DEEP SEA ELECTRONICS

DSE BC2410Ei Configuration Suite
PC Software Manual

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DSE BC2410Ei Configuration Suite PC Software Manual

Amendments Since Last Publication

Issue No.	Comments
1	Initial release

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

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SECTION PAGE

1 INTRODUCTION

This document details the use of the *DSE Configuration Suite PC Software* with the DSE BC2410Ei module, which is part of the DSEPower® 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 DSE BC2410Ei 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
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.
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
053-154	DSE2541 Installation Instructions
053-251	DSE BC2410Ei 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
N/A	DSEGencomm (MODBUS Protocol for DSE Products)
057-151	DSE Configuration Suite PC Software Installation & Operation Manual
057-220	Options for Communications with DSE Controllers
057-277	DSE2541 Operator Manual
057-316	DSE BC2410Ei Operator Manual

1.3.3 TRAINING GUIDES

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

DSE Part	Description
056-006	Introduction to Comms
056-030	Module PIN Codes
056-036	DSE Module Expansion
056-069	Firmware Update
056-076	Reading DSEGencomm Alarms
056-079	Reading DSEGencomm Status
056-080	MODBUS

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.

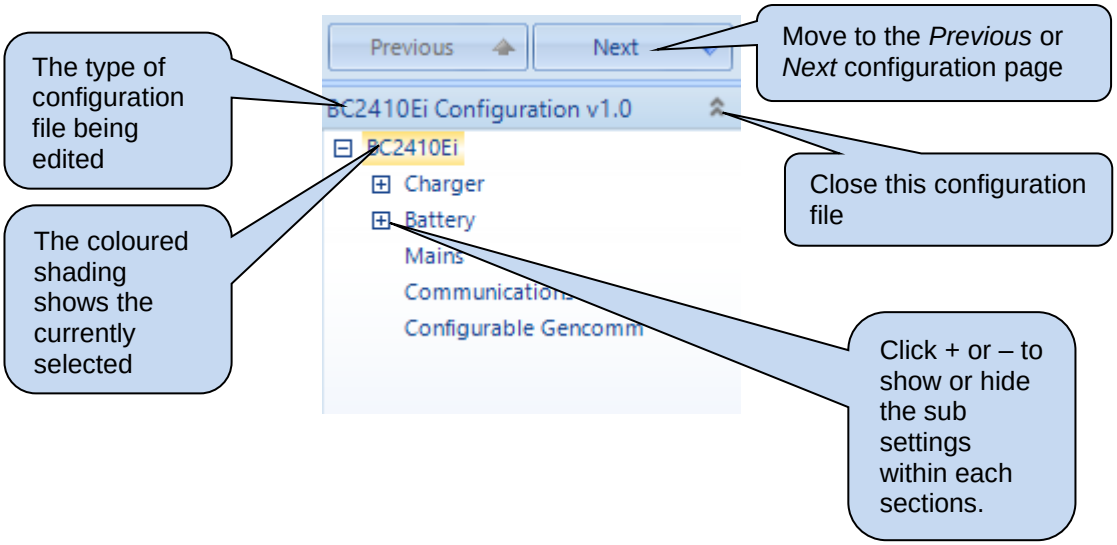
1.4 INSTALLATION AND USING THE DSE CONFIGURATION SUITE SOFTWARE

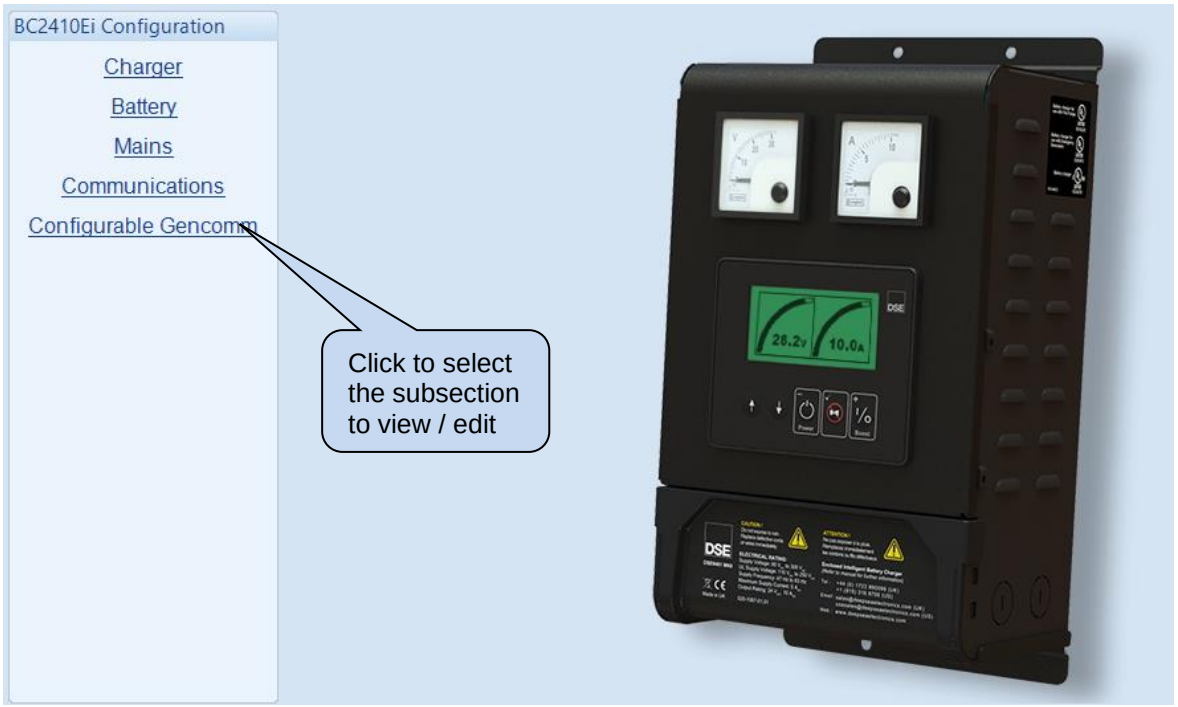
For information in regards to installing and using the *DSE Configuration Suite PC Software,* refer to DSE publication: ***057-151 DSE Configuration Suite PC Software Installation & Operation Manual*** which is found on the DSE website: www.deepseaelectronics.com

2 EDIT CONFIGURATION

This menu allows module configuration, to change the function of Input, activate/deactivate the Output, system timers and level settings to suit a particular application.

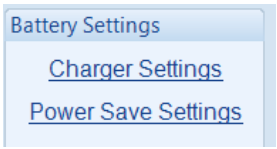
2.1 SCREEN LAYOUT





2.2 CHARGER

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



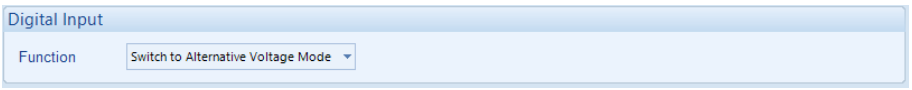
2.2.1 CHARGER SETTINGS

Charger Settings

Parameter	Description
Site ID	Enter the site ID (name) that the is charger located.
Charger ID	Enter the ID (name) of the charger.

