DEEP SEA ELECTRONICS

DSE334 Configuration Suite PC Software Manual

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DSE334 Configuration Suite PC Software Manual

Amendments List

Amd. No.	Comments
1	Initial release
2	Update for V2.2

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.

TABLE OF CONTENTS

1 INTRODUCTION

This document details the use of the *DSE Configuration Suite PC Software* with the DSE334 module, which is part of the DSEATS® 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 DSE334 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 generator 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
DSE3xx	All modules in the DSE3xx ATS range.
CT	Current Transformer An electrical device that takes a large AC current and scales it down by a fixed ratio to a smaller current.
BMS	Building Management System A digital/computer based control system for a building's infrastructure.
HMI	Human Machine Interface A device that provides a control and visualisation interface between a human and a process or machine.
IDMT	Inverse Definite Minimum Time
IEEE	Institute of Electrical and Electronics Engineers
LED	Light Emitting Diode
SCADA	Supervisory Control And Data Acquisition A system that operates with coded signals over communication channels to provide control and monitoring of remote equipment

1.3 BIBLIOGRAPHY

This document refers to, and is referred by the following DSE publications which are obtained from the DSE website: www.deepseaelectronics.com or by contacting DSE technical support: support@deepseaelectronics.com.

1.3.1 INSTALLATION INSTRUCTIONS

Installation instructions are supplied with the product in the box and are intended as a 'quick start' guide only.

DSE Part	Description
053-136	DSE334 Installation Instructions
053-033	DSE2130 Input Expansion Installation Instructions
053-034	DSE2157 Output Expansion Installation Instructions
053-032	DSE2548 LED Expansion Annunciator Installation Instructions
053-049	DSE9xxx Battery Charger Installation Instructions
053-147	DSE9460 & DSE9461 Battery Charger Installation Instructions
053-185	DSE9473 & DSE9483 Battery Charger Installation Instructions

1.3.2 MANUALS

Product manuals are obtained from the DSE website: www.deepseaelectronics.com or by contacting DSE technical support: support@deepseaelectronics.com.

DSE Part	Description
057-151	DSE Configuration Suite PC Software Installation & Operation Manual
057-233	DSE334 Operator Manual
057-082	DSE2130 Input Expansion Operator Manual
057-083	DSE2157 Output Expansion Operator Manual
057-084	DSE2548 Annunciator Expansion Operator Manual
057-085	DSE9xxx Battery Charger Operator Manual
057-151	DSE Configuration Suite PC Software Installation & Operation Manual
057-175	PLC Programming Guide For DSE Controllers
057-176	DSE9460 & DSE9461 Battery Charger Operator Manual
N/A	DSEGencomm (MODBUS protocol for DSE controllers)

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
056-005	Using CTs With DSE Products
056-017	OC Configuration Interfacing
056-018	Negative Phase Sequence
056-019	Earth Fault Protection
056-021	Mains Decoupling
056-022	Switchgear Control
056-024	GSM Modem
056-026	kVA, kW, kvar and Power Factor
056-030	Module PIN Codes
056-036	DSE Module Expansion
056-047	Out of Sync and Failed To Close
056-051	Sending DSEGencomm Control Keys
056-053	Recommended Modems
056-069	Firmware Update
056-075	Adding Language Files
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
056-097	USB Earth Loops and Isolation
056-099	Digital Output to Digital Input Connection
056-116	Underspeed and Overspeed

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 generator handbook. L.L.J. Mahon
ISBN 0-9625949-3-8	On-Site Power Generation. EGSA Education Committee.

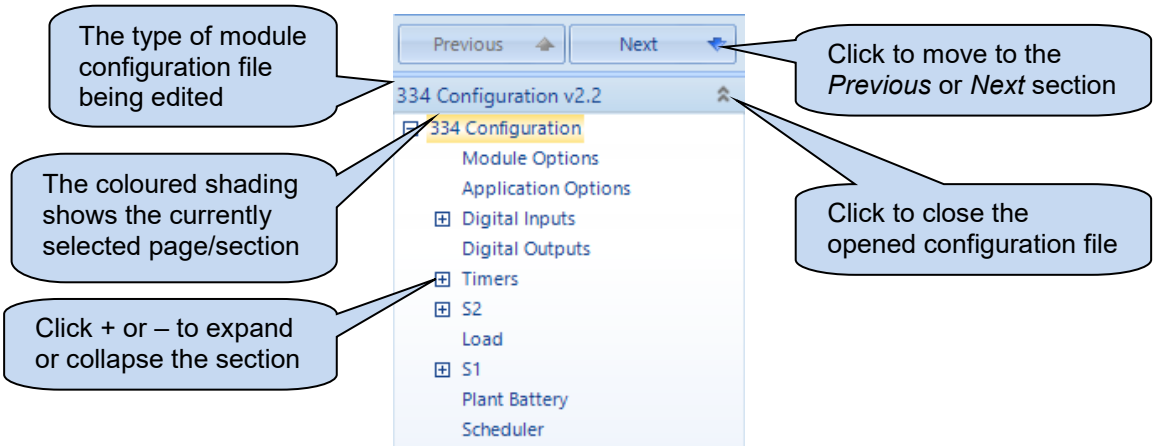
1.4 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

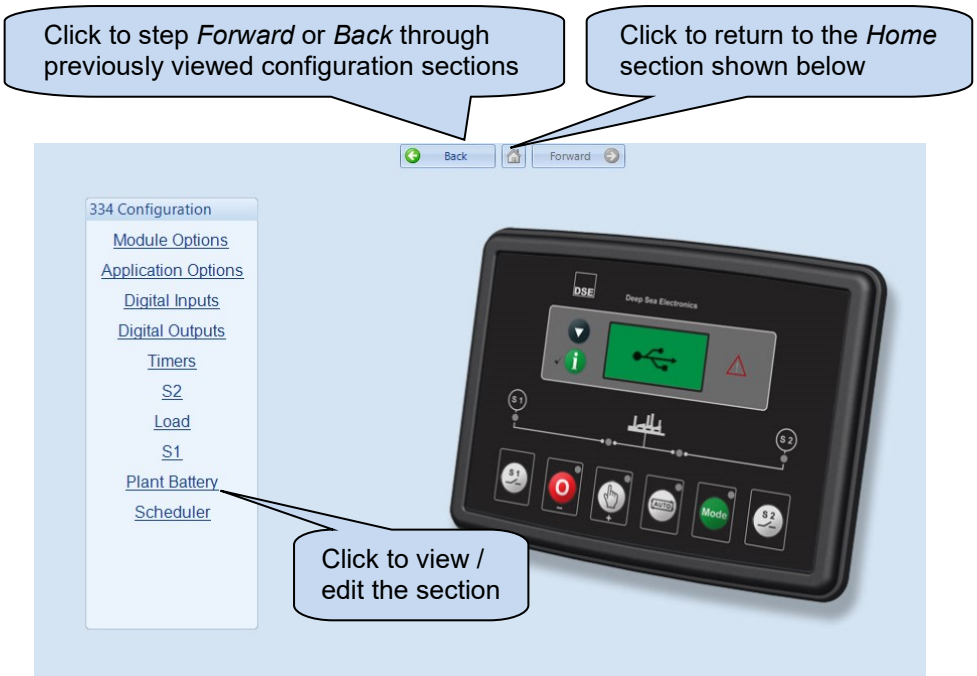
For information in regards to installing and using the *DSE Configuration Suite PC Software,* refer to DSE publication: ***057-151 DSE Configuration Suite PC Software Installation & Operation Manual*** which is found on the DSE website: www.deepseaelectronics.com

2 EDITING THE CONFIGURATION

The software is broken down into separate sections to provide simple navigation whilst editing the module's configuration to suit a particular application.

2.1 SCREEN LAYOUT

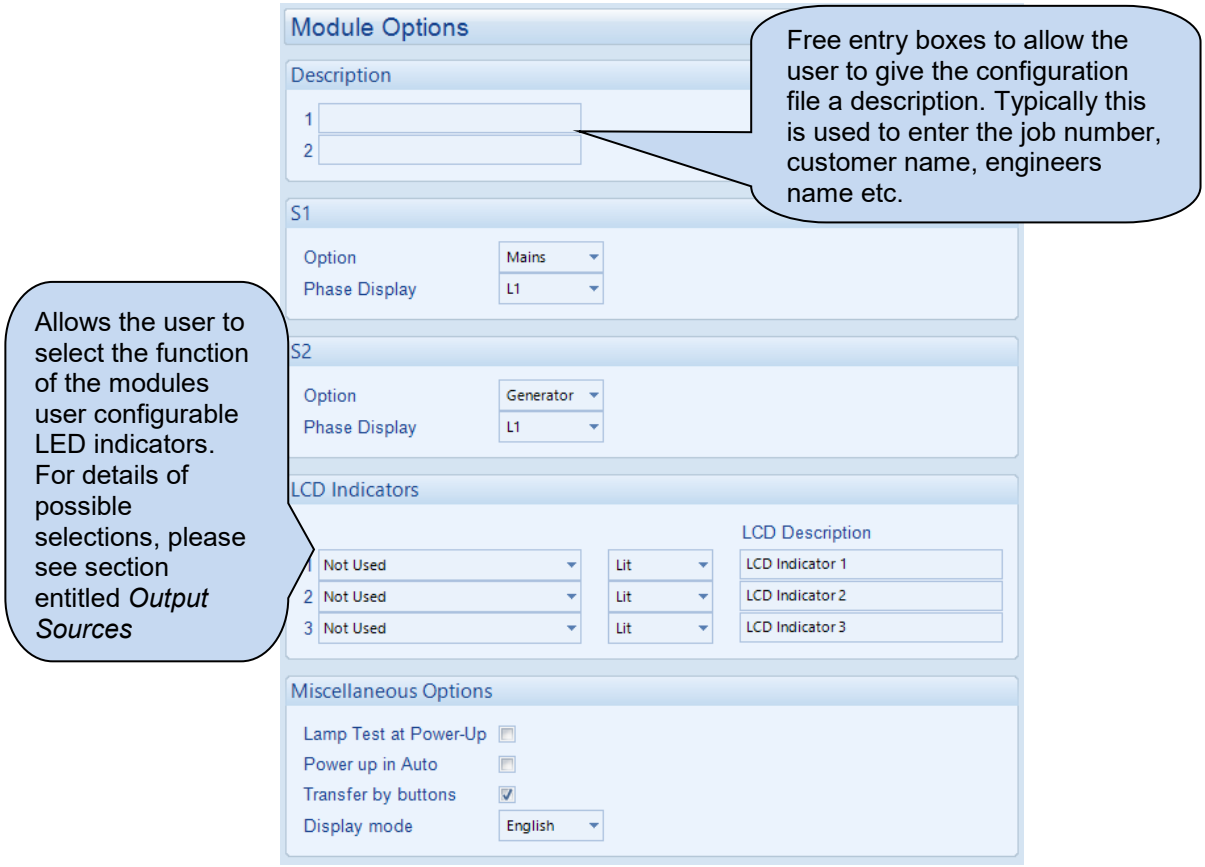




2.2 MODULE

The *Module* section allows the user to edit options related to the module itself and is subdivided into smaller sections.

