



DEEP SEA ELECTRONICS PLC

DSE334 Configuration Suite Software Manual

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DSE334 Configuration Suite PC Software Manual

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Amendments List

Issue	Comments	Minimum Module version required	Minimum Configuration Suite Version required
1	Initial release	1	

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





	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.
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SAE	Society of Automotive Engineers (USA)

TABLE OF CONTENTS

1 BIBLIOGRAPHY 4

2 DESCRIPTION 5

3 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE 6

4 EDIT CONFIG 6

 4.1 SCREEN LAYOUT 6

 4.2 MODULE 8

 4.3 APPLICATION 9

 4.3.1 BREAKER SCHEME A 10

 4.3.2 BREAKER SCHEME B 11

 4.4 DIGITAL INPUTS 13

 4.4.1 INPUT FUNCTIONS 14

 4.5 DIGITAL OUTPUTS 16

 4.5.1 OUTPUT SOURCES 17

 4.6 TIMERS 19

 4.6.1 START TIMERS 19

 4.6.2 LOAD / STOPPING TIMERS 20

 4.6.3 MODULE TIMERS 20

 4.7 S2 21

 4.7.1 S2 OPTIONS 21

 4.7.2 S2 ALARMS 22

 4.8 LOAD CURRENT 22

 4.9 S1 23

 4.9.1 S1 OPTIONS 23

 4.9.2 S1 ALARMS 24

 4.10 PLANT BATTERY 25

 4.11 SCHEDULER 26

5 SCADA 27

 5.1 MIMIC 28

 5.2 DIGITAL INPUTS 29

 5.3 DIGITAL OUTPUTS 30

 5.4 S2 31

 5.5 S1 31

 5.6 LOAD 32

 5.7 PLANT BATTERY 32

 5.8 ALARMS 32

 5.9 STATUS 33

 5.10 EVENT LOG 33

 5.11 TIME 34

1 BIBLIOGRAPHY

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

DSE PART	DESCRIPTION
053-135	DSE334 Installation Instructions
057-154	DSE334 ATS Operators Manual
056-022	Breaker Control Training Guide

The following third party documents are also referred to:

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

2 DESCRIPTION

This manual covers the operation of the **DSE Configuration Suite** for DSE334 ATS module. Separate manuals cover the remaining DSE modules supported by the software.

The **DSE Configuration Suite** allows the DSE334 module to be connected to a PC via USB 'A –USB B' cable. Once connected the various operating parameters within the module can be viewed or edited as required by the engineer. This software allows easy controlled access to these values and also has diagnostic monitoring facilities.

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

The information contained in this manual should be read in conjunction with the information contained in the appropriate module documentation. This manual only details which settings are available and how they may be used.

A separate manual deals with the operation of the individual module (See section entitled *Bibliography* elsewhere in this document).

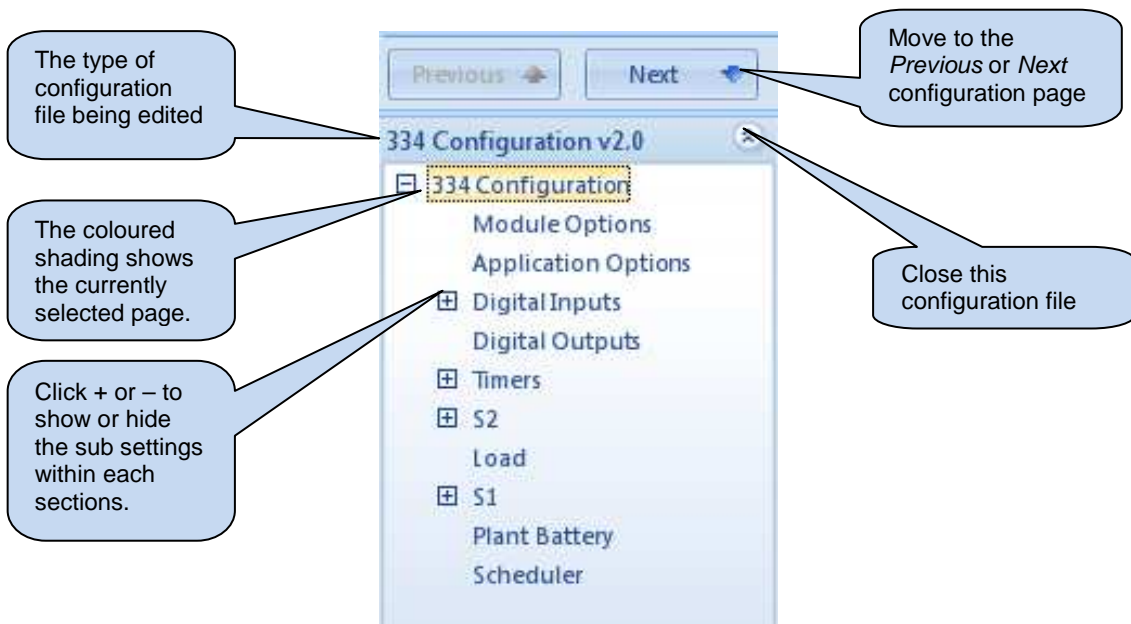
3 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

