



DEEP SEA ELECTRONICS PLC

DSE2131 DSEnet Ratiometric Input Expansion Module Operator Manual

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DSE2131 DSEnet ratiometric input expansion module

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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	4
2	INTRODUCTION	4
3	SPECIFICATIONS	5
3.1	PART NUMBERING	5
3.1	POWER SUPPLY	5
3.2	TERMINAL SPECIFICATION	5
3.3	RATIOMETRIC INPUTS	5
3.3.1	DIGITAL INPUTS	5
3.3.2	RESISTIVE SENSOR INPUTS	6
3.3.3	0-10V INPUTS.....	6
3.3.4	4-20 MA INPUTS	6
3.4	DSENET®	6
3.5	DIMENSIONS	7
3.6	APPLICABLE STANDARDS	7
4	INSTALLATION	8
4.1	USER CONNECTIONS	8
4.1.1	CONNECTOR A	8
4.1.2	CONNECTOR B.....	8
4.2	SCHEMATIC INTERCONNECTION DIAGRAM	9
4.3	TYPICAL WIRING DIAGRAM	9
5	CONTROLS AND INDICATIONS	10
5.1	LED INDICATIONS	10
5.2	ID SWITCH	10
6	FAULT DIAGNOSIS	11
7	MAINTENANCE, SPARES, REPAIR AND SERVICING	11
8	WARRANTY	11
9	DISPOSAL	11
9.1	WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)	11
9.2	ROHS (RESTRICTION OF HAZARDOUS SUBSTANCES	11

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
057-115	8610 operator manual
057-119	8600 series configuration software manual

2 INTRODUCTION

This document details the installation requirements of the DSE2131 ratiometric input expansion module part of the DSEExtra® range of ancillary devices.

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.deepseapl.com

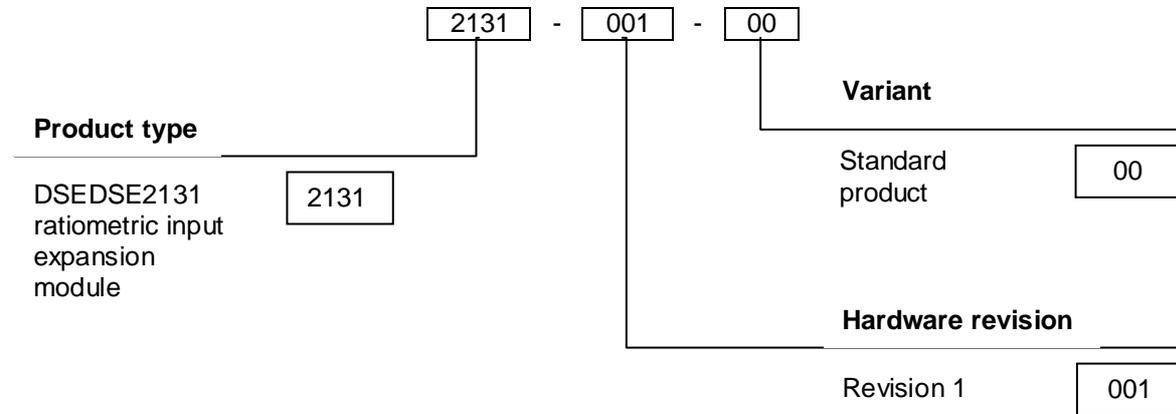
DSE2131 input expansion module is used in conjunction with supported DSE controllers to provide additional input functionality (10 'ratiometric'). The inputs are configured in the 'host controller', the DSE2131 module is not itself configured apart from the 'ID switch'.

'Ratiometric' inputs can be configured in a number of ways to connect to digital switches, resistive sensors, 0-10 V signals or 4-20 mA signals.