2.2.1 MODULE OPTIONS



Parameters are described overleaf…

2.2.1.1 S1

Parameter	Description
Option	Select the function of the module's S1 sensing terminals: ***Mains*** ***Generator***
S1 Phase Display	Choose which phase voltage to show on the module display

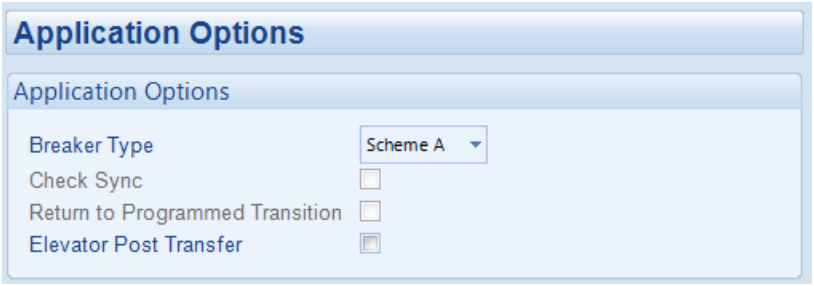
2.2.1.2 S2

Parameter	Description
Option	Select the function of the module's S2 sensing terminals: ***Mains*** ***Generator***
S2 Phase Display	Choose which phase voltage to show on the module display

2.2.1.3 MISCELLANEOUS OPTIONS

Parameter	Description
Lamp test at power up	☐ = Lamp test at power up is disabled. ☑ = All module lamps illuminate when power is first applied.
Power Up in Auto	☐ = The module enters START INHIBIT mode when DC power is applied. ☑ = The module enters AUTO mode when DC power is applied.
Transfer by buttons	☐ = Fascia load control buttons are disabled. ☑ = Fascia load control buttons are enabled when the module is in Manual Mode.
Display Mode	Selecth the type of *Display Mode* ***English*** The Module displays instrumentation in *English* ***Icons*** The Module displays instrumentation in the form of *Icons*

2.3 APPLICATION OPTIONS



Parameter	Description
Breaker Type	See overleaf for description of the *Breaker Type*.
Check Sync	This option is only available when *Scheme B* is selected. See overleaf for description of the *Check Sync* options ☐ = None check sync operation ☑ = During load transfer, the module only closes its breaker within the check sync window. See overleaf for description of the *Check Sync* options.
Return to programmed transition	This option is only available when *Check Sync* is enabled. See overleaf for description of the *Check Sync* options ☐ = Normal operation ☑ = During load transfer if the *check sync* of the supplies does not occur within two minutes, a 'break' or 'open transition' transfer occurs.
Elevator Post Transfer	☐ = Normal operation ☑ = Any configurable output set to *elevator control* remains active for the duration of the *elevator delay* after a load transfer has taken place.

Section continued overlead

2.3.1 BREAKER SCHEME A

Breaker scheme A is suitable for contactors or ACBs.

NOTE: S1 Closed Auxiliary and S2 Closed Auxiliary inputs do not affect the operation of the load switching in Breaker Scheme A

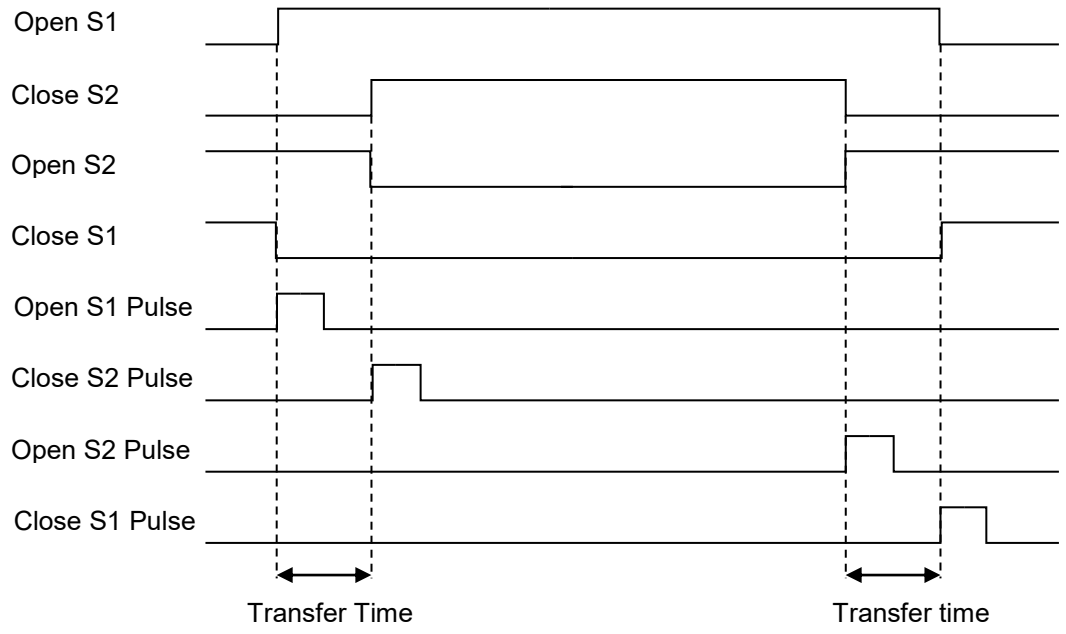
2.3.1.1 S1 / S2 LOAD INHIBIT

Activation of an input configured to *S1 Load Inhibit* or *S2 Load Inhibit* inputs cause the corresponding breaker to be opened immediately. No other change in function occurs.
When the input is deactivated the breaker is closed again if appropriate.

2.3.1.2 S1 AND S2 LOAD INHIBIT

If an input configured to *S1 and S2 Load Inhibit* is activated, outputs set to Open S1 and Open S2 energise, and inputs configured to Close S1 and Close S2 de-energise. Open S1 Pulse and Open S2 Pulse outputs only energise if the corresponding supply was on load before application of the *S1 and S2 Load Inhibit* input.
When the *S1 and S2 Load Inhibit* input is deactivated the load is returned to the supply that was disconnected, providing that supply is healthy.

2.3.1.3 TIMING DIAGRAM



2.3.2 BREAKER SCHEME B

Breaker Scheme B is intended only for use with certain designs of transfer switch. For example, rotary transfer switches with very short changeover time.
This scheme is only suitable for breakers which require pulse signals for opening and closing.

2.3.2.1 CHECK SYNC IS DISABLED

TRANSFERRING TO S1

To open the S1 breaker the *Open S1* output energises, it then de-energises when the *S1 Closed Auxiliary* indicates it has successfully opened, or after 1s whichever occurs first.
When the 'S1 Closed Auxiliary' indicates the S1 breaker has opened, the *transfer timer* begins.
When the *transfer timer* expires, the module attempts to close the S2 breaker by energising the *Open S1* and *Close S2* outputs simultaneously, it then de-energises these outputs when the *S1 Closed Auxiliary* input indicates it has successfully closed, or after 1s whichever occurs first.

TRANSFERRING TO S2

To open the S2 breaker the *Open S2* output energises, it then de-energises when the *S2 Closed Auxiliary* indicates it has successfully opened, or after 1s whichever occurs first.
When the 'S2 Closed Auxiliary' indicates the S2 breaker has opened, the *transfer timer* begins.
When the *transfer timer* expires, the module attempts to close the S1 breaker by energising the *Open S2* and *Close S1* outputs simultaneously, it then de-energises these outputs when the *S1 Closed Auxiliary* input indicates it has successfully closed, or after 1s whichever occurs first

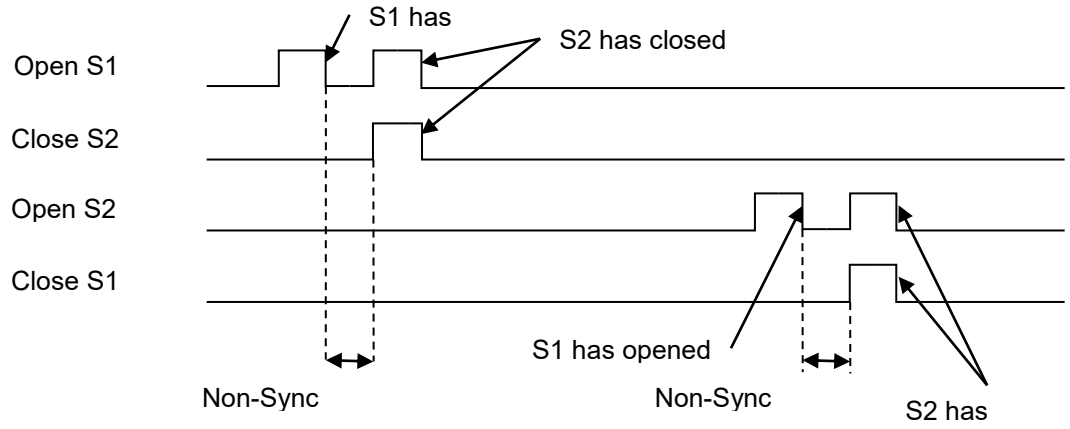
S1 AND S2 LOAD INHIBIT INPUT

When the *S1 and S2 Load Inhibit* input is activated while S2 is closed the *Open S2* output energises, it then de-energises when the *S2 Closed Auxiliary* input indicates that it has successfully opened, or after 1s whichever occurs first.

When the *S1 and S2 Load Inhibit* input is activated while S1 is closed the *Open S1* output energises, it then de-energises when the *S1 Closed Auxiliary* input indicates that it has successfully opened, or after 1s whichever occurs first.

When the *S1 and S2 Load Inhibit* input is deactivated the load is returned to the supply that was disconnected, providing that supply is healthy.

TIMING DIAGRAM



2.3.2.2 CHECK SYNC IS ENABLED

NOTE : The module waits indefinitely for synchronisation unless the 'Return to programmed transition' function is active in which case after 2 minutes it performs a non-sync transfer as described in the previous section.

NOTE: The transfer time is ignored during a check-sync but is used if the transfer fails and it performs a non-sync transfer.

TRANSFER TO S2

When the module is about to transfer from S1 to S2 it activates the check sync function.
When the S1 and S2 supplies are within the phase and frequency window the module energises the *Open S1* and *Close S2* outputs simultaneously. These outputs are de-energised when the *S2 Closed Auxiliary* input indicates it has successfully closed, or after 1s whichever occurs first.

TRANSFER TO S1

When the module is about to transfer from S2 to S1 it activates the check sync function.
When the S1 and S2 supplies are within the phase and frequency window the module energises the *Open S2* and *Close S1* outputs simultaneously. These outputs are de-energised when the *S1 Closed Auxiliary* input indicates it has successfully closed, or after 1s whichever occurs first.

