DEEP SEA ELECTRONICS PLC

DSE REMOTE BATTERY CHARGER DISPLAY MODULE OPERATOR MANUAL

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DSE Remote Battery Charger Display Module Operator Manual

Amendments since last publication

Issue. No.	Comments
1	First 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.

TABLE OF CONTENTS

1 BIBLIOGRAPHY

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

1.1 INSTALLATION INSTRUCTIONS

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 Remote Battery Charger Display Installation Instructions
053-049	DSE9xxx Battery Charger Installation Instructions
053-147	DSE9460 / DSE9461 Enclosed Intelligent Battery Charger Installation Instructions
053-175	DSE9474 & DSE9484 Installation Instructions
053-185	DSE9473 & DSE9483 Installation Instructions

1.2 MANUALS

DSE PART	DESCRIPTION
057-159	DSE9400 Series Configuration Suite PC Software Manual
057-085	DSE9xxx Battery Chargers Operators Manual
057-176	DSE9460 / DSE9461 Enclosed Intelligent Battery Charger Operators Manual
057-231	DSE9474 & DSE9484 Intelligent Battery Chargers Operators Manual

2 INTRODUCTION

This document details the installation requirements of the DSE range of Remote Battery Charger Display Module. 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.* You will not be automatically informed of updates. Any future updates of this document will be added to the DSE website at www.deepseaplc.com.

3 SPECIFICATION

3.1 DIMENSIONS AND MOUNTING

3.1.1 DIMENSIONS

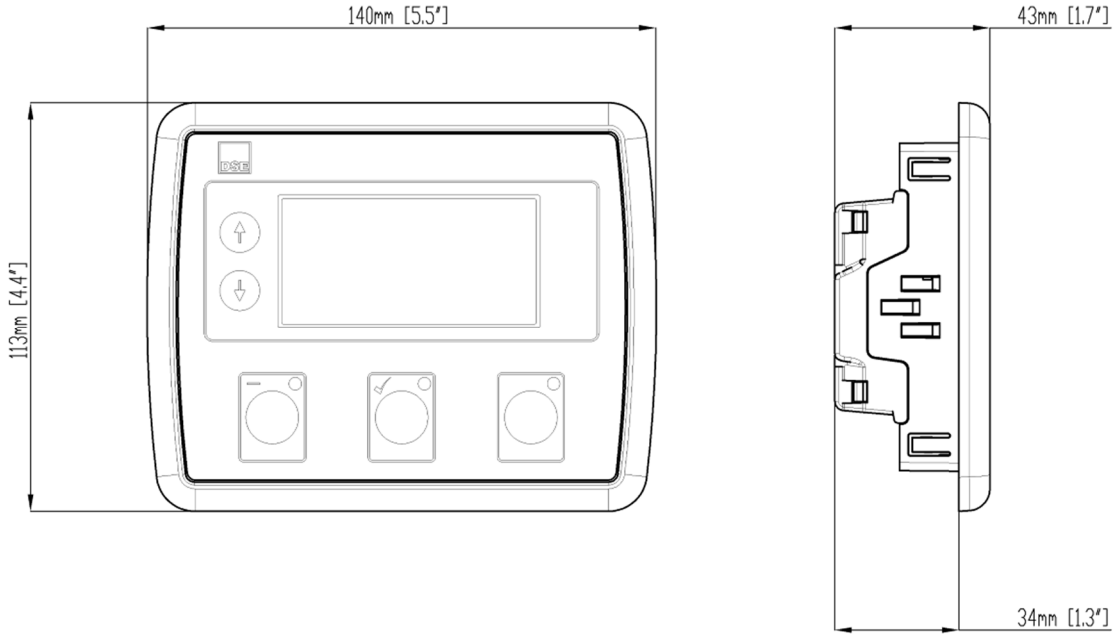
140 mm x 113 mm x 43 mm
(5.5 ” x 4.4 ” x 1.7 ”)

3.1.2 PANEL CUTOUT

118 mm x 92 mm
(4.6 ” x 3.6 ”)

3.1.3 WEIGHT

0.16 kg
(0.35 lb, 5.64 oz)

