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DEEP SEA ELECTRONICS

DSEEXTRA®

DSE2157 relay output expansion module

057-083

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DSE2157 relay output expansion module

Amendments since last publication

Amd. No.	Comments

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.

1 BIBLIOGRAPHY

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

DSE PART	DESCRIPTION
057-074	7000 series operators manual
057-077	7000 series configuration software manual

2 INTRODUCTION

This document details the installation requirements of the DSE2157 relay expansion module part of the DSEExtra® range of ancilliary modules.
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 included to the DSE website at www.deepseaplc.com

DSE2157 relay expansion module is used in conjunction with the DSE7000 series controllers to provide additional relay output functionality. The relay outputs are configured in the 'host controller', the DSE2157 module is not itself configured aside from the 'ID switch' detailed below.

For further details on configuring the 'host controller' you are referred to the relevant configuration software manual (refer to the section entitled *Bibliography* elsewhere in this document).

3 SPECIFICATIONS

3.1 PART NUMBERING

| 2157 | - | 001 | - | 00 |

Variant

| Standard product | 00 |

Product type

| DSE 2157 input expansion module | 2157 |

Hardware revision

| Revision 1 | 001 |
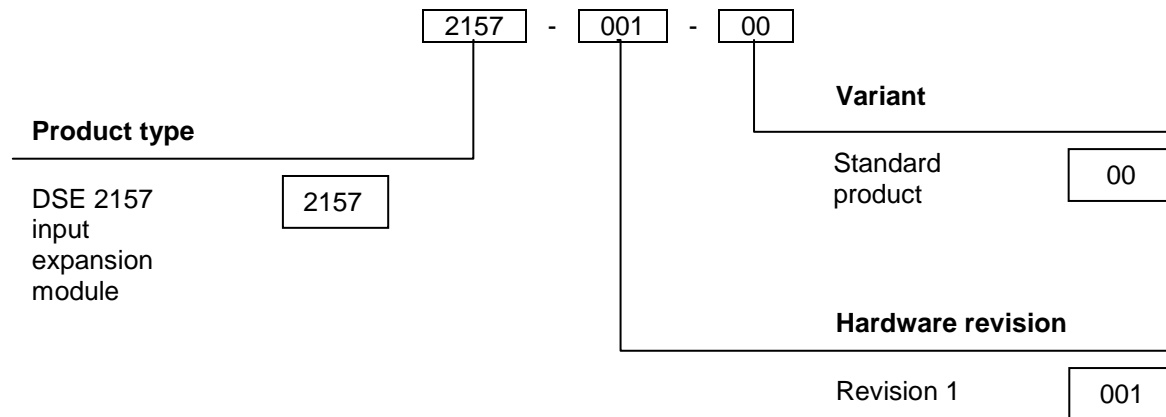
At the time of this document production, there are no variants of this product and there have been no revisions of the module hardware.

3.1 POWER SUPPLY

Minimum supply voltage	8V continuous, 4V for up to 5 minutes.
Cranking dropouts	Able to survive 0V for 50mS providing the supply was at least 10V before the dropout and recovers to 5 volts afterwards.
Maximum supply voltage	35V continuous (protection to 60V)
Maximum operating current	325mA at 12V, 152mA at 24V Conditions: All relays energised.
Maximum standby current	70mA at 12V, 32mA at 24V Conditions: All relays de-energised.

3.2 DSENET®

DSEnet is the interconnection cable between the host controller and the expansion module(s) and must not be connect to any device other than DSE equipment designed for connection to the DSEnet.

| Cable type	Two core screened twisted pair
Cable characteristic impedance	120Ω
Recommended cable	Belden 9841 Belden 9271
Maximum cable length	1000m (1km) when using Belden 9841 or direct equivalent. 500m (0.5km) when using Belden 9271 or direct equivalent.
DSEnet topology	Bus with no stubs (spurs)
DSEnet termination	120Ω. Fitted internally to host controller. Must be fitted externally to the 'last' expansion module by the customer .
Maximum expansion modules	Refer to host controller documentation

NOTE : As a termination resistor is internally fitted to the host controller, the host controller must be the 'first' unit on the DSEnet. A termination resistor MUST be fitted to the 'last' unit on the DSEnet. For further details, please see the section entitled *'typical wiring diagram'* elsewhere in this document.