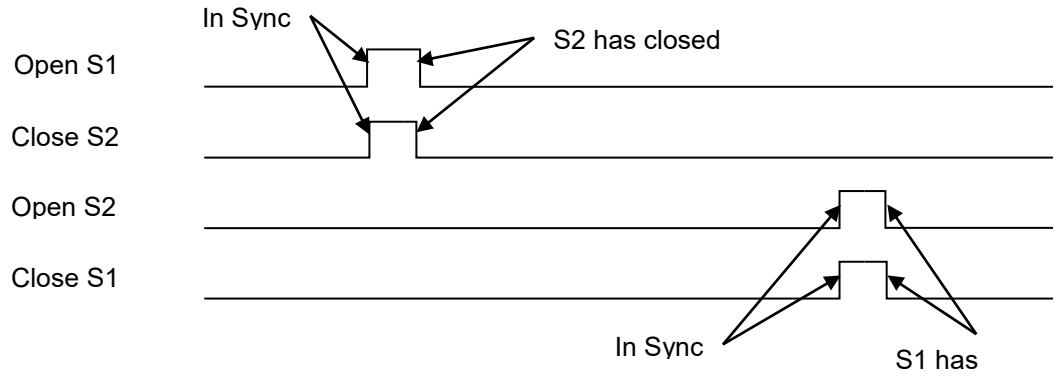
S1 AND S2 LOAD INHIBIT

When the *S1 and S2 Load Inhibit* input is activated while the S2 is closed the *Open S2* output energises, it then de-energises when the *S2 Closed Auxiliary* input indicates that it has successfully opened, or after 1s whichever occurs first.

When the *S1 and S2 Load Inhibit* input is activated while the S1 is closed the *Open S1* output energises, it then de-energises when the *S1 Closed Auxiliary* input indicates that it has successfully opened, or after 1s whichever occurs first.

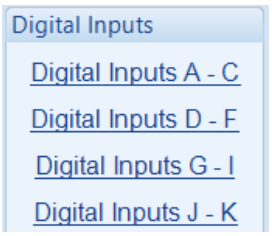
When the *S1 and S2 Load Inhibit* input is deactivated the load is returned to the supply that was disconnected, providing that supply is healthy.

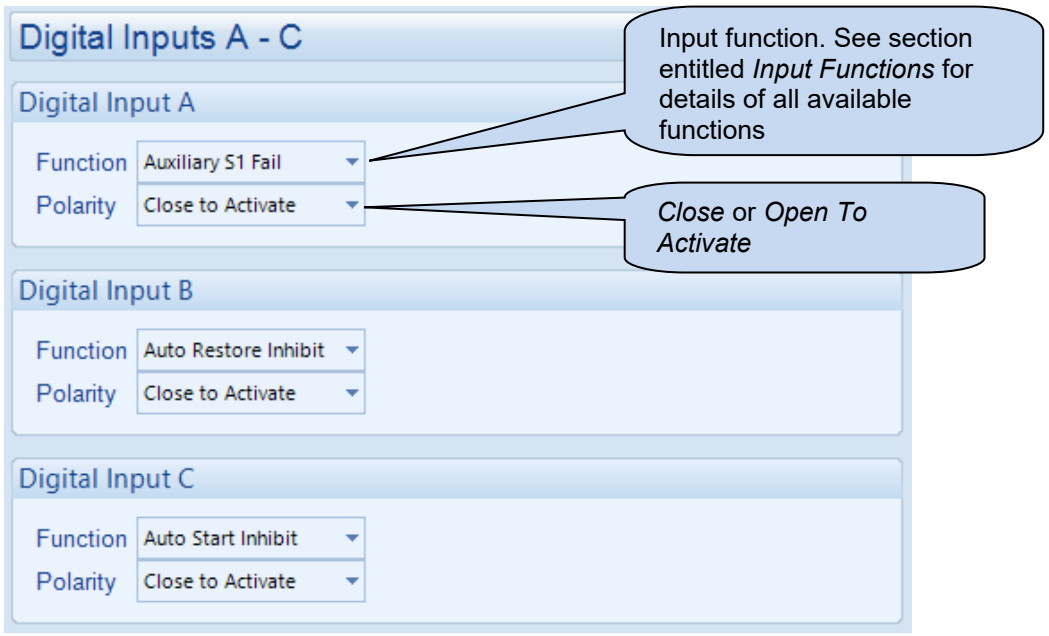
TIMING DIAGRAM



2.4 DIGITAL INPUTS

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





2.4.1 INPUT FUNCTIONS

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

Function	Description
Not used	The input is disabled
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/unload S2.
Auto Restore Inhibit IEEE 37.2 - 3 Checking Or Interlocking Relay	In the event of a remote start/S1 failure, S2 is instructed to start and take load. On removal of the remote start signal/S1 return the module continues to run S2 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 S1 is controlled remotely or by an automated system.
Auto Start Inhibit IEEE 37.2 - 3 Checking Or Interlocking Relay	This input is used to provide an over-ride function to prevent the controller from starting S2 in the event of a remote start/S1 out of limits condition occurring. If this input is active and a remote start signal/S1 failure occurs the module does not give a start command to the S2. If this input signal is then removed, the controller operates as if a remote start/S1 failure has occurred, starting and loading S2. This function is used to give an **'AND'** function so that S2 is only called to start if S1 fails and another condition exists which requires S2 to run. If the 'Auto start Inhibit' signal becomes active once more it is ignored until the module has returned the S1 supply on load and shutdown. This input does not prevent starting of the engine in MANUAL or TEST modes.
Auxiliary S1 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 S1 supply or some aspect of the incoming S1 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 S1 supply has fallen outside of limits, S2 is instructed to start and take the load. Removal of the input signal causes the module to act if S1 has returned to within limits providing that the S1 sensing also indicates that the S1 is within limits.
Auxiliary S2 Ready	Allows an external device (such as the engine control module) to instruct the controller that S1 is healthy and available to take load. The controller then monitors the voltage and frequency to check they are within acceptable limits before performing the load transfer function.
External Panel Lock	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*).
Inhibit Scheduled Run IEEE 37.2 - 3 Checking Or Interlocking Relay	This input is used to provide a means of disabling a scheduled run.

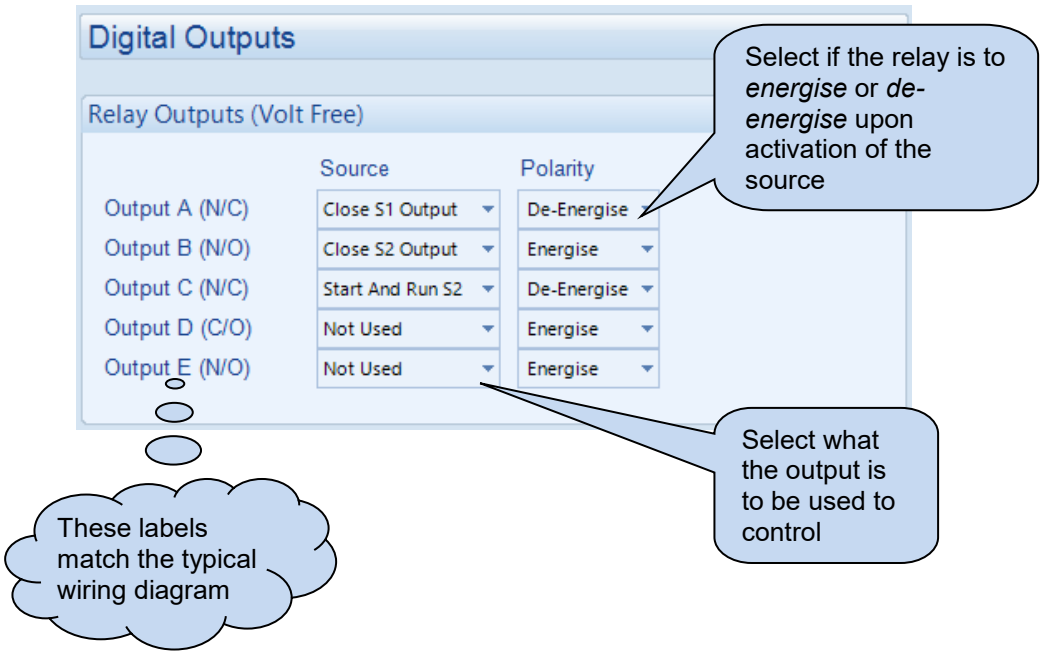
Parameter descriptions are continued overleaf…

Function	Description
Lamp Test	This input is used to provide a test facility for the front panel indicators fitted to the module. When the input is activated all LED's illuminate.
Open / Close S1 IEEE 37.2 - 52 AC Circuit Breaker	Allows connection of an external signal to control open and closing of the S1 load switch device.
Open / Close S2 IEEE 37.2 - 52 AC Circuit Breaker	Allows connection of an external signal to control open and closing of the S2 load switch device.
Remote Start Off Load	If this input is active, operation is similar to the 'Remote Start on load' function except that S2 is not instructed to take the load. This function is used where an engine only run is required e.g. for exercise.
Remote Start Off Load	When in auto mode, the module performs the start sequence and transfers load to S2. In Manual mode, the load is transferred to S2 if the supply is already healthy, however in manual mode, this input does not generate start/stop requests of S2.
S1 Closed Auxiliary IEEE 37.2 - 3 Checking Or Interlocking Relay (Breaker Scheme B)	This input is used to provide feedback to allow the controller to give true indication of the contactor or circuit breaker switching status. It must be connected to the S1 load switching device auxiliary contact. In 'Breaker Scheme A', Incorrect application of this signal does not trigger an alarm condition, it is used solely for indication of the breaker status. In 'Breaker Scheme B' this feedback is used for internal interlocking of the breaker outputs. In 'Breaker Scheme C' this feedback is used for ensuring a closed transition has occurred within the Breaker Close Transition timer.
S1 Load Inhibit IEEE 37.2 - 52 AC Circuit Breaker	**NOTE: This input only operates to control the S1 switching device if the module's load switching logic is attempting to load S1. It does not control the S1 switching device when the S2 supply is on load.** This input is used to prevent the controller from loading S1. If S1 is already on load, activating this input causes the controller to unload S1. Removing the input allows S1 to be loaded again.
S2 Closed Auxiliary IEEE 37.2 - 3 Checking Or Interlocking Relay (Breaker Scheme B)	This input is used to provide feedback to allow the controller to give true indication of the contactor or circuit breaker switching status. It must be connected to the S2 load switching device auxiliary contact. In 'Breaker Scheme A', Incorrect application of this signal does not trigger an alarm condition, it is used solely for indication of the breaker status. In 'Breaker Scheme B' this feedback is used for internal interlocking of the breaker outputs. In 'Breaker Scheme C' this feedback is used for ensuring a closed transition has occurred within the Breaker Close Transition timer.
S2 Load Inhibit IEEE 37.2 - 52 AC Circuit Breaker	**NOTE: This input only operates to control the S2 switching device if the module's load switching logic is attempting to load S2. It does not control the S2 switching device when the S1 supply is on load.** This input is used to prevent the controller from loading S2. If S2 is already on load, activating this input causes the controller to unload S2. Removing the input allows S2 to be loaded again.

Parameter descriptions are continued overleaf…

Function	Description
Simulate S1 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 S1 supply and behaves as if the supply is healthy.
Simulate S2 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 S2 supply and behaves as if the supply is healthy.

2.4.2 DIGITAL OUTPUTS



2.4.3 OUTPUT SOURCES

The list of output sources available for configuration of the module relay outputs also applies to the LED configuration and expansion relay outputs.