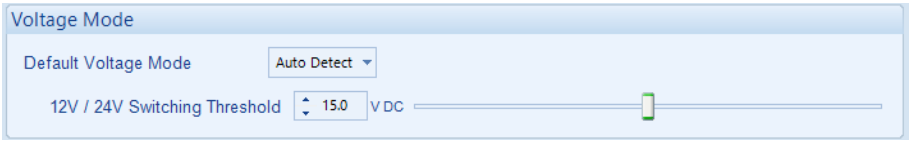
Digital Input

Allows for user configuration of the charger digital input.



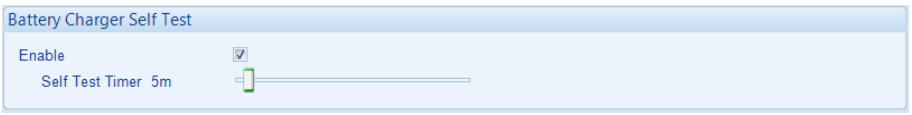
Parameter	Description
Enable Battery Detection	When active, the battery charger detects the presence of the battery and illuminates its LEDs to indicate the status.
Lamp Test	This input illuminates all on board LEDs
Manual Boost	This input forces the charger into boost mode
Max Current Mode (Manual)	When active, enables *Max Current Mode*. During this time, the charger sets the output current to maximum. Derating functions remain as standard.
Max Current Mode (Timed)	When active, enables *Max Current Mode*. During this time, the charger sets the output current to maximum for the configured *Max Current Mode Timer*, during which charger deratings are disabled. Once this timer has elapsed the charger returns to normal operation.
Stop Charging	This input turns off the charger output
Switch To Alternative Voltage Mode	This input switches the output voltage to the alternative mode i.e. if the default voltage mode is set to 12 V, activating this input changes the output voltage to 24 V.

Voltage Mode



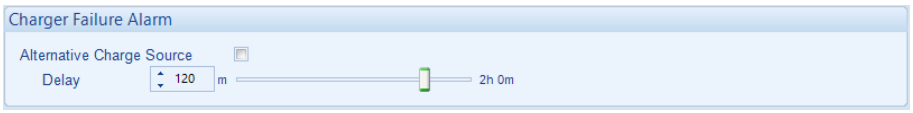
Parameter	Description
Auto Detect	**NOTE: The Battery Type cannot be determined automatically by this feature, the user must still select the correct *Battery Type* from the *Battery Profile* section.** **NOTE: The AC supply and battery (load) must removed and re-connected prior to power up.** During power up the charger automatically detects whether a 12 V or 24 V battery is connected by sensing the battery voltage level. The charger switches to the 12 V mode when the battery voltage is below the configured *Switching Threshold* level. The charger switches to the 24 V mode when the battery voltage is over the configured *Switching Threshold* level.
12 V	The charger assumes a 12 V battery is connected regardless of sensing the battery voltage level.
24 V	The charger assumes a 24 V battery is connected regardless of sensing the battery voltage level.

Battery Charger Self Test



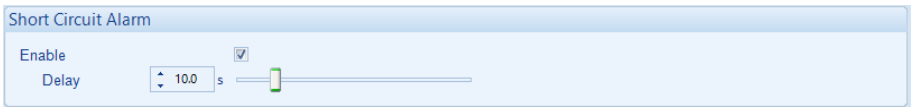
Parameter	Description
Enable	☐ = Feature disabled. ☑ = The battery charger performs a self test in a regular interval set by the *Self Test Timer*. The alarm activates when an internal failure is detected.
Self Test Timer	Set the time interval between the *Battery Charger Self Test* runs.

Charger Failure



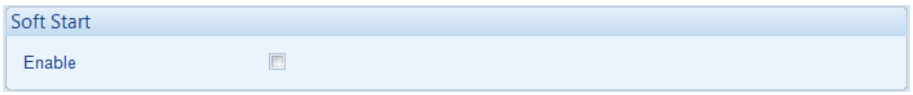
Parameter	Description
Alternative Charge Source	☐ = The *Alternative Charge Source* is disabled and the *Charger Failure Alarm* activates when the battery charger measures a voltage higher than its output voltage. The alarm is delayed by the configurable *Delay* timer. ☑ = The *Alternative Charge Source* is enabled and the *Charger Failure Alarm* no longer activates when the battery charger measures a voltage higher than its output voltage. This typically occurs when a either a DC Alternator is fitted on a running engine or when the battery charger switches from *Bulk* mode to *Float* charging mode.In both scenarios the battery voltage is typically higher than the battery charger output voltage.
Delay	When the *Alternative Charge Source* is disabled, this sets the time delay for the *Charger Failure Alarm.*

Short Circuit Alarm



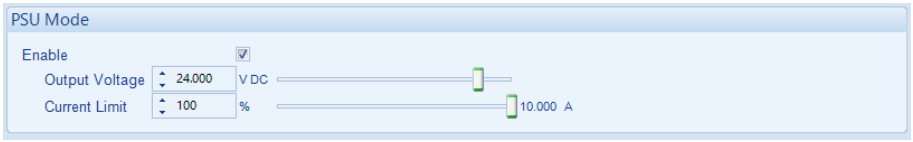
Parameter	Description
Enable	☐ = The *Short Circuit Alarm* is disabled; however the battery charger switches its output off when a short circuit is detected. ☑ = The *Short Circuit Alarm* is enabled and activates when a short circuit is detected for longer than the configurable *Delay* timer.
Delay	Set the time delay for the *Short Circuit Alarm*. This is useful to delay the alarm when the engine crank motor is engaged; the battery charger detects the current drawn by the crank motor as a short circuit. In this case, the charger immediately switches its output off for protection but the alarm is delayed.

Soft Start



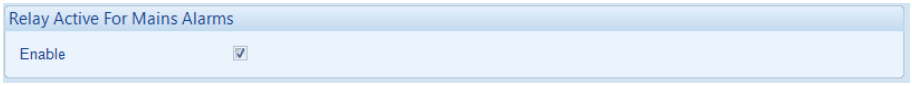
Parameter	Description
Enable	☐ = The *Soft Start* is disabled. ☑ = The *Soft Start* is enabled. The charger rises its output voltage to the required DC voltage level in steps, and takes longer time to reach the maximum output voltage level. This feature helps to reduce the inrush current caused by the capacitive loads or deeply discharged batteries.

PSU Mode



Parameter	Description
Enable	☐ = The module operates as a Battery Charger. ☑ = The module operates as a Power Supply within the user configured *Output Voltage* and *Current Limit* range. All other features that affect the *Output Voltage* are disabled.