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



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	166mA at 12V, 80mA at 24V Conditions: Ratiometric mode with 0Ω on input
Minimum Operating current	70mA at 12V, 35mA at 24V Conditions: 0-10V or 4-20mA mode

3.2 TERMINAL SPECIFICATION

Connection type	Screw terminal, rising clamp, no internal spring
Min cable size	0.5mm ² (AWG 20)
Max cable size	2.5mm ² (AWG 14)

3.3 RATIOMETRIC INPUTS

3.3.1 DIGITAL INPUTS

Arrangement	Contact between input terminal and battery negative
Low level threshold	2.1V minimum
High level threshold	6.6V maximum
Max input voltage	+60V DC with respect to battery negative
Min input voltage	-24V DC with respect to battery negative
Contact wetting current	7mA typical
Open circuit voltage	12V typical

3.3.2 RESISTIVE SENSOR INPUTS

Arrangement	Differential resistance measurement input with individual common terminals for each sensor input
Measurement current	9.3mA typical
Full scale	480Ω
Sensor fail	Values greater than full scale return an over range sentinel that may be interpreted as sensor fail if appropriate (host controller dependant)
Resolution	1% of full scale
Accuracy	±2% of full scale resistance, excluding transducer (sensor) error
Maximum common mode voltage	3V
Transducer (sensor type)	Configurable in host controller
Use with contacts	Inputs may be used with a contact to ground providing the corresponding common terminal is grounded. (ie can be used as digital inputs if correctly configured in the host controller)

3.3.3 0-10V INPUTS

Internal impedance	>10 kΩ
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3.3.4 4-20 MA INPUTS

Internal sense resistor	240Ω
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3.4 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.

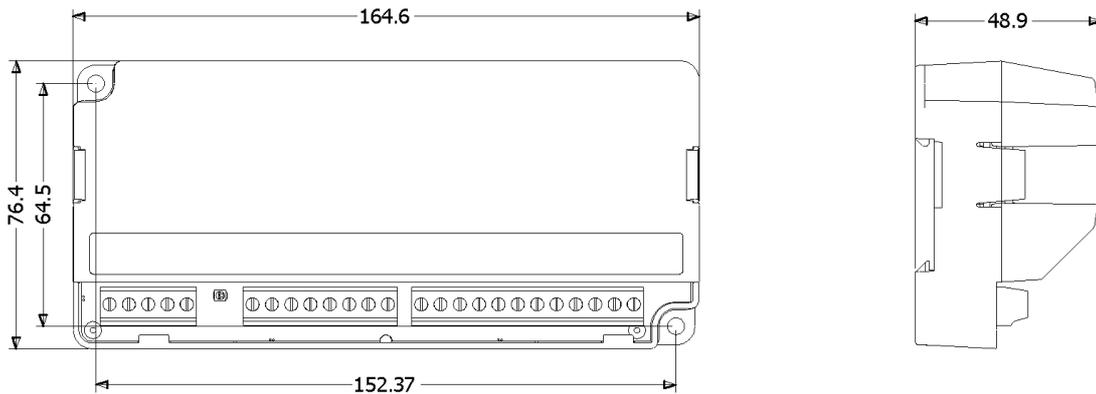
Cable type	Two core screened twisted pair
Cable characteristic impedance	120Ω
Recommended cable	Belden 9841 Belden 9271
Maximum cable length	1000m (1km) when using Belden 9841 or direct equivalent. 500m (0.5km) when using Belden 9271 or direct equivalent.
DSEnet topology	Bus with no stubs (spurs)
DSEnet 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 connection details, you are referred to the section entitled '*typical wiring diagram*' elsewhere in this document.

Specifications

3.5 DIMENSIONS

Overall size	164.6mm x 76.4mm x 48.9mm (6.48" x 3.01" x 1.93")
Weight	150g (0.6lb)
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

3.6 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 DSE2131 is designed to be mounted within a control panel, either on the panel DIN rail utilising the integral mounts, or chassis mounted, utilising the mounting holes. For dimension and mounting details, see the section entitled *Specification, Dimensions* elsewhere in this document.