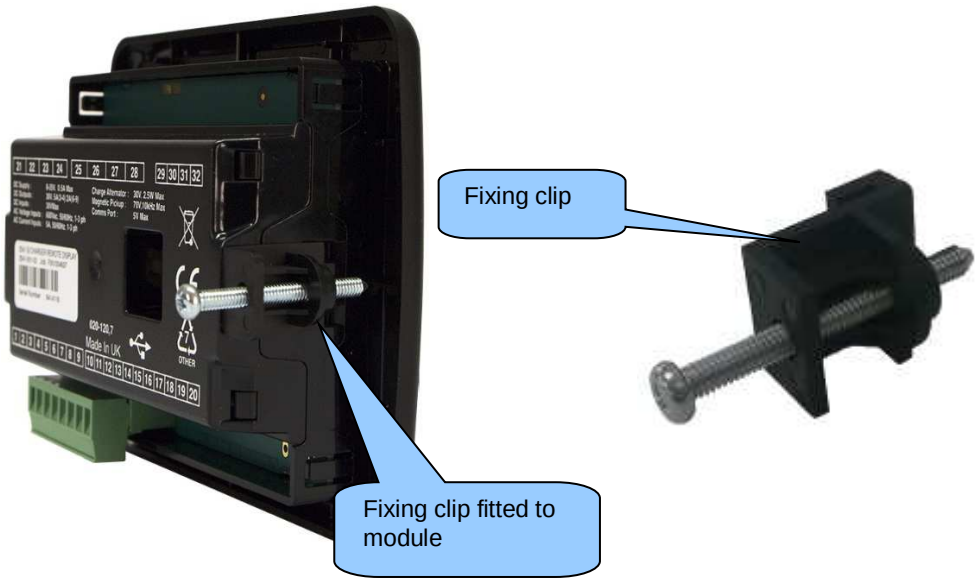


3.1.4 FIXING CLIPS

NOTE: In conditions of excessive vibration, mount the module on suitable anti-vibration mountings.

The module is held into the panel fascia using the supplied fixing clips.

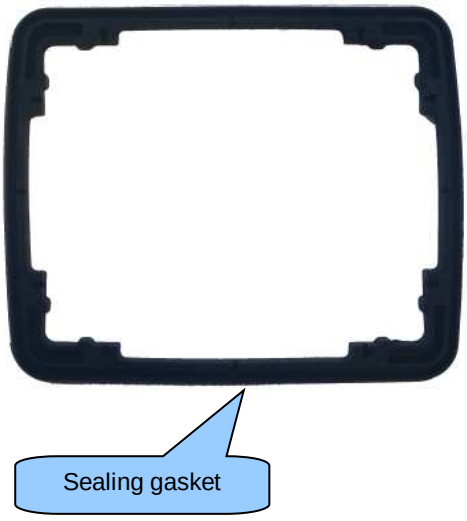
Withdraw the fixing clip screw (turn anticlockwise) until only the pointed end is protruding from the clip.
Insert the three 'prongs' of the fixing clip into the slots in the side of the module case.
Pull the fixing clip backwards (towards the back of the module) ensuring all three prongs of the clip are inside their allotted slots.
Turn the fixing clip screws clockwise until they make contact with the panel fascia.
Turn the screw a quarter of a turn to secure the module into the panel fascia. Care must be taken not to over tighten the fixing clip screws.



3.1.5 OPTIONAL SILICON SEALING GASKET

NOTE: For purchasing a silicon gasket from DSE, see the section entitled Maintenance, Spares, Repair and Servicing elsewhere in this document.

The silicon gasket provides improved sealing between module and the panel fascia. The gasket is fitted to the module before installation into the panel fascia. Take care to ensure the gasket is correctly fitted to the module to maintain the integrity of the seal.



3.2 APPLICABLE STANDARDS

Standard	Description
BS 4884-1	This document conforms to BS4884-1 1992 Specification for presentation of essential information.
BS 4884-2	This document conforms to BS4884-2 1993 Guide to content
BS 4884-3	This document conforms to BS4884-3 1993 Guide to presentation
BS EN 60068-2-1 (Minimum temperature)	-30 °C (-22 °F)
BS EN 60068-2-2 (Maximum temperature)	+70 °C (158 °F)
BS EN 60950	Safety of information technology equipment, including electrical business equipment
BS EN 61000-6-2	EMC Generic Immunity Standard (Industrial)
BS EN 61000-6-4	EMC Generic Emission Standard (Industrial)
BS EN 60529 (Degrees of protection provided by enclosures)	IP65 (front of module when installed into the control panel with the optional sealing gasket) IP42 (front of module when installed into the control panel WITHOUT being sealed to the panel)
UL508 NEMA rating (Approximate)	12 (Front of module when installed into the control panel with the optional sealing gasket). 2 (Front of module when installed into the control panel WITHOUT being sealed to the panel)

In line with our policy of continual development, Deep Sea Electronics, reserve the right to change specification without notice.