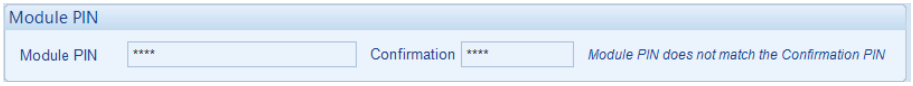
Relay Active For Mains Alarms



Parameter	Description
Enable	☐ = Fault relay does not activate upon Mains Voltage alarms. ☑ = Fault relay activates on all alarms.

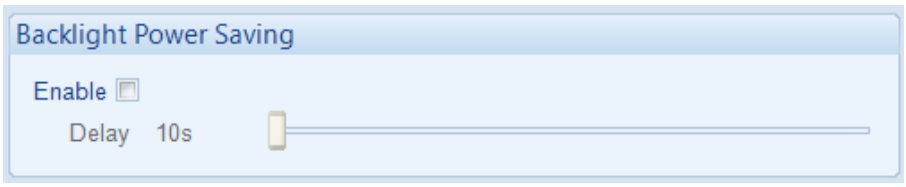
Module PIN

Once set and the configuration containing the PIN has been sent to the battery charger, the PIN is required before further configuration changes can be made.



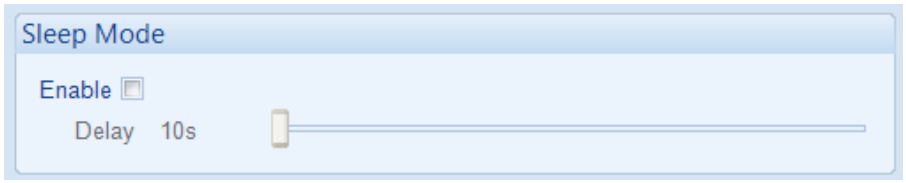
2.2.2 POWER SAVE SETTINGS

Backlight Power Saving



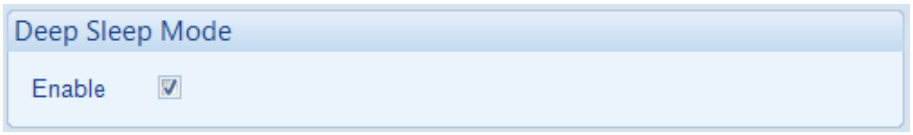
Parameter	Description
Enable	☐ = *Backlight Power Saving* is disabled. ☑ = Upon a Mains failure the Charger enters *Backlight Power Saving Mode* which powers down the LCD display and illumination after the configured delay has lapsed. In this state the processor remains active allowing continued communication to connected devices. Pressing any button will turn the display and illumination back on and reset the delay.

Sleep Mode



Parameter	Description
Enable	☐ = *Sleep Mode* is disabled. ☑ = Upon a Mains failure, the Charger enters *Sleep Mode* after the *Delay* time has expired. *Sleep Mode* disables the Charging Output while maintaining the monitoring of the battery voltage, this allows for a lower power consumption (less than 12 mA) from the battery. *Sleep Mode* becomes inactive and the delay is reset upon the Mains returning.

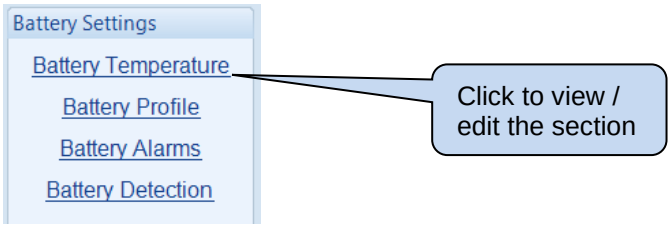
Deep Sleep Mode



Parameter	Description
Enable	☐ = *Deep Sleep Mode* is disabled. ☑ = Upon a Mains failure the Charger enters *Deep Sleep Mode*. After the configured Delay. This mode overrides *Sleep Mode* and *Backlight Power Saving Mode*. *Deep Sleep Mode* disables the Charger Mircoprocessor as well as the Comm's port. This allows for a lower power consumption (less than 7 mA) from the battery. When *Deep Sleep Mode* has been triggered and a USB connection is made the charger wakes but the delay is not reset. *Deep Sleep Mode* becomes inactive upon the Mains returning or when the USB port is active.

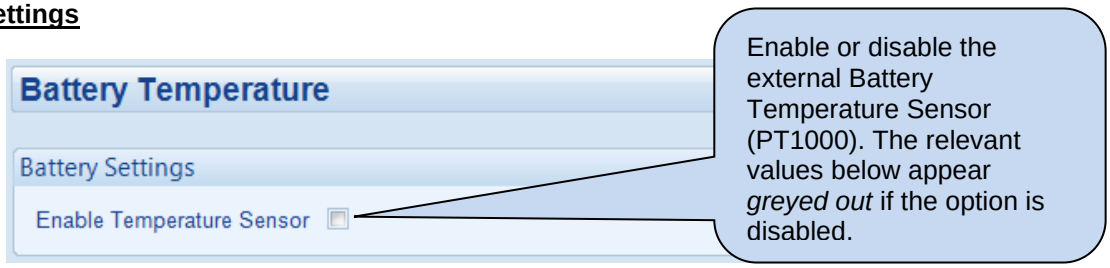
2.3 BATTERY

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



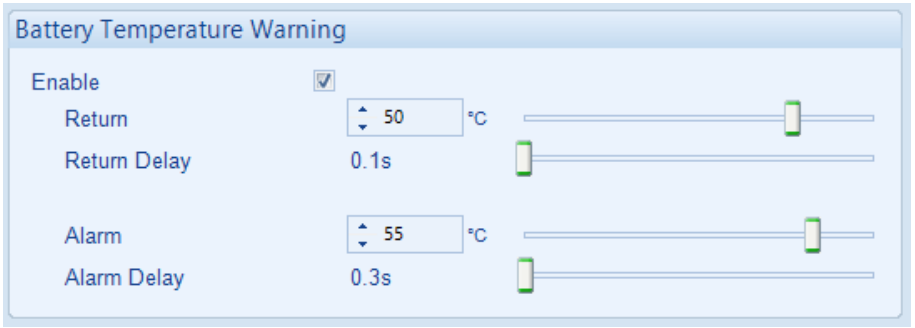
2.3.1 BATTERY TEMPERATURE

Battery Settings



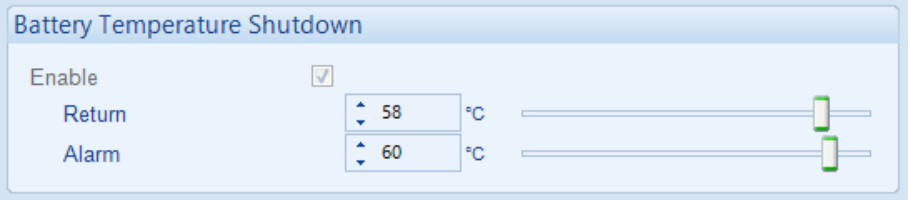
Parameter	Description
Enable Temperature Sensor	☐ = External battery temperature sensor is not used, all other temperature settings are disabled and 'greyed out'. ☑ = The battery charger reads the battery temperature using the externally fitted PT1000 sensor. Other temperature settings are available as below.