3.3   OUTPUTS

Relay rating	2A DC rated (Max 30V)

3.4   DIMENSIONS

Overall size	164.6mm x 76.4mm x 48.9mm (6.48" x 3.01" x 1.93")
Mounting type	DIN rail or chassis mounting
Din rail type	EN 50022 35mm type only
Mounting holes	M4 clearance
Mounting hole centres	152.37mm x 64.50mm (6.00" x 2.54")
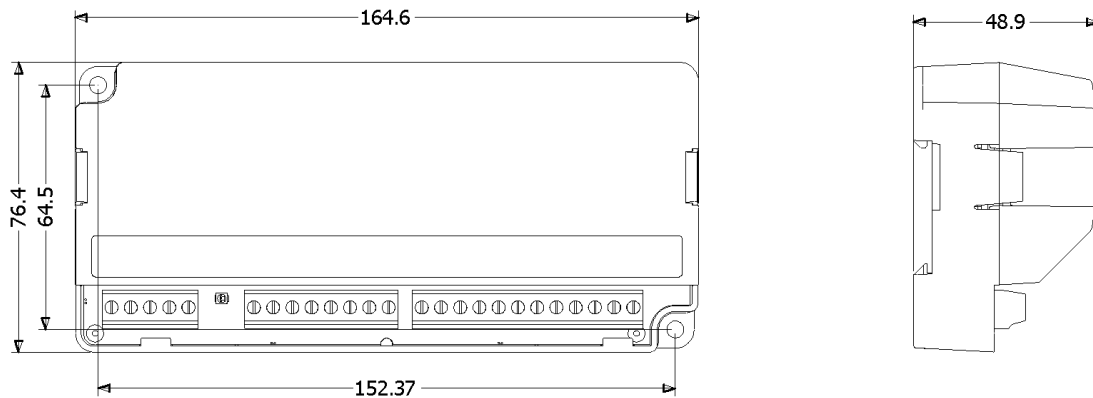
Dimensions in mm

3.5   APPLICABLE STANDARDS

BS 4884-1:1992	This document conforms to BS4884-1 1992 Specification for presentation of essential information.
BS 4884-2:1993	This document conforms to BS4884-2 1993 Guide to content
BS 4884-3:1993	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)	IP21
UL508 NEMA rating	enclosure type 1 (indoor use only)

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

4   INSTALLATION

The DSE2130 is designed to mounted within a control panel, on the panel DIN rail utilising the integral mounts. For dimension and mounting details, see the section entitled *Specification, Dimensions* elsewhere in this document.

5   USER CONNECTIONS

5.1   TERMINAL SPECIFICATION

| Connection type	Screw terminal, rising clamp, no internal spring
Min cable size	0.5mm² (AWG 20)
Max cable size	2.5mm² (AWG 14)
Recommended cable size	Refer to tables below
Relay rating	2A DC rated (Max 30V)
Update rate	The host controller updates the 2157 relay state every 100ms. It is not recommended to use the 2157 relays for load switching control.

5.1.1   CONNECTOR A

Terminal	Function	Recommended size	
1	DC supply positive	1.0mm² (AWG 18)	
2	DC supply negative	1.0mm² (AWG 18)	
3	Screen		DSEnet only. Do not connect to earh
4	A	0.5mm² (AWG 20)	DSEnet only
5	B	0.5mm² (AWG 20)	DSEnet only

5.1.2   CONNECTOR B

Terminal	Function	Recommended size	
6	Relay 1	1.0mm² (AWG 18)	Normally open
7	Relay 1	1.0mm² (AWG 18)	Normally open
8	Relay 2	1.0mm² (AWG 18)	Normally open
9	Relay 2	1.0mm² (AWG 18)	Normally open
10	Relay 3	1.0mm² (AWG 18)	Normally open
11	Relay 3	1.0mm² (AWG 18)	Normally open
12	Relay 4	1.0mm² (AWG 18)	Normally open
13	Relay 4	1.0mm² (AWG 18)	Normally open
14	Relay 5	1.0mm² (AWG 18)	Common
15	Relay 5	1.0mm² (AWG 18)	Normally closed
16	Relay 5	1.0mm² (AWG 18)	Normally open
17	Relay 6	1.0mm² (AWG 18)	Common
18	Relay 6	1.0mm² (AWG 18)	Normally closed
19	Relay 6	1.0mm² (AWG 18)	Normally open
20	Relay 7	1.0mm² (AWG 18)	Common
21	Relay 7	1.0mm² (AWG 18)	Normally closed
22	Relay 7	1.0mm² (AWG 18)	Normally open
23	Relay 8	1.0mm² (AWG 18)	Common
24	Relay 8	1.0mm² (AWG 18)	Normally closed
25	Relay 8	1.0mm² (AWG 18)	Normally open

