DEEP SEA ELECTRONICS

DSE8003 MKII Operator Manual

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DSE8003 MKII Operators Manual

Amendments List

Issue No.	Comments
1	First Release
1.1	Updated dimensions, panel cutout and weight.
1.2	Updated to mention about different firmware versions for DSE7xxx MKII and DSE8xxx MKII modules.
1.3	Updated to mention the number of DSE7xxx MKII modules supported

TABLE OF CONTENTS

1 INTRODUCTION

This document details the installation and operation requirements of the DSE8003 MKII module, part of the DSEGenset® 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.* You will not be automatically informed of updates. Any future updates of this document will be included on the DSE website at www.deepseaplc.com

The DSE8003 MKII is used in conjunction with the DSE73xx MKII (V4.2 and upwards), DSE74xx MKII (V4.2 and upwards) and DSE8xxx MKII series of modules. The DSE8003 MKII is NOT a standalone module.

The DSE73xx MKII, DSE74xx MKII and DSE8xxx MKII series are designed to provide differing levels of functionality across a common platform. This allows the generator OEMs greater flexibility in the choice of controller to use for a specific application.

The DSE modules have been designed to allow the operator to start and stop the generator, and if required, transfer the load to the generator either manually (via fascia mounted push buttons) or automatically.

Synchronising and Load Sharing features are included within the DSE8xxx MKII modules, along with the necessary protections for such a system. This provides forward sync, back sync (no break changeover) and start/stop upon changing load levels.

The user also has the facility to view the system operating parameters via the LCD display.

The DSE genset modules monitor the engine, indicating the operational status and fault conditions, automatically shutting down the engine and giving a true first up fault condition of an engine failure by a common audible alarm. The LCD display indicates the fault.

The powerful microprocessor contained within the module allows for of a range of enhanced features when connected to a supported module:

- *Text and image based colour 7” TFT LCD display (800 x 480 pixels)*
- ***True RMS** Voltage, Current and Power display.*
- *Engine parameter display.*

Using a PC and the DSE SCADA Suite software allows alteration of the graphical interface. Additionally, the DSE8003 MKII integral front panel configuration editor allows adjustment of connected modules.

A robust plastic case designed for front panel mounting houses the module. Connections are via locking plug and sockets.

Access to critical operational sequences and timers for use by qualified engineers, can be protected by a security code. Module access can also be protected by PIN code. Selected parameters can be changed from the module’s front panel.

The module is housed in a robust plastic case suitable for panel mounting. Connections to the module are via locking plug and sockets.

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 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.

1.2.1 INSTALLATION INSTRUCTIONS

Installation instructions are supplied with the product in the box and are intended as a 'quick start' guide only.

DSE Part No	Description
053-181	DSE7300 MKII Installation Instructions
053-182	DSE8610 MKII Installation Instructions
053-184	DSE8660 MKII Installation Instructions
053-182	DSE8620 MKII Installation Instructions
053-191	DSE7400 MKII Installation Instructions

1.3 MANUALS

Product manuals are obtained from the DSE website: www.deepseaelectronics.com or by contacting DSE technical support: support@deepseaelectronics.com.

DSE Part No	Description
057-004	Electronic Engines And DSE Wiring Manual
057-045	Synchronising and Load Sharing Part 1
057-046	Synchronising and Load Sharing Part 2
057-047	Load Share Design and Commissioning
057-082	DSE2130 Operators Manual
057-083	DSE2157 Operators Manual
057-084	DSE2548 Operators Manual
057-128	DSE SCADA Suite Software Manual
057-139	DSE2131 Operators Manual
057-140	DSE2133 Operators Manual
057-141	DSE2152 Operators Manual
057-238	DSE8610 MKII Configuration Software Manual
057-239	DSE8620 MKII Configuration Suite PC Software Manual
057-243	DSE7300 MKII Configuration Software Manual
057-253	DSE7300 MKII Operators Manual
057-254	DSE8610 MKII Operators Manual
057-257	DSE8660 MKII Configuration Software Manual
057-259	DSE8660 MKII Operators Manual
057-262	DSE7400 MKII Configuration Software Manual
057-263	DSE7400 MKII Operators Manual
057-301	DSE8620 MKII Operators Manual

2 SPECIFICATIONS

2.1 SHORT NAMES

Short Name	Description
DSE7300 MKII, DSE73xx MKII	All modules in the DSE73xx MKII range (V4.2 and upwards)
DSE7400 MKII, DSE74xx MKII	All modules in the DSE74xx MKII range (V4.2 and upwards)
DSE8000 MKII, DSE8xxx MKII	All modules in the DSE8xxx MKII range
DSE8600 MKII, DSE86xx MKII	All modules in the DSE86xx MKII series
DSE8x60 MKII	All the mains ATS controllers in the DSE8xxx MKII range
DSE8x10 MKII	All the auto start generator controllers in the DSE8xxx range
DSE8x20 MKII	All the AMF generator controllers in the DSE8xxx range

2.2 OPERATING TEMPERATURE

Module	Description
DSE8003 MKII	-30 ºC to +70 ºC (-22 ºF to +158 ºF)

2.3 TERMINAL SPECIFICATION

NOTE: For purchasing additional connector plugs from DSE, please see the section entitled Maintenance, Spares, Repair and Servicing elsewhere in this document.

Description	Specification	
Connection Type	Two part connector. • Male part fitted to module • Female part supplied in module packing case - Screw terminal, rising clamp, no internal spring.	 Example showing cable entry and screw terminals of a 10 way connector
Minimum Cable Size	0.5 mm² (AWG 24)	
Maximum Cable Size	2.5 mm² (AWG 10)	

2.4 POWER SUPPLY REQUIREMENTS

Description	Specification
Minimum Supply Voltage	5 V continuous
Cranking Dropouts	Able to survive 0 V for 50 ms providing the supply was at least 10 V before the dropout and recovers to 5 V afterwards.
Maximum Supply Voltage	35 V continuous (60 V protection)
Reverse Polarity Protection	-35 V continuous
Maximum Operating/Standby Current	300 mA at 12 V 150 mA at 24 V

2.4.1 MODULE SUPPLY INSTRUMENTATION DISPLAY

Description	Specification
Range	0 V to 70 V DC (note Maximum continuous operating voltage of 35 V DC)
Resolution	0.1 V
Accuracy	1% full scale (±0.7 V)

2.5 COMMUNICATION PORTS

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

NOTE: All communication ports can be used at the same time.

Port	Specification
USB Slave Port	Non – isolated Type B USB 2.0 For connection to PC running DSE Configuration Suite Max distance 6 m (20 feet)
USB Host Port	Type A USB 2.0 Capability to add a maximum of 16 GB USB storage device to module upload configuration.
Serial Communication	RS232 and RS485 are both fitted and provide independent operation
RS232 Serial Port	Non – isolated Max Baud rate 115 kbaud subject to configuration TX, RX, RTS, CTS, DSR, DTR, DCD Male 9 way D type connector Max distance 15 m (50 feet)
RS485 Serial Port	Isolated Data connection 2 wire + common Half Duplex Data direction control for Transmit (by s/w protocol) Max Baud Rate 115 kbaud subject to configuration External termination required (120 Ω) Max common mode offset 70 V (on board protection transorb) Max distance 1.2 km (¾ mile)
Ethernet Port	RJ45 Ethernet connection for TCP/IP Auto detecting 10/100 Mbit Ethernet port Auto MDIX to remove need for crossover cables Max distance 100 m (328 feet) between routers

2.6 COMMUNICATION PORT USE

2.6.1 USB CONNECTION

2.6.1.1 USB SLAVE PORT (FIRMWARE UPDATE)

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

NOTE: DSE stock 2 m (6.5 feet) USB type A to type B cable, DSE Part Number: 016-125. Alternatively, they are purchased from any PC or IT store.

The DSE8003 MKII requires a different firmware version to communicate to the DSE73xx MKII and DSE74xx MKII units compared with the DSE86xx MKII units.

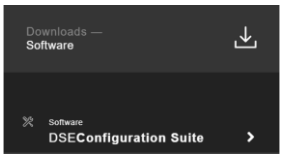
Using the DSE Configuration Suite Software, the USB slave port provides a simple means of connection between a PC and the controller to change the firmware version in the controller.

To connect a module to a PC by USB, the following items are required:

- DSE8003 MKII Controller

- DSE Configuration Suite PC Software

  (Available from www.deepseaelectronics.com).



- USB cable Type A to Type B.

  (This is the same cable as often used between a PC and a USB printer)

2.6.1.2 USB HOST PORT (CONFIGURATION)

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

USB Type A connection for connection to an external USB storage device with a maximum size of 16 GB to provide a means of uploading the configuration file to the module

2.6.2 RS232 PORT

NOTE: For direct connection an RS232 null modem (crossover) cable is required. This is rated to a maximum cable length of 15 m (49 feet).

RS232 is for short distance communication of maximum 15 m (49 feet) and is typically used to connect the DSE8003 MKII to a single module for remote communications.

The various operating parameters (such as mains voltage, bus frequency, load kW, etc.) of the system are available to be viewed.

2.6.3 RS485 PORT

NOTE: For a single module to module connection and distances up to 15 m (49 feet) the RS232 connection method is more suitable and provides for a lower cost alternative to RS485 (which is more suited to longer distance connections).

NOTE: The DSE8003 MKII Colour Display Module supports maximum a combination of FOUR DSE73xx MKII and DSE74xx MKII modules.