3.2.1 ENCLOSURE CLASSIFICATIONS

3.2.1.1 IP CLASSIFICATIONS

The modules specification under BS EN 60529 Degrees of protection provided by enclosures

IP65 (Front of module when module is installed into the control panel with the optional sealing gasket).
IP42 (front of module when module is installed into the control panel WITHOUT being sealed to the panel)

First Digit Protection against contact and ingress of solid objects		Second Digit Protection against ingress of water	
0	No protection	0	No protection
1	Protected against ingress solid objects with a diameter of more than 50 mm. No protection against deliberate access, e.g. with a hand, but large surfaces of the body are prevented from approach.	1	Protection against dripping water falling vertically. No harmful effect must be produced (vertically falling drops).
2	Protected against penetration by solid objects with a diameter of more than 12 mm. Fingers or similar objects prevented from approach.	2	Protection against dripping water falling vertically. There must be no harmful effect when the equipment (enclosure) is tilted at an angle up to 15°from its normal position (drops falling at an angle).
3	Protected against ingress of solid objects with a diameter of more than 2.5 mm. Tools, wires etc. with a thickness of more than 2.5 mm are prevented from approach.	3	Protection against water falling at any angle up to 60°from the vertical. There must be no harmful effect (spray water).
4	Protected against ingress of solid objects with a diameter of more than 1 mm. Tools, wires etc. with a thickness of more than 1 mm are prevented from approach.	4	Protection against water splashed against the equipment (enclosure) from any direction. There must be no harmful effect (splashing water).
5	Protected against harmful dust deposits. Ingress of dust is not totally prevented but the dust must not enter in sufficient quantity to interface with satisfactory operation of the equipment. Complete protection against contact.	5	Protection against water projected from a nozzle against the equipment (enclosure) from any direction. There must be no harmful effect (water jet).
6	Protection against ingress of dust (dust tight). Complete protection against contact.	6	Protection against heavy seas or powerful water jets. Water must not enter the equipment (enclosure) in harmful quantities (splashing over).

3.2.1.2 NEMA CLASSIFICATIONS

NOTE: There is no direct equivalence between IP / NEMA ratings. IP figures shown are approximate only.

12 (Front of module when module is installed into the control panel with the optional sealing gasket).
2 (Front of module when module is installed into the control panel WITHOUT being sealed to the panel)

1 **IP30**	Provides a degree of protection against contact with the enclosure equipment and against a limited amount of falling dirt.
2 **IP31**	Provides a degree of protection against limited amounts of falling water and dirt.
3 **IP64**	Provides a degree of protection against windblown dust, rain and sleet; undamaged by the formation of ice on the enclosure.
3R **IP32**	Provides a degree of protection against rain and sleet:; undamaged by the formation of ice on the enclosure.
4 (X) **IP66**	Provides a degree of protection against splashing water, windblown dust and rain, hose directed water; undamaged by the formation of ice on the enclosure. (Resist corrosion).
12/12K **IP65**	Provides a degree of protection against dust, falling dirt and dripping non corrosive liquids.
13 **IP65**	Provides a degree of protection against dust and spraying of water, oil and non corrosive coolants.

3.3 COMMUNICATION PORTS

Communication	Specification
USB Port	USB2.0 Device for connection to PC running DSE Configuration Suite Max distance 6m (20 feet)
RS485 Serial Port	Isolated Data connection 2 wire + common Half Duplex Data direction control for Transmit (by s/w protocol) Max Baud Rate 115200 External termination required (120Ω) Max common mode offset 70V (on board protection transorb) Max distance 1.2km (¾ mile)

3.3.1 USB CONNECTION

The USB port is provided to give a simple means of connection between a PC and the DSE2541 Remote Battery Charger Display Module. Using the DSE Configuration Suite Software, the operator connects to the DSE2541.

To connect the DSE2541 Remote Display Module to a PC by USB, the following items are required:

- DSE2541 Remote Battery Charger Display Module.

- DSE Configuration Suite Software
  (Supplied on configuration suite software CD or available from www.deepseaplc.com).

- USB cable Type A to Type B.
  (This is the same cable as often used between a PC and a USB printer)

  DSE can supply this cable if required :
  PC Configuration interface lead (USB type A – type B)
  DSE Part No 016-125

3.3.2 RS485

The RS485 port on the DSE2541 Remote Battery Charger Display connects to all DSE Intelligent Battery Chargers' RS485 port, supporting one DSE Intelligent Charger at a time.