Battery Temperature Warning



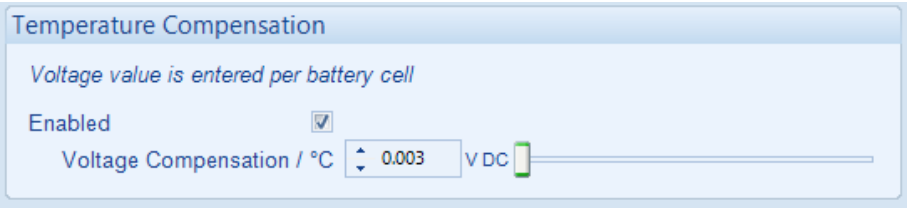
Parameter	Description
Battery Temperature Warning	☐ = Warning alarm disabled. ☑ = Warning alarm is raised should the battery temperature exceed the *Alarm* level for longer than the *Alarm Delay* setting. The alarm is cancelled when the battery temperature falls below the *Return* level for longer than the period set in *Return Delay*.

Battery Temperature Shutdown



Parameter	Description
Battery Temperature Shutdown	This feature cannot be disabled, however the alarm levels may be adjusted. ***Alarm:*** The charger output switches off when the battery temperature exceeds this setting for more than one second (this delay cannot be changed). ***Return:*** The charger output switches back on when the temperature falls below this setting.for more than one second (this delay cannot be changed).

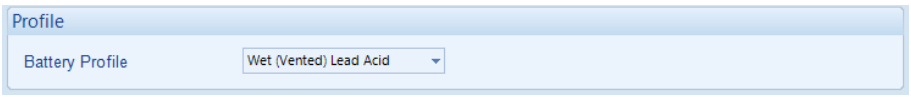
Temperature Compensation



Parameter	Description
Voltage Compensation / °C	**NOTE: For further information on the temperature compensation, refer to DSE Publication: 057-316 *DSE BC2410Ei Operator Manual* available on our website: *www.deepseaelectronics.com*** Set the variation of the charger output voltage for each degree Celsius of temperature change. *This is normally specified by the battery manufacturer.*

2.3.2 BATTERY PROFILE

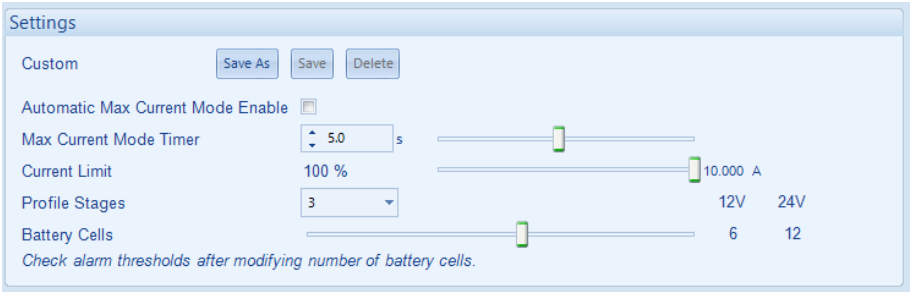
Profile



Parameter	Description
Battery Profile	**NOTE: The Battery Type availability depends from the DSE Battery Charger model, select Custom to create the desired Battery Profile if the required Battery Type is not available in the list.** Select the appropriate battery charging profile for your batteries from the list: - Calcium - Lead Acid Antimony - Lead Crystal 12Ah - Lithium Phosphate - NiCd 18 Cell - NiCd 20 Cell - VRLA-AGM - VRLA-GEL - Wet (Vented) Lead Acid - Custom

Settings

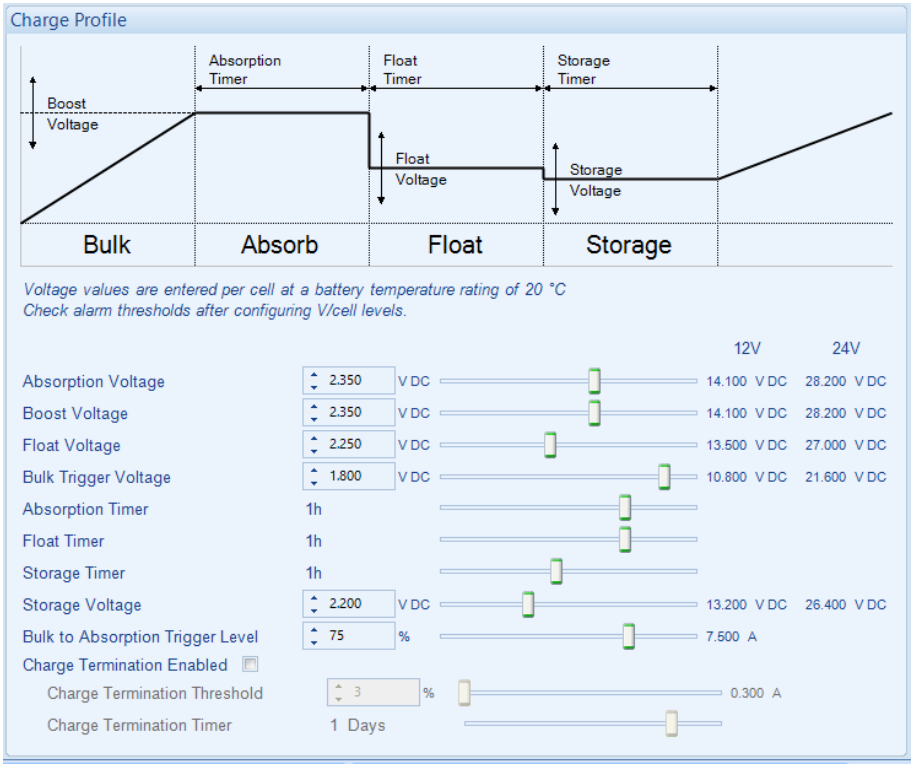
NOTE: Settings are only editable when the *Profile* is set to *Custom.*



Parameter	Description
Custom	Used to create or save new Battery Profile(s)
Automatic Max Current Mode Enable	☐ = Automatic Max Current Mode is disabled. ☑ = If a sudden rise in output current is detected the charger sets the output current to maximum for the configured *Max Current Mode Timer*, during which charger deratings are disabled. Once this timer has elapsed the charger returns to normal operation.
Max Current Mode Timer	Defines the period for which the charger remains at full output current following the initiation of Max Current Mode, either automatically or by the *Max Current Mode (Timed)* digital input.
Current Limit	Set the maximum charging current limit.
Profile Stages	Define the number of stages 3 or 4.
Battery Cells	Define the number of battery cells.

