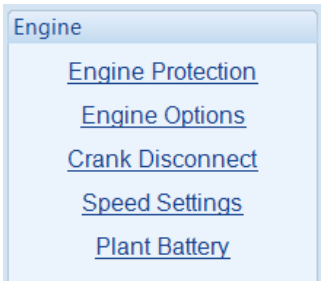
2.5.3 MODULE TIMERS



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 Mode Delay	When the module is in Power Save Mode, if left unattended for the duration of the *Deep Sleep Mode Delay* timer it will enter 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 will revert to show the Status page.
Audible Alarm	**NOTE: Only available when the Digital Output *Audible Alarm* and *Limit Alarm Duration* is configured. Refer to section entitled *Digital Outputs* and *Module Options* elsewhere in this document for further details.** The amount of time the audible alarm (sounder) remains active.

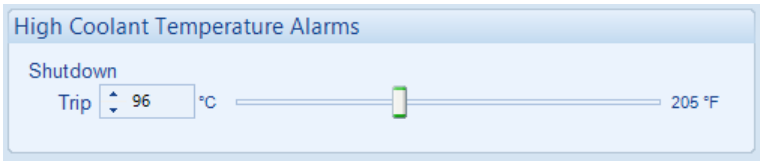
2.6 ENGINE

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



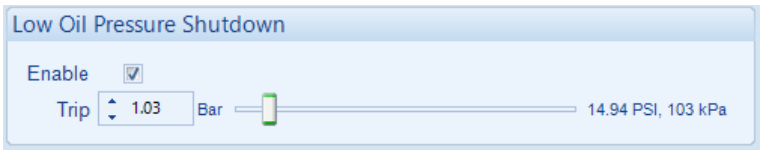
2.6.1 ENGINE PROTECTION

High Coolant Temperature Alarms



Parameter	Description
High Coolant Temperature Alarm	The *High Coolant Temperature Shutdown Alarm* is active when the measured coolant temperature rises above the configured *Trip* level.

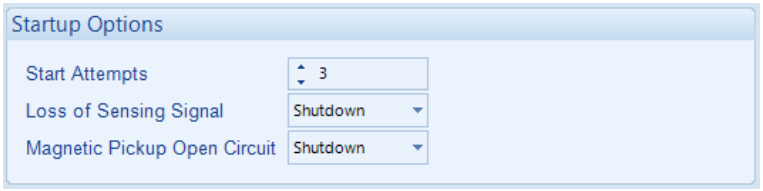
Low Oil Pressure Shutdown



Parameter	Description
Low Oil Pressure Alarm	☐ = Alarm is disabled. ☑ = The *Low Oil Pressure Shutdown Alarm* is active when the measured oil pressure drops below the configured *Trip* level.

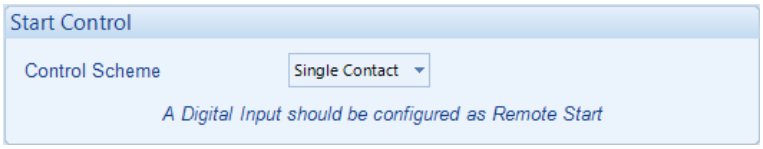
2.6.2 ENGINE OPTIONS

Startup Options



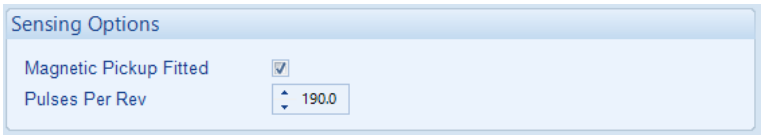
Parameter	Description
Start Attempts	The number of starting attempts the module makes. If the module does not detect that the engine has fired before the end of the *Cranking Time*, then the current start attempt is cancelled, and the *Crank Rest* time takes place before the next crank attempt begins. If, after all configured *start attempts,* the engine is not detected as running, the *Fail to Start* shutdown alarm is generated. 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: ***Shutdown:*** The engine is immediately stopped. ***Warning Always Latched:*** The engine continues to run, however a latched warning alarm is raised.
Magnetic Pickup Open Circuit	If the magnetic pickup device is not detected, an alarm is generated: ***Shutdown*** ***Warning Always Latched***

Start Control



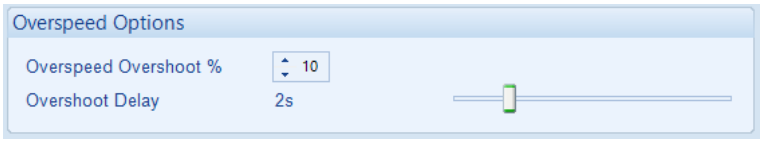
Parameter	Description
Type	The *Start Control Scheme* is selected from different types. This determines the module's response to the start/stop input functions when in Auto mode. ***Float Contacts:*** The engine starting sequence is initiated when the *Remote Start* input function changes from active to inactive. The engine remains running even if the *Remote Start* input function changes its state. The stopping sequence is initiated upon the *Remote Stop* input becoming active. ***Single Contact:*** The engine starting sequence is initiated when the *Remote Start* input function is active for longer than the *Start Delay* timer. Upon removal of the *Remote Start* input, the stopping sequence is initiated. ***Start/Stop Contacts:*** The engine starting sequence is initiated when the *Remote Start* input function remains active for longer than the *Start Delay* timer. The engine remains running even if the *Remote Start* input function changes its state. The stopping sequence is initiated upon the *Remote Stop* input becoming active.

Sensing Options



Parameter	Description
Magnetic Pickup Fitted	**NOTE: For specifications of the pulse input, refer to DSE Publication: 057-273 DSEE100 Operator Manual which is found on our website: www.deepseaelectronics.com** ☐ = Pulse device is not connected to the DSE module. ☑ = A low impedance pulse device is connected to the DSE module to measure engine speed.
Pulses Per Rev	Define the number of pulses which are counted by the speed sensing device in each engine revolution.