One advantage of the RS485 interface is the large distance specification (1.2km) when using Belden 9841 (or equivalent) cable. This allows for a large distance between the DSE Intelligent Battery Charger and the DSE2541. The operator is then able to view all the operating parameters on the DSE2541's display

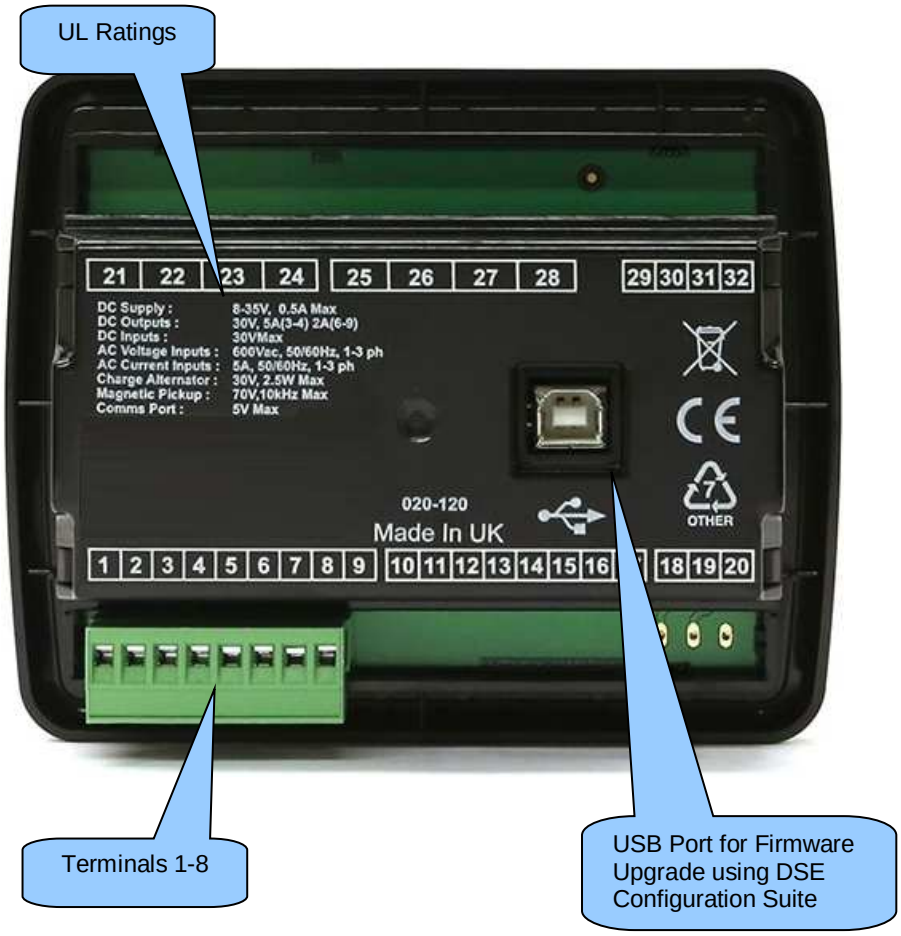
Cable Type	Two core screened twisted pair
Cable Characteristic Impedance	120Ω
Recommended Cable	Belden 9841 Belden 9271
Maximum Cable Length	1200m (¾ mile) when using Belden 9841 or direct equivalent. 600m (666 yds) when using Belden 9271 or direct equivalent.
RS485 Topology	"Daisy Chain" Bus with no stubs (spurs)
RS485 Termination	120Ω. Termination resistor must be fitted externally to the 'first' and 'last' Remote Display and/or charger by the customer as required by the RS485 specification.

4 INSTALLATION

The module is designed to be mounted on the panel fascia. For dimension and mounting details, see the section entitled *Dimension and Mounting* elsewhere in this document.

4.1 USER CONNECTIONS

To aid user connection, icons are used on the rear of the module to help identify terminal functions. An example of this is shown below.



4.2 CONNECTION DESCRIPTIONS

4.2.1 DC SUPPLY & RS485

NOTE: Screened 120Ω impedance cable specified for use with RS485 must be used for the RS485 link.
DSE stock and supply Belden cable 9841 which is a high quality 120Ω impedance cable suitable for RS485 use (DSE part number 016-030)

Pin No	Description	Cable Size	Notes
1	DC Plant Supply Input (Negative)	2.5mm² AWG 13	Connect to ground where applicable.
2	DC Plant Supply Input (Positive)	2.5 mm² AWG 13	Saupplies the Remote Battery Charger Display Module.
3	RS485 Port Screen	Shield	Use only 120 _ CAN or RS485 approved cable
4	RS485 Port B (+)	0.5 mm² AWG 20	Use only 120 _ CAN or RS485 approved cable
5	RS485 Port A (-)	0.5 mm² AWG 20	Use only 120 _ CAN or RS485 approved cable

4.2.2 USB SLAVE (PC CONFIGURATION) CONNECTOR

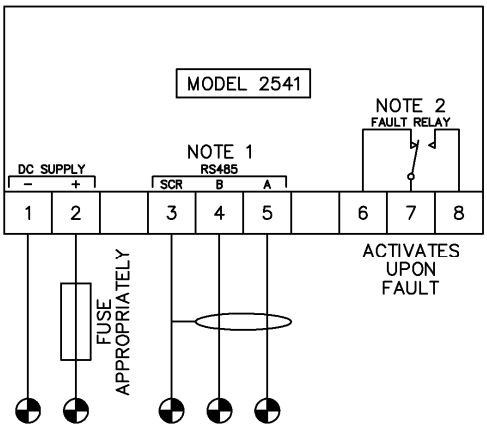
NOTE: The USB connection cable between the PC and the module must not be extended beyond 5 m (yards). For distances over 5 m, it is possible to use a third party USB extender. Typically, they extend USB up to 50 m. The supply and support of this type of equipment is outside the scope of Deep Sea Electronics PLC.