RS485 is used for point-to-point cable connection of more than one device (maximum 20). One advantage of the RS485 interface is the large distance specification which is 1.2 km when using Belden 9841 (or equivalent) cable. This allows for a large distance between the DSE8004 and multiple modules.

2.6.3.1 CABLE SPECIFICATION

NOTE: DSE recommend Belden 9841 (or equivalent) cable for RS485 communication. This is rated to a maximum cable length of 1.2 km. DSE Stock Belden 9841 cable, DSE Part Number: 016-030.

Description	Specification
Cable Type	Two core screened and shielded twisted pair
Cable Characteristics	120 Ω impedance Low capacitance
Recommended Cable	Belden 9841 Belden 9271
Maximum Cable Length	1200 m (¾ mile) when using Belden 9841 or direct equivalent. 600 m (656 yards) when using Belden 9271 or direct equivalent.
RS485 Topology	“Daisy Chain” Bus with no stubs (spurs)
RS485 Termination	120 Ω. Not fitted internally to module. Must be fitted externally to the ‘first’ and ‘last’ device on the RS485 link.

2.6.4 ETHERNET PORT

NOTE: DSE stock 2 m (6.5 feet) Ethernet Cable, DSE Part Number: 016-137. Alternatively, they can be purchased from any PC or IT store.

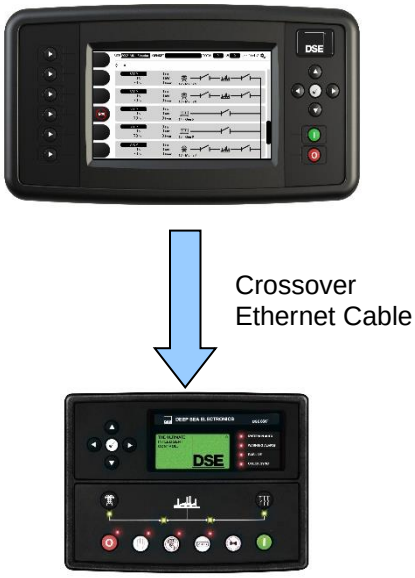
NOTE: The DSE8003 MKII Colour Display Module supports maximum a combination of FOUR DSE73xx MKII and DSE74xx MKII modules.

Ethernet is used for point-to-point cable connection of more than one device (maximum 20). One advantage of the Ethernet interface is the ability to interface into an existing LAN (Local Area Network) connection for remote connection via an internet connection. This allows for a large distance between the DSE8003 MKII and multiple modules.

2.6.4.1 DIRECT MODULE CONNECTION

Requirements

- Crossover Ethernet cable (see Below)

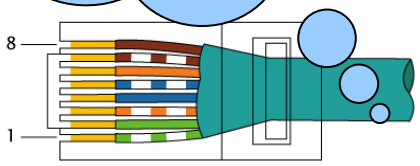


Crossover Cable Wiring Detail

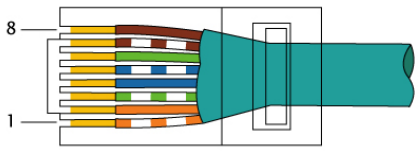
Two pairs crossed, two pairs uncrossed
10baseT/100baseT crossover

Pin	Connection 1 (T568A)	Connection 2 (T568B)
1	white/green stripe	white/orange stripe
2	green solid	orange solid
3	white/orange stripe	white/green stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	green solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid

For the advanced Engineer, a crossover cable is a CAT5 cable with one end terminated as T568A and the other end terminated as T568B



EIA/TIA-568A



EIA/TIA-568B

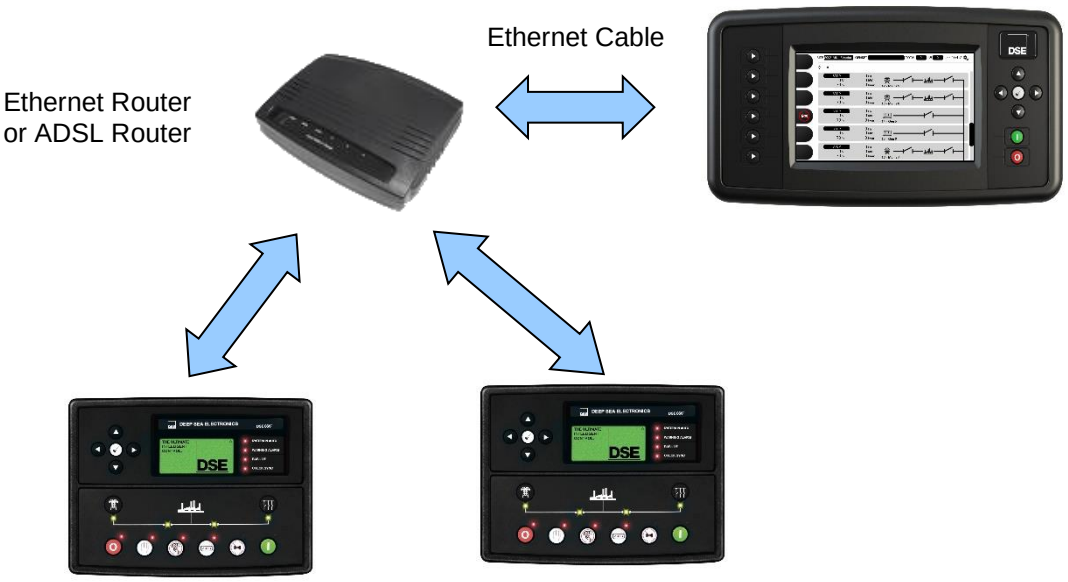
NOTE: This cable can be purchased from any PC or IT store.

2.6.4.2 CONNECTION TO BASIC ETHERNET

NOTE: DSE stock 2 m (6.5 feet) Ethernet Cable, DSE Part Number: 016-137. Alternatively, they can be purchased from any PC or IT store.

Requirements

- Ethernet cable (see below)
- Working Ethernet (company or home network)

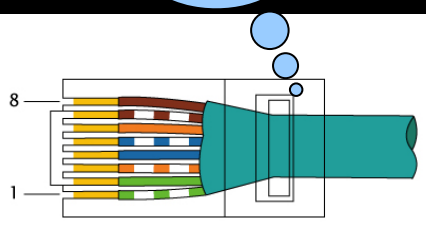


Ethernet Cable Wiring Detail

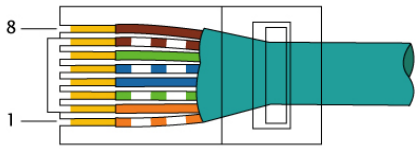
For the advanced Engineer, this cable has both ends terminated as T568A or T568B.

10baseT/100baseT

Pin	Connection 1 (T568A)	Connection 2 (T568A)
1	white/green stripe	white/green stripe
2	green solid	green solid
3	white/orange stripe	white/orange stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	orange solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid



EIA/TIA-568A



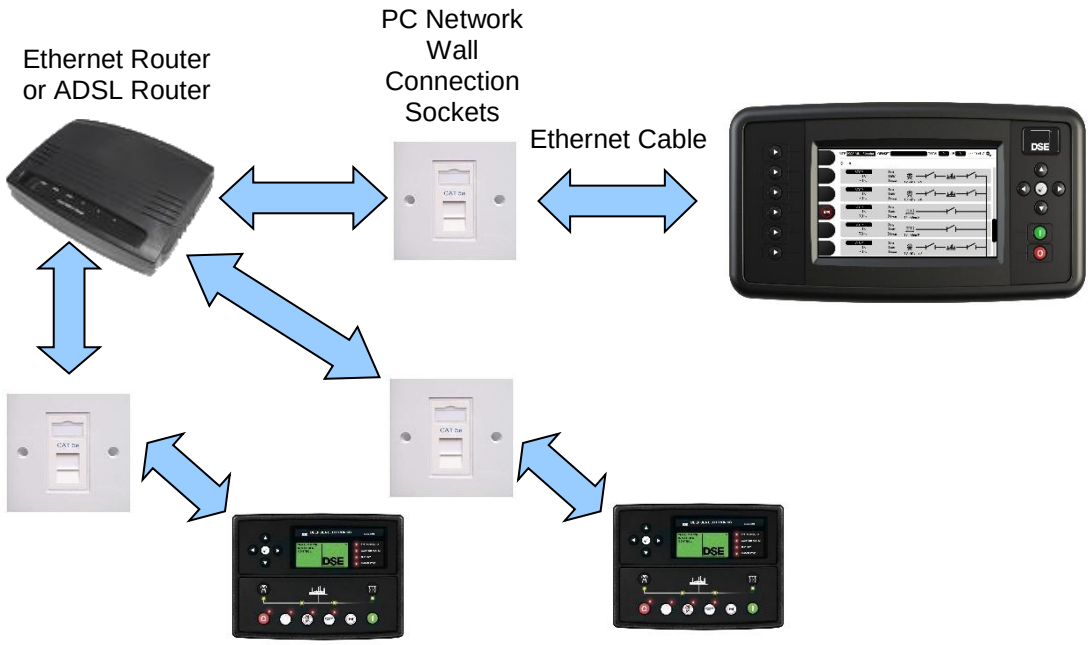
EIA/TIA-568B

2.6.4.3 CONNECTION TO COMPANY INFRASTRUCTURE ETHERNET

NOTE: DSE stock 2 m (6.5 feet) Ethernet Cable, DSE Part Number: 016-137. Alternatively, they can be purchased from any PC or IT store.