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

4 EDIT CONFIG

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

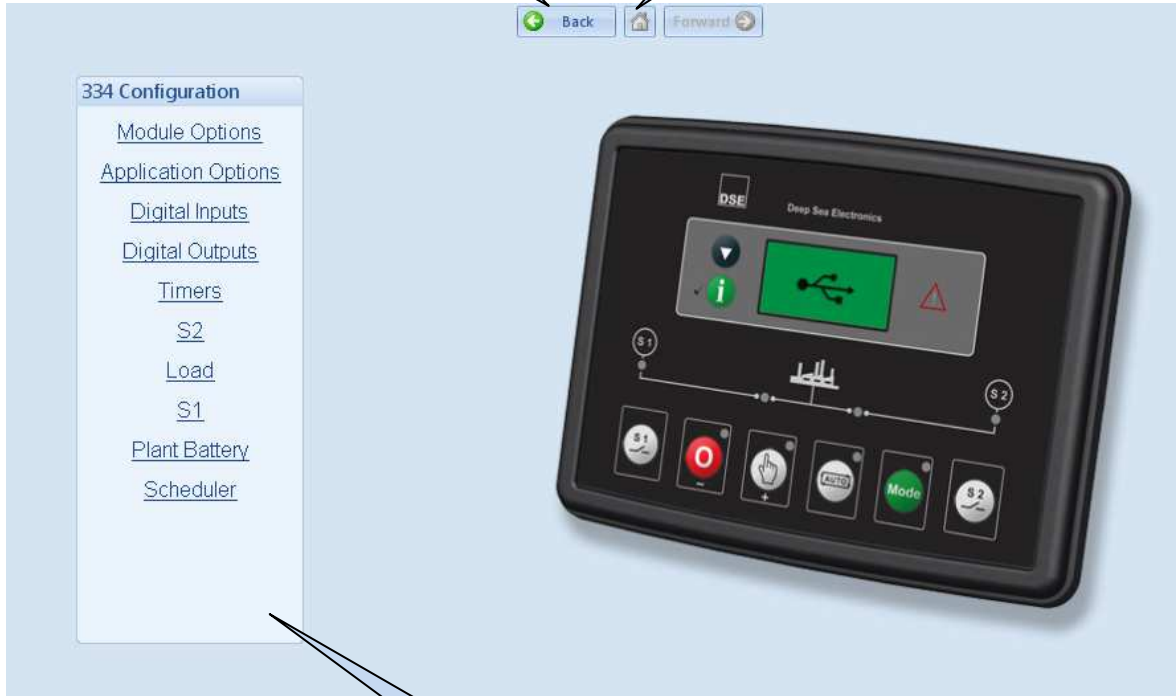
4.1 SCREEN LAYOUT



Edit Configuration

Step forward or backward through previously viewed

Click to return to this page at any time



Click to select the subsection to view / edit

4.2 MODULE

The screenshot shows the 'Module Options' configuration screen. It is divided into several sections:

- Description:** Two free entry boxes for configuration file descriptions. Callout: "Free entry boxes to allow the user to give the configuration file a description. Typically this is used to enter the job number, customer name, engineers name etc."
- S1:** Sensing terminals configuration. Includes 'Option' (Mains) and 'Phase display' (L1). Callout: "Allows the user to select the function of the module's sensing terminals for either a Mains or Generator supply."
- S2:** Sensing terminals configuration. Includes 'Option' (Generator) and 'Phase display' (L1). Callout: "Allows the user to select which phase the module's sensing is taken from."
- LCD Indicators:** Three rows for indicator configuration. Each row has a status dropdown (all set to 'Not Used'), a 'Lit' dropdown, and an 'LCD Description' text box. Callout: "Allows the user to select from a list of functions with the ability to display on the screen your own LCD description."
- Miscellaneous Options:** Includes checkboxes for 'Lamp test at power up', 'Power up in Auto', and 'Transfer by buttons', and a 'Display mode' dropdown (set to 'English').

Miscellaneous Options	
Lamp test at power up	<input type="checkbox"/> =Lamp test at power up is disabled. <input checked="" type="checkbox"/> =All module lamps illuminate when power is first applied.
Power Up in Auto	<input type="checkbox"/> =The module enters START INHIBIT mode when DC power is applied. <input checked="" type="checkbox"/> = The module enters AUTO mode when DC power is applied.
Transfer by buttons	<input type="checkbox"/> =Fascia load control buttons are disabled. <input checked="" type="checkbox"/> =Fascia load control buttons are enabled when the module is in Manual Mode.
Latched Alarms	<input type="checkbox"/> = Normal Operation, the warnings and pre-alarms will automatically reset once the triggering condition has cleared. <input checked="" type="checkbox"/> = Warnings and pre-alarms latch when triggered. Resetting the alarm is performed by either an external reset applied to one of the inputs.
Test Mode	On Load = The module will place the S2 supply on load when the test mode is initiated. Off Load = The module will give start S2 if configured as a generator and run off load when the test mode is initiated.
Display Mode	English = The module's display will be in the English language. Icon = The module's display will be icon based.

4.3 APPLICATION

Application

Application Options

Breaker Type Scheme A ▾

Check Sync


Return to Programmed Transition

Elevator Post Transfer

Application Options	
Breaker type	See overleaf for description of the <i>Breaker Type</i> .
Check Sync	This option is only available when <i>Scheme B</i> is selected. See overleaf for description of the <i>Check Sync</i> options <input type="checkbox"/> = None check sync operation <input checked="" type="checkbox"/> = During load transfer, the module will only close its breaker within the check sync window. See overleaf for description of the <i>Check Sync</i> options.
Return to programmed transition	This option is only available when <i>Check Sync</i> is enabled. See overleaf for description of the <i>Check Sync</i> options <input type="checkbox"/> = Normal operation <input checked="" type="checkbox"/> = During load transfer if the <i>check sync</i> of the supplies does not occur within two minutes, a 'break' or 'open transition' transfer will occur.
Elevator Post Transfer	<input type="checkbox"/> = Normal operation <input checked="" type="checkbox"/> = Any configurable output set to <i>elevator control</i> remains active for the duration of the <i>elevator delay</i> after a load transfer has taken place.