CAUTION!: Care must be taken not to overload the PCs USB system by connecting more than the recommended number of USB devices to the PC. For further information, consult your PC supplier.

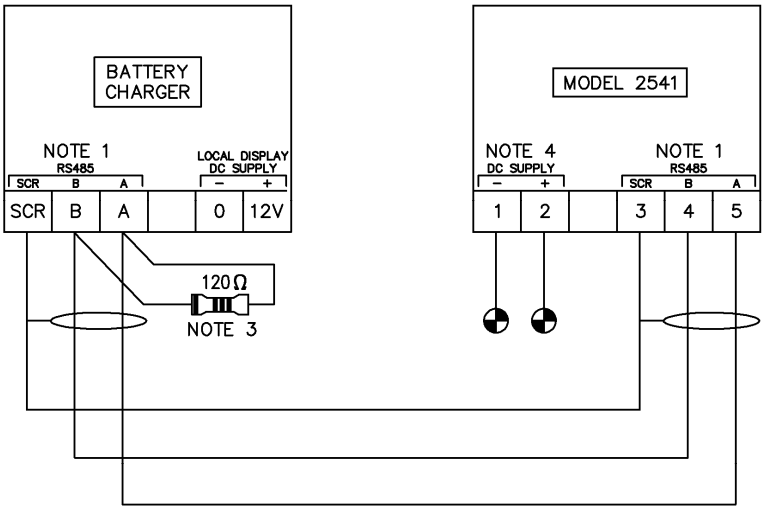
NOTE: The DSE2541's USB port is for the use of its Firmware Upgrade when applicable.

	Description	Cable Size	Notes
	Socket for connection to PC with DSE Configuration Suite Software	0.5 mm² AWG 20	This is a standard USB type A to type B connector. 

4.3 TYPICAL CONNECTION DIAGRAM



NOTE 1
A 120 OHM TERMINATION RESISTOR IS FITTED INTERNALLY
NOTE 2
FAULT RELAY ONLY FITTED TO 2541–001–02 VARIANT



NOTE 1
A 120 OHM TERMINATION RESISTOR IS FITTED INTERNALLY

NOTE 3
A 120 OHM TERMINATION RESISTOR MUST BE FITTED TO CHARGER

NOTE 4
WHEN ENCLOSED CHARGER HAS FACTORY FITTED DISPLAY OR THE DSE2541 IS A LONG DISTANCE AWAY, AN EXTERNAL DC SUPPLY MUST BE USED.

5 OPERATION OF LCD DISPLAY

NOTE: The LCD display is available ready fitted into a complete enclosure containing the display and charger, models DSE9460 and DSE9461 (check the DSE Website for more details www.deepseaplc.com).

5.1 BACKLIGHT

The LCD backlight is ON while the module is powered and flashes up detection of an alarm condition.

5.2 LED

The Display Module has three integral LEDs to show operation status and fault conditions.

NOTE: All DSE Intelligent Battery Chargers have a lamp test. When the charger is in lamp test, the DSE2541 display illuminates all three of its LEDs.