Requirements

- Ethernet cable (see below)
- Working Ethernet (company or home network)

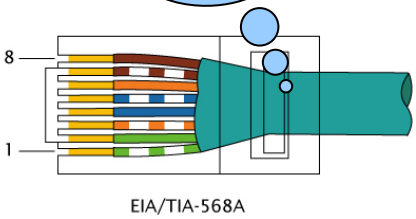


Ethernet Cable Wiring Detail

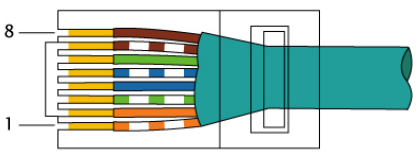
10baseT/100baseT

For the advanced Engineer, this cable has both ends terminated as T568A or T568B.

Pin	Connection 1 (T568A)	Connection 2 (T568A)
1	white/green stripe	white/green stripe
2	green solid	green solid
3	white/orange stripe	white/orange stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	orange solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid



EIA/TIA-568A



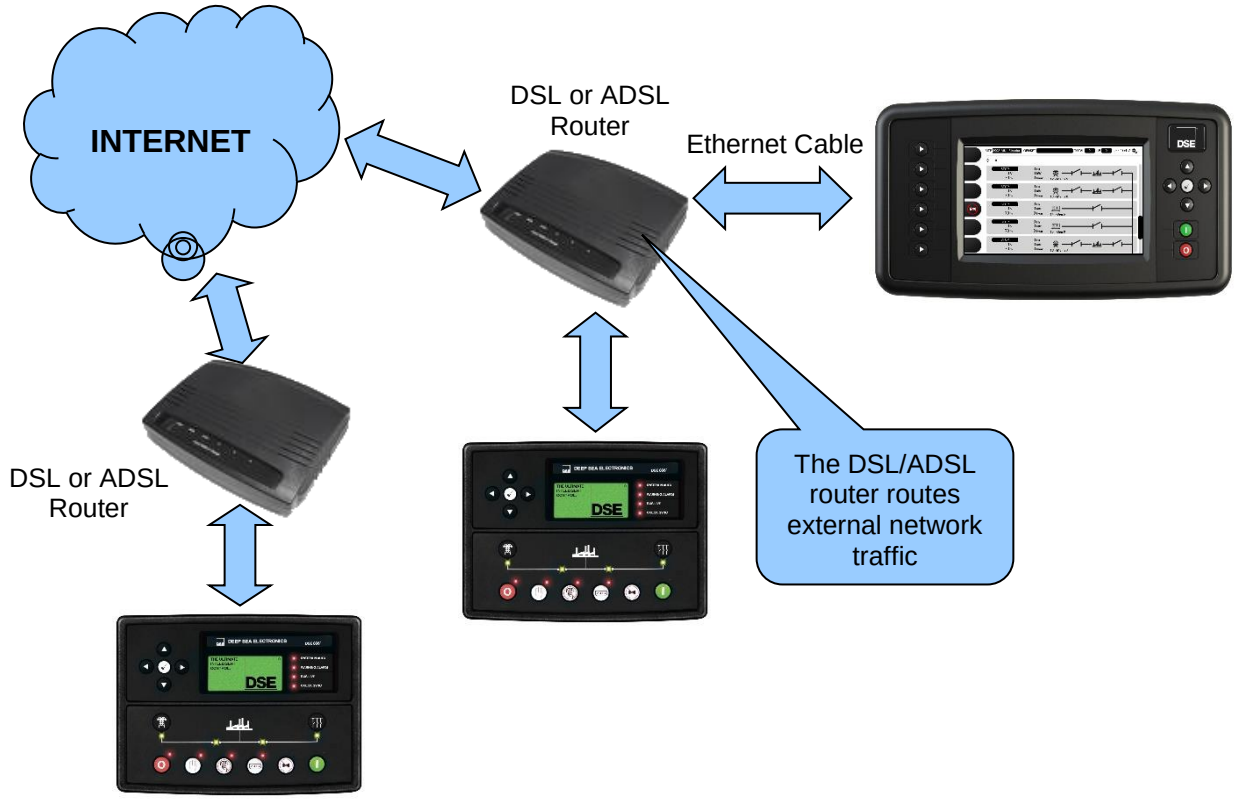
EIA/TIA-568B

2.6.4.4 CONNECTION TO THE INTERNET

NOTE: DSE stock 2 m (6.5 feet) Ethernet Cable, DSE Part Number: 016-137. Alternatively they can be purchased from any PC or IT store.

Requirements

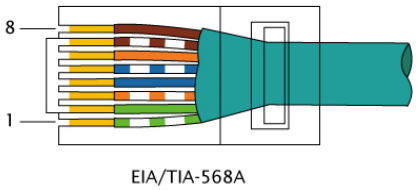
- Ethernet cable (see below)
- Working Ethernet (company or home network)
- Working Internet connection (ADSL or DSL recommended)



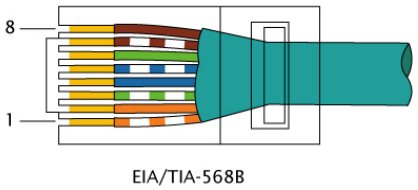
Ethernet Cable Wiring Detail

10baseT/100baseT

Pin	Connection 1 (T568A)	Connection 2 (T568A)
1	white/green stripe	white/green stripe
2	green solid	green solid
3	white/orange stripe	white/orange stripe
4	blue solid	blue solid
5	white/blue stripe	white/blue stripe
6	orange solid	orange solid
7	white/brown stripe	white/brown stripe
8	brown solid	brown solid



EIA/TIA-568A



EIA/TIA-568B

For the advanced Engineer, this cable has both ends terminated as T568A or T568B.

2.6.4.5 FIREWALL CONFIGURATION FOR INTERNET ACCESS

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

As modems or routers differ enormously in their configuration, it is not possible for DSE to give a complete guide to their use with the module. However it is possible to give a description of the requirements in generic terms. For details of how to achieve the connection to the modem or router refer to the supplier of the modem or router equipment.

The module makes its data available over Modbus TCP and as such communicates over the Ethernet using a Port configured via the DSE SCADA Suite software.

Configure the modem or router to allow inbound traffic on this port. For more information refer to the WAN interface device (modem/router) manufacturer.

It is also important to note that if the port assigned (setting from software “Modbus Port Number”) is already in use on the LAN, the module cannot be used and another port must be used.

Outgoing Firewall Rule

As the module makes its user interface available to standard web browsers, all communication uses the chosen port. It is usual for a firewall to make the same port outgoing open for communication.

Incoming Traffic (Virtual Server)

Network Address and Port Translation (NAPT) allows a single device, such as the modem/router gateway, to act as an agent between the Internet (or "public external network") and a local (or "internal private") network. This means that only a single, unique IP address is required to represent an entire group of computers.

For our application, this means that the WAN IP address of the modem/router is the IP address we need to access the site from an external (internet) location.

When the requests reach the modem/router, we want this passed to a ‘virtual server’ for handling, in our case this is the module.

Result: Traffic arriving from the WAN (internet) on port xxx is automatically sent to IP address set within the configuration software on the LAN for handling.

2.7 SOUNDER

The module features an internal sounder to draw attention to warning, shutdown and electrical trip alarms.

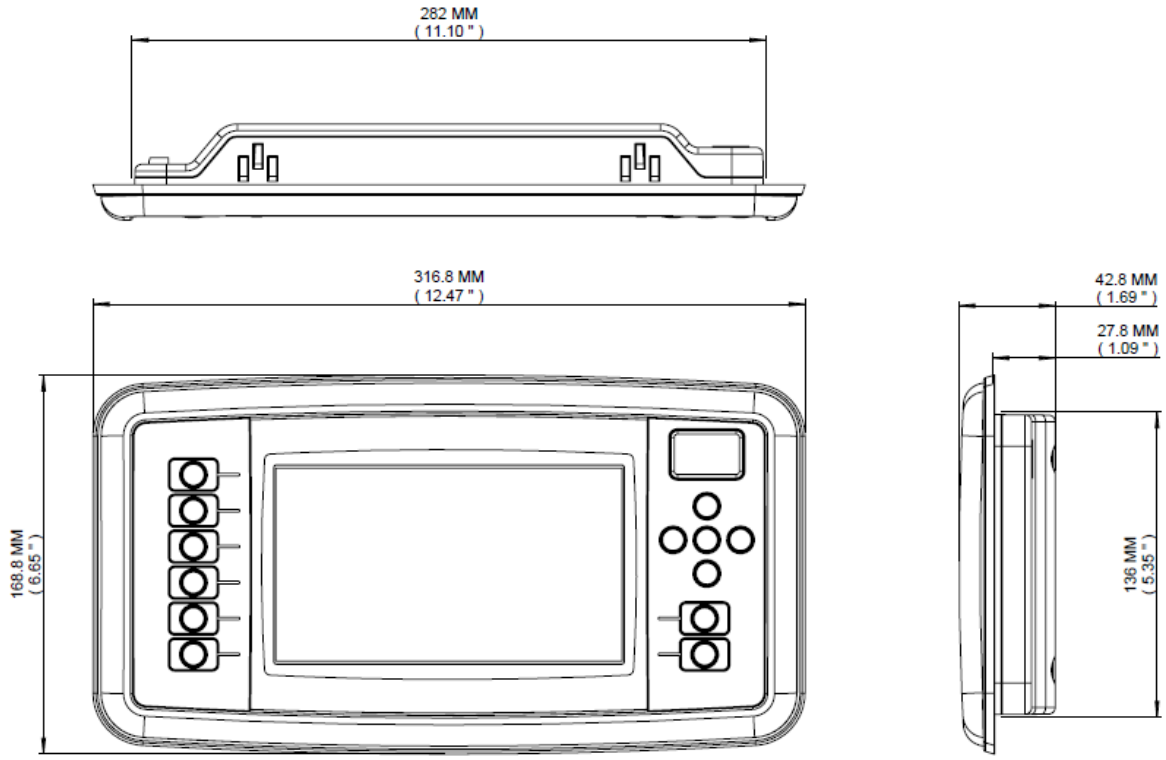
Description	Specification
Sounder Level	64 db at 1 m

2.7.1 ADDING AN EXTERNAL SOUNDER TO THE APPLICATION

Should an external alarm or indicator be required, this can be achieved by using the DSE8003 MKII running editor to configure an auxiliary output for “Audible Alarm”. See section entitled *Front Panel Configuration* for further details.