4.3.1 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**

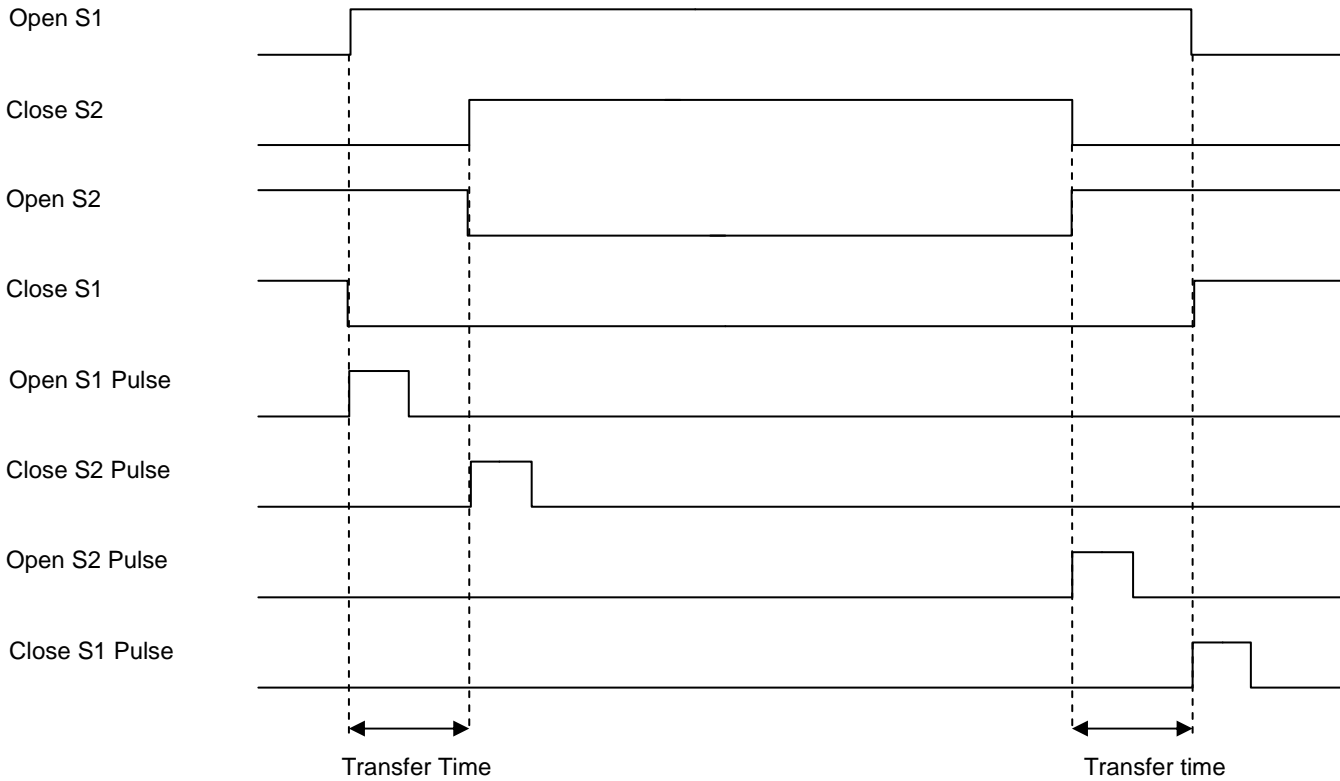
4.3.1.1 S1 / S2 LOAD INHIBIT

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 will occur. When the input is deactivated the breaker is closed again if appropriate.

4.3.1.2 LOAD SHEDDING

If an input configured to Load Shed is activated, outputs set to Open S1 and Open S2 will energise, and inputs configured to Close S1 and Close S2 will de-energise. Open S1 Pulse and Open S2 Pulse outputs will only energise if the corresponding supply was on load before application of the Load Shed input. When the Load Shed input is deactivated, the load will be transferred back to the supply that was disconnected before application of the input.

4.3.1.3 TIMING DIAGRAM



4.3.2 BREAKER SCHEME B

Breaker Scheme B is intended only for use with certain designs of transfer switch. If you are using contactors, you MUST select Breaker Scheme A.

4.3.2.1 CHECK SYNCHRONISING IS DISABLED

4.3.2.1.1 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.

4.3.2.1.2 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

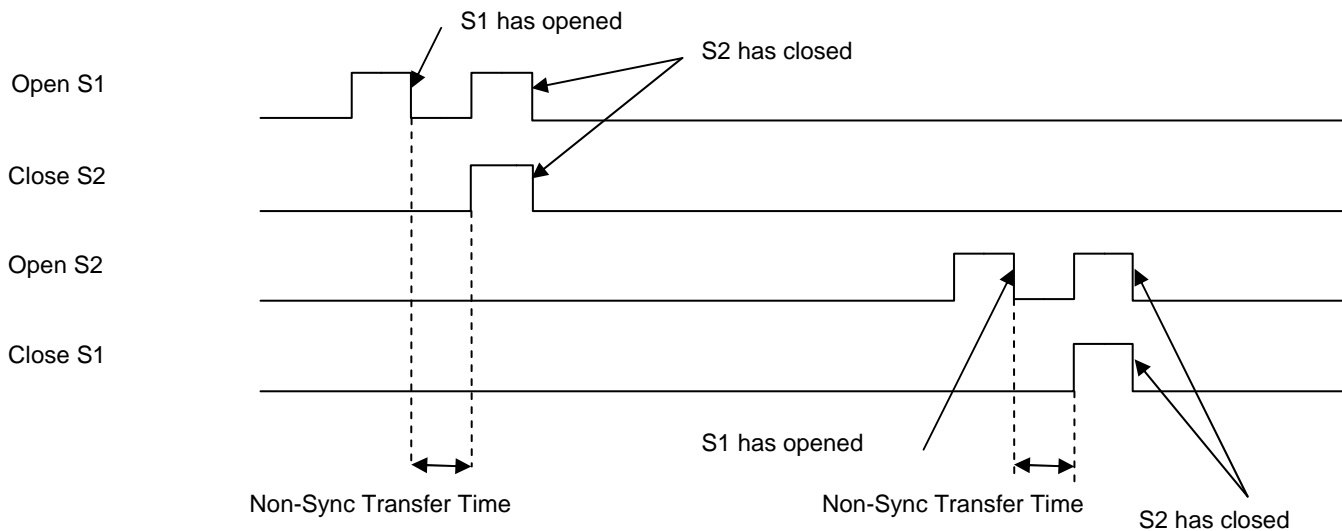
4.3.2.1.3 LOAD SHED INPUT

When the *Load Shed* 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 *Load Shed* 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 *Load shed* input is de-energised the load will be returned to the supply that was disconnected, providing that supply is healthy.

4.3.2.1.4 TIMING DIAGRAM



4.3.2.2 CHECK SYNCHRONISING 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.

4.3.2.2.1 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.

4.3.2.2.2 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.