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

Output Source	Activates…	Is Not Active….
Not Used	The output does not change state (Unused)	
Audible Alarm IEEE 37.2 – 74 Alarm Relay	This output indicates that the internal sounder is operating to allow it to feed an external sounder. Operation of the Mute pushbutton resets this output once activated.	Inactive if the internal sounder is not operating.
Battery High Voltage IEEE 37.2 – 59 DC Over Voltage Relay	This output indicates that a Battery Over voltage alarm has occurred.	Inactive when battery voltage is not High
Battery Low Voltage IEEE 37.2 – 27 DC Under Voltage Relay	This output indicates that a Battery Under Voltage alarm has occurred.	Inactive when battery voltage is not Low
Calling for Scheduled Run		
Close S1 Output IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects S1 to be on load, this control source is active.	The output is inactive whenever S1 is not required to be on load
Close S1 Output Pulse IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects S1 to be on load this control source is active for the duration of the Breaker Close Pulse timer, after which it becomes inactive again.	

Parameter descriptions are continued overleaf…

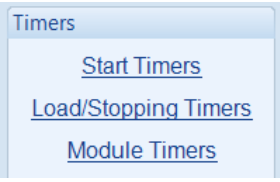
Output Source	Activates…	Is Not Active….
Close S2 Output IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects S2 to be on load this control source is active.	The output is inactive whenever S2 is not required to be on load
Close S2 Output Pulse IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects 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 to N Output IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects S1 and S2 to not supply the load this control source is active.	The output is inactive when S1 or S2 are required to be on load
Close to N Output Pulse IEEE 37.2 – 52 AC Circuit Breaker	Used to control the load switching device. Whenever the module selects ATS to be in the neutral position, this control source is active for the duration of the Breaker Close Pulse timer, after which it becomes inactive again.	
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 present
Cooling Down	Active when the Cooling timer is in progress	The output is inactive at all other times
Digital Input A – K	Active when the digital input is active	Inactive when : • the input is not active • the input is active but conditioned by activation delay or arming requirements.
Elevator Control	Active during the *elevator delay* time before a load transfer takes place and remains active for the duration of the *elevator delay* after a transfer takes place (when *elevator post transfer* is enabled.	Inactive at all other times
Fail to Start	Active when the *S2* is configured as generator and no voltage or frequency is measured for *S2* within the *Start Delay* timer.	
Fail to Stop	Active when the *S2* is configured as generator and the generator fails to stop within the *Fail to Stop Delay* timer.	
Loading Frequency Not Reached	Active when S2 has failed to reach the loading frequency after the '*Safety on Delay*' timer.	
Loading Voltage Not Reached	Active when S2 has failed to reach the loading voltage after the '*Safety on Delay*' timer.	
Open S1 Output IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects S1 to be off load this control source is active.	The output is inactive whenever S1 is required to be on load
Open S1 Output Pulse IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects S1 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 S2 Output IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects S2 to be off load this control source is active.	Inactive whenever S2 is required to be on load

Parameter descriptions are continued overleaf…

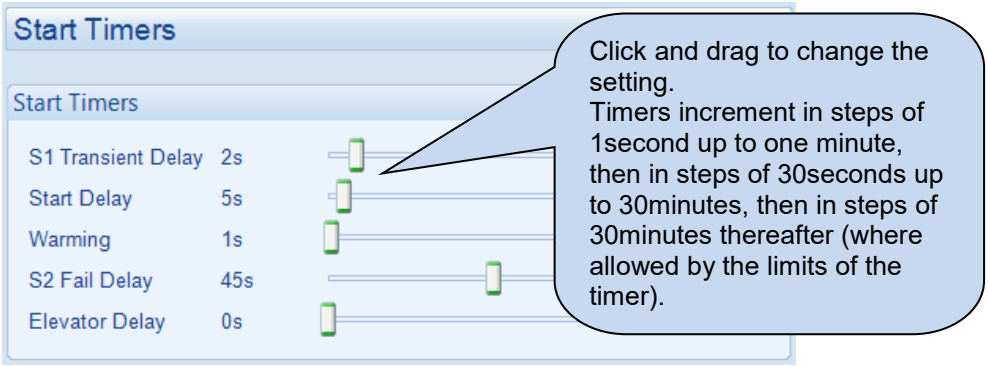
Output Source	Activates… Is Not Active….
Open S2 Output Pulse IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects S2 to be off load this control source is active for the duration of the Breaker Open Pulse timer, after which it becomes inactive again.
Return Delay in Progress	Indicates that S2 is on load, and S1 is available, during the *return delay* timers.
S1 Failure Latched	Activates when the S1 failure alarm is active. Reset by digital input configured to *Alarm Reset*
S1 Failure Unlatched	Activates when the S1 failure alarm is active. Reset automatically when S1 becomes available
S1 High Frequency	Becomes active if S1's frequency goes higher than the configured trip setting.
S1 High Voltage	Becomes active if S1's voltage goes higher than the configured trip setting.
S1 In Limits	Activates when S1 becomes available and is within configured limits.
S1 Load Inhibited	Indicates that an input configured to *S1 Load Inhibit* is active, preventing the supply from taking load.
S1 Low Frequency	Becomes active if S1's frequency goes lower than the configured trip setting.
S1 Low Voltage	Becomes active if S1's voltage goes lower than the configured trip setting.
S2 Available	Active when the S1 supply is available and within limits
S2 Failure Latched	Activates when the S2 failure alarm is active. Reset by digital input configured to *Alarm Reset*
S2 Failure Unlatched	Activates when the S2 failure alarm is active. Reset automatically when S1 becomes available
S2 In Limits	Activates when S2 becomes available and is within configured limits.
S2 Load Inhbited	Indicates that an input configured to *S1 Load Inhibit* is active, preventing the supply from taking load.
S2 Ready	Activates when S2 becomes available and both the warming and cooldown time are not active. Ignores alarm conditions and the *S2 transient delay*
S2 Start and Run	Active when the controller has requested for S2 to start and run.
Start Delay in Progress	Active when the controller is in the *start delay* timer, after which the set is called to start.
System in Auto Mode	Active when unit is in Auto mode
System in Manual Mode	Active when unit is in Manual mode
System in Prohibit Return Mode	Active when unit is in Prohibit Return Mode
System In Start Inhibit Mode	Active when unit is in Start Inhibit Mode
System in Test Off-Load Mode	Active when unit is in Test Off-Load Mode
System in Test On-Load Mode	Active when unit is in Test On-Load Mode
Waiting For Manual Restore	Becomes active when S2 is on load and the S1 supply is healthy but an input configured to Manual Restore is active. This is used to signal to an operator that action is required before the set transfers back to the S1 supply.
Waiting For S2	Active when the controller has requested for S2 to start and is waiting for it to become available.
Warming Up	Active when S2 is running off load, during the warming timer, before taking load.

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



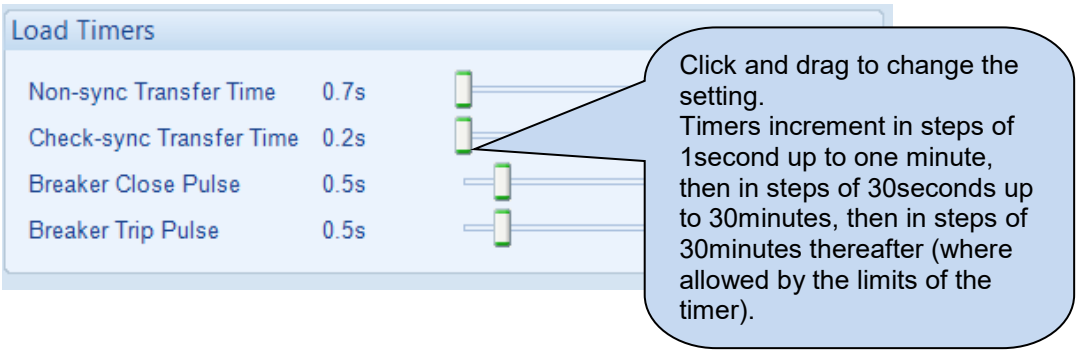
2.5.1 START TIMERS



Timer	Description
S1 Transient Delay	Used to delay the detection of S1 failure. This is normally used to prevent short term transients or brownout conditions from being classified as a S1 Failure and opening the breaker.
Start Delay	Used to give a delay before starting in AUTO mode. This timer is activated upon the respective start command being issued. Typically this timer is applied to prevent starting upon fleeting remote start signals or short term S2 failures.
Warming	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.
S2 Fail Delay	The module instructs that S2 is to start and waits for the period of this timer for S2 to become available. If it is not available when the timer expires, the *S2 failure* alarm is triggered.
Elevator Delay	Used to delay the *Elevator control* output before and after the load transfer takes place. For further details see section entitled *Elevator Control* elsewhere in this manual.

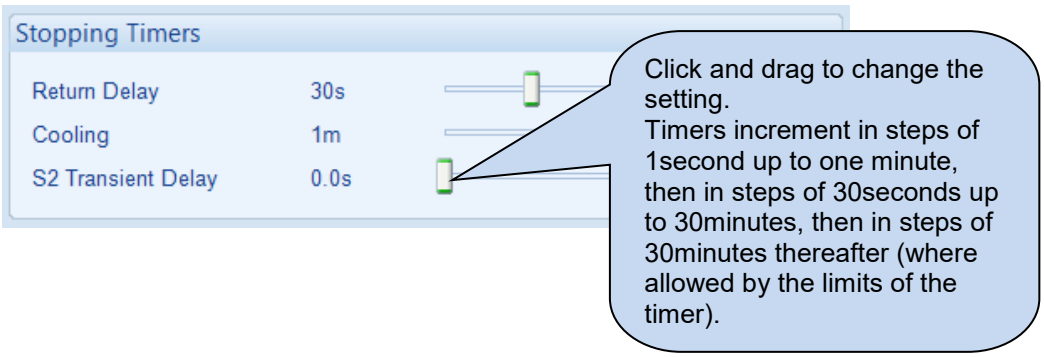
2.5.2 LOAD/STOPPING TIMERS

2.5.2.1 LOAD TIMERS



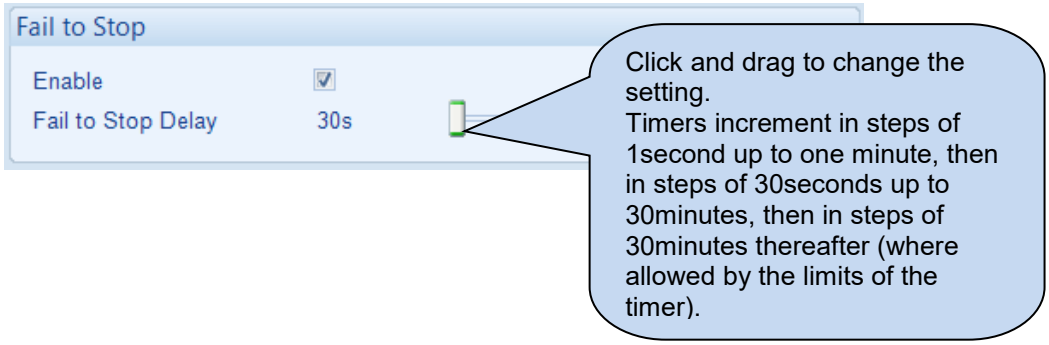
Timer	Description
Non-sync Transfer Time	The time between one supply's load switch being opened and the other supply's load switch being closed. Used to give time for the load switches to move to their correct positions and to prevent the mechanical interlock from "jamming". This timer is also used to give a 'dead time' to ensure that any machinery stops fully after removal of the supply, before applying the new supply to the equipment (for instance directly driven AC motors).
Check-Sync Transfer Time	The time allowed for the *Sync Transfer* to be completed. If the two supplies do not come in sync during this time, the module reverts to perform a *Non-Sync Transfer*.
Breaker close pulse	The amount of time that *Breaker Close Pulse* signals are present when the request to close a breaker is given.
Breaker Trip pulse	The amount of time that *Breaker Open Pulse* signals are present when the request to open a breaker is given.