The audible alarm output activates and de-activates at the same time as the module’s internal sounder. The monitored DSE controllers alarm mute input and alarm mute button activate ‘in parallel’ with each other. Either signal will mute both the internal sounder and audible alarm output.

2.8 DIMENSIONS AND MOUNTING



2.8.1 DIMENSIONS

316.8 mm x 168.8 mm x 42.8 mm
(12.47” x 6.65” x 1.69”)

2.8.2 PANEL CUTOUT

282 mm x 136 mm
(11.1” x 5.35”)

2.8.3 WEIGHT

1.0 kg
(2.2 lb)

2.8.4 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 screws a little more to secure the module into the panel fascia. Care should be taken not to over tighten the fixing clip screws.

2.8.5 SILICON SEALING GASKET

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

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

2.8.6 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)
IEEE C37.2 (Standard Electrical Power System Device Function Numbers and Contact Designations)	Under the scope of IEEE 37.2, *function numbers can also be used to represent functions in microprocessor devices and software programs*. The controller is device number 11L-8000 (Multifunction device protecting Line (Generator) –module). As the module is configurable by the Generator OEM, the functions covered by the module vary. Under the module's factory configuration, the device numbers included within the module are : 30 – Annunciator Relay 74 – Alarm Relay 77 – Telemetering Device

2.8.7 ENCLOSURE CLASSIFICATIONS

2.8.7.1 **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).

2.8.7.2 **NEMA CLASSIFICATIONS**

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

The Modules NEMA Rating (Approximate))

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)

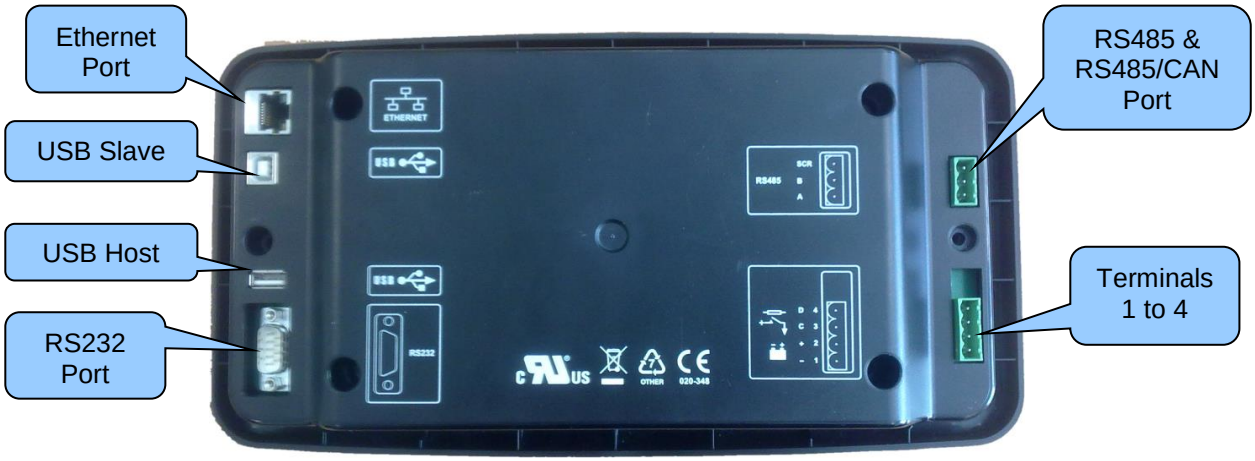
1 **IP30**	Provides a degree of protection against contact with the enclosure equipment and against a limited amount of falling dirt.
2 **IP31**	Provides a degree of protection against limited amounts of falling water and dirt.
3 **IP64**	Provides a degree of protection against windblown dust, rain and 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 INSTALLATION

The module is designed to be mounted on the panel fascia. 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.

NOTE: Full details on terminals are provided in the section entitled *Terminal Description* elsewhere in this manual.

NOTE: For dimension and mounting details, see the section entitled *Specification, Dimension and Mounting* elsewhere in this document.



3.1 CONNECTIONS

3.1.1 DC SUPPLY, DIGITAL INPUTS AND OUTPUTS

	Pin No	Description	Cable Size	Notes
	1	DC Plant Supply Input (Negative)	2.5 mm² AWG 13	Connect to a good clean earth point.
	2	DC Plant Supply Input (Positive)	2.5 mm² AWG 13	Supplies the module and DC Outputs A, B & C
	3	Configurable Digital Input or DC Output A	1.0mm² AWG 18	As input: Switch to negative by connecting to a good clean earth point
	4	Configurable Digital Input or DC Output B	1.0mm² AWG 18	As output: 2 A DC output supplied from terminal 2

3.1.2 RS485 & RS485/CAN CONNECTOR

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

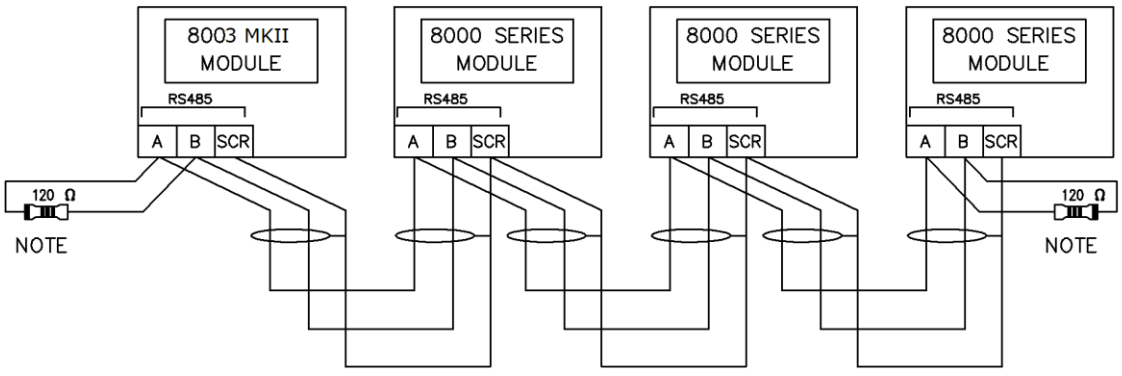
NOTE: A 120 Ω termination resistor must be fitted across terminals A and B if the DSE8004 is the first or last device on the R485 link.

NOTE: For further details on how utilise an RS485 connection, refer to section entitled *Communication Port Usage* elsewhere in this document.

	Description	Cable
	Socket for connection between DSE8004 and multiple DSE modules	Belden 9841

	Pin No	Description	Cable Size	Notes
RS485	SCR	RS485 Port Screen	0.5 mm² AWG 20	Use only 120 Ω RS485 approved cable (Belden 9841)
	B	RS485 Port B (+)	0.5 mm² AWG 20	Connect to RXD+ and TXD+ Use only 120 Ω RS485 approved cable (Belden 9841)
	A	RS485 Port A (-)	0.5 mm² AWG 20	Connect to RXD- and TXD- Use only 120 Ω RS485 approved cable (Belden 9841)
RS485/ CAN	SCR	RS485 Port Screen	0.5 mm² AWG 20	Use only 120 Ω RS485 approved cable (Belden 9841)
	B/L	RS485 Port B (+) or CAN Low	0.5 mm² AWG 20	Connect to RXD+ and TXD+ or CAN L Use only 120 Ω RS485 approved cable (Belden 9841)
	A/H	RS485 Port A (-) or CAN High	0.5 mm² AWG 20	Connect to RXD- and TXD- or CAN H Use only 120 Ω RS485 approved cable (Belden 9841)

3.1.3 TYPICAL WIRING OF RS485



3.1.4 USB SLAVE (FIRMWARE UPDATE) CONNECTOR

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 the PC supplier.

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

NOTE: The USB connection cable between the PC and the module must not be extended beyond 6 m (20 feet). For distances over 6 m, it is possible to use a third party USB extender. Typically, they extend USB up to 50 m (55 yards). The supply and support of this type of equipment is outside the scope of Deep Sea Electronics Ltd.

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

3.1.5 USB HOST (CONFIGURATION) CONNECTOR

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

NOTE: For further details on how to utilise a USB storage device for module configuration, refer to section entitled *Configuration (Graphical Interface Setup)* elsewhere in this document.