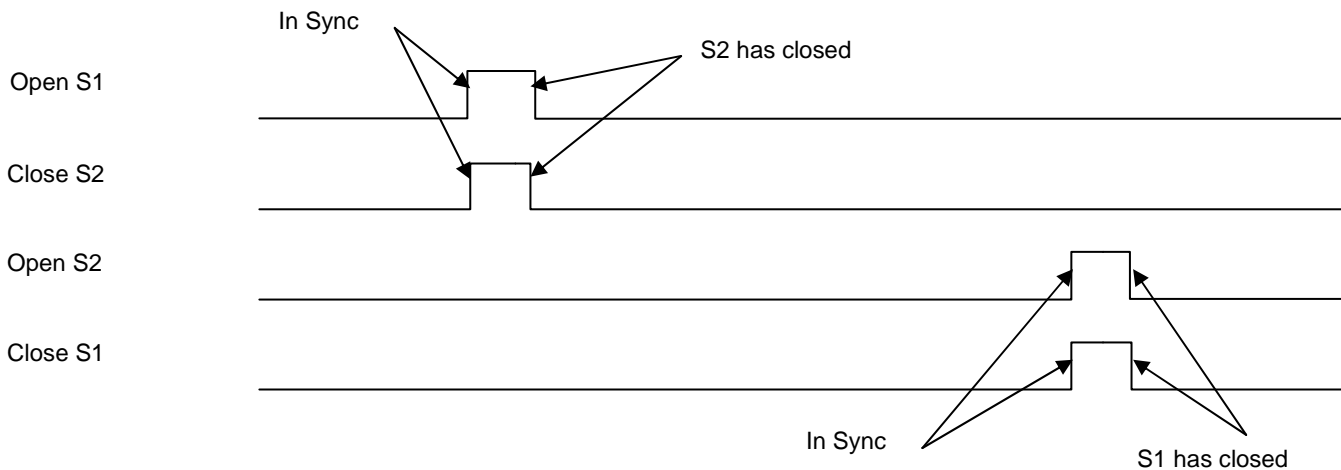
4.3.2.2.3 LOAD SHED INPUT

When the *Load Shed* 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 *Load Shed* 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 *Load shed* input is de-energised the load will be returned to the supply that was disconnected, providing that supply is healthy.

4.3.2.2.4 TIMING DIAGRAM



4.4 DIGITAL INPUTS

The screenshot shows a configuration window titled "Digital Inputs" with four sections: Digital Input A, Digital Input B, Digital Input C, and Digital Input D. Each section contains two dropdown menus: "Function" and "Polarity".

Input	Function	Polarity
Digital Input A	S1 Closed Auxiliary	Close to Activate
Digital Input B	S2 Closed Auxiliary	Close to Activate
Digital Input C	Auxiliary S2 Ready	Open to Activate
Digital Input D	Lamp Test	Close to Activate



Callout 1 (pointing to the Function dropdown of Digital Input A): Input function. See section entitled *Input functions* for details of all available functions

Callout 2 (pointing to the Polarity dropdown of Digital Input A): Close or open to activate

4.4.1 INPUT FUNCTIONS

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

Function	Description
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 the generator.
Auto Restore Inhibit IEEE 37.2 - 3 checking or interlocking relay	In the event of a remote start/S1 failure, S2 will be instructed to start and take load. On removal of the remote start signal/S1 return the module will continue to run S2 on load until the <i>Auto Restore Inhibit</i> input is removed. This input allows the controller to be fitted as part of a system where the restoration to 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 will not give a start command to the S2. If this input signal is then removed, the controller will operate as if a remote start/S1 failure has occurred, starting and loading S2. This function can be used to give an 'AND' function so that S2 will only be 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 will be 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 will monitor 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 will operate as if the incoming S1 supply has fallen outside of limits, S2 will be instructed to start and take the load. Removal of the input signal will cause 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 ATS controller that S2 is healthy and available to take load. The ATS 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 will 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 will still be able to view the various instrumentation pages etc. (<i>Front panel configuration access is still possible while the system lock is active</i>).
Inhibit Scheduled Run IEEE 37.2 - 3 checking or interlocking relay	This input is used to provide a means of disabling a scheduled run.
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 will illuminate.
Load Shedding	Opens both the S1 and S2 load switch devices. See the section entitled <i>Breaker Scheme</i> for details of how this input interacts with the load switching control.
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.

Function	Description
Remote Start off load	If this input is active, operation will be similar to the 'Remote Start on load' function except that S2 will not be instructed to take the load. This function can be used where an engine only run is required e.g. for exercise.
Remote Start on load	When in auto mode, the module will perform the start sequence and transfer load to S2. In Manual mode, the load will be transferred to S2 if the supply is already healthy, however in manual mode, this input will 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 300 to give true indication of the contactor or circuit breaker switching status. It should 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.
S1 Load Inhibit IEEE 37.2 - 3 checking or interlocking relay	This input is used to prevent the 300 from loading the S1 supply. If the S1 supply is already on load activating this input will cause the 300 to unload the S1 supply. Removing the input will allow S1 to be loaded again.  NOTE: -This input only operates to control the S1 switching device if the 300 load switching logic is attempting to load to S1. It will <u>not</u> control the S1 switching device when S2 is on load.
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 should 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.
S2 Load Inhibit IEEE 37.2 - 52 AC circuit breaker	This input is used to prevent the controller from loading S2. If S2 is already on load, activating this input will cause the controller to unload S2. Removing the input will allow S2 to be loaded again.  NOTE: -This input only operates to control the S2 switching device if the 300 load switching logic is attempting to load S2. It will not control the S2 switching device when the S1 supply is on load.
Simulate S1 available	This function is provided to override the module's internal monitoring function. If this input is active, the module will not respond to the state of the incoming AC S1 supply.
Simulate S2 available	This function is provided to override the module's internal monitoring function. If this input is active, the module will not respond to the state of the incoming AC S2 supply.

4.5 DIGITAL OUTPUTS

The screenshot shows a configuration window titled "Digital Outputs" with a sub-section "Relay Outputs (Volt Free)". It contains a table with two columns: "Source" and "Polarity". The table lists five outputs (A through E) with their respective source and polarity settings. Callouts provide instructions: "Select what the output is to be used to control" points to the Source column, "Select if the relay is to energise or de-energise upon activation of the source" points to the Polarity column, and "These labels match the typical wiring diagram" points to the output labels.

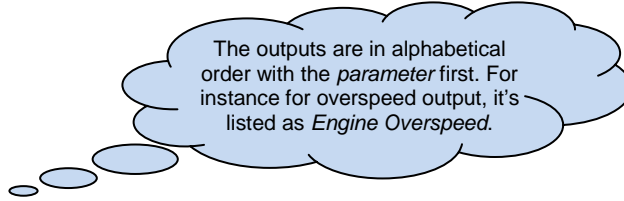
	Source	Polarity
Output A (N/C)	Close S1 Output	De-Energise
Output B (N/O)	Close S2 Output	Energise
Output C (N/C)	Start and Run S2	De-Energise
Output D (C/O)	Not Used	Energise
Output E (N/O)	Not Used	Energise

The list of output sources available for configuration of the module outputs is listed in the section entitled *Output Sources*.