5.2.1 CHARGER STATUS

Condition	LED State
Charger off	OFF
Charger on	Constant Red

5.2.2 FAULT STATUS

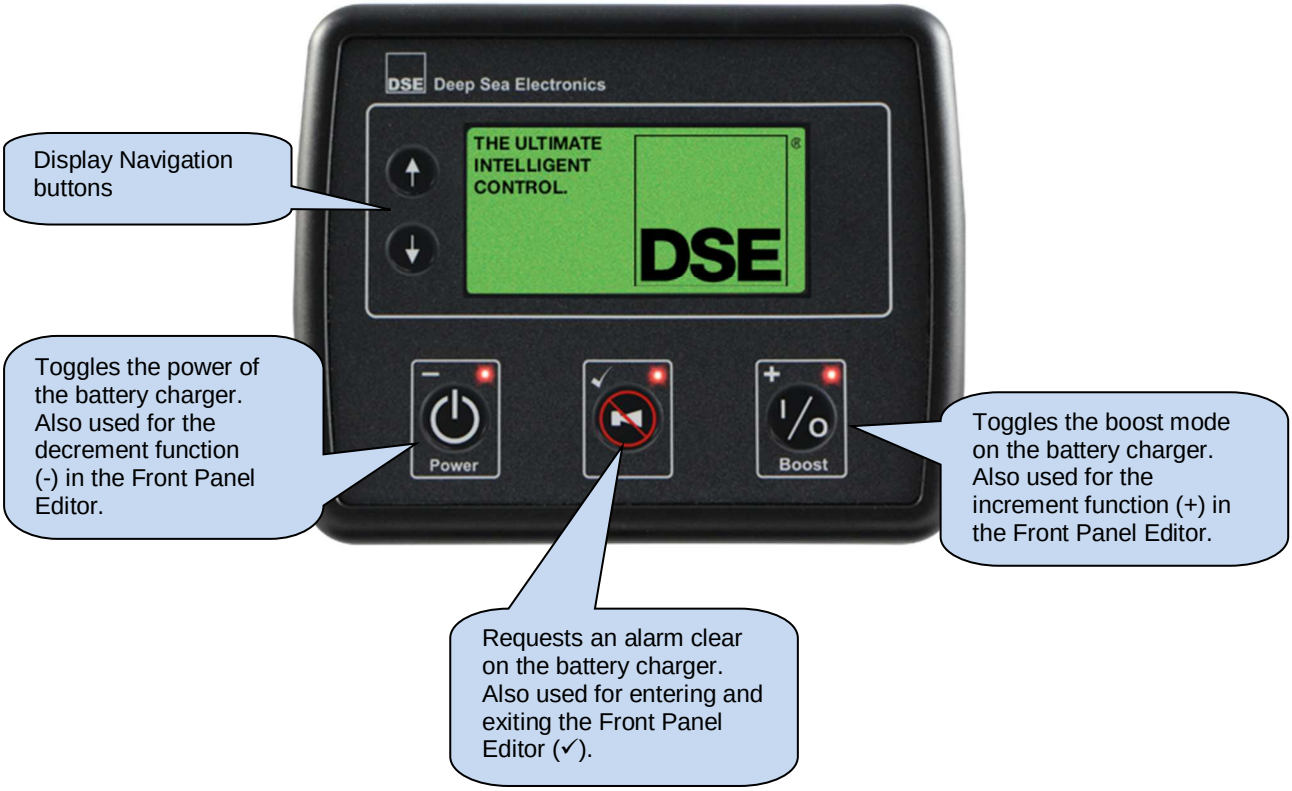
Condition	LED State
No Fault	OFF
Warning Fault	Constant Red
Shutdown Fault	Flashing Red

5.2.3 BOOST MODE

Condition	LED State
No Boost	OFF
In Boost Mode	Constant Red

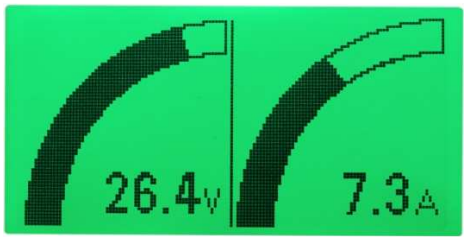
5.3 CONTROL BUTTONS

The LCD display has five control buttons :



5.4 HOME SCREEN

The home screen shows the visual representation dials of the charger output voltage and current, relative to their maximum outputs.



5.5 LINK ICON

The link icon indicates a successful link to the battery charger over the RS485 link. If there is no link active the icon is not shown.

Alarm Condition	Icon
RS485 Active	

5.6 BATTERY ICON

The battery icon indicates the current state of charging.

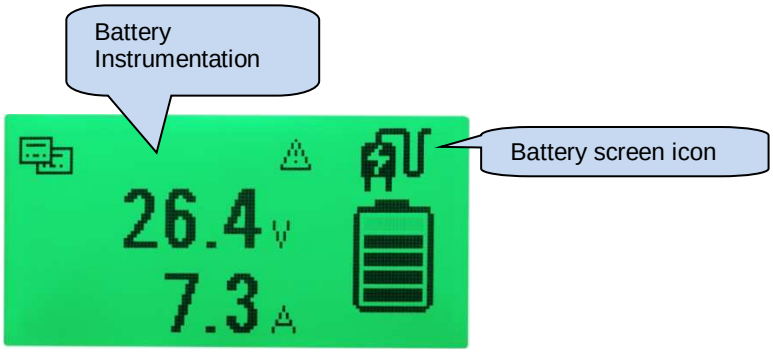
Battery State	Icon graphic
Not Charging	
Bulk/boost	
Absorption	
Float	
Storage	
Fault	