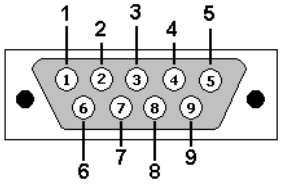
	Description	Storage Size	Notes
	Socket for connection to USB storage device for configuration	Maximum 16 GB	USB storage device formatted as FAT, not FAT32.

3.1.6 RS232 CONNECTOR

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

NOTE: For further details on how utilise an RS232 connection, refer to section entitled *Communication Port Usage* elsewhere in this document.

	Description	Cable
	Socket for connection to a single DSE module.	RS232 Null Modem Cable



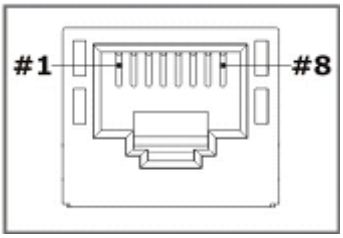
View looking into the male connector on the module

PIN No	Notes
1	Received Line Signal Detector (Data Carrier Detect)
2	Received Data
3	Transmit Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Request To Send
8	Clear To Send
9	Ring Indicator

3.1.7 ETHERNET CONNECTOR

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

	Description	Cable
	Socket for connection to an existing network to communicate to multiple DSE modules.	Ethernet Cable



View looking into the female connector on the module

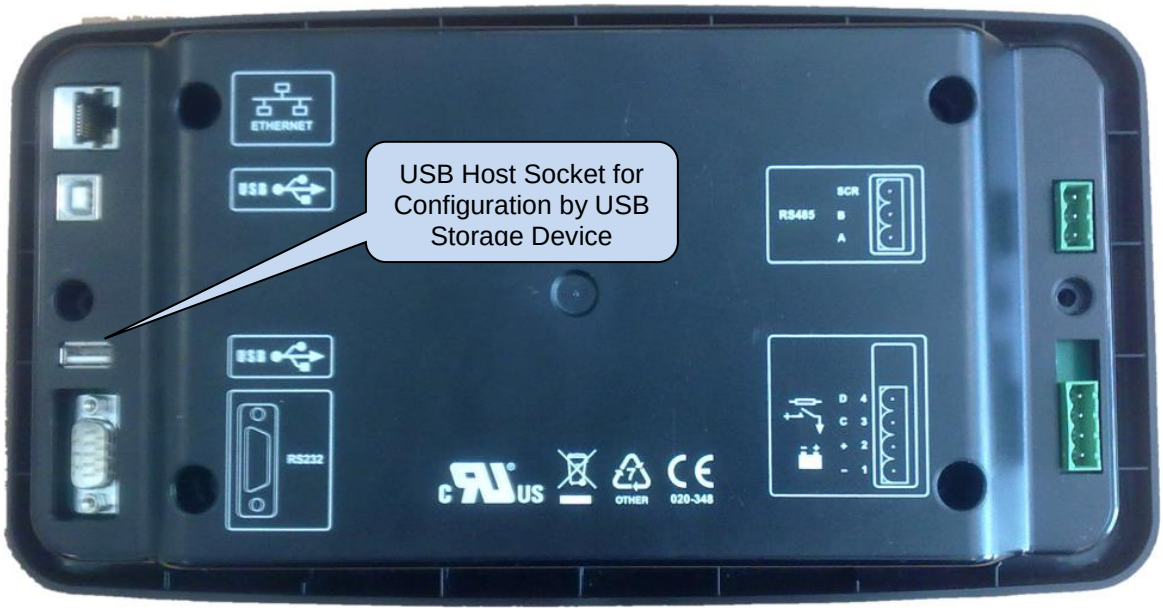
PIN No	Notes
1	TXD+
2	TXD-
3	RXD+
4	Do not connect
5	Do not connect
6	RXD-
7	Do not connect
8	Do not connect

3.2 CONFIGURATION (GRAPHICAL USER INTERFACE SETUP)

NOTE: For further details of module configuration, refer to DSE Publication: *057-128 DSE8005 SCADA Suite Software Manual.*

The configuration is setup using the DSE8005 SCADA Suite PC Software in conjunction with a USB storage device.

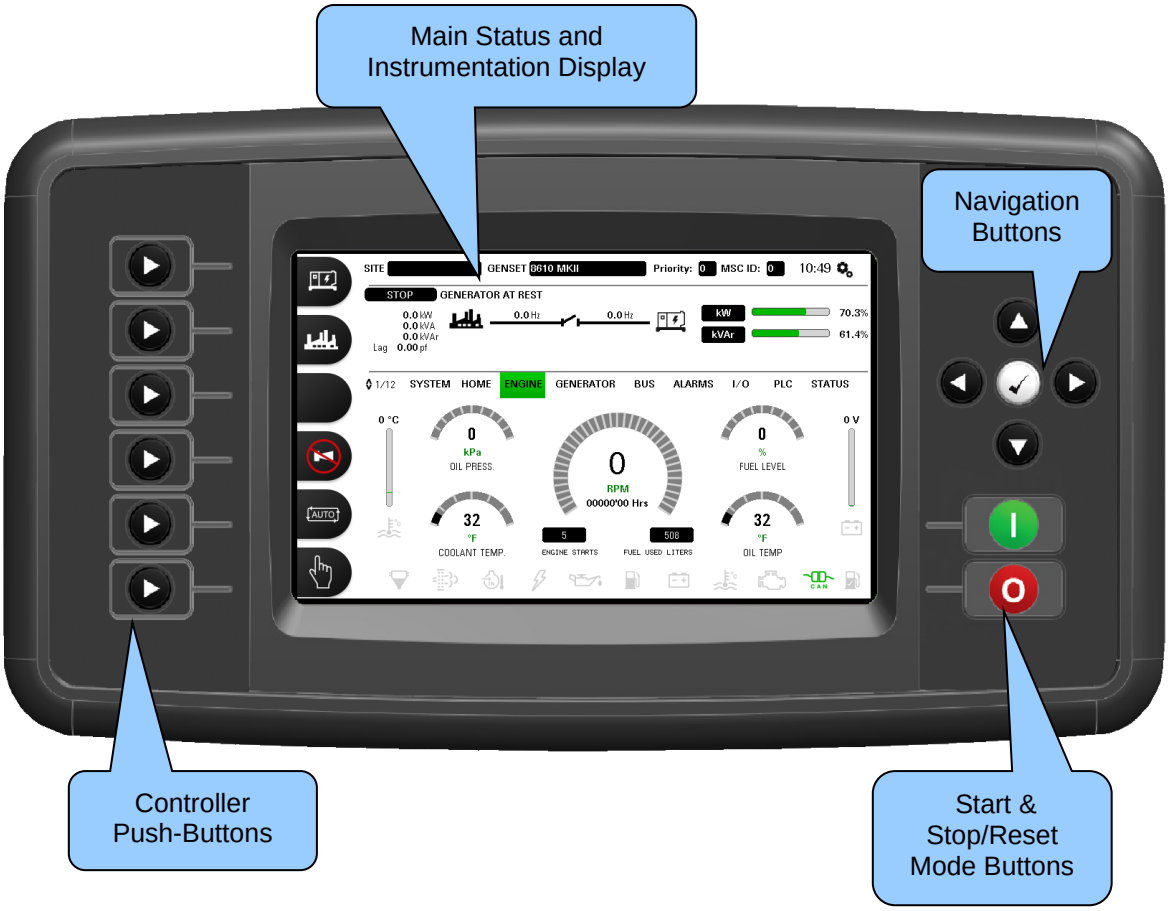
1. Save the file to the root of a USB storage device with the filename *layout.xml*.
2. Insert the USB storage device into the USB host socket.
3. Access the DSE8003 MKII Front Panel Configuration menu.
4. Navigate to the *Layout Update* section in FPE and select the layout file.
5. Once the file is selected, the display prompts a power cycle.
6. Reboot the module, the configuration file is loaded automatically.



4 DESCRIPTION OF CONTROLS

The following section details the function and meaning of the various controls on the module.

Together with the start and stop button, the six buttons to the left of the screen are used to provide control of the currently view DSE8xxx controller. The navigation buttons are used to navigate through the numerous DSE8003 MKII display pages. The display is a 7” TFT with 800x480 pixels.



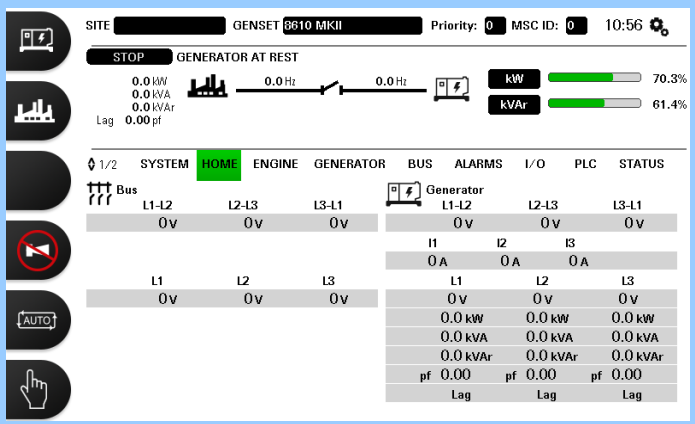
4.1 DISPLAY

4.1.1 SYSTEM OVERVIEW

Touch the screen or use the up/down arrow buttons to select the engine to control / monitor. The selected item appears with a blue border as shown below.
The buttons to the left of the display change according to the selected controller.