> **NOTE : Normally open / normally closed refers to the contacts when the DC supply is removed from the module. The powered up state of the module depends upon configuration of the connected 'host module'.**
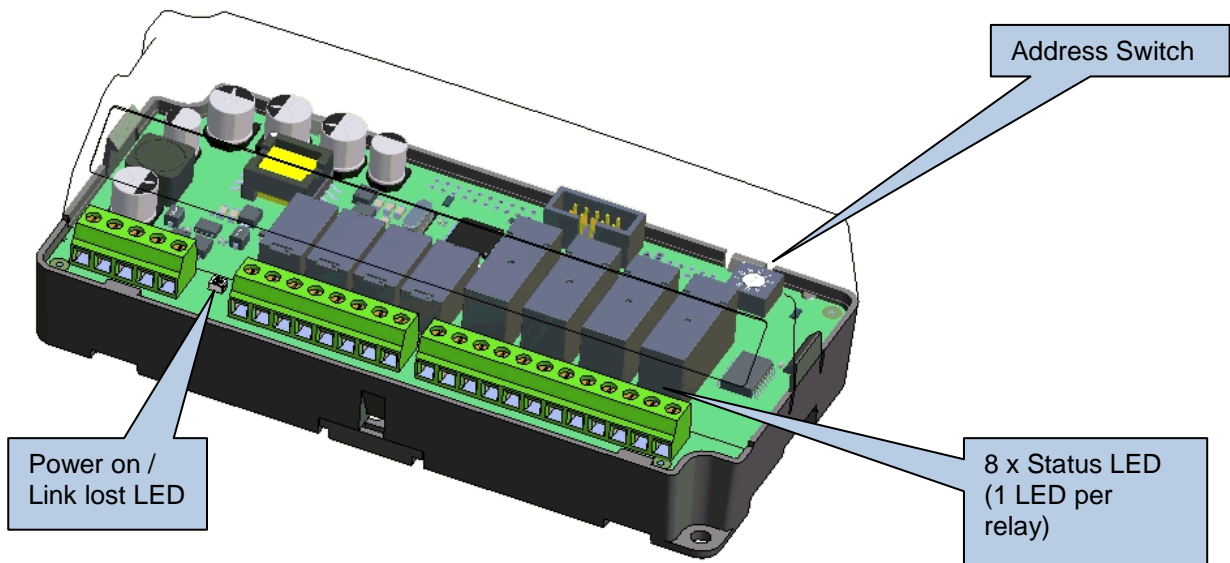
6 TYPICAL WIRING DIAGRAM
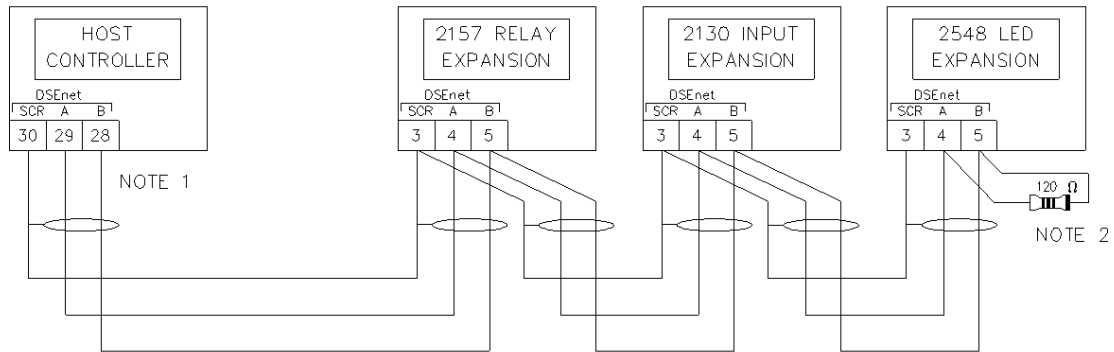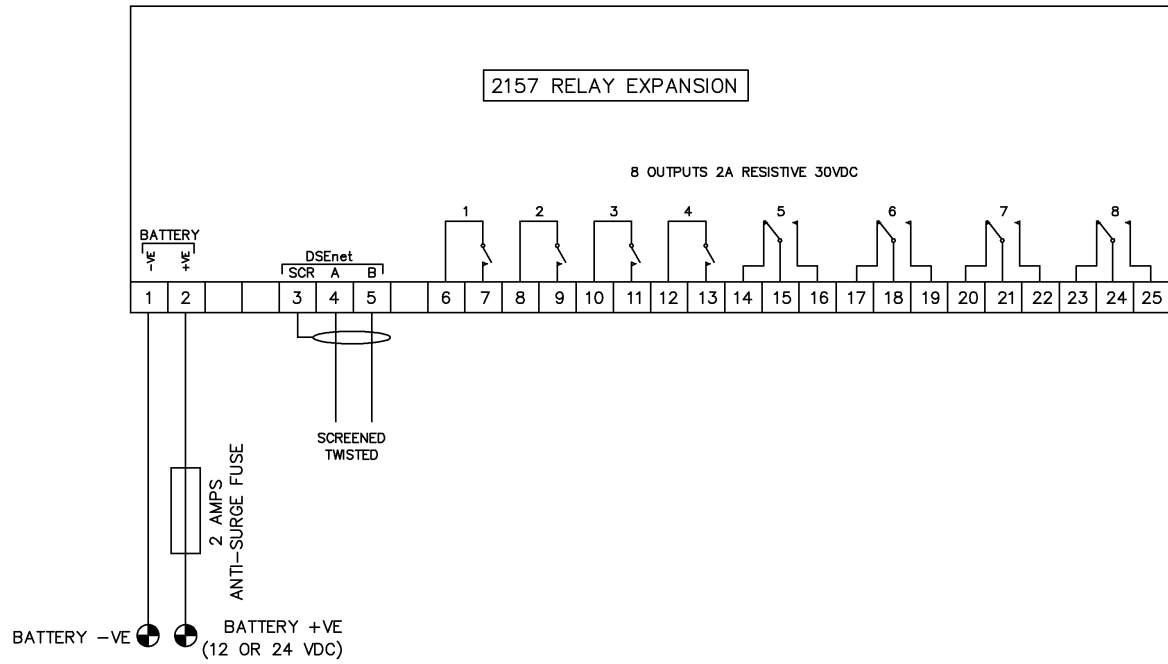
NOTE 1