2.5.2.2 STOPPING TIMERS



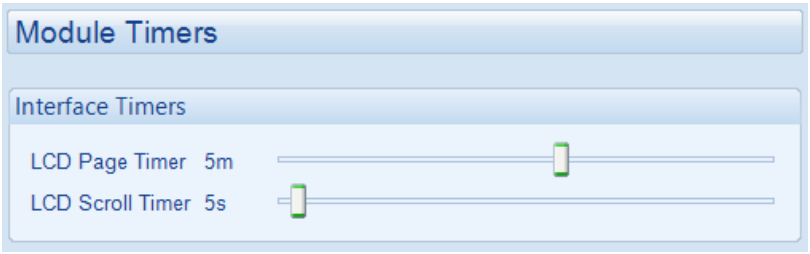
Timer	Description
Return Delay	A delay, used in auto mode only, that allows for short term removal of the request to unload the supply before action is taken. This is usually used to ensure the supply remains on load before accepting that the start request has been removed.
Cooling	The amount of time that the set runs OFF LOAD before being stopped. This is to allow the set to cool down and is particularly important for engines with turbo chargers.
Transient Delay	Used to delay the detection of S1 failure. This is normally used to prevent short term transients or brownout conditions from being classified as a S1 Failure and opening the breaker.

2.5.2.3 FAIL TO STOP



Timer	Description
Fail to Stop Delay	☐ = Alarm is disabled ☑ = If the supply is called to stop and is still running after the configurable *Fail to Stop* delay time expires, a *Fail to Stop* alarm is generated.

2.5.2.4 MODULE TIMERS



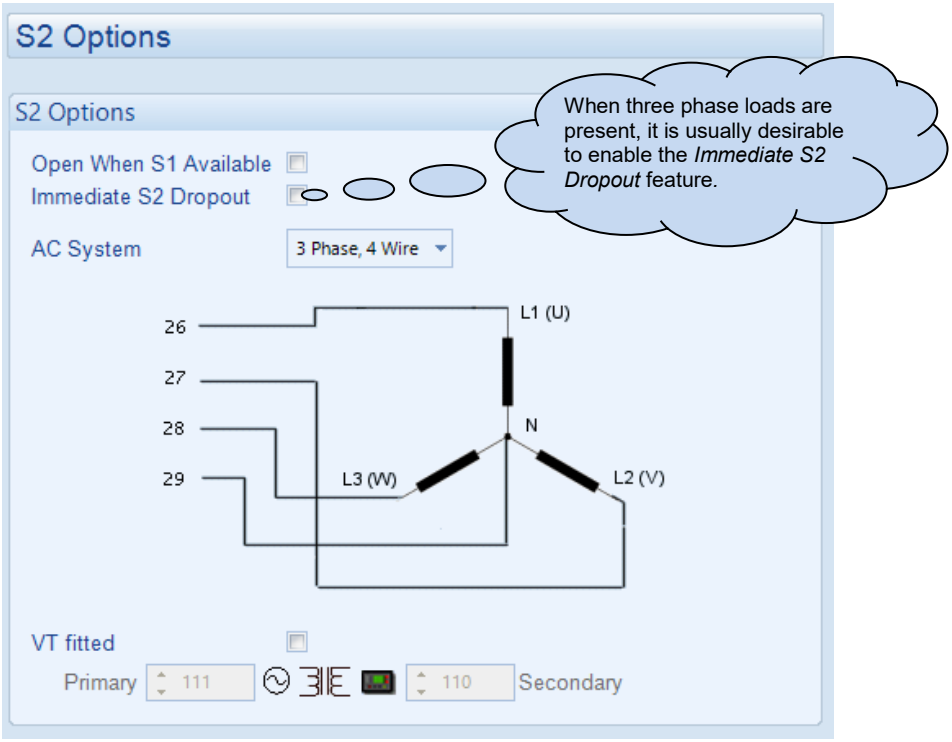
Parameter	Description
LCD Page Timer	The amount of time before the module reverts to show the *Status* page when it is left unattended
LCD Scroll Timer	The amount of time for automatic scroll between parameters on a selected page.

2.6 S2

The *S2* section is subdivided into smaller sections. Select the required section with the mouse.

Parameter descriptions are continued overleaf…

2.6.1 S2 OPTIONS



Parameter	Description
Open When S1 Available	**NOTE: Active when S2 source is set to *Generator.* For further details see section entitled *Application Options* elsewhere in this document**
	NOTE: S1/S2 Closed Auxiliary must be configured to enable this Parameter. For further details, see section entitled *Digital Inputs* elsewhere in this document.
	☐ = The S2 breaker can be requested to open regardless if S1 is available. This is useful when using DC controlled opening signals. ☑ = The S2 breaker is only requested to open when S1 is available. This is required when S2's breaker's opening signals are supplied by S1's supply.
Immediate S2 Dropout	**NOTE: This feature is inactive when *Open When S1 Available* is enabled or when S2 is set to *Standby*. For further details see section entitled *Application Options* elsewhere in this document.**
	☐ = Upon S2 failure, the S2 Breaker remains closed until a transfer to S1 is initiated. ☑ = Upon S2 failure, the S2 Breaker opens immediately.
AC System	This defines the topology of the alternator/source and the connections to the DSE module sensing terminals.

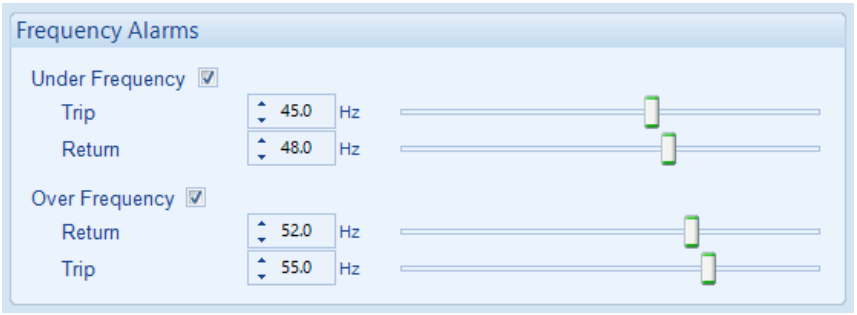
Parameter	Description
VT Fitted	☐ = The voltage sensing to the controller is direct from the alternator ☑ = The voltage sensing to the controller is via Voltage Transformers (VTs or PTs) This is used to step down the generated voltage to be within the controller voltage specification. By entering the Primary and Secondary voltages of the transformer, the controller displays the Primary voltage rather than the actual measured voltage. This is typically used to interface the DSE module to high voltage systems (ie 11kV) but also used on systems such as 600V ph-ph.

2.6.2 S2 ALARMS

2.6.2.1 VOLTAGE ALARMS

Alarm	Description
Under Voltage IEEE 37.2 – 27 AC Undervoltage Relay	☐ = S2 Under Voltage detection is disabled ☑ = S2 Under Voltage gives an alarm in the event of the mains voltage falling below the configured *Under Voltage Trip* value. The *Under Voltage Trip* value is adjustable to suit the application. Th
Over Voltage IEEE 37.2 – 59 AC Overvoltage Relay	☐ = S2 Over Voltage detection is disabled ☑ = S2 Over Voltage gives an alarm in the event of the S2 voltage rising above the configured *Over Voltage Trip* value. The *Over Voltage Trip* value is adjustable to suit the application.

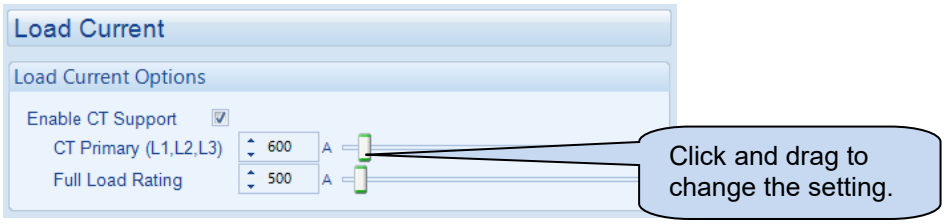
2.6.2.2 FREQUENCY ALARMS



Alarm	Description
Under Frequency IEEE 37.2 – 81 Frequency Relay	☐ = S2 Under Frequency detection is disabled ☑ = S2 Under Frequency gives an alarm in the event of the S2 frequency falling below the configured *Under Frequency Trip* value. The *Under Frequency Trip* value is adjustable to suit the application. The alarm is reset and the S2 is considered within limits when the S2 frequency rises above the configured *Under Frequency Return* level.
Over Frequency IEEE 37.2 – 81 Frequency Relay	☐ = S2 Over Frequency detection is disabled ☑ = S2 Over Frequency gives an alarm in the event of the S2 frequency rising above the configured *Over Frequency Trip* value. The *Over Frequency Trip* value is adjustable to suit the application. The alarm is reset and the S2 is considered within limits when the S2 frequency falls below the configured *Over Frequency Return* level.

2.7 LOAD

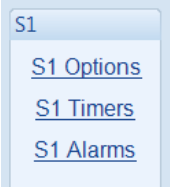
2.7.1 LOAD CURRENT OPTIONS



Parameter	Description
Enable CT Support	☐ = Disables Current Transformer support. ☑ = Enables Current Transformer support and displays the Current value on the Modules facia.
CT Primary	Primary rating of the Current Transformers
Full Load Rating	Full load rating (100% rating) of the load current

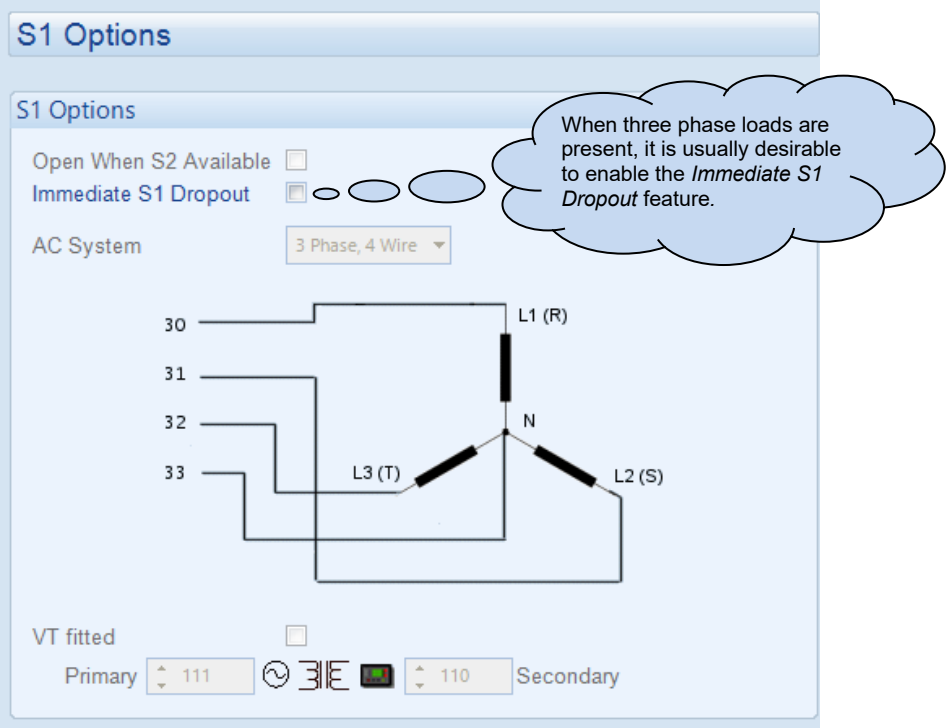
2.8 S1

The *S1* section is subdivided into smaller sections. Select the required section with the mouse.