The selected controller is operated using the control buttons to the left of the display or by touching the screen buttons

To “zoom in” to the selected controller, press the tick button or press VIEW in the corner of the display screen:



Sample screen after selecting VIEW for a DSE8x10 controller

4.2 CONTROL PUSH-BUTTONS

4.2.1 START/STOP BUTTONS

Icon	Description
	**Stop / Reset Mode** This button places the module into its ***Stop/Reset Mode*** . This clears any alarm conditions for which the triggering criteria have been removed. If the generator is running on load and the module is put into ***Stop/Reset Mode*** , the module automatically opens the generator bus breaker *('**Close Bus**' become inactive)* and instructs the DSE module to enter the return delay. Should any form of ***Remote Start Signal*** be present while operating in this mode, a start request to the DSE8610 MKII module over the MSC Link does <u>not</u> occur.
	**Start** This button is only active in the ***Stop/Reset Mode*** , ***Manual Mode*** and ***Test Mode*** . Pressing the ***Start*** button in ***Stop/Reset Mode*** , powers the ECU but does not start the engine. This can be used to check the status of the CAN communication and to prime the fuel system. Pressing the ***Start*** button in ***Manual Mode*** or ***Test Mode*** starts the generator and run it off load in ***Manual Mode*** or on load in ***Test Mode.***

4.2.2 WHEN CONNECTED TO DSE7XXX MKII

Icon	Description
	**Auto Mode** This button places the module into its ***Auto Mode*** . This mode allows the module to control the function of the generator automatically. The module monitors numerous start requests and when one has been made, the set is automatically started. Once the generator is available, the mains is taken off load *('**Close Mains Output**' becomes inactive (if used on DSE7320 MKII or on DSE7420 MKII))* and the generator is placed on load *('**Close Generator Output**' becomes active (if used)).* Upon removal of the starting signal, the module starts the *Return Delay Timer* and once expired, takes the generator off load *('**Close Generator Output**' becomes inactive (if used on))* and place the mains on load *('**Close Mains Output**' becomes active (DSE7320 MKII or DSE7420 MKII)).* The generator then continues to run for the duration of the *Cooling Timer* until it stops. The module then waits for the next start event.
	**Manual Mode** This button places the module into its ***Manual Mode*** . Once in ***Manual Mode*** , the module responds to the ***Start*** button to start the generator and run it off load. To place the generator on load, use the ***Transfer to Generator*** button. The module automatically instructs the changeover device to take the mains off load *('**Close Mains Output**' becomes inactive (if used on DSE7320 MKII or on DSE7420 MKII))* and place the generator on load *('**Close Generator Output**' becomes active (if used)).* To place the generator off load, use the ***Transfer to Mains*** or ***Open Generator*** buttons. The module automatically instructs the changeover device to take the generator off load *('**Close Generator Output**' becomes inactive (if used on))* and place the mains on load *('**Close Mains Output**' becomes active (DSE7320 MKII or DSE7420 MKII)).* Additional digital inputs can be assigned to perform these functions. If the engine is running off-load in ***Manual Mode*** and on load signal becomes active, the module automatically instructs the changeover device the changeover device to take the mains off load *('**Close Mains Output**' becomes inactive (if used on DSE7320 MKII or on DSE7420 MKII))* and place the generator on load *('**Close Generator Output**' becomes active (if used))*. Upon removal of the on load signal, the generator remains on load until either selection of the ***Stop/Reset Mode*** or ***Auto Mode*** .
	**Alarm Mute / Lamp Test** This button silences the audible alarm in the controller, de-activates the *Audible Alarm* output (if configured) and illuminates all of the LEDs on the module's facia as a lamp test function.

Icon	Description
	**Open Generator (DSE7x10 MKII Only)** The ***Open Generator*** button is only active in the ***Manual Mode*** and allows the operator to open the generator load switch. Pressing the ***Open Generator*** button when the Generator is on load, the generator load switch is opened *('**Close Generator**' becomes inactive).* Further presses of the ***Open Generator*** button have no effect.
	**Transfer To Generator** The ***Transfer to Generator*** button controls the operation of the generator load switch is only active in the ***Manual Mode*** once the generator is available. **'Normal' Breaker Button Control** Pressing the ***Transfer to Generator*** button when the Generator is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator load switch is closed *('**Close Generator**' becomes active)*. Further presses of the ***Transfer to Generator*** button have no effect. **'Alternative' Breaker Button Control** Pressing the ***Transfer to Generator*** button when the Generator is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator load switch is closed *('**Close Generator**' becomes active)*. Further presses of the ***Transfer to Generator*** button opens and closes the Generator load switch *('**Close Generator**' changes state)* and leaves the Mains load switch in the open position *('**Close Mains**' remains inactive)*.
	**Transfer To Mains (DSE7x20 MKII Only)** The ***Transfer to Mains*** button controls the operation of the mains load switch and is only active in ***Manual Mode***. **'Normal' Breaker Button Control** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the generator switch is opened *('**Close Generator**' becomes inactive)* and the mains switch is closed *('**Close Mains**' becomes active)*. Further presses of the ***Transfer to Mains*** button have no effect. **'Alternative' Breaker Button Control** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the generator load switch is opened *('**Close Generator**' becomes inactive)* and the mains load switch is closed *('**Close Mains**' becomes active)*. Further presses of the ***Transfer to Mains*** button opens and closes the mains load switch *('**Close Mains**' changes state)* and leaves the generator load switch in the open position *('**Close Generator**' remains inactive)*.

4.2.3 WHEN CONNECTED TO DSE8610 MKII

Icon	Description
	**Auto Mode** This button places the module into its ***Auto Mode***  . This mode allows the module to control the function of the generator automatically. The module monitors various remote start functions and once a start request is made, the set is automatically started, synchronises and placed on load *('**Close Generator**' become active)*. Upon removal of the starting signal, the module removes the load from the generator and shut the set down observing the *stop delay* timer and *cooling* timer as necessary *('**Close Generator**' becomes inactive)*. The module then waits for next start event.
	**Manual Mode** This button places the module into its ***Manual Mode***  . Once in ***Manual Mode***  , the module responds to the ***Start***  button to start the generator and run it off load. To place the generator on load, use the ***Close Generator***  button. The module automatically instructs the generator to synchronise if required and then closes the generator load switch *('**Close Generator**' becomes active)*. To place the generator off load, use the ***Open Generator***  . The module automatically instructs the generator to ramp down if possible and open the breaker *('**Close Generator**' becomes inactive)*. If the engine is running off-load in ***Manual Mode***  .and an on load becomes active, the module automatically instructs the changeover device to place the generator on load instructs the generator to synchronise if required and then closes the generator load switch *('**Close Generator**' becomes active)*. Upon removal of the on load signal, the generator remains on load until either selection of the ***Stop/Reset Mode***  or ***Auto Mode***  .
	**Alarm Mute / Lamp Test** This button de-activates the audible alarm on the module, the *Audible Alarm* output (if configured) and illuminates all of the LEDs on the module's facia.

Icon	Description
	**Open Generator** The ***Open Generator*** button controls the operation of the generator load switch and is only active in ***Manual Mode*** once the generator bus is available. **Synchronising NOT Enabled:** Pressing the ***Open Generator*** button when the generator is available and on load causes the generator load switch to open *('**Close Generator**' becomes inactive)*. Further presses of the ***Open Generator*** button have no effect. **Synchronising Enabled:** Pressing the ***Open Generator Breaker*** button when the generator is available and on load causes the generator to ramp down if possible and open the breaker *('**Close Generator**' becomes inactive)*. Further presses of the ***Open Generator Breaker*** button have no effect.
	**Close Generator** The ***Close Generator*** button control the operation of the generator load switch and is only active in ***Manual Mode*** once the generator bus is available. **Synchronising NOT Enabled:** Pressing the ***Close Generator*** button when the generator is available and off load causes the generator load switch to close *('**Close Generator**' becomes active)*. Further presses of the ***Close Generator*** button have no effect. **Synchronising Enabled:** Pressing the ***Close Generator*** button when the generator is available and of load causes the generator to synchronise if required and then closes the generator load switch *('**Close Generator**' becomes active)*. Further presses of the ***Close Generator*** button have no effect.

4.2.4 WHEN CONNECTED TO DSE8660 MKII

The function of the context buttons down the left side of the DSE8003 MKII are indicated on the LCD display:

Icon	Description
	**Auto Mode** This button places the module into its ***Auto Mode***  . This mode allows the module to control the function of the system automatically. The module monitors various ***Start Signals*** and once a start request is made, sends a start request to the DSE8610 MKII module over the MSC Link. The module monitors the MSC Link for feedback from the DSE8610 MKII module to confirm the generator bus is available. Once the generator bus is available and if requested, it is automatically placed on load *('**Close Bus**' becomes active)*, synchronising to the Mains if required. Upon removal of the ***Start On Load Signal***, the module starts the *Return Delay Timer* and once expired, the generator bus is taken off load *('**Close Bus**' becomes inactive)*. The module then waits for next start event.
	**Manual Mode** This button places the module into its ***Manual Mode***  . Once in ***Manual Mode***  , the module responds to the ***Start***  button to send a start request to the DSE8610 MKII module over the MSC Link. The module monitors the MSC Link for feedback from the DSE8610 MKII module to confirm the generator bus is available. If the generator bus is running off-load in the ***Manual Mode***  and a ***Start Signal*** becomes active, the module automatically instructs the changeover device to place the generator bus on load *('**Close Bus**' becomes active)*, synchronising to the Mains if required. Upon removal of the ***Start On Load Signal***, the generator bus remains on load until either the ***Stop/Reset Mode***  or ***Auto Mode***  is selected. Also in ***Manual Mode***  , the module responds to the ***Transfer to Mains***  and ***Transfer to Generator Bus***  buttons after the generator bus is available. Synchronising occurs automatically if required.
	**Alarm Mute / Lamp Test** This button de-activates the audible alarm on the module, the *Audible Alarm* output (if configured) and illuminates all of the LEDs on the module's facia.