Charge Profile

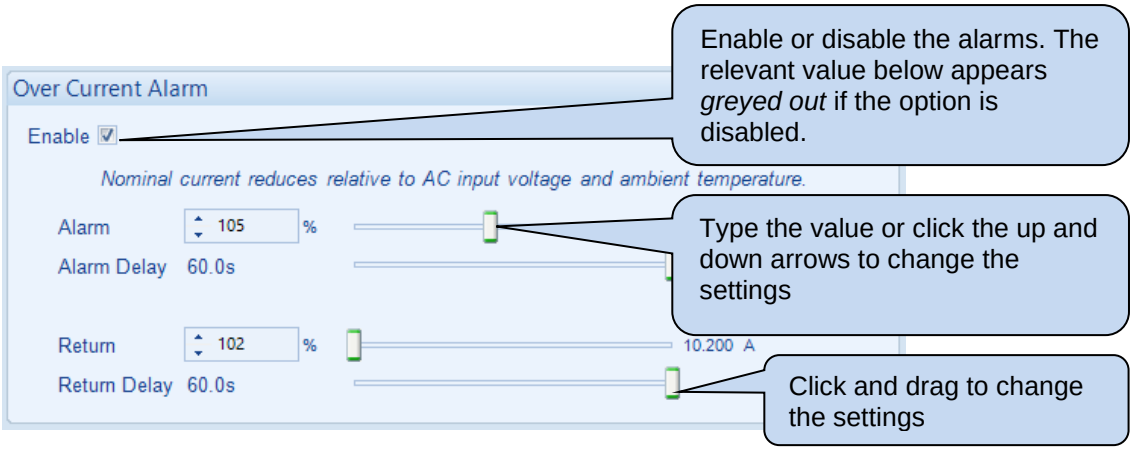
NOTE: For a 2-Stage charging profile, select a 3-Stage profile and configure Boost Voltage and Float Voltage to the same value.



Parameter	Description
Absorption Voltage	The charge voltage level per cell during the *Absorb* stage.
Boost Voltage	The charge voltage level per cell during the *Bulk* stage.
Float Voltage	The charge voltage level per cell during the *Float* stage.
Bulk Trigger Voltage	The battery's cell voltage value for the charger to go into the *Bulk* charge state when the cell voltage level is below the *Bulk Trigger Voltage* level.
Absorption Timer	The charging time at *Absorb* stage.
Float Timer	The charging time at *Float* stage
Storage Timer	The charging time at *Storage* stage
Storage Voltage	The charge voltage level per cell during the *Storage* stage.
Bulk To Absorption Trigger Level (%)	The output charge current level at which the DSE Battery Charger switches from *Bulk* stage to *Absorb* stage when it is reduced below the configured % level.
Charger Termination Enabled	☐ = The *Charger Termination* is disabled. ☑ = The *Charger Termination* is enabled. The DSE Intelligent Battery Charger terminates the charging when the charging current reaches below the configured *Charge Termination Threshold* % level.
Charge Termination Threshold (%)	The charge current percentage level below which the charging is terminated when the *Charger Termination* is enabled.
Charge Termination Timer	The time duration the charger waits with no charging before it starts charging again.

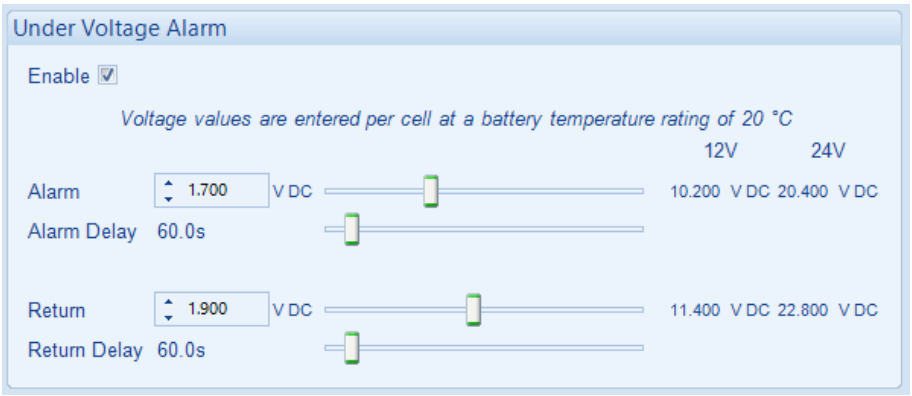
2.3.3 BATTERY ALARMS

Over Current Alarm



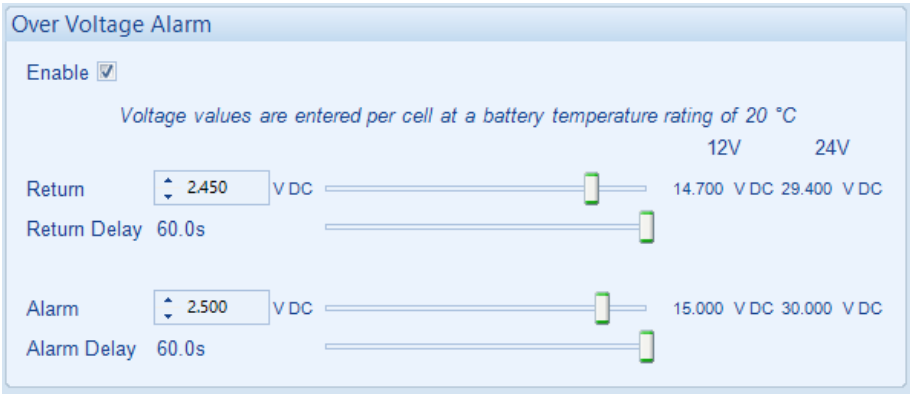
Parameter	Description
Over Current Alarm Enable	☐ = The *Over Current Alarm* is disabled. ☑ = The *Over Current Alarm* is enabled.
Alarm	The alarm activates when the current drawn by the battery exceeds the *Trip* setting for longer than the *Trip Delay* duration.
Return	The alarm is deactivated when the current drawn by the battery falls below the *Return* value setting for longer than the *Return Delay* duration.

Under Voltage Alarm



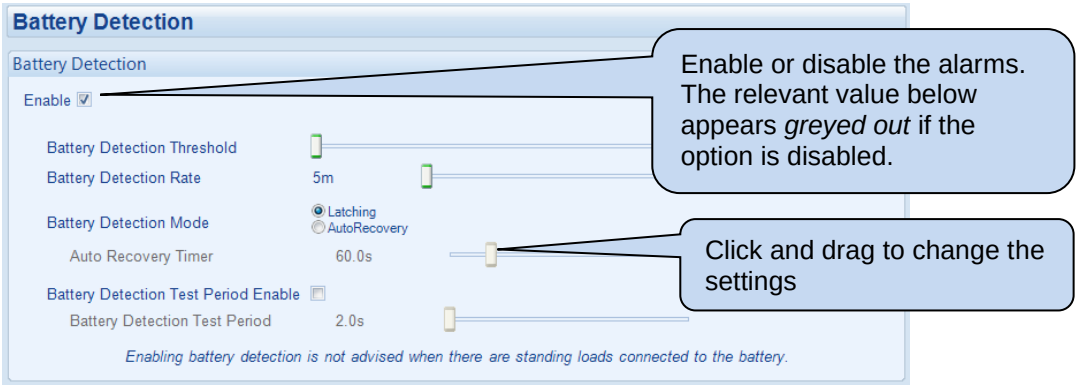
Parameter	Description
Under Voltage Alarm Enable	☐ = The *Under Voltage Alarm* is disabled. ☑ = The *Under Voltage Alarm* is enabled.
Alarm	The alarm activates when the battery voltage falls below the *Trip* setting for longer than the *Trip Delay* duration.
Return	The alarm is deactivated when the current drawn by the battery falls below the *Return* value setting for longer than the *Return Delay* duration.