Overspeed Options



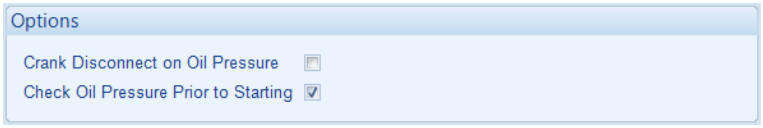
Parameter	Description
Overspeed Overshoot %	To prevent spurious overspeed alarms at engine start up, the module includes configurable *Overspeed Overshoot* protection. This allows the engine speed to 'overshoot' the Overspeed setting during the starting process for a short time. The DSE module ignores the Overspeed alarms when the speed increases by the *Overspeed Overshoot %* of the *Over Speed Alarm Trip* level for the duration of *Overspeed Overshoot Delay* timer.
Overspeed Overshoot Delay	Rather than 'inhibiting' the Overspeed alarms, the levels are temporarily raised by the *Overspeed Overshoot %* for the duration of the *Overspeed Overshoot* delay from starting.

2.6.3 CRANK DISCONNECT

Cranking 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.

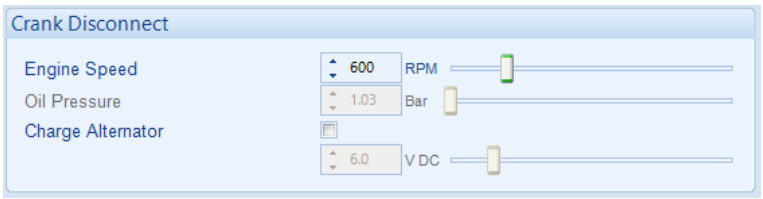
Having more than one *crank disconnect* source allows for a much faster crank disconnect response leading to less wear on the engine and starter components and provides added safety in case one source is lost, by a blown or tripped fuse for example.

Options



Parameter	Description
Crank Disconnect on Oil Pressure	☐ = The DSE module does not use oil pressure to decide when to disengage the starter motor. ☑ = The DSE module does uses oil pressure to decide when to disengage the starter motor in addition to the enabled methods
Check Oil Pressure Prior to Starting	☐ = The DSE module does not use oil pressure as an indication if the engine is running. This is disabled for large engines that have an electrical oil pump which is used to maintain oil pressure even when the engine is stationary. ☑ = The DSE module uses oil pressure as an indication if the engine is running.

Crank Disconnect



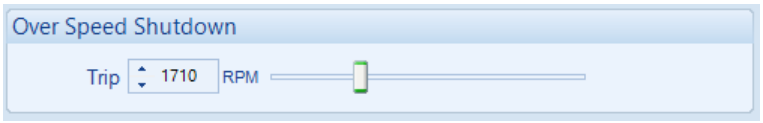
Parameter	Description
Engine Speed	The DSE module disengages the starter motor when the engine speed rises above the configured level.
Oil Pressure	The DSE module disengages the starter motor when the engine oil pressure rises above the configured level for longer than the configured *Delay*.
Charge Alternator	☐ = The DSE module does not use charge alternator voltage to decide when to disengage the starter motor. ☑ = The DSE module disengages the starter motor when the charge alternator voltage rises above the configured level.

2.6.4 SPEED SENSING

Under Speed Shutdown

Parameter	Description
Under Speed Alarm	☐ = *Under Speed* alarm is disabled ☑ = Under Speed gives an alarm in the event of the engine speed falling below the configured *Under Speed Alarm Trip* value. The *Underspeed Alarm Trip* value is adjustable to suit user requirements.

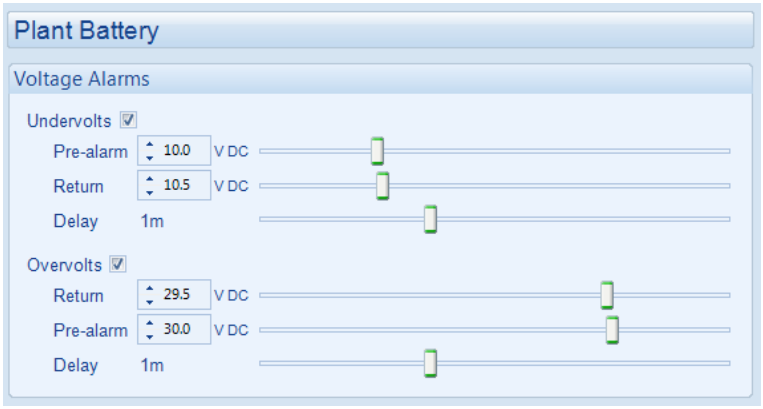
Over Speed Shutdown



Parameter	Description
Over Speed Alarm	Over Speed gives a *Shutdown* alarm in the event of the engine speed rising above the configured *Over Speed Alarm Trip* value. The *Over Speed Alarm Trip* value is adjustable to suit user requirements.

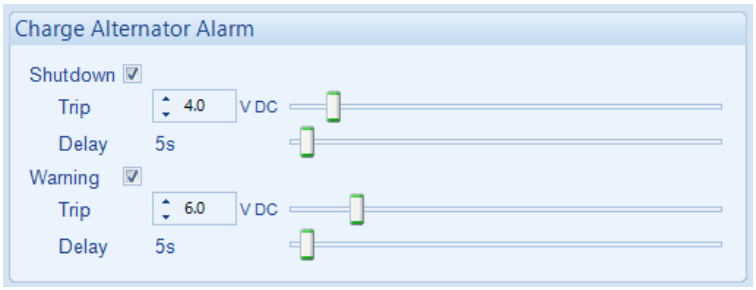
2.6.5 PLANT BATTERY

Voltage Alarms



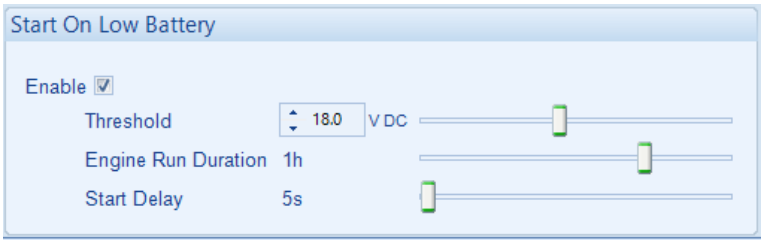
Parameter	Description
Undervolts IEEE 37.2 -27 DC Undervoltage Relay	The alarm activates when the battery voltage drops below the configured *Pre-Alarm* level for the configured *Delay* time. When the battery voltage rises above the configured *Return* level, the alarm is de-activated.
Overvolts IEEE 37.2 -59 DC Overvoltage Relay	The alarm activates when the battery voltage rises above the configured *Pre-Alarm* level for the configured *Delay* time. When the battery voltage drops below the configured *Return* level, the alarm is de-activated.