4.1 USER CONNECTIONS

4.1.1 CONNECTOR A

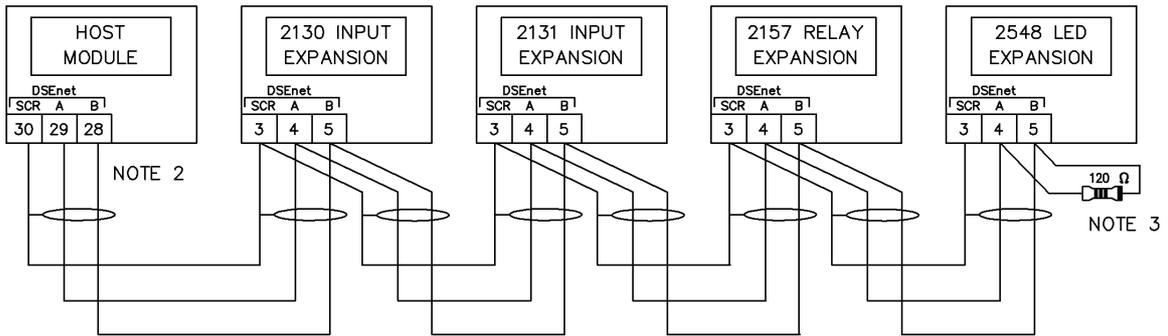
Terminal	Function	Recommended size	Notes
1	DC supply positive	1.0mm ² (AWG18)	
2	DC supply negative	1.0mm ² (AWG18)	
3	Screen		DSEnet only
4	A	0.5mm ² (AWG20)	DSEnet only
5	B	0.5mm ² (AWG20)	DSEnet only

4.1.2 CONNECTOR B

See typical wiring diagram for connection options.

Terminal	Function	Recommended size
6	Ratiometric input A	0.5mm ² (AWG20)
7	Ratiometric input A	0.5mm ² (AWG20)
8	Ratiometric input B	0.5mm ² (AWG20)
9	Ratiometric input B	0.5mm ² (AWG20)
10	Ratiometric input C	0.5mm ² (AWG20)
11	Ratiometric input C	0.5mm ² (AWG20)
12	Ratiometric input D	0.5mm ² (AWG20)
13	Ratiometric input D	0.5mm ² (AWG20)
14	Ratiometric input E	0.5mm ² (AWG20)
15	Ratiometric input E	0.5mm ² (AWG20)
16	Ratiometric input F	0.5mm ² (AWG20)
17	Ratiometric input F	0.5mm ² (AWG20)
18	Ratiometric input G	0.5mm ² (AWG20)
19	Ratiometric input G	0.5mm ² (AWG20)
20	Ratiometric input H	0.5mm ² (AWG20)
21	Ratiometric input H	0.5mm ² (AWG20)
22	Ratiometric input i	0.5mm ² (AWG20)
23	Ratiometric input I	0.5mm ² (AWG20)
24	Ratiometric input J	0.5mm ² (AWG20)
25	Ratiometric input J	0.5mm ² (AWG20)

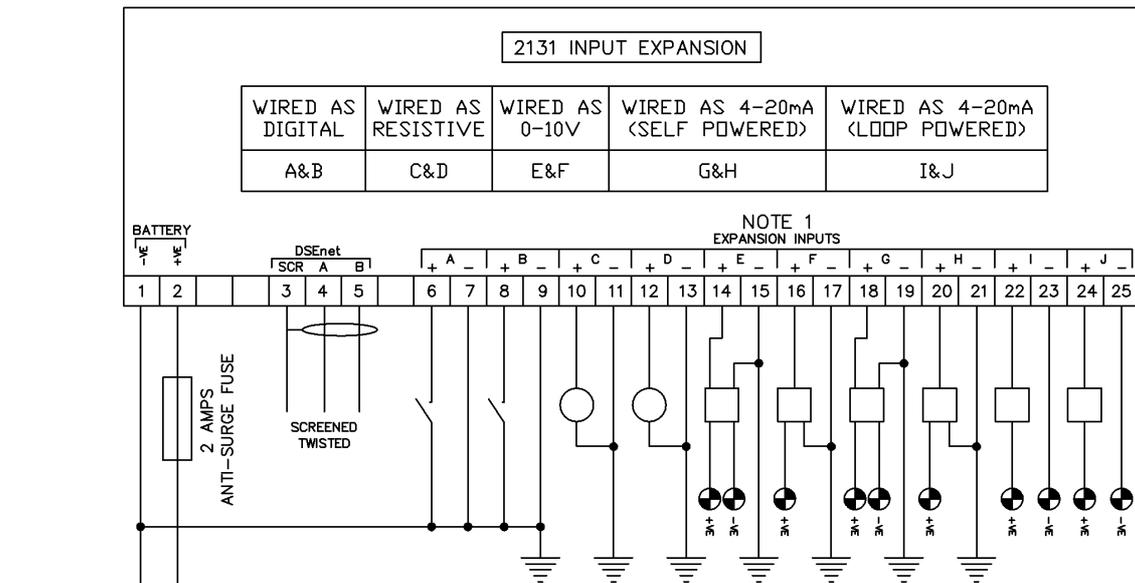
4.2 SCHEMATIC INTERCONNECTION DIAGRAM



NOTE 2
 AS A TERMINATING RESISTOR IS INTERNALLY FITTED TO THE HOST CONTROLLER, THE HOST CONTROLLER MUST BE THE FIRST UNIT ON THE DSEnet