Over Voltage Alarm



Parameter	Description
Over Voltage Alarm Enable	☐ = The *Over Voltage Alarm* is disabled. ☑ = The *Over Voltage Alarm* is enabled.
Alarm	The alarm activates when the battery voltage exceeds the *Trip* setting for longer than the *Trip Delay* duration.
Return	The alarm is deactivated when the battery voltage falls below the *return* setting for longer than the *Return Delay* time duration.

2.3.4 BATTERY DETECTION

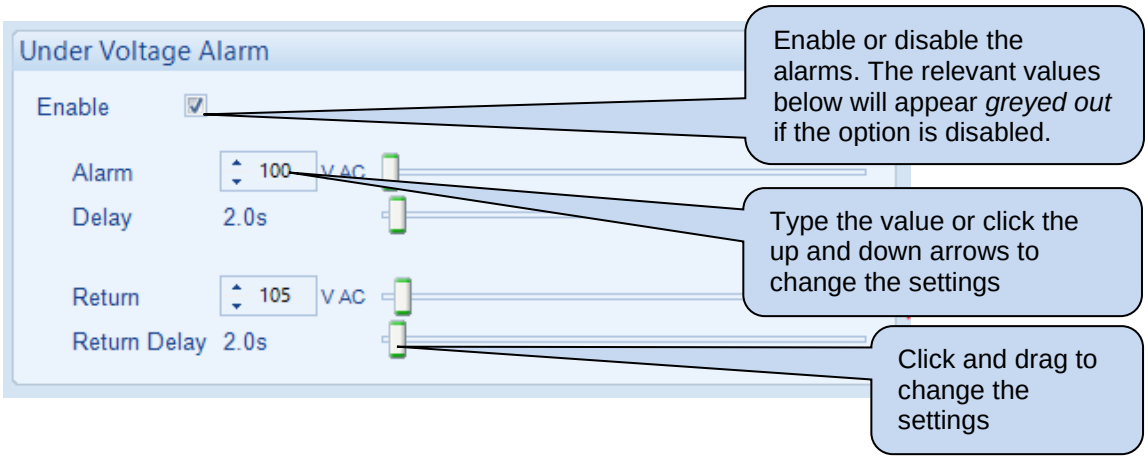


The *Battery Detection* feature allows the Charger to ensure a Battery is connected and healthy

Parameter	Description
Battery Detection Test	☐ = The Battery Charger does not attempt to detect if a battery is connected. ☑ = The Battery Charger does attempt to detect if a battery is connected according the parameters listed below.
Battery Detection Threshold	During the *Battery Detection* test, the charger reduces its output voltage to 0.5 V below the *Battery Detection Threshold*. The battery voltage is then monitored for 2 seconds. If the battery voltage falls below the configured *Battery Detection Threshold,* the battery charger considers the battery to be *Disconnected* and issues a *Warning* alarm for *Battery Disconnected.*
Battery Detection Rate	The time period between *Battery Detection* Tests.
Battery Detection Mode	***Latching:*** Upon the *Battery Disconnected Alarm* becoming active, the Battery Charger output voltage remains at the *Battery Detection Threshold* until the alarm is cleared. No more *Battery Detection Tests* take place until the alarm is cleared. The alarm is cleared by either power cycling the Battery Charger or if the battery voltage rises above the *Battery Detection Threshold* value. ***Auto Recovery:*** Upon the *Battery Diconnected Alarm* becoming active, the Battery Charger output voltage remains at *Battery Detection Threshold* and the *Auto Recovery Timer* begins. Upon completion of the *Auto Recovery Timer,* the battery charger output voltage rises to the *Bulk Trigger Voltage* and normal charging resumes. The test is repeated at the *Battery Detection Rate* interval. The alarm is cleared by either power cycling the Battery Charger or if the voltage rises above the *Battery Detection Threshold* value at the next scheduled *Battery Detection Test.*
Battery Detection Test Period Enable	☐ = Upon the *Battery Detection Test* becoming active the Battery Charger output voltage falls to 0.5 V below the *Battery Detection Threshold.* The battery voltage is then monitored for 2 seconds. ☑ = Upon the *Battery Detection Test* becoming active the Battery Charger output voltage falls to 0.5 V below the *Battery Detection Threshold* for the duration of *Battery Detection Test Period* timer. Upon completion of the *Battery Detection Test Period* timer the battery voltage is then monitored for 2 seconds. This is used to obtain an accurate indication of battery condition when a standing load is applied but Battery Charger supply is not available (typically during Battery Charger mains supply failure).

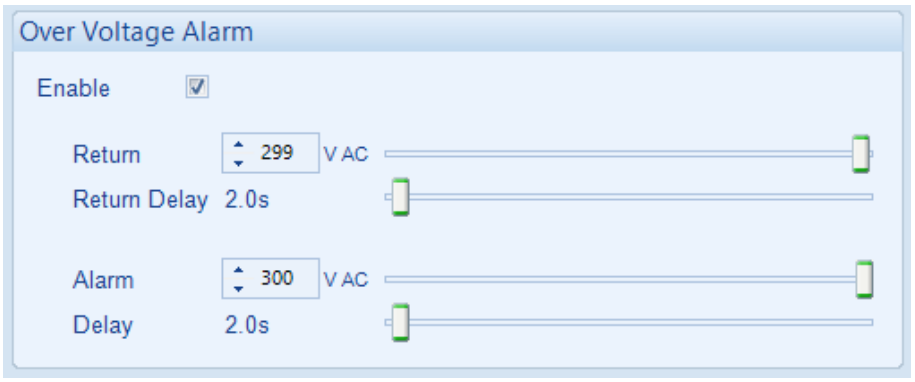
2.4 MAINS

Under Voltage Alarm



Parameter	Description
Mains Under Voltage Alarm Enable	☐ = The *Mains Under Voltage Alarm* is disabled. ☑ = The *Mains Under Voltage Alarm* is enabled.
Alarm	The alarm activates when the Mains voltage falls below the *Trip* setting for longer than the *Trip Delay* duration.
Return	The alarm is deactivated when the Mains voltage exceeds the *Return* setting for longer than the *Return Delay* duration.