4.5.1 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 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.



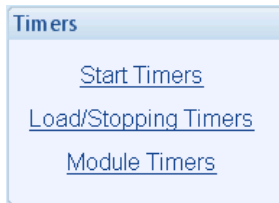
Output source	Activates...	Is not active....
Not Used	The output will not change state (Unused)	
Audible Alarm IEEE 37.2 – 74 alarm relay	This output indicates that the internal sounder is operating to allow it to feed an external sounder. Operation of the Mute pushbutton will reset this output once activated.	Inactive if the internal sounder is not operating.
Battery High Voltage IEEE 37.2 – 59DC 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 – 27DC under voltage relay	This output indicates that a Battery Under Voltage alarm has occurred.	Inactive when battery voltage is not Low
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 will be 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 will be active for the duration of the Breaker Close Pulse timer, after which it will become inactive again.	
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 will be 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 will be active for the duration of the Breaker Close Pulse timer, after which it will become inactive again.	
Close to Neutral 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 will be active.	The output is inactive when S1 or S2 are required to be on load
Close to Neutral 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 will be active for the duration of the Breaker Close Pulse timer, after which it will become inactive again.	
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 present
Cooling Down	Active when the Cooling timer is in progress	The output is inactive at all other times
Digital Input A - D	Active when the digital input is active	Inactive when : <ul style="list-style-type: none"> • If the input is not active • If the input is active but conditioned by activation delay, safety timer or Arming requirements.
Elevator Control	Active during the <i>elevator delay</i> time before a load transfer takes place and remains active for the duration of the <i>elevator delay</i> after a transfer takes place (when <i>elevator post transfer</i> is enabled.	Inactive at all other times
Fail to Reach Loading Frequency	Active when S2 has failed to reach the loading frequency after the 'Safety on Delay' timer.	
Fail to Reach Loading Voltage	Active when S2 has failed to reach the loading voltage after the 'Safety on Delay' timer.	
Fail to Start IEEE 37.2 - 48 Incomplete Sequence Relay	Becomes active if S2 is not seen to be running after the configurable number of start attempts.	
Fail to Stop IEEE 37.2 - 48 Incomplete Sequence Relay	If S2 is still running a configurable amount of time after it has been given the stop command, the output will become active. This is the <i>Fail to stop</i> timer.	

Edit Configuration - Digital Outputs

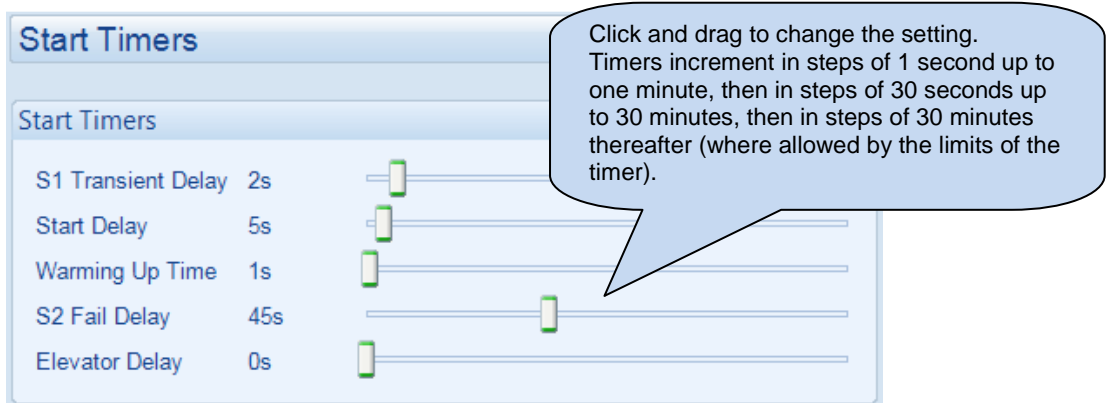
Output source	Activates...	Is not active...
Open S1 Output IEEE 37.2 – 52 ac circuit breaker	Used to control the load switching device. Whenever the module selects S1 to be off load this control source will be active.	The output is inactive whenever S1 is required to be on load
Open S1 Output Pulse IEEE 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 will be active for the duration of the Breaker Open Pulse timer, after which it will become 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 will be active.	Inactive whenever S2 is required to be on load
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 will be active for the duration of the Breaker Open Pulse timer, after which it will become inactive again.	
Return Delay in Progress	Indicates that S2 is on load, and S1 is available, during the <i>return delay</i> timers.	
S1 Failure Latched	Activates when the S1 failure alarm is active. Reset by digital input configured to <i>Alarm Reset</i>	
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 <i>S1 Load Inhibit</i> 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	Activates when S2 becomes available. Ignores alarm conditions and the <i>S2 transient delay</i>	
S2 Failure Latched	Activates when the S2 failure alarm is active. Reset by digital input configured to <i>Alarm Reset</i>	
S2 Failure Unlatched	Activates when the S2 failure alarm is active. Reset automatically when S1 becomes available	
S2 In Limits	Activates when the S2 becomes available, is within configured limits and the <i>Auxiliary S2 Ready</i> input is active.	
S2 Load Inhibited	Indicates that an input configured to <i>S2 Load Inhibit</i> 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 <i>S2 transient delay</i>	
Scheduled Run	Active when the controller is requesting the set to run under control of the inbuilt <i>Scheduler</i> .	
Start and Run S2	Active when the controller has requested for S2 to start and run.	
Start Delay in Progress	Active when the controller is in the <i>start delay</i> timer, after which the set will be 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 <i>Prohibit Return Mode</i>	
System in Stop Mode	Active when unit is in <i>Stop Mode</i>	
System in Test Off-Load Mode	Active when unit is in <i>Test Off-Load Mode</i>	
System in Test On-Load Mode	Active when unit is in <i>Test On-Load Mode</i>	
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 can be used to signal to an operator that action is required before the set can transfer 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.	