5.7 VIEWING THE INSTRUMENTATION

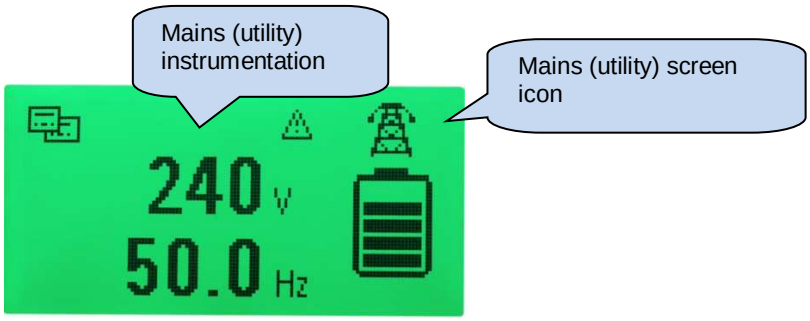
Press the navigation buttons (up) and (down) to cycle through the available instrumentation screens.

An icon is used to show the meaning of the currently visible screen as shown in the following sections.

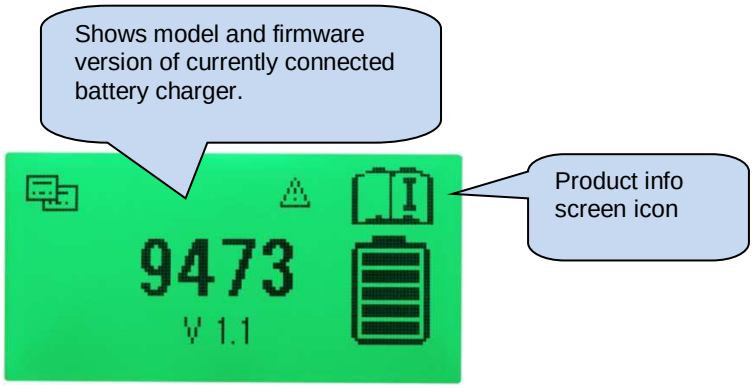
5.7.1 BATTERY



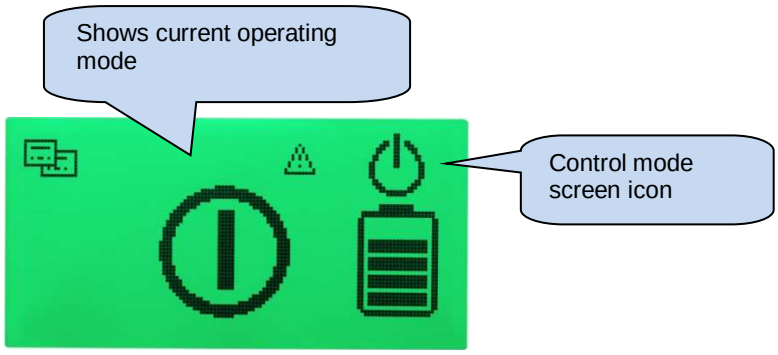
5.7.2 MAINS



5.7.3 PRODUCT INFO



5.7.4 CONTROL MODE

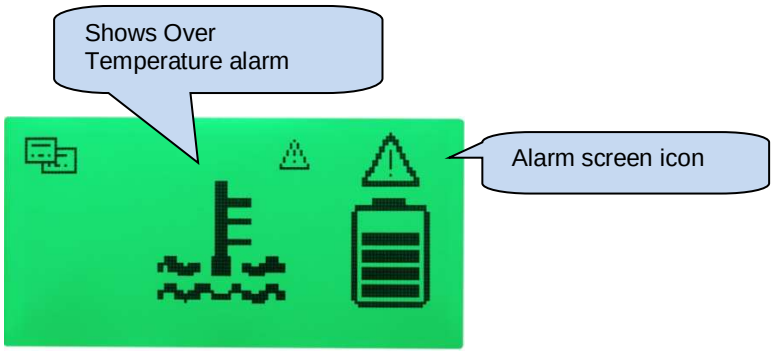


Control State	Icon displayed
On	
Off	
Boost	

5.7.5 ALARMS

When a new alarm is detected, the LCD displays the alarm screen and the LCD backlight flashes.

Press the (✓) button to accept the alarm, exit the alarm screen and return to the summary screen.



Alarm condition	Icon displayed
DC Over Volts	
DC Over Current	
AC Under or Over Volts	
Over Temperature	
Short Circuit or Reverse polarity	
Battery open circuit	
Battery Charger Failure	

5.7.6 ENGINEERING PAGE 1

Item	String	Units
Output voltage	OPV	V
Output current	OPC	A
Output Voltage Limit (if available)	OPVL	V
Output current Limit	OPCL	A
Charger output power	OPPW	W
Remote battery sense voltage	BSV	V
Battery Temperature	BTMP	℉ or ℃ (depends on confi g)
Module Temperarure	MTMP	℉ or ℃ (depends on config)

5.7.7 ENGINEERING PAGE 2

Item	String	Units
AC supply voltage	ACSV	V
AV Supply frequency	ACSF	Hz
AC supply current	ACSC	A
Fan 1 Speed	FSP1	rpm
Fan 2 Speed	FSP2	rpm

5.8 FRONT PANEL EDITOR

5.8.1 ACCESSING THE FRONT PANEL EDITOR

The front panel editor (FPE) is accessed by pressing and holding the (✓) button.