Charge Alternator Alarm



Parameter	Description
Charge Alternator Alarm	The alarm activates when the charge alternator voltage falls below the configured *Trip* level for the configured *Delay* time.
Charge Alternator Pre-Alarm	The alarm activates when the charge alternator voltage falls below the configured *Trip* level for the configured *Delay* time.

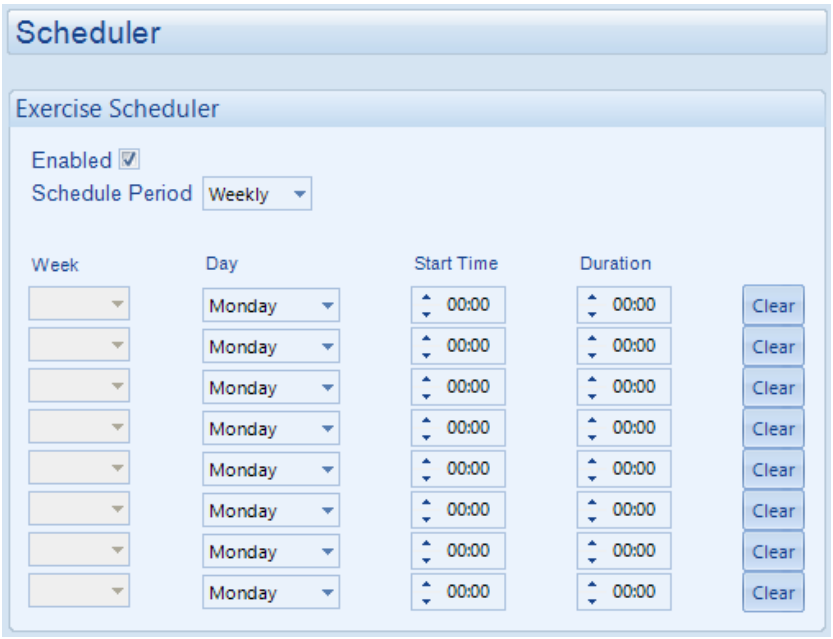
Start On Low Battery



Parameter	Description
Start on Low Battery	☐ = Start on Low Battery is disabled. ☑ = 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
Engine Run Duration	The length of time the engine will run for.
Start Delay	Start delay timer for the *Start on Low Battery* function.

2.7 SCHEDULER

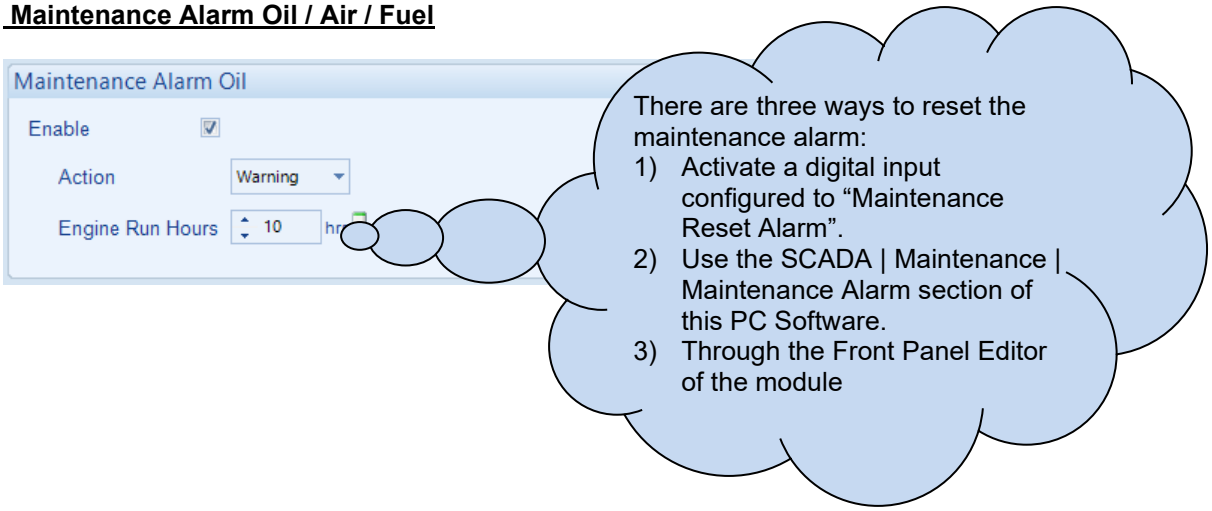
The scheduler is used to automatically start the engine at a configured day and time and run for the configured duration of hours.



Function	Description
Enabled	☐ = Scheduled runs are disabled ☑ = Scheduled runs are enabled based on the below settings.
Schedule Period	Determines the repeat interval for the scheduled run. Options available are: Weekly, Monthly
Week	Specifies the week of the month, on which the scheduled run takes place
Day	Specifies the day of week, on which the scheduled run takes place
Start Time	Determines at what time of day the scheduled run starts
Duration	Determines the time duration in hours for the scheduled run
Clear	Resets the values for the Day, Start Time and Duration to defaults

2.8 MAINTENANCE ALARM

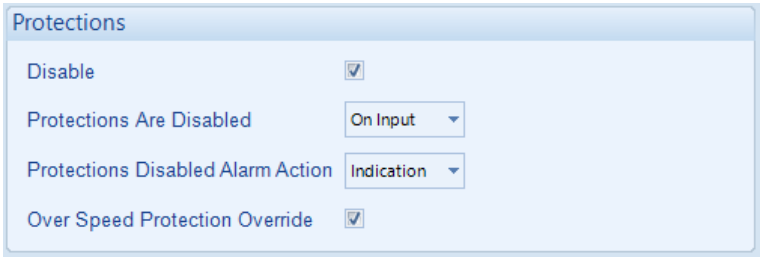
Maintenance Alarm Oil / Air / Fuel



Function	Description
Enable	☐ = The maintenance alarm is disabled. ☑ = The maintenance alarm is activated when the engine hours exceed more the configured *Engine Run Hours*.
Action	**NOTE: For details of these, see the section entitled Alarm Types elsewhere in this document.** Select the type of alarm required from the list: ***Shutdown*** ***Warning***
Engine Run Hours	The value the engine hours must increase by to trigger the maintenance alarm.

2.9 ADVANCED OPTIONS

WARNING! - Enabling this feature prevents the set being stopped upon critical alarm conditions. All shutdown alarms are disabled with the exception of EMERGENCY STOP which continues to operate.