4.6 TIMERS

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



4.6.1 START TIMERS



Timer	Description
S1 Transient Delay	Used to delay the detection of S1 failure. This is normally used to prevent short term transients or <i>brownout</i> 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 S1 failures.
Warming Up Time	The amount of time that the set will run 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 <i>S2 failure</i> alarm is triggered.
Elevator Delay	Use to delay the <i>elevator control</i> output before and after load transfer takes place. See section entitled <i>Application</i> for details of <i>elevator control</i> .

4.6.2 LOAD / STOPPING TIMERS

Load/Stopping Timers

Load Timers

- Non-sync Transfer Time: 0.7s
- Check-sync Transfer Time: 0.2s
- Breaker Close Pulse: 0.5s
- Breaker Trip Pulse: 0.5s

Stopping Timers

- Return Delay: 30s
- Cooling Time: 1m
- S2 Transient Delay: 0.0s

Fail to Stop

- Enable:
- Fail to Stop Delay: 30s

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

Timer	Description
Transfer Time	The time between S2 load switch being opened and the S1 load switch being closed (or vice versa). Used to give time for the load switches to move to their correct positions and to prevent the mechanical interlock from "jamming". This timer can also be 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).
Breaker close pulse	The amount of time that <i>Breaker Close Pulse</i> signals will be present when the request to close a breaker is given.
Breaker Trip pulse	The amount of time that <i>Breaker Open Pulse</i> signals will be present when the request to open a breaker is given.
Return delay	A delay, used in auto mode only, that allows for short term removal of the request to stop the set before action is taken. This is usually used to ensure the set remains on load before accepting that the start request has been removed.
Cooling time	The amount of time that the set will be made to run OFF LOAD before being stopped. This is to allow the set to cool down and is particularly important for engines with turbo chargers.
S2 Transient Delay	Used to delay the S2 source under/over volts/frequency alarms. Typically this is used to prevent spurious alarms caused by large changes in load levels.
Fail to Stop Delay	If the set is called to stop and is still running after the <i>fail to stop</i> delay, a <i>Fail to Stop</i> alarm is generated.

4.6.3 MODULE TIMERS

Module Timers

Interface Timers

- LCD Page Timer: 5m
- LCD Scroll Timer: 5s

Timer	Description
LCD Page timer	If the module is left unattended for the duration of the <i>LCD Page Timer</i> it will revert to show the <i>Status</i> page.
LCD Scroll Timer	The scroll time between parameters on a selected page

4.7 S2

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



4.7.1 S2 OPTIONS

Parameter	Description
Immediate S2 Dropout	<input type="checkbox"/> = Upon S2 failure, the S2 load switch will be kept closed until the S1 is up to frequency and voltage. <input checked="" type="checkbox"/> = Upon S2 failure, the S2 load switch will be opened immediately, subject to the setting of the S2 <i>Transient Timer</i> .
AC System	These settings are used to detail the type of AC system to which the module is connected: 3 phase 4 wire 1 phase 2 wire 2 phase 3 wire – L1-L2 2 phase 3 wire – L1-L3 3 phase 3 wire 3 phase 4 wire delta This list is not exhaustive. DSE reserve the right to add to this list as part of our policy of continual development

4.7.2 S2 ALARMS

The screenshot shows the 'S2 Alarms' configuration window, divided into 'Voltage Alarms' and 'Frequency Alarms' sections. Each section has checkboxes to enable or disable specific alarm types (Under Voltage, Over Voltage, Under Frequency, Over Frequency) and their corresponding trip values. The trip values are displayed in input boxes and can also be adjusted using sliders. Callouts provide instructions: 'Click to enable or disable the alarms. The relevant values below will appear greyed out if the alarm is disabled.' points to the checkboxes; 'Type the value or click the up and down arrows to change the settings' points to the input boxes; and 'Click and drag to change the setting.' points to the sliders.

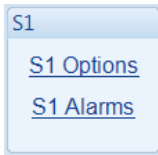
Alarm	IEEE designation
S2 Under voltage	IEEE 37.2 - 27AC Undervoltage relay
S2 Loading Voltage	The S2 supply will not be permitted to take load until the <i>loading voltage</i> and <i>loading frequency</i> have been reached.
S2 Under Frequency	IEEE 37.2 -81 Frequency relay
S2 Loading Frequency	The S2 supply not be permitted to take load until the <i>loading voltage</i> and <i>loading frequency</i> have been reached.

4.8 LOAD CURRENT

The screenshot shows the 'Load Current' configuration window, specifically the 'Load Current Options' section. It features a checkbox for 'Enable CT Support' which is checked. Below it are two rows for 'CT Primary (L1,L2,L3)' and 'Full Load Rating', each with a numerical input box (600 and 500 respectively) and a slider control. A callout points to the 'Enable CT Support' checkbox with the text 'Click to enable current reading'.

4.9 S1

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



4.9.1 S1 OPTIONS

The screenshot shows the 'S1 Options' configuration page. At the top, there is a title 'S1 Options' and a sub-title 'S1 Options'. Below this, there is a checkbox labeled 'Immediate S1 Dropout' which is currently checked. Underneath the checkbox is a dropdown menu labeled 'AC System' with the value '3 Phase, 4 Wire' selected. Below the dropdown is a schematic diagram of a three-phase, four-wire system. The diagram shows three phase lines labeled L1, L2, and L3 (W) connected to a central neutral line labeled N. The phase lines are connected to terminals 15, 16, and 17 respectively, and the neutral line is connected to terminal 18. Two callout boxes are present: one pointing to the 'Immediate S1 Dropout' checkbox with the text 'If three phase loads are present, it is usually desirable to set this parameter to to enable *Immediate S1 Dropout*.' and another pointing to the 'AC System' dropdown with the text 'This is 'read only' for information purposes. The AC system is configured in the 'S1 Options' page.'

Parameter	Description
Immediate S2 Dropout	<input type="checkbox"/> = Upon S1 failure, the S1 load switch will be kept closed until the S2 is up to frequency and voltage. <input checked="" type="checkbox"/> = Upon S1 failure, the S1 load switch will be opened immediately, subject to the setting of the <i>S1 Transient Timer</i> .
AC System	This is 'read only' for information purposes. The AC system is configured in the ' <i>S1 Options</i> ' page.