AS A TERMINATING RESISTOR IS
INTERNALLY FITTED TO THE
HOST CONTROLLER, THE HOST
CONTROLLER MUST BE THE
FIRST UNIT ON THE DSEnet

NOTE 2

A 120 OHM TERMINATION
RESISTOR MUST BE FITTED TO
THE LAST UNIT ON THE DSEnet

7 CONTROLS AND INDICATIONS

Address Switch

Power on / Link lost LED

8 x Status LED (1 LED per relay)

7.1 LED INDICATIONS

Function	Colour	Action
Power on / Link lost	RED	Steady when DC supply is connected and data is being received from the host controller. Flashing when the DC supply is connected and the data connection to the host controller is not operating.
Status 1-8	RED	Lit when the corresponding relay is active

7.2 ID SWITCH

The rotary ID switch is used to select the 'ID' of the 2157 expansion module as the host controller is capable of giving instructions to a number of 2157 expansion modules at the same time (consult relevant modules instructions for further details on number of supported expansion units).

The enclosure cover must be unclipped and removed to gain access to the switch. The switch should be operated using a small screwdriver and set to match the required ID.

NOTE : The ID must be a unique number, different from the ID of any other 2157 module connected to the host controller.
If two or more 2157 controllers are required to 'mimic' each other then they should be configured with different IDs, and both configured the same in the host controller.

8   FAULT DIAGNOSIS

Nature of problem	Suggestion
Relays don't activate on the 2157 board	Ensure the host controller is correctly configured to send signals to the 2157
Power LED indication does not illuminate	Check polarity and size of the connected DC supply are within the specifications of the DSE2157
Power LED flashes	This means the the communications link to the host controller has been lost. Check the connection of the DSEnet paying particular attention to the cable type being used and the positioning of the termination resistors.

9   MAINTENANCE, SPARES, REPAIR AND SERVICING

The DSE2157 is 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).

10 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).

11 DISPOSAL

11.1 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)

Directive 2002/96/EC
If you use electrical and electronic equipment you must store, collect, treat, recycle and dispose of WEEE separately from your other waste.

11.2 ROHS (RESTRICTION OF HAZARDOUS SUBSTANCES

Directive 2002/95/EC:2006
To remove specified hazardous substances (Lead, Mercury, Hexavalent Chromium, Cadmium, PBB & PBDE´s)

Exemption Note: Category 9. (Monitoring & Control Instruments) as defined in Annex 1B of the WEEE directive will be exempt from the RoHS legislation. This was confirmed in the August 2005 UK´s Department of Trade and Industry RoHS REGULATIONS Guide (Para 11).

Despite this exemption DSE has been carefully removing all non RoHS compliant components from our supply chain and products.
 When this is completed a Lead Free & RoHS compatible manufacturing process will be phased into DSE production.

This is a process that is almost complete and is being phased through different product groups.