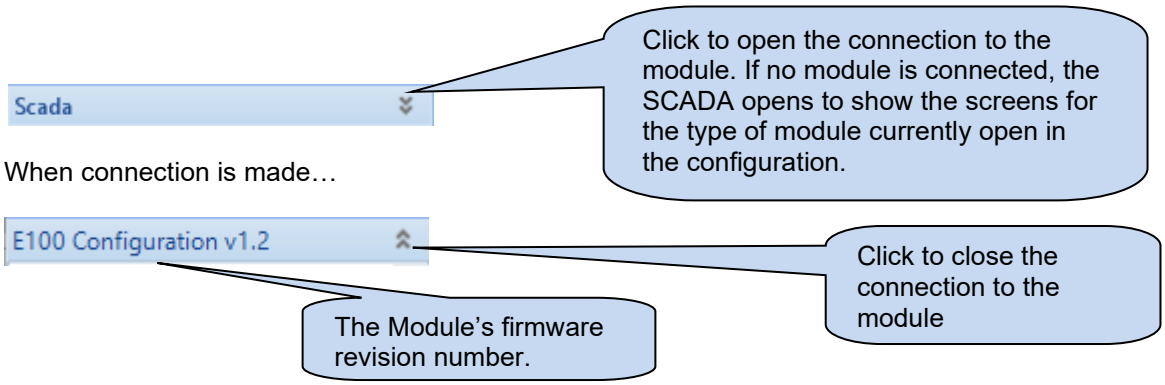


This feature is provided to assist the system designer in meeting specifications for “Warning only”, “Protections Disabled”, “Run to Destruction”, “Battle short Mode” or other similar wording.

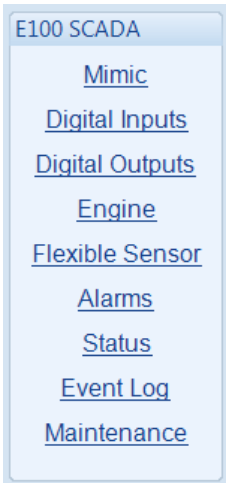
Parameter	Description
Disable	**NOTE: Writing a configuration to the controller that has “Protections Disabled” configured, results in a warning message appearing on the PC screen for the user to acknowledge before the controller’s configuration is changed. This prevents inadvertent activation of the feature.** ☐ = The module operates as normal and provide engine shutdown if required. ☑ = *Protections disabled* function is activated. Operation depends upon the following configuration.
Protections are disabled	***Never*** **:** The protections are not disabled ***Always*****:** Protections are always overridden by the DSE controller. ***On Input*****:** Protections are disabled whenever a configurable input set to *Protections Disabled* is activated
Protections Disabled Alarm Action	If *Disable All Protections* is set to *On Input*, this selection allows configuration of an alarm to highlight that the protections have been disabled on the engine. ***Indication:*** Any output or LCD display indicator configured to *Protections Disabled* is made active; however the *Audible Alarm* Output does not operate if configured. ***Warning:*** Any output or LCD display indicator configured to *Protections Disabled* is made active, and the *Audible Alarm* Output operates if configured. When protections are disabled, *Protections Disabled* icon appears on the module display to inform the operator of this status.
Overspeed Protection Override	☐ = The Over Speed Alarm remains enabled regardless of the Protection Disabled input state ☑ = The Over Speed Alarm is disabled when the Protection Disabled Input is active.

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

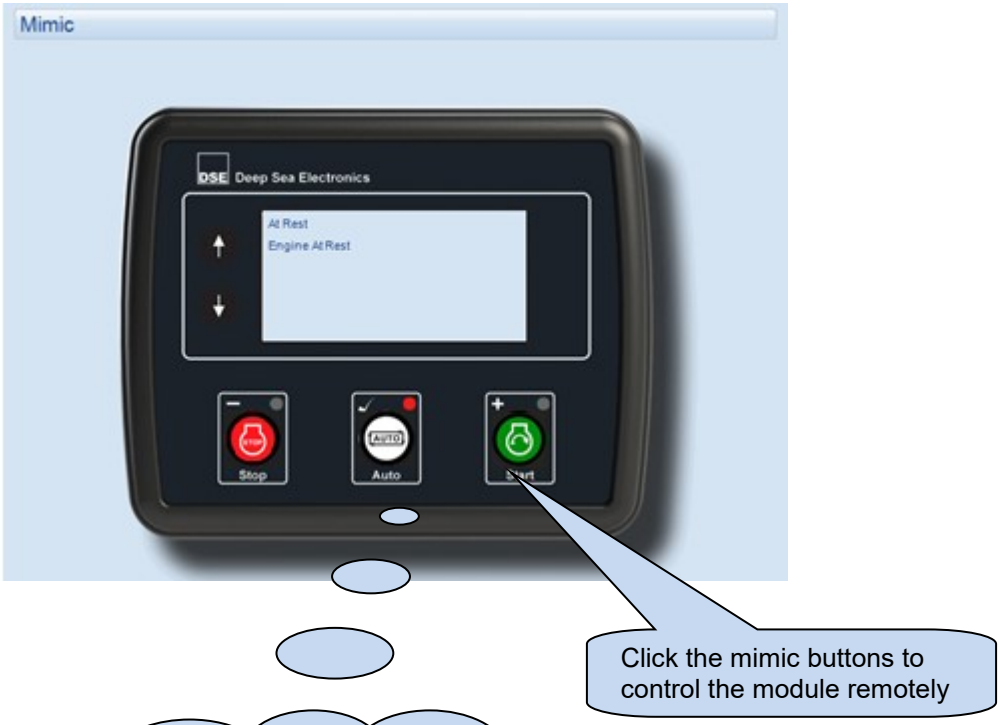


The *SCADA* page is subdivided into smaller sections.
Select the required section with the mouse.



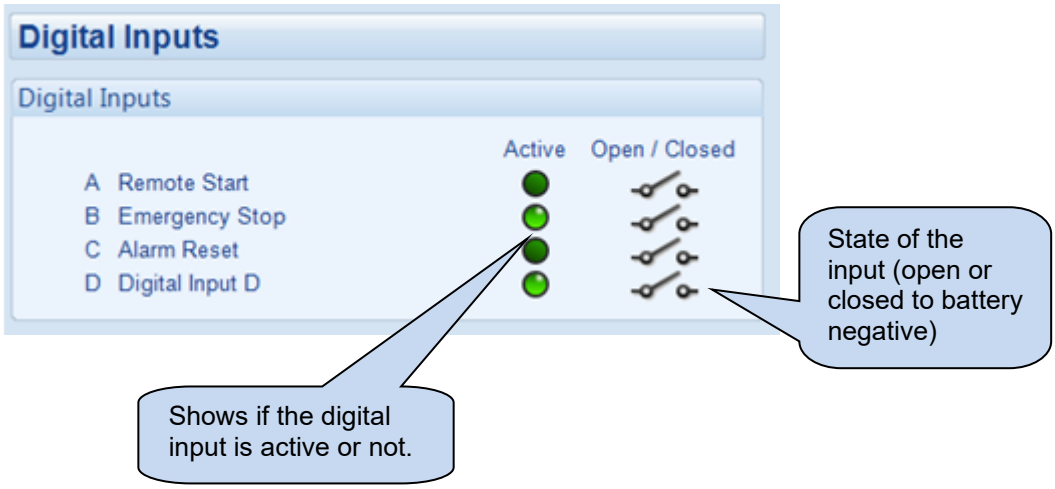
3.1 MIMIC

This screen provides a mimic of the control module and allows the operator to change the control mode of the module.
Only the mode control and load switch buttons are operational in the mimic display. The menu navigation buttons are inoperable.

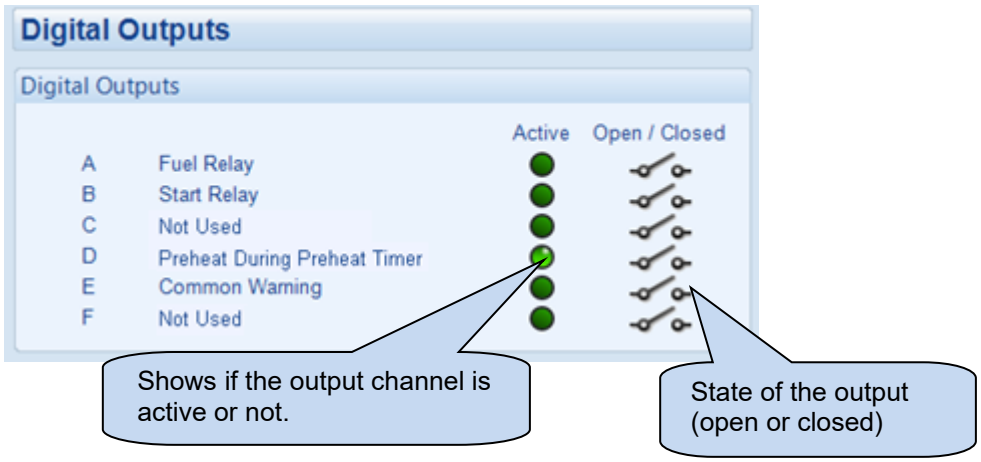


Hint : Buttons may not operate if this has been locked out by the *Access Permissions* security feature of the Configuration Suite Software. Refer to your system supplier for details.

3.2 DIGITAL INPUTS

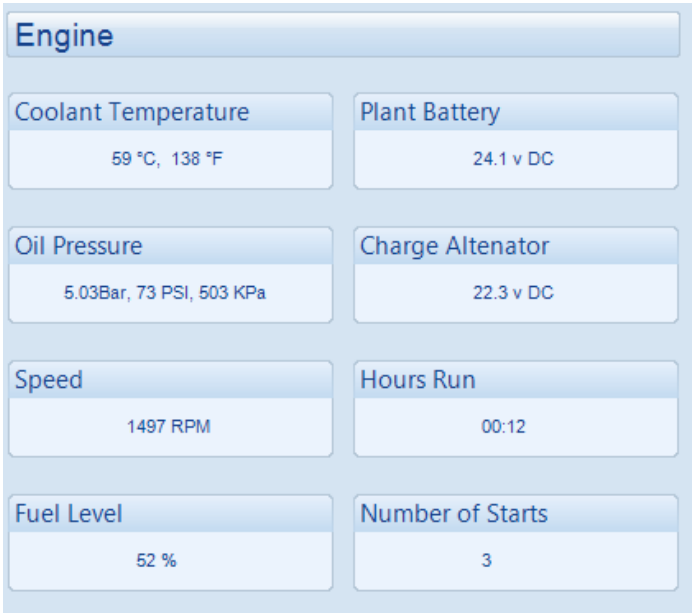


3.3 DIGITAL OUTPUTS



3.4 ENGINE

Shows the modules measurements of the engine parameters.

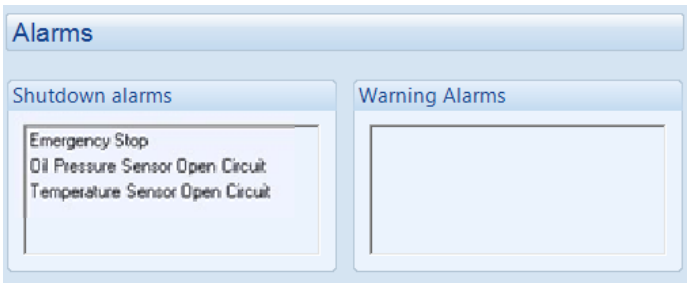


3.5 FLEXIBLE SENSORS

Shows the measurement of the Flexible Sensor (If configured)

3.6 ALARMS

Shows any present alarm conditions.
For a description of the different alarm types, see the section entitled *Alarm Types* elsewhere in this manual.

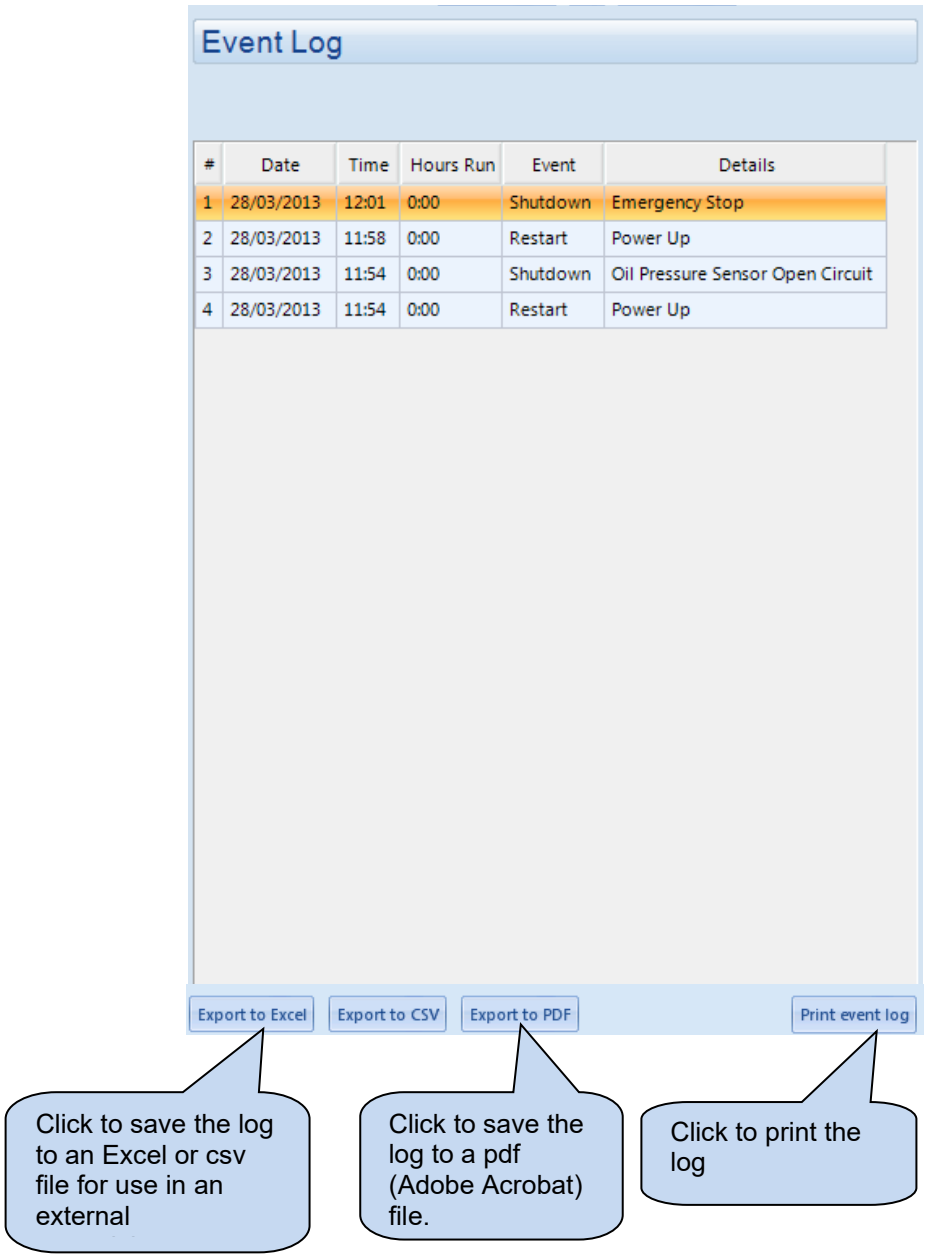


3.7 STATUS

Shows the module's current status.

3.8 EVENT LOG

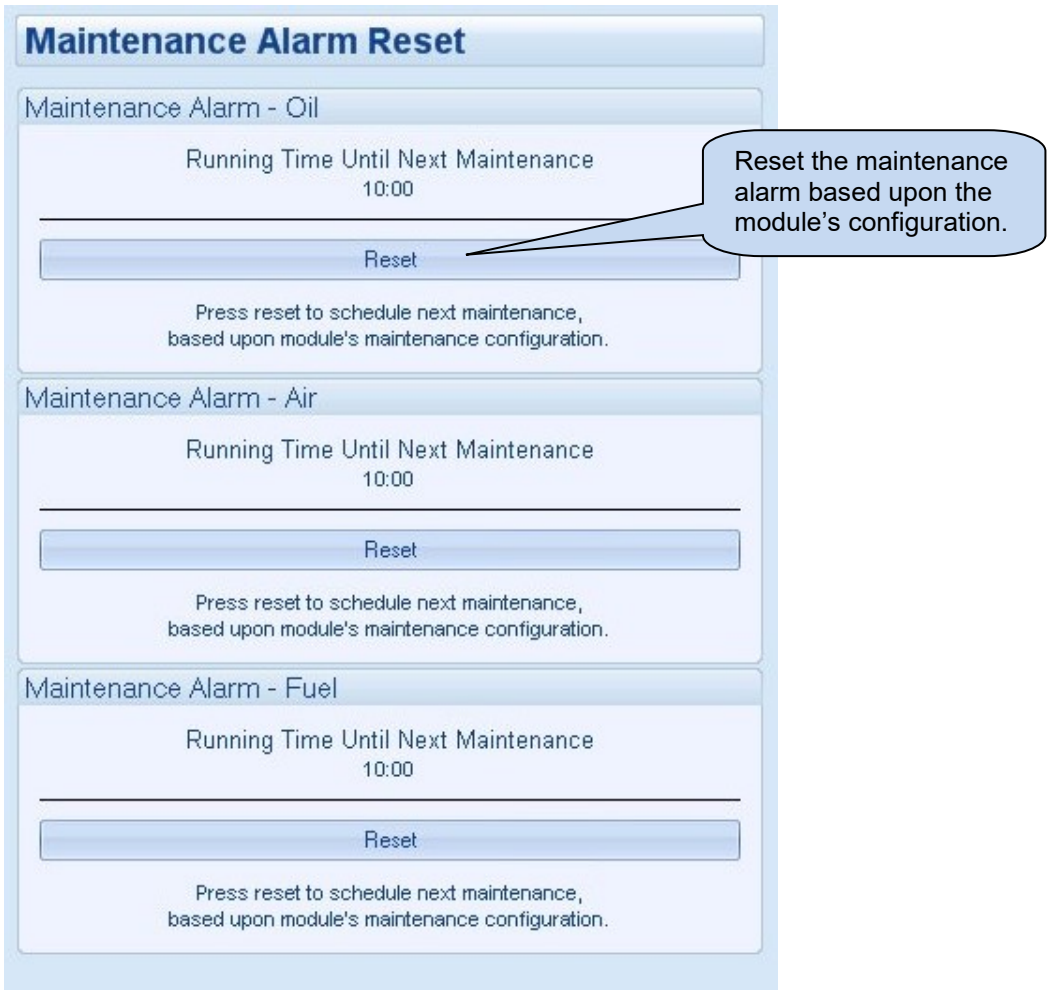
Shows the contents of the module's event log.