4.9.2 S1 ALARMS

The screenshot displays the 'S1 Alarms' configuration window, divided into 'Voltage Alarms' and 'Frequency Alarms' sections. Each section contains checkboxes for enabling/disabling alarms and sliders for setting trip and return values. Callouts provide instructions: 'Click to enable or disable the alarms. The relevant values below will appear greyed out if the alarm is disabled.' points to the checkboxes; 'Type the value or click the up and down arrows to change the settings' points to the input fields; and 'Click and drag to change the setting.' points to the sliders.

Voltage Alarms

- Undervolts** (checked):
 - Trip: 184 v PhN
 - Return: 207 v PhN
- Overvolts** (checked):
 - Return: 253 v PhN
 - Trip: 276 v PhN

Frequency Alarms

- Under Freq.** (checked):
 - Trip: 45.0 Hz
 - Return: 48.0 Hz
- Over Freq.** (checked):
 - Return: 52.0 Hz
 - Trip: 55.0 Hz

Alarm	IEEE designation
S1 Under voltage	IEEE 37.2 - 27AC Undervoltage relay
S1 Over voltage	IEEE 37.2 - 27AC Undervoltage relay
S1 Under Frequency	IEEE 37.2 -81 Frequency relay
S1 Over Frequency	IEEE 37.2 -81 Frequency relay

4.10 PLANT BATTERY

Plant Battery

Voltage Alarms

Undervolts

Warning VDC

Return VDC

Delay

Overvolts

Return VDC

Warning VDC

Delay

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

Click and drag to change the setting.

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

Alarm	IEEE designation
Plant Battery Undervolts	IEEE 37.2 -27 DC Undervoltage relay
Plant Battery Overvolts	IEEE 37.2 -59 DC Overvoltage relay

4.11 SCHEDULER

The scheduler is used to automatically start S2 at a configured day and time and run for the set duration. The S2 supply made to run *on load* or *off load* depending upon the configuration :

The screenshot shows the 'Scheduler' configuration page, specifically the 'Exercise Scheduler' section. It is currently set to 'Enabled'. Below this, there are two main sections: 'Bank 1' and 'Bank 2'. Each bank has a 'Run Mode' dropdown set to 'Off Load' and a 'Schedule Period' dropdown set to 'Weekly'. Below these are two tables, one for each bank, with columns for 'Week', 'Day', 'Start Time', and 'Duration'. Each row in the tables has a 'Clear' button. Callouts provide instructions: 'Click to enable or disable the option. The relevant values below will appear greyed out if the alarm is disabled.' points to the 'Enabled' checkbox; 'Configure Off Load or On Load' points to the 'Run Mode' dropdown; 'Configure the required start time and run duration.' points to the 'Start Time' and 'Duration' columns; and 'Select Weekly or Monthly' points to the 'Schedule Period' dropdown.

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

Configure Off Load or On Load

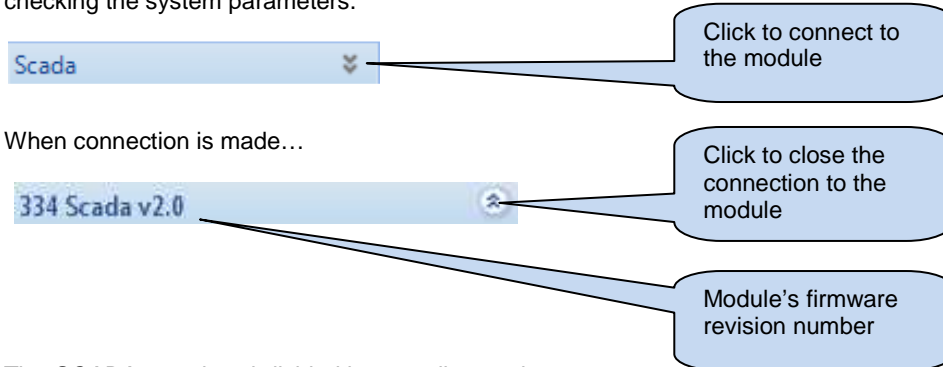
Configure the required start time and run duration.

Select Weekly or Monthly

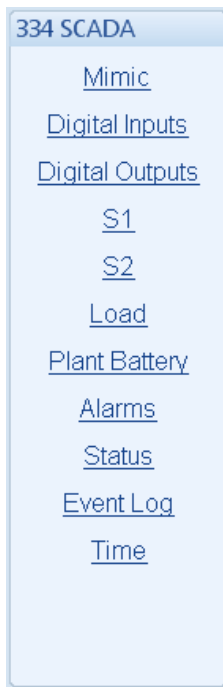
5 SCADA

SCADA stands for **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition and is provided both as a service tool and also as a means of monitoring / controlling the ATS.

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.



5.1 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.

Module status information. This is **not** an exact duplicate of the module's own display.

Click the 'Accept Button' to accept a mode change

Hint: Before the mimic buttons will operate, ensure you have this enabled under TOOLS | ACCESS PERMISSIONS

Click the mode button to change module mode. The load switch buttons are also operable (in manual mode as with the module's own fascia buttons)

5.2 DIGITAL INPUTS

The image shows a SCADA interface for Digital Inputs. It features a table with two columns: 'Active' (indicated by green circles) and 'Open / Closed' (indicated by switch icons). Callouts provide detailed explanations for the active status and configuration of the inputs.

Label	Active	Open / Closed
A Auxiliary S1 Fail	●	⏏
B Auto Restore Inhibit	●	⏏
C Auto Start Inhibit	●	⏏
D S1 Closed Auxiliary	●	⏏
E S2 Closed Auxiliary	●	⏏
F S1 Load Inhibit	●	⏏
G S2 Load Inhibit	●	⏏
H Lamp Test	●	⏏
I Digital Input I	●	⏏
J Digital Input J	●	⏏
K Auxiliary S2 Ready	●	⏏

Callout 1 (top): Shows if the input channel is active or not. This input is *open* but is active. The input is configured to be *open to activate*

Callout 2 (right): State of the input (open or closed to battery negative)

Callout 3 (bottom): Shows if the input channel is active or not. This input is *closed* and is active. The input is configured to be *close to activate*

5.3 DIGITAL OUTPUTS

Digital Outputs		Active	Open / Closed
A	Close S1 Output		
B	Close S2 Output		
C	Start and Run S2		
D	Not Used		
E	Not Used		

Shows if the output channel is active or not, The Output C is NC (normally closed) De-energised Volts free contact. When controller energises the source will operate the output C volts free contact.