Icon	Description
	**Test Mode** This button places the module into its ***Test Mode*** . Once in ***Test Mode*** , the module responds to the ***Start*** button to send a start request to the DSE8610 MKII module over the MSC Link. The module monitors the MSC Link for feedback from the DSE8610 MKII module to confirm the generator bus is available. Once the generator bus is available, it is automatically placed on load *('**Close Bus**' becomes active)*, synchronising to the Mains if required. Depending upon module configuration, the generator bus remains in constant parallel with the Mains or proceeds to run in island operation *('**Close Mains**' becomes inactive)*. The generator bus remains on load until either the ***Stop/Reset Mode*** or ***Auto Mode*** is selected.

Icon	Description
	**Transfer to Mains** The ***Transfer to Mains*** button control the operation of the mains load switching and is only active in ***Manual Mode*** once the generator bus is available. **'Normal' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the generator bus load switch is opened *('**Close Bus**' becomes inactive)* and the mains load switch is closed *('**Close Mains**' becomes active)*. Further presses of the ***Transfer to Mains*** button have no effect. • **Synchronising Enabled:** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the module synchronise the Generator Bus to the Mains. The mains load switch is then closed in parallel with the Generator Bus *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Mains*** button ramps the entire load from the Generator Bus to the Mains. Once done, the Generator Bus load switch opens *('**Close Bus**' becomes inactive)* leaving just the mains supplying the load. **'Alternative' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the generator bus load switch is opened *('**Close Bus**' becomes inactive)* and the mains load switch is closed *('**Close Mains**' becomes active)*. Further presses of the ***Transfer to Mains*** button opens and closes the mains load switch *('**Close Mains**' changes state)* and leaves the bus load switch in the open position *('**Close Bus**' remains inactive)*. • **Synchronising is enabled:** Pressing the ***Transfer to Mains*** button when the Mains is available and off load, the module synchronise the Generator Bus to the Mains. The mains load switch is then closed in parallel with the Generator Bus *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Mains*** button ramps the entire load from the Mains to the Generator Bus. Once done, the Mains load switch opens *('**Close Mains**' becomes inactive)* leaving just the Generator Bus supplying the load.

Icon	Description
	**Transfer to Generator Bus** The ***Transfer to Generator Bus*** button control the operation of the mains load switching and is only active in ***Manual Mode*** once the generator bus is available. **'Normal' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator Bus load switch is closed *('**Close Bus**' becomes active)*. Further presses of the ***Transfer to Generator Bus*** button have no effect. • **Synchronising Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the module synchronise the Generator Bus to the Mains. The Generator Bus load switch is then closed in parallel with the Mains *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Generator Bus*** button ramps the entire load from the Mains to the Generator Bus. Once done, the Mains load switch opens *('**Close Mains**' becomes inactive)* leaving just the Generator Bus supplying the load. **'Alternative' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator Bus load switch is closed *('**Close Bus**' becomes active)*. Further presses of the ***Transfer to Generator Bus*** button opens and closes the Generator Bus load switch *('**Close Bus**' changes state)* and leaves the Mains load switch in the open position *('**Close Mains**' remains inactive)*. • **Synchronising Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the module synchronise the Generator Bus to the Mains. The Generator Bus load switch is then closed in parallel with the Mains *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Generator Bus*** button ramps the entire load from the Generator Bus to the Mains. Once done, the Generator Bus load switch opens *('**Close Bus**' becomes inactive)* leaving just the Mains supplying the load.

4.2.5 WHEN CONNECTED TO DSE8680

The function of the context buttons down the left side of the DSE8003 MKII are indicated on the LCD display:

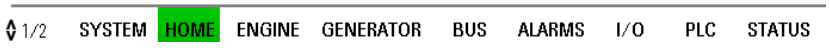
Icon	Description
	**Auto Mode** This button places the module into its **'Automatic'** mode. This mode allows the module to control the function of the system automatically.
	**Manual Mode** This mode allows manual control of the functions. Once in **Manual mode** the module will respond to the  button, toggling the bus breaker.
	**Alarm Mute / Lamp Test** This button de-activates the audible alarm on the module, the *Audible Alarm* output (if configured) and illuminates all of the LEDs on the module's facia.
	**Reset** Resets any alarms that were detected by the controller.
	**Breaker Control** Activate Manual mode by pressing the  pushbutton. Manual mode allows the operator to open and close the breaker manually by toggling the  button.

Icon	Description
	**Transfer to Generator Bus** The ***Transfer to Generator Bus*** button control the operation of the mains load switching and is only active in ***Manual Mode*** once the generator bus is available. **'Normal' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator Bus load switch is closed *('**Close Bus**' becomes active)*. Further presses of the ***Transfer to Generator Bus*** button have no effect. • **Synchronising Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the module synchronise the Generator Bus to the Mains. The Generator Bus load switch is then closed in parallel with the Mains *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Generator Bus*** button ramps the entire load from the Mains to the Generator Bus. Once done, the Mains load switch opens *('**Close Mains**' becomes inactive)* leaving just the Generator Bus supplying the load. **'Alternative' Breaker Button Control** • **Synchronising NOT Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the Mains load switch is opened *('**Close Mains**' becomes inactive)* and the Generator Bus load switch is closed *('**Close Bus**' becomes active)*. Further presses of the ***Transfer to Generator Bus*** button opens and closes the Generator Bus load switch *('**Close Bus**' changes state)* and leaves the Mains load switch in the open position *('**Close Mains**' remains inactive)*. • **Synchronising Enabled:** Pressing the ***Transfer to Generator Bus*** button when the Generator Bus is available and off load, the module synchronise the Generator Bus to the Mains. The Generator Bus load switch is then closed in parallel with the Mains *('**Close Mains**' & '**Close Bus**' are active)*. Further presses of the ***Transfer to Generator Bus*** button ramps the entire load from the Generator Bus to the Mains. Once done, the Generator Bus load switch opens *('**Close Bus**' becomes inactive)* leaving just the Mains supplying the load.

4.3 VIEWING THE INSTRUMENT PAGES

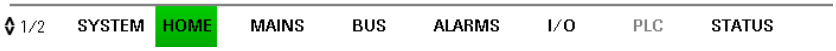
It is possible to scroll to display the different pages of information by repeatedly operating the ***Next & Previous Page***  buttons. The currently selected page illuminates with Blue background.

Example When Connected To DSE8610 MKII Controller



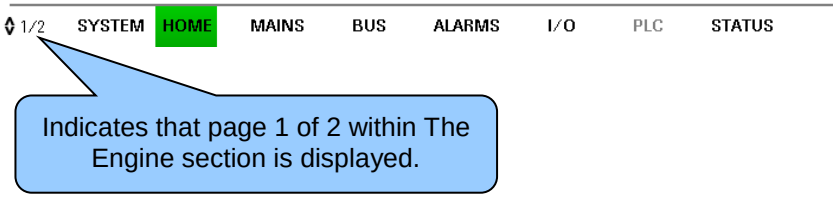
Press the ***Next Page***  to view the next instrument page (Engine) etc. Further presses of this button returns the display to the *Home* page.

Example When Connected To DSE8660 MKII Controller



Once selected the page will remain on the LCD display until the user selects a different page, or after an extended period of inactivity, the module reverts to the Home display.

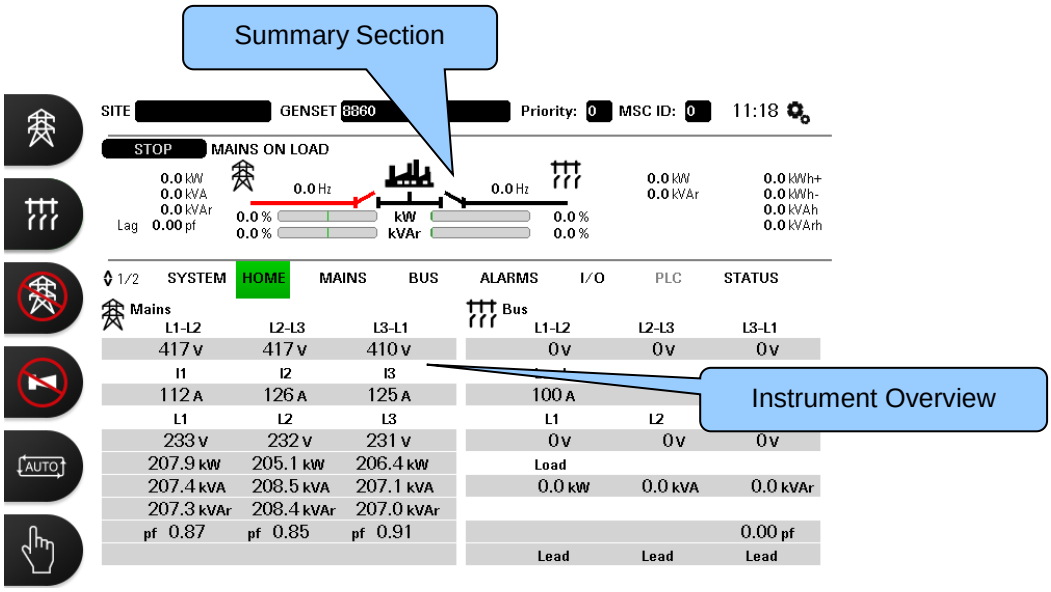
To view additional pages within the current section, press the ***Instrumentation Scroll***  buttons.