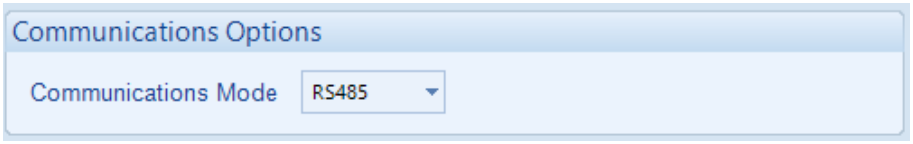
Over Voltage Alarm



Parameter	Description
Mains Over Voltage Alarm Enable	☐ = The *Mains Over Voltage Alarm* is disabled. ☑ = The *Mains Over Voltage Alarm* is enabled.
Alarm	The alarm activates when the Mains voltage exceeds the *Trip* setting for longer than the *Trip Delay* duration.
Return	The alarm is deactivated when the Mains voltage falls below the *Return* setting for longer than the *Return Delay* duration

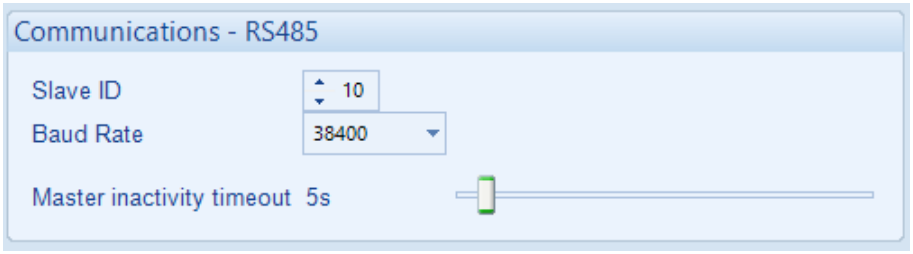
2.5 COMMUNICATIONS

Communications Options



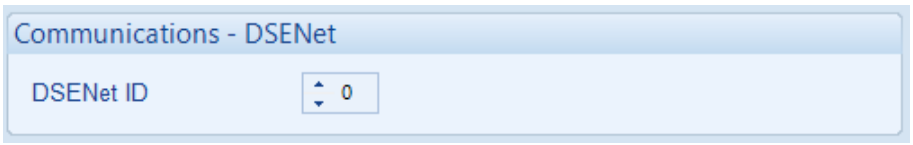
Parameter	Description
Communications Mode	**RS485:** Configures the RS485 port to be used for MODBUS communication **DSENet:** Configures the RS485 port to be used for DSENet communication

Communucations – RS485



Parameter	Description
Slave ID	**Slave ID:** This is used when connecting the RS485 port to a Modbus Master device.
Baud Rate	The communications link speed. Adjustable from 4800 to 115200.
Master Inactivity Timeout	Modbus timer to enable the charger to detect when the Modbus Master is no longer communicating.

Communucations DSENet

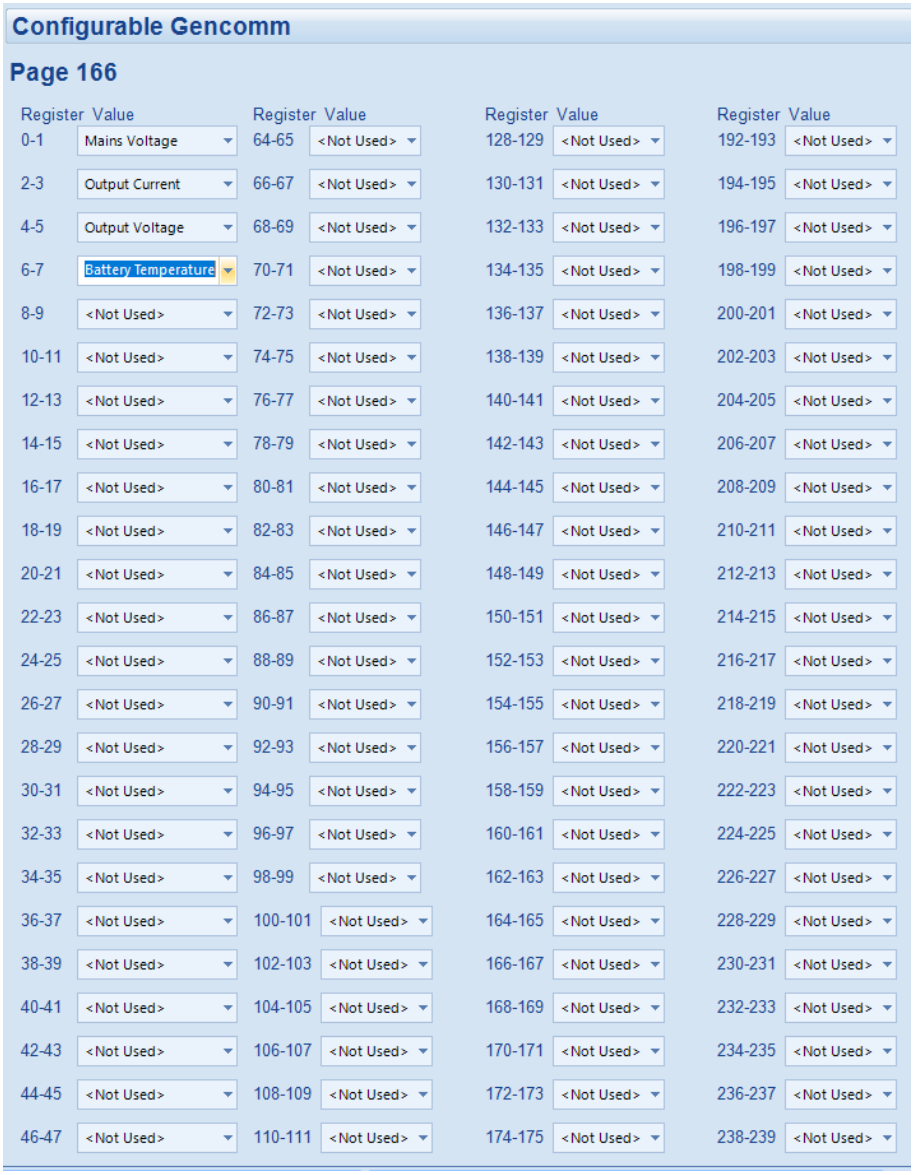


Parameter	Description
DSENet	The DSENet slave address This is used when connecting the RS485 port to a DSE module's DSENet port.

2.6 CONFIGURABLE GENCOMM

For advanced MODBUS users of the controller, configurable Gencomm pages are available. The intention is to allow the user to create personal collections of data in subsequent registers to minimise the number of MODBUS reads required by the master, and hence speed up data collection.

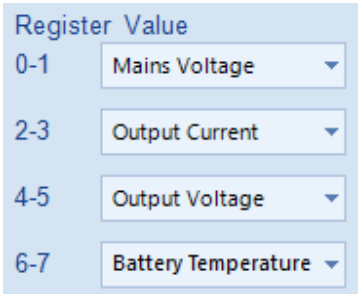
All configurable Gencomm registers are 32-bit unsigned format.