Parameter descriptions are continued overleaf…

2.9 S1 OPTIONS

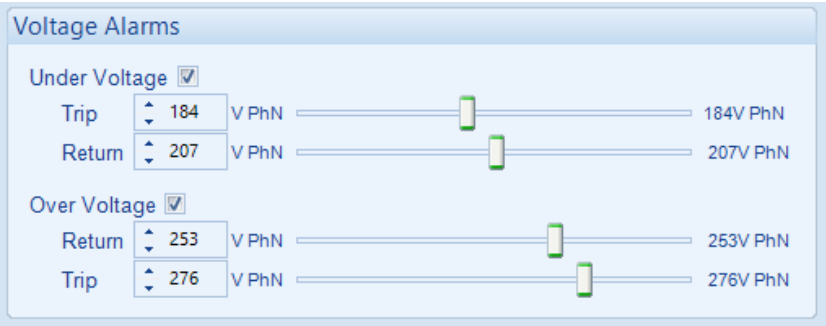


Parameter	Description
Open When S2 Available	**NOTE: Active when S1 source is set to *Generator.* For further details see section entitled *Application Options* elsewhere in this document**
	NOTE: Tick box shown for read only purpose. To configure the tick box see section entitled *S2 Options* elsewhere in this document
	☐ = The S1 breaker can be requested to open regardless if S2 is available. This is useful when using DC controlled opening signals. ☑ = The S1 breaker is only requested to open when S2 is available. This is required when S1's breaker's opening signals are supplied by S2's supply.
Immediate S1 Dropout	**NOTE: This feature cannot be enabled when *Open When S2 Available* is enabled.**
	☐ = Upon S1 failure, the S1 Breaker remains closed until a transfer to S2 is initiated. ☑ = Upon S1 failure, the S1 Breaker opens immediately.
AC System	This defines the topology of the alternator/source and the connections to the DSE module sensing terminals.

Parameter	Description
VT Fitted	☐ = The voltage sensing to the controller is direct from the alternator ☑ = The voltage sensing to the controller is via Voltage Transformers (VTs or PTs) This is used to step down the generated voltage to be within the controller voltage specification. By entering the Primary and Secondary voltages of the transformer, the controller displays the Primary voltage rather than the actual measured voltage. This is typically used to interface the DSE module to high voltage systems (ie 11kV) but also used on systems such as 600V ph-ph.

2.9.1 S1 ALARMS

2.9.1.1 VOLTAGE ALARMS

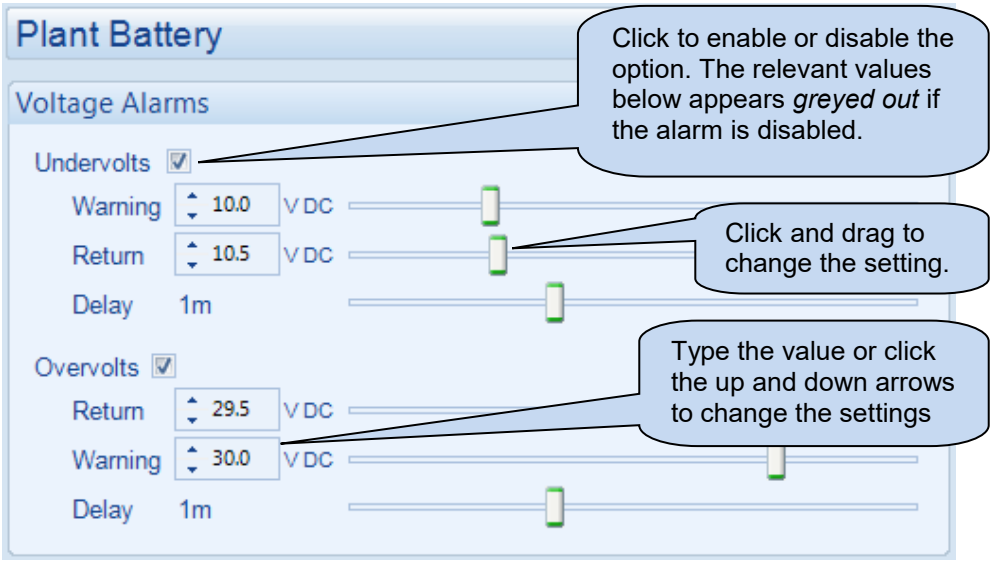


Alarm	Description
Under Voltage IEEE 37.2 – 27 AC Undervoltage Relay	☐ = S1 Under Voltage detection is disabled ☑ = S1 Under Voltage gives an alarm in the event of the mains voltage falling below the configured *Under Voltage Trip* value. The *Under Voltage Trip* value is adjustable to suit the application. The alarm is reset and the S1 is considered within limits when the S1 voltage rises above the configured *Under Voltage Return* level.
Over Voltage IEEE 37.2 – 59 AC Overvoltage Relay	☐ = S1 Over Voltage detection is disabled ☑ = S1 Over Voltage gives an alarm in the event of the S1 voltage rising above the configured *Over Voltage Trip* value. The *Over Voltage Trip* value is adjustable to suit the application. The alarm is reset and the S1 is considered within limits when the S1 voltage falls below the configured *Over Voltage Return* level.

2.9.1.2 FREQUENCY ALARMS

Alarm	Description
Under Frequency IEEE 37.2 – 81 Frequency Relay	☐ = S1 Under Frequency detection is disabled ☑ = S1 Under Frequency gives an alarm in the event of the S1 frequency falling below the configured *Under Frequency Trip* value. The *Under Frequency Trip* value is adjustable to suit the application. The alarm is reset and the S1 is considered within limits when the S1 frequency rises above the configured *Under Frequency Return* level.
Over Frequency IEEE 37.2 – 81 Frequency Relay	☐ = S1 Over Frequency detection is disabled ☑ = S1 Over Frequency gives an alarm in the event of the S1 frequency rising above the configured *Over Frequency Trip* value. The *Over Frequency Trip* value is adjustable to suit the application. The alarm is reset and the S1 is considered within limits when the S1 frequency falls below the configured *Over Frequency Return* level.

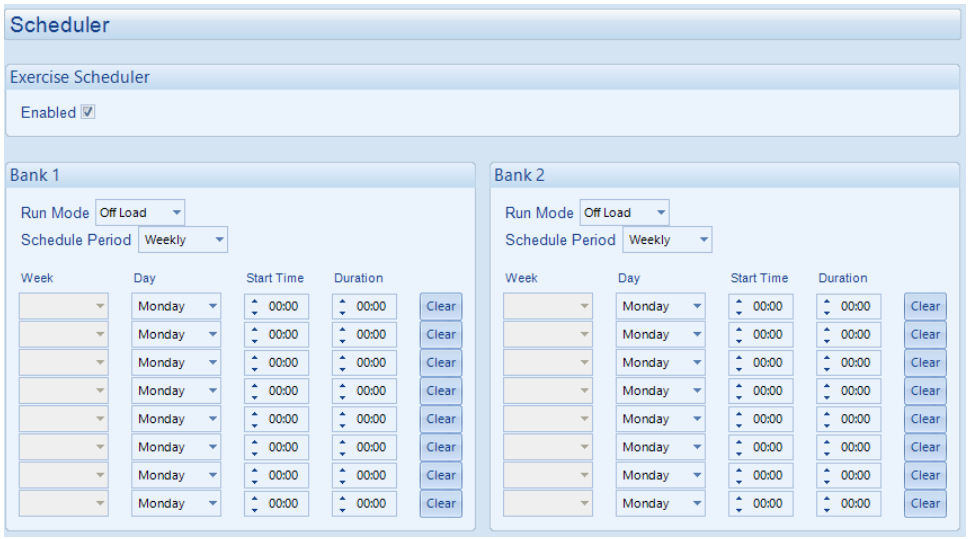
2.10 PLANT BATTERY



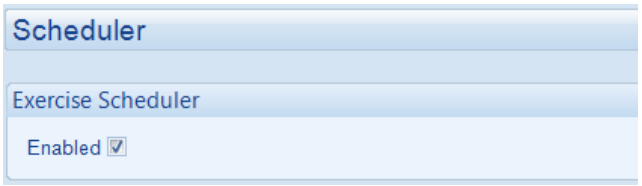
Parameter	Description
Plant Battery Undervolts IEEE 37.2 -27 DC Undervoltage Relay	The alarm activates when the battery voltage drops below the configured *Pre-Alarm* level for the configured *Delay* time. When the battery voltage rises above the configured *Return* level, the alarm is de-activated.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

2.11 SCHEDULER

The *Scheduler* allows the user to configure pre-set automatic starting and stopping of the Generator aswell as stopping the ATS carrying out a transfer (when in Automode).



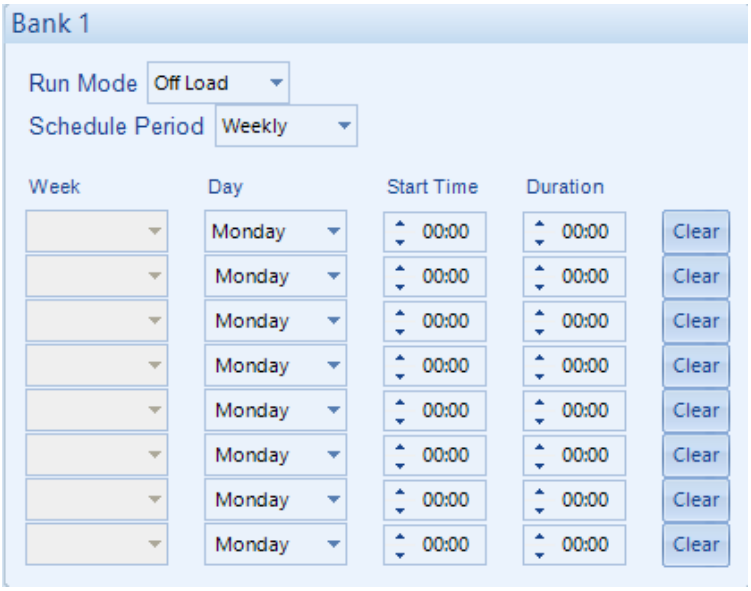
2.11.1 EXERCISE SCHEDULER



Function	Description
Enable Exercise Scheduler	☐ = The scheduler is disabled. ☑ = The scheduler is enabled, Bank 1 and Bank 2 become editable.