If an alarm becomes active while viewing the status page, the display shows the Alarms page to draw the operator's attention to the alarm condition.

4.3.1 HOME PAGE

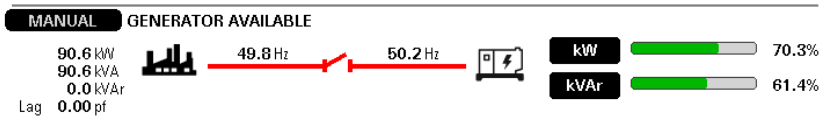
The Home page of the viewed controller is shown when no other page has been selected. It is also the page that is automatically displayed after a period of inactivity of the module control buttons. The parameters that are displayed change dependent upon the controller being viewed.



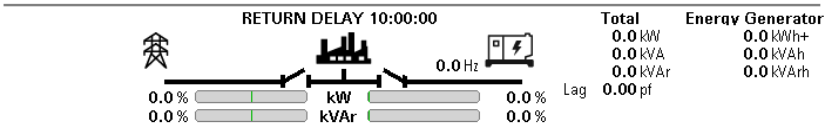
4.3.1.1 SUMMARY SECTION

The content of the area is arranged as shown in the examples below. This serves as an overview of the viewed DSE Controller. Further information is viewed using the *Instrument Pages* as detailed below.

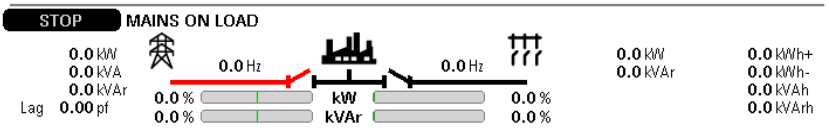
When Connected To DSExx10 Controller



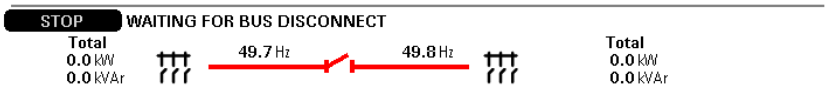
When Connected To DSExx20 Controller



When Connected To DSE8660 MKII Controller



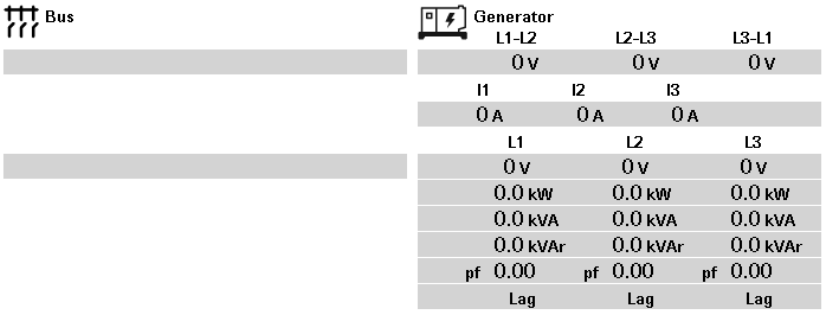
When Connected To DSE8680 Controller



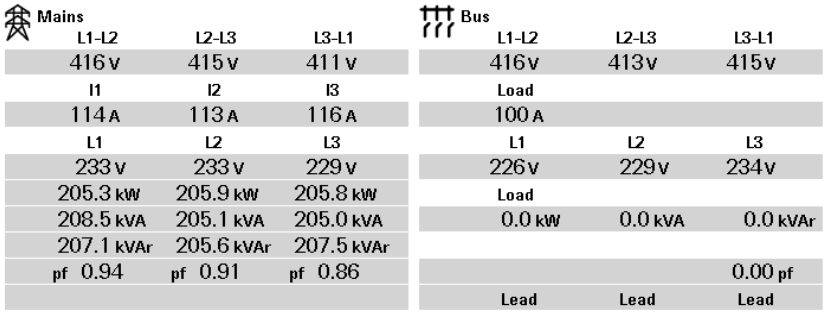
4.3.1.2 **INSTRUMENT OVERVIEW**

The content of the area is arranged as shown in the examples below. This serves as an overview of the measured instruments of the viewed DSE Controller. Further information is viewed using the *Instrument Pages* as detailed below.

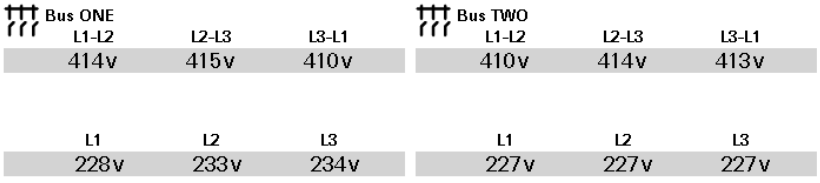
When Connected to DSExx10 Controller



When Connected to DSE8x60 Controller



When Connected to DSE8680 Controller



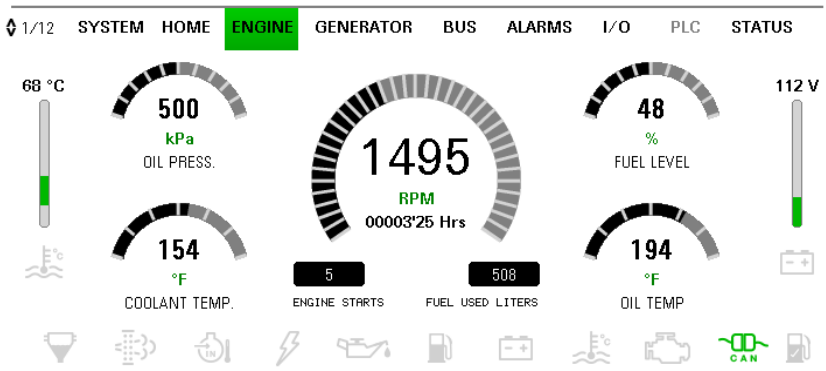
4.3.2 ENGINE

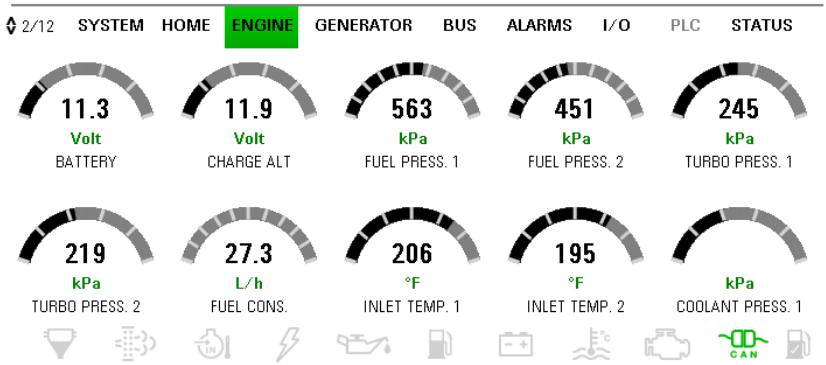
NOTE: Not applicable to DSE8660 MKII or DSE8680 modules.

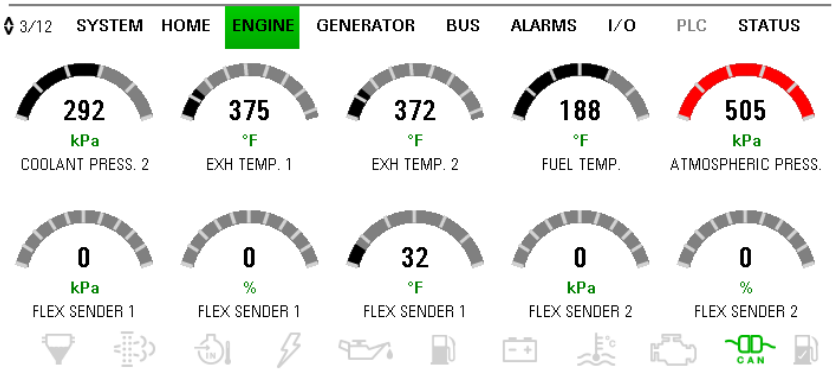
Contains instrumentation gathered about the engine which may be obtained using a CAN link. The content may change depending upon the selected engine and the features supported by the engine.

To view additional pages within the current section, press the ***Instrumentation Scroll*** buttons.

Examples of engine data are shown below.







The alarm icons above the instruments are shown as below:

Parameter	Inactive (Grey)	Warning (Yellow)	Shutdown (Red)
Water In Fuel			
After Treatment			
Inlet Temperature			
Charge Alternator			
Oil Pressure			
Fuel Level			
Battery Voltage			
Coolant Temperature			
ECU Lamp			

Parameter	CAN Link Unknown (Grey)	CAN Link Active (Green)	CAN Link Lost (Red)
CAN Link Status			