State of the output (open or closed)

5.4 S2

Shows the modules measurements of the S2 supply

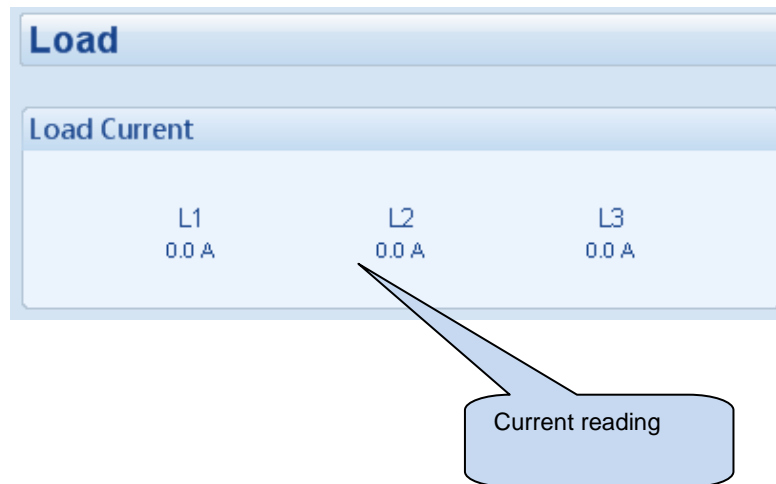
S2		
Frequency		
50.1 Hz		
Phase to Neutral Voltages		
L1 - N 230.0 v	L2 - N 230.6 v	L3 - N 230.8 v
Phase to Phase Voltages		
L1 - L2 397.2 v	L2 - L3 398.7 v	L3 - L1 401.2 v

5.5 S1

Shows the modules measurements of the S1 supply

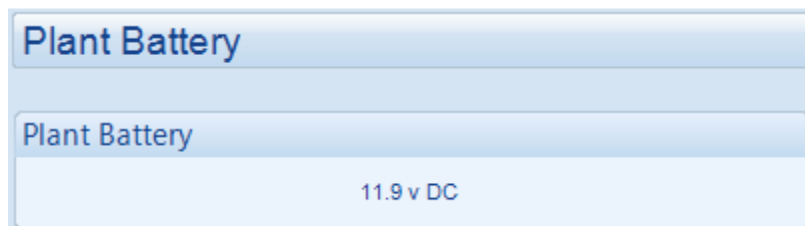
S1		
Frequency		
50.0 Hz		
Phase to Neutral Voltages		
L1 - N 230.6 v	L2 - N 232.9 v	L3 - N 233.0 v
Phase to Phase Voltages		
L1 - L2 400.6 v	L2 - L3 402.9 v	L3 - L1 403.4 v

5.6 LOAD



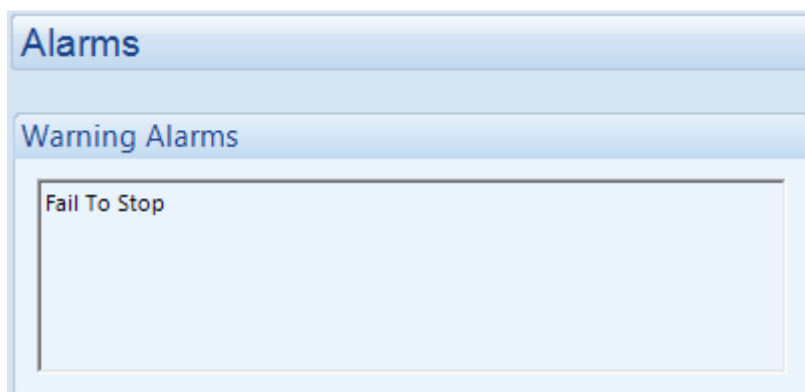
5.7 PLANT BATTERY

Shows the measurement of the plant battery



5.8 ALARMS

Shows any present alarm conditions.



5.9 STATUS

Shows the module's current status.

Status

<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Supervisor State</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">No Start Request</div>	<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Software Version</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">2.0</div>
<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Load Switching State</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">S1 Closed</div>	<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Module ID</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">215BC4820</div>
<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">S1 State</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">S1 Healthy</div>	<div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 2px; margin-bottom: 5px;">Mode</div> <div style="background-color: #e6f2ff; border: 1px solid #ccc; padding: 5px; text-align: center;">Start Inhibit</div>

5.10 EVENT LOG

Event Log

#	Date	Time	Event	Details
1	05/11/2011	09:53	S1 Fail	S1 Fail
2	05/11/2011	09:53	Restart	Power Up
3	05/11/2011	08:08	S1 Fail	S1 Fail
4	05/11/2011	08:08	Restart	Power Up
5	05/11/2011	07:37	S1 Fail	S1 Fail
6	05/11/2011	07:37	Restart	Power Up
7	04/11/2011	18:01	S1 Fail	S1 Fail
8	04/11/2011	18:01	Restart	Power Up
9	04/11/2011	17:48	S1 Fail	S1 Fail
10	04/11/2011	17:48	Restart	Power Up

5.11 DAY AND TIME

The screenshot displays a web-based interface for configuring the day and time of a module. It is organized into four main sections:

- Day and Time**: The overall title of the configuration page.
- Module Day**: Shows the current day as "Monday".
- Module Time**: Shows the current time as "01:19:43".
- Set Day and Time**: A configuration area with two dropdown menus. The "Day" dropdown is set to "Monday" and the "Time" dropdown is set to "01:19:01". Below these is a "Set" button.
- Set to PC Time**: Shows the current PC time as "Day Monday" and "Time 16:16:33". Below this is a "Set to PC Time" button.

Callout boxes provide the following instructions:

- One callout points to the "Module Day" and "Module Time" fields, stating: "Display of the module's current date and time".
- Another callout points to the "Set Day and Time" dropdowns, stating: "Type the new date / time or click the up and down arrows to change the settings".
- A third callout points to the "Set" button in the "Set Day and Time" section, stating: "Click Set to adjust the module to the selected date/time.".
- A fourth callout points to the "Set to PC Time" button, stating: "Click Set to adjust the module to the date/time that your PC is set to.".

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