The configurable MODBUS pages are:

Page	Hex Address	Decimal Address
166	A600	42496

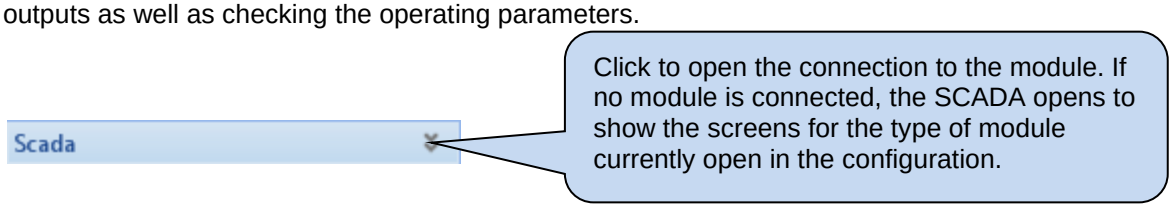
Example of Gencomm Configuration:



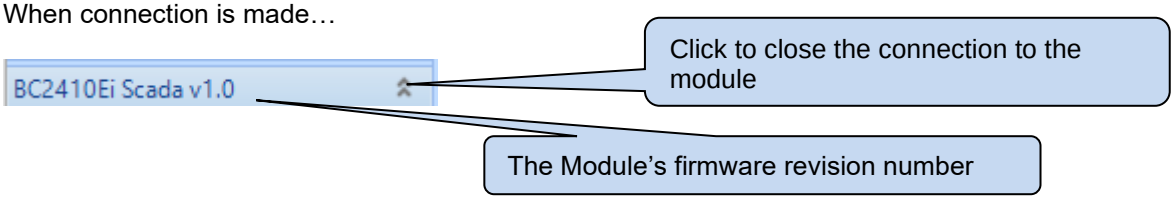
The register address is obtained from the formula:
register_address=page_number*256+register_offset.
To read the *Mains Voltage* from the above register, the MODBUS master device needs to read the data in two registers and then combine the data from the Most Significant Bit and the Least Significant Bit.
LSB address in Decimal = (166 * 256) + 0 = 42496
MSB address in Decimal = (166 * 256) + 1 = 42497

3 SCADA

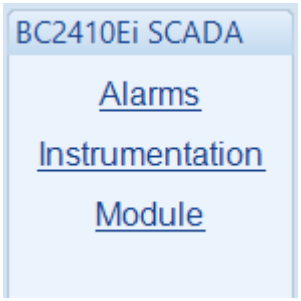
SCADA stands for **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition and is provided both as a service tool and also as a means of monitoring / controlling the module.
As a service tool, the SCADA pages are to check the operation of the controller's inputs and outputs as well as checking the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



When connection is made…



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

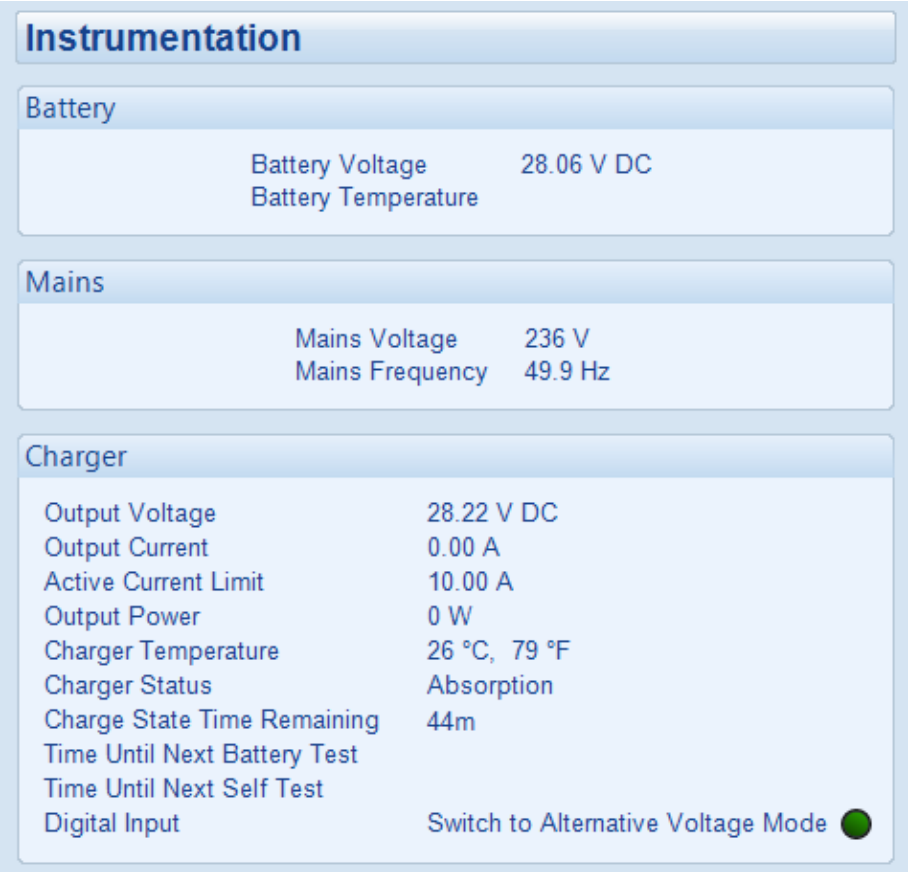


3.1 ALARMS

Shows any present alarm conditions.

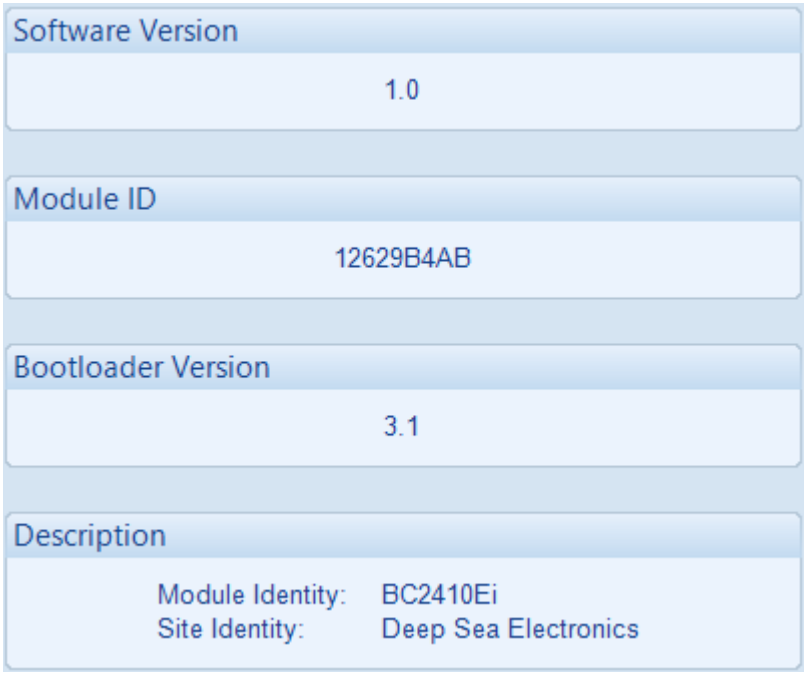
3.2 INSTRUMENTATION

Shows the DSE Intelligent Chargers instrumentation parameters.



3.3 MODULE

Shows the chargers software versions and identity information.



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