The first parameter is displayed.

5.8.2 SELECTING A PARAMETER

- Press (+) or (-) to change between parameter pages (listed overleaf).
- Press (up) or (down) to cycle through the available parameters (listed overleaf).

5.8.2.1 EDITING A PARAMETER

- Press (✓) to edit a parameter when it is being viewed on the screen. The value flashes to show edit mode is in progress.
- Press (+) or (-) to change the parameter to the required value.
- Press (✓) to save the currently selected value. The value ceases flashing to show editing is complete.

Other parameters can now be selected and edited in the same manner.

5.8.2.2 EXITING THE EDITOR

- Press and hold (✓) to exit the editor.

5.8.3 FRONT PANEL EDITOR PARAMETERS

NOTE: On later versions of the DSE2541 only parameters 100 to 107 are available for configuration. All other parameters must be configured using the DSE Configuration Suite PC Software., refer to the relevant Intelligent Battery Charger's Configuration Suite PC Software Manual for more information on the connected charger's configuration.

5.8.3.1 PAGE 1 – MISCELLANEOUS

Index	Configuration item	Icon
100	Contrast	
101	Temperature Units	
102	Slave ID	
103	Baud Rate	
104	Enable Alarm Splash Screen	
105	Page Timout Screen	
106	Page Timeout	
107	Sleep Mode Timeout	
108	Enable Engineering Page	

Parameter 105 – Page Timeout Screen selects the 'main' display screen. This is the screen that is displayed after a period of inactivity (no buttons are pressed for the duration of *Page* Timeout (parameter 106). It has the following possible selections :

Value	Function
0	Analogue Meters
1	Output Voltage And Current
2	Output Power And Battery Charger Temperature
3	Battery Sensed Voltage And Battery Temperature
4	Mains AC Voltage And Frequency
5	Battery Charger Model And Charger Software Version
6	Control Page
7	Alarms Page
8	Engineering Page 1
9	Engineering Page 2

Parameter 108 – Digital Input Function has the following possible selections :

Value	Function
0	Lamp Test
1	Charger Off
2	Enable Battery Detection
3	Manual Boost
4	Switch Voltage Mode (12V / 24V)

6 FAULT DIAGNOSIS

Nature of problem	Suggestion
The charger is not operating	Check that the incoming AC supply is correctly connected and within limits and check the integrity of any external fuse that may be fitted. Ensure the charger is not being operated above the maximum temperature specification.
Charge fail relay continuously operated	Check the connected load of the charger is not reverse connected or short circuit.
Batteries fail to charge	Check the batteries using the battery manufacturers recommendations.
Charge time is too long	Typically a battery will charge from flat to 80% capacity in 16hrs when when charged at C/10. For example charging a 50Ah battery for 16hrs at 5A will charge the battery to 80% of its full capacity. Remember to take into account any other standing load such as control panel requirements when calculating how much power is 'left' to charge the battery.

7 MAINTENANCE, SPARES, REPAIR AND SERVICING

The DSE battery chargers are designed to be *Fit and Forget*. As such, there are no user serviceable parts. In the case of malfunction you should contact your original equipment supplier (OEM).

7.1 PURCHASING ADDITIONAL CONNECTOR PLUGS FROM DSE

If you require additional plugs from DSE, please contact our Sales department using the part numbers below.

7.1.1 INDIVIDUAL PLUGS

Module Terminal Designation	Plug Description	Part No.
1-8	8 way 5.08mm	007-164
USB	PC Configuration interface lead (USB type A – USB type B)	016-125

7.2 PURCHASING ADDITIONAL FIXING CLIPS FROM DSE

Item	Description	Part No.
	Module Fixing Clips (Packet Of 2)	020-406

7.3 PURCHASING ADDITIONAL SEALING GASKET FROM DSE

Item	Description	Part No.
	Module Silicon Sealing Gasket	020-282

8 WARRANTY

DSE provides limited warranty to the equipment purchaser at the point of sale. For full details of any applicable warranty, you are referred to your original equipment supplier (OEM).

9 DISPOSAL

9.1 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)

If you use electrical and electronic equipment you must store, collect, treat, recycle and dispose of WEEE separately from your other waste.

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