NOTE 3
 A 120 OHM TERMINATION RESISTOR MUST BE FITTED TO THE LAST UNIT ON THE DSEnet

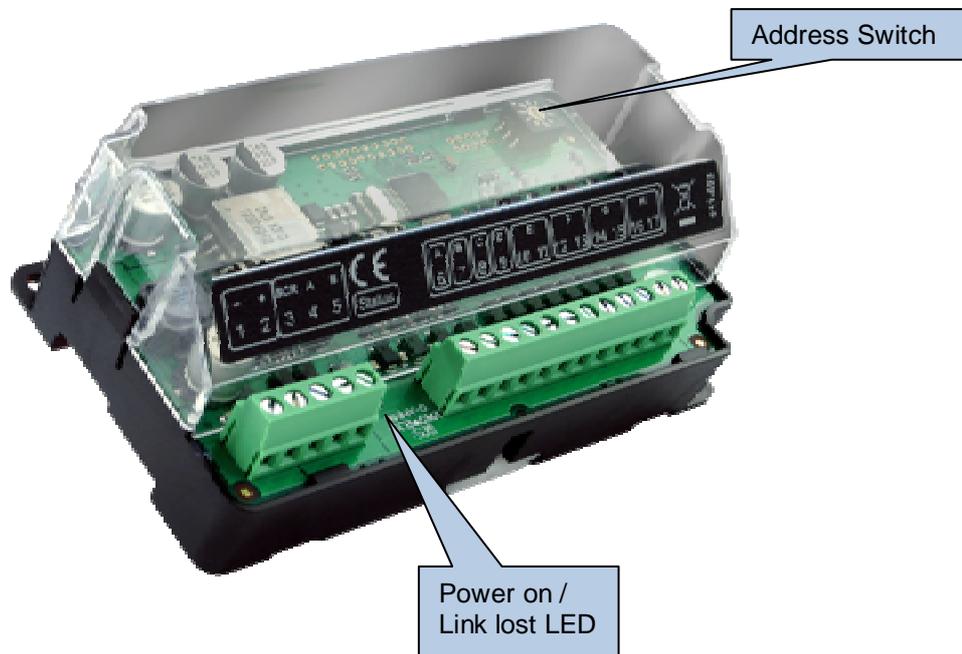
4.3 TYPICAL WIRING DIAGRAM



NOTE 1
 ALL INPUTS CAN BE CONFIGURED AS EITHER A DIGITAL INPUT, RESISTIVE INPUT, 0-10V INPUT, 4-20mA INPUT OR ANY COMBINATION OF THE ABOVE

NOTE : Configuration of the inputs is performed in the host controller.

5 CONTROLS AND INDICATIONS



5.1 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.

5.2 ID SWITCH

The rotary ID switch is used to select the 'Identification' of the DSE2131 expansion module as the host controller is capable of giving instructions to a number of DSE2131 expansion modules at the same time. Consult the relevant module's operating instructions for further details on number of supported expansion units (refer to the section entitled *Bibliography* elsewhere in this document).

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 set to be a unique number, different from the ID of any other DSE2131 input expansion module connected on the DSEnet. The ID of the DSE2131 will not interfere with the ID of any other *type* of expansion module. For instance it's OK to have a DSE2131 with ID1 and a 2157 with ID1. As the two modules are different type

6 FAULT DIAGNOSIS

Nature of problem	Suggestion
Inputs don't activate on the host controller	Ensure the host controller is correctly configured to accept the module.
Power LED indication does not illuminate	Check polarity and size of the connected DC supply are within the specifications.
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.

7 MAINTENANCE, SPARES, REPAIR AND SERVICING

The module 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).

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)

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.



9.2 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.