2.11.2 BANK 1 / BANK 2

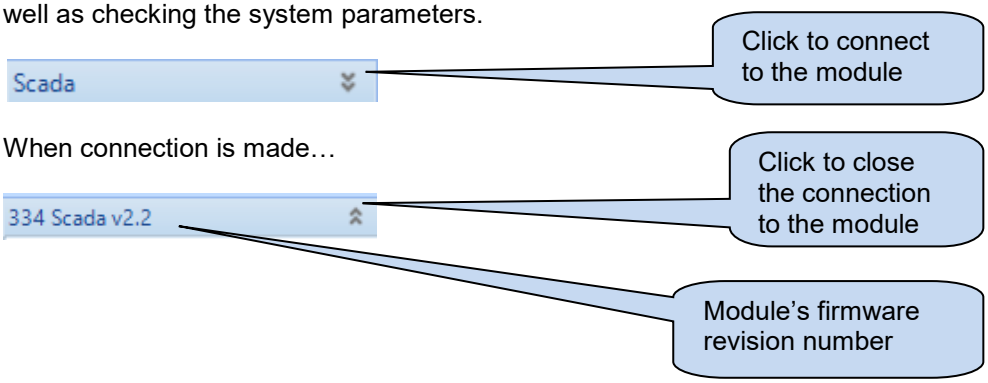
Each Bank of the Exercise Scheduler is used to give up to 8 scheduled runs per bank, 16 in total. This run schedule is configurable to repeat every 7 days (weekly) or every 28 days (monthly). The run is *On Load*, *Off Load* or *Auto Start Inhibit.*
Each scheduler bank configured differently either to weekly or monthly based exercises.



Function	Description
Run Mode	Determines the loading state mode of the generator when running on schedule ***Auto Start Inhibit:*** The generator is prevented from running in *Auto* mode. ***Off Load:*** The module runs the generator on schedule with the load switch open ***On Load:*** The module runs the generator on schedule and closes the load switch
Schedule Period	Determines the repeat interval for the scheduled run. Options available are: ***Weekly:*** The schedule events occur every week. ***Monthly:*** The schedule events occur every month on the week selected.
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

3 SCADA

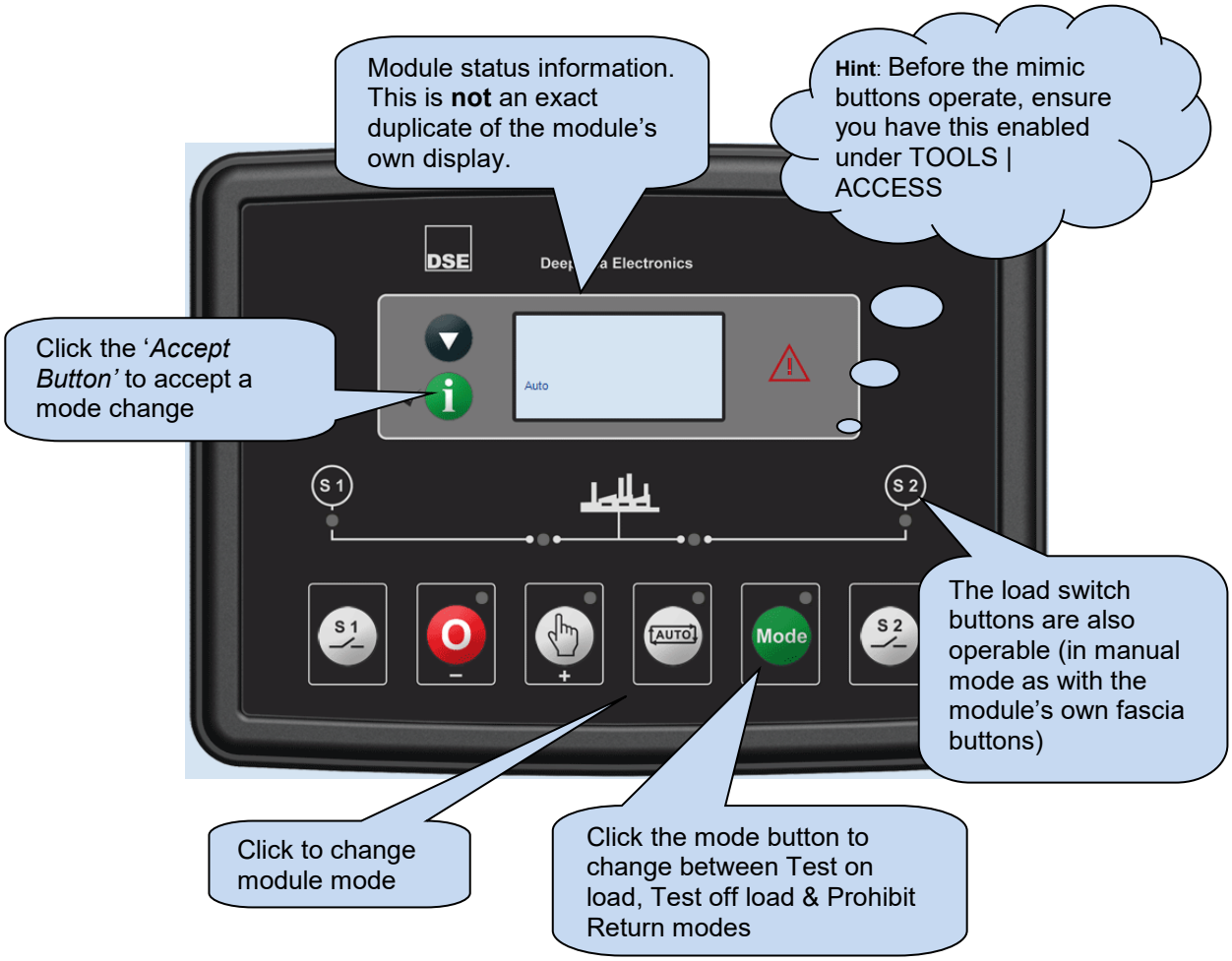
SCADA stands for **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition and is provided both as a service tool and also as a means of monitoring and control.
As a service tool, the SCADA pages is to check the operation of the controller's inputs and outputs as well as checking the system parameters.



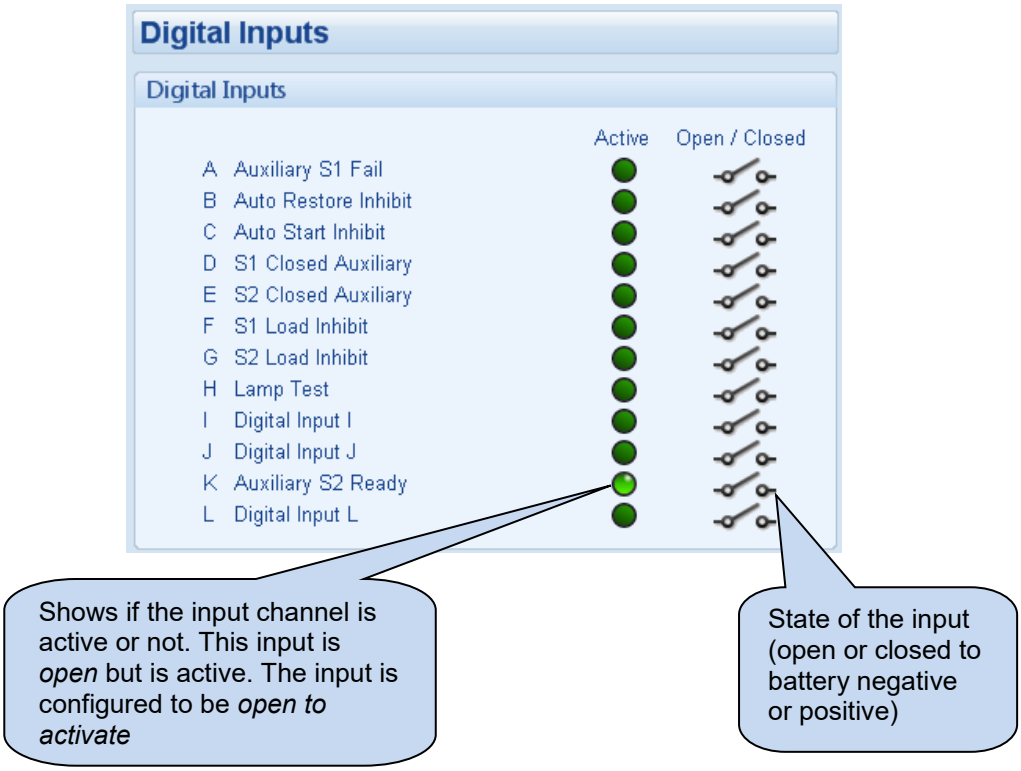
The *SCADA* page is subdivided into smaller sections.
Select the required section with the mouse.

3.1 MIMIC

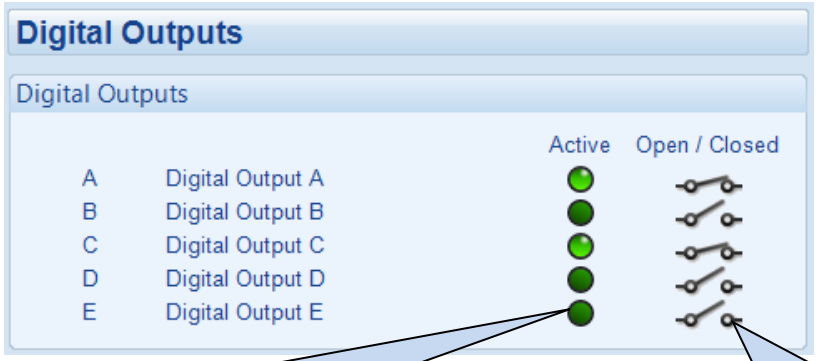
This screen provides a mimic of the control module and allows the operator to change the control mode of the module.
Only the mode control and load switch buttons are operational in the mimic display. The menu navigation buttons are inoperable.



3.2 DIGITAL INPUTS



3.3 DIGITAL OUTPUTS



Shows if the output channel is active or not. This output is *Close* but is active. The output is configured to be *Close S1 Output de-energise.* As relay is normally closed (N/C) and the *Close S1* source is present, the output is *activated* to *close* the N/C relay.