3.9 MAINTENANCE

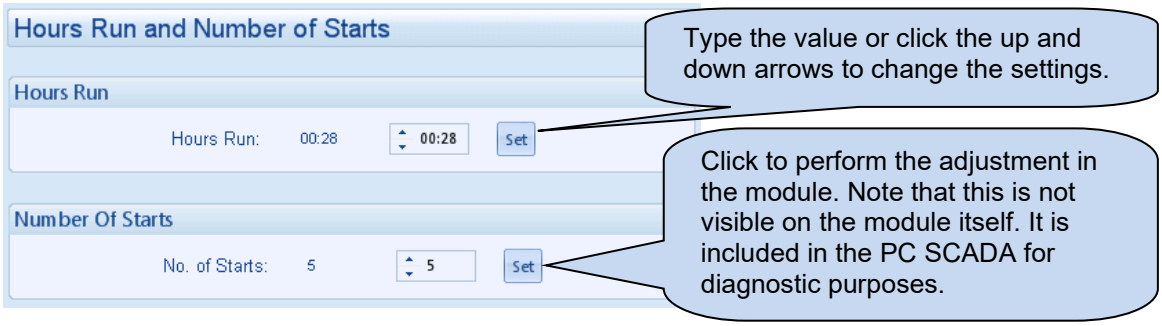
The *Maintenance* section is subdivided into smaller sections.
Select the required section with the mouse.

3.9.1 MAINTENANCE ALARM RESET



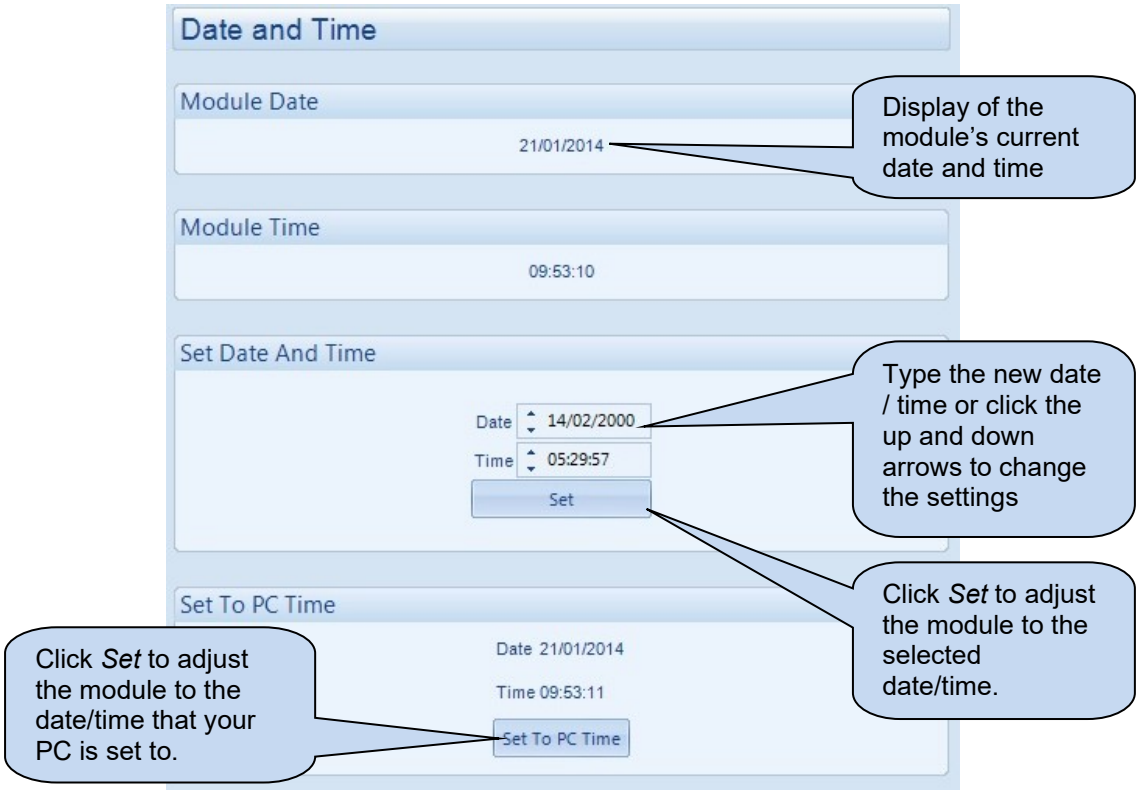
3.9.2 HOURS RUN AND NUMBER OF STARTS

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 engine so that the controller display matches the amount of work previously done by the system.



3.9.3 DATE AND TIME

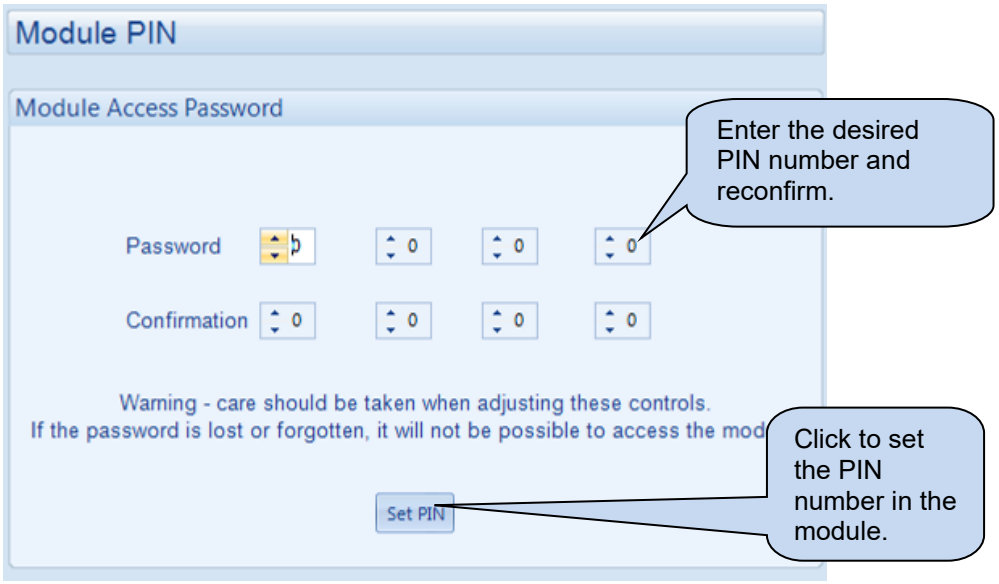
This section allows the day and time to be set and changed on the controller.



3.9.4 MODULE PIN

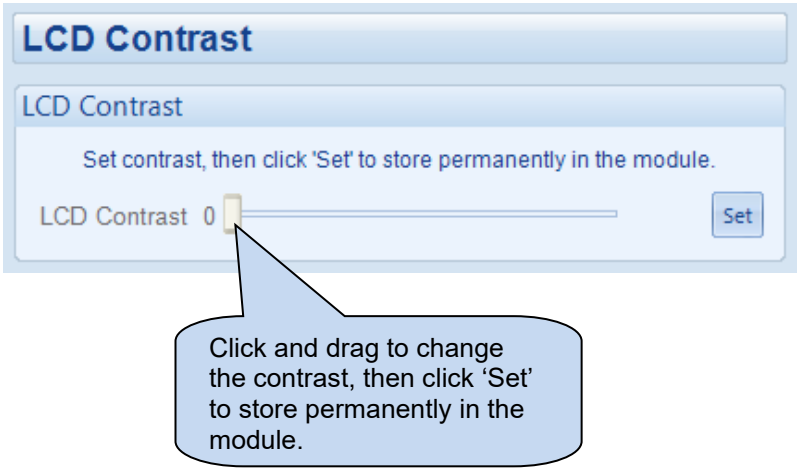
NOTE : If the PIN is lost or forgotten, it is no more possible to access the module!

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 is sent to the controller from the PC software.



3.9.5 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.



3.9.6 SPEED CALIBRATION

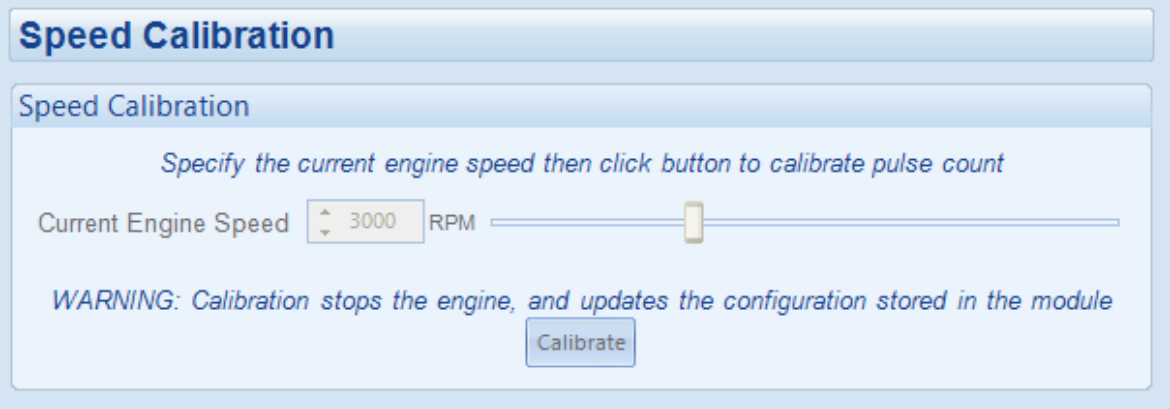
NOTE: The prerequisites of speed calibration must be fulfilled to successfully carry out the *Speed Calibration.* During the procedure the engine speed must be between 600 rpm and 8000 rpm and the resultant pulses per revolution must be between 2.0 and 50.0.

The *Speed Calibration* procedure is designed for reading engine speed via the charge alternator tachometer terminal, by calculating the ratio between crankshaft speed and charge alternator speed.

Prerequisites:

- Set the *Pulses Per Rev* initially to zero.
- Set *Crank Disconnect On Oil Pressure* to enabled when an oil pressure sensor is configured.
- Disable the *Under Speed Shutdown*.

After the prerequisites have been fulfilled the engine is started, current engine speed (measured by an external device chosen by the commissioner) is entered into the *Current Engine Speed* setting and the calibration is activated. The module then calculates the new value for the *Pulses Per Revolution* and writes the value into the module's configuration. Once the calibration is complete, the *Under Speed Shutdown* must be re enabled by reading the configuration from the module and checking *Enable* in the *Engine* | *Speed Settings* tabs.



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. *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. *Warning alarms* are used to draw the operator's attention to a minor issue or to a problem that may escalate to a *Shutdown Alarm* if left untreated.
Shutdown	Audible alarm and common alarm signal is generated. The engine is taken off load and immediately stopped. *Shutdown alarms* are serious issues that demand immediate stopping of the engine. For instance Emergency Stop or Overspeed alarms require immediate shutdown.

5 ALARM ARMING

The protections on the DSE module are active during their configured *Alarm Arming* setting. The table below shows the timing segment for the different *Alarm Arming* options with regards to the set status.

Timing Segment	Stopped	Start Delay	Preheat	Cranking	Safety Delay	Smoke Limiting	Smoke Limiting Off	Warming Up	On Load	Cooling	Cooling in Idle
Always											
From Starting											
From Safety On											
Engine Protection											
Overspeed Overshoot											

5.1 ALWAYS

The protection is always active on the controller. This is used to constantly monitor statuses such as a fuel level switch irrespective of the engine running state.

5.2 FROM STARTING

The protection is active from the beginning of engine cranking, until the engine stops.

5.3 FROM SAFETY ON

The protection is active when the set is running and the *Safety on Delay* timer has expired.

5.4 ENGINE PROTECTION

The protection is active when the engine is running and all engine protection (for example oil pressure and coolant temperature) are in a 'healthy' state.

Oil Pressure Warning
Oil Pressure Shutdown
Oil Pressure Open Circuit
High Coolant Temperature Warning
High Coolant Temperature Shutdown
High Coolant Temperature Open circuit

5.5 OVERSHOOT

Active during the *Safety Delay* timer, this allows for a temporary raise of the overspeed trip points during start-up.

Protection Level	Over Speed Trip Level
Immediate Shutdown	Over Speed + Overshoot %
Delayed Shutdown (Overspeed Overshoot Delay)	Over Speed

Example

1700 rpm *Over Speed* setting, 10% *Overspeed Overshoot*
During *Safety Delay* an engine speed above (1700 rpm x 1.1) = 1870 rpm results in an immediate shutdown without delay.
After *Safety delay*, an engine speed above 1700 rpm for the period of the *Speed Transient Delay* results in a shutdown.

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