State of the output (open or closed)

3.4 S1

3.4.1 FREQUENCY AND VOLTAGE

Shows the modules measurements of the S1 *Frequency* and *Voltages*

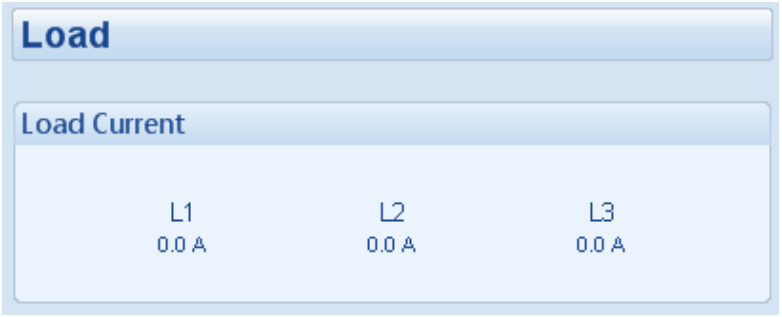
3.5 S2

3.5.1 FREQUENCY AND VOLTAGE

Shows the modules measurements of the S1 *Frequency* and *Voltages*

3.6 LOAD

Shows the measurement of the load current.

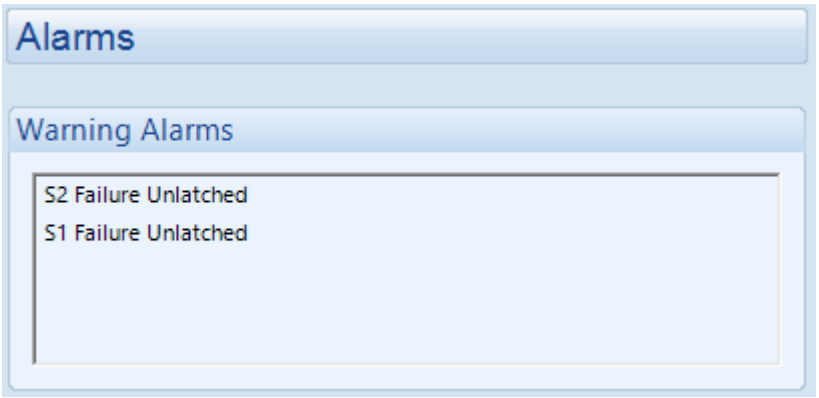


3.7 PLANT BATTERY

Shows the measurement of the plant battery

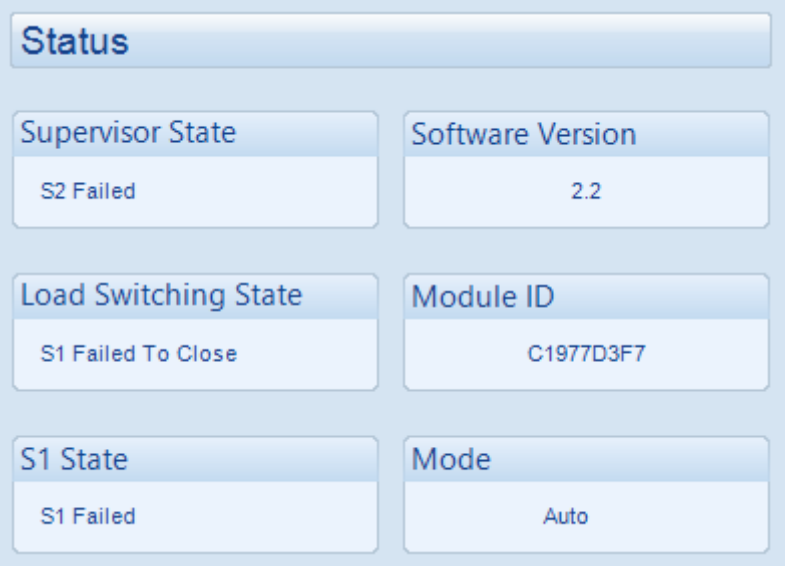
3.8 ALARMS

Shows any present alarm conditions.



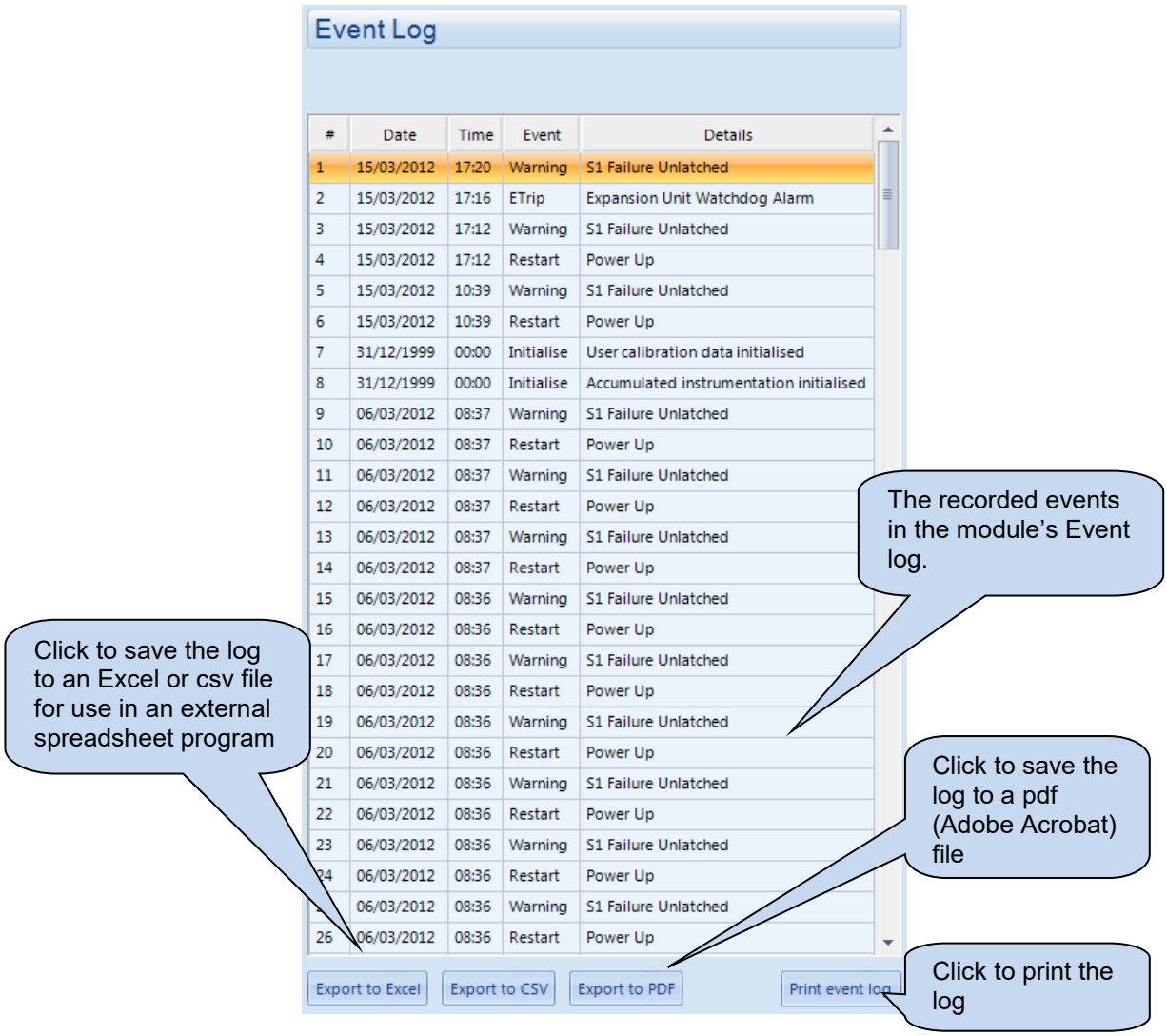
3.9 STATUS

Shows the module's current status.

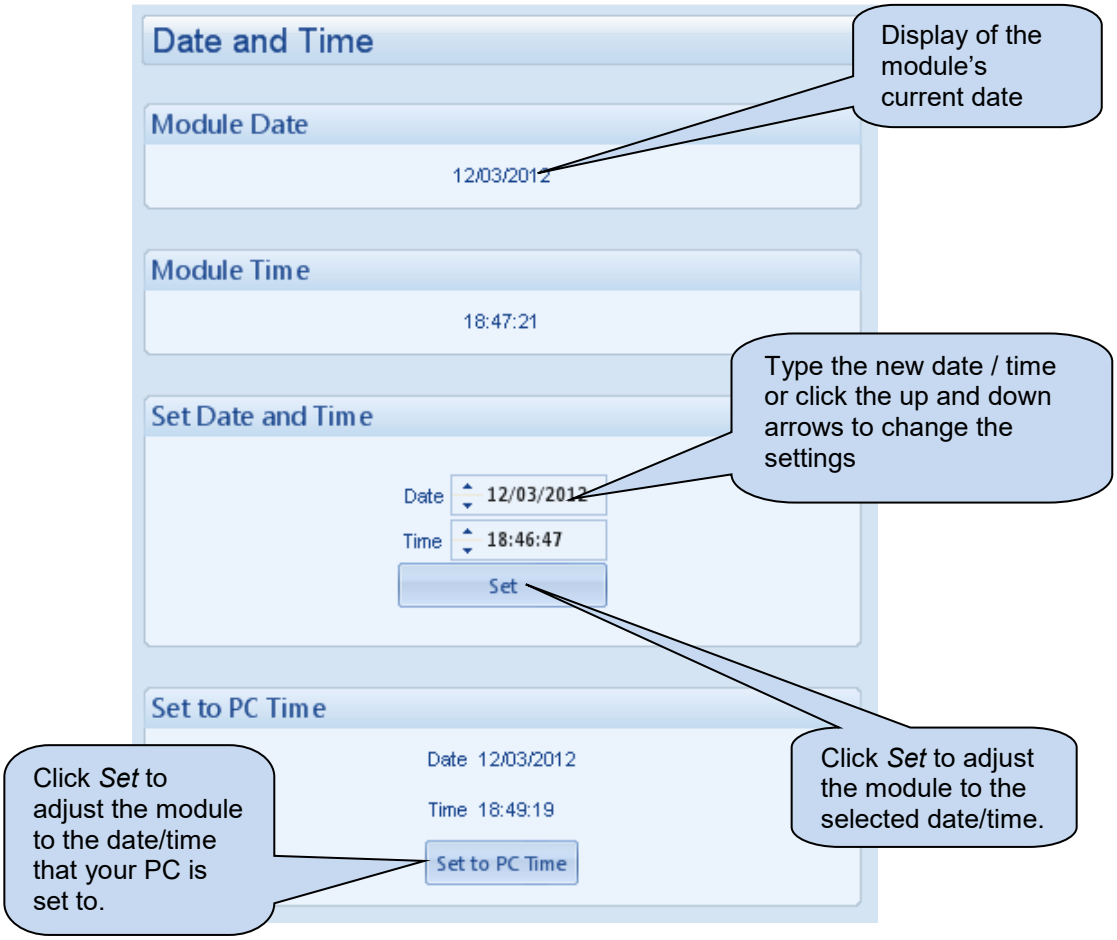


3.10 EVENT LOG

Shows the contents of the module's event log



3.11 TIME


Date and Time
Module Date
12/03/2012
Module Time
18:47:21
Set Date and Time
Date 12/03/2012
Time 18:46:47
Set
Set to PC Time
Date 12/03/2012
Time 18:49:19
Set to PC Time
Display of the module's current date
Type the new date / time or click the up and down arrows to change the settings
Click Set to adjust the module to the selected date/time.
Click Set to adjust the module to the date/time that your PC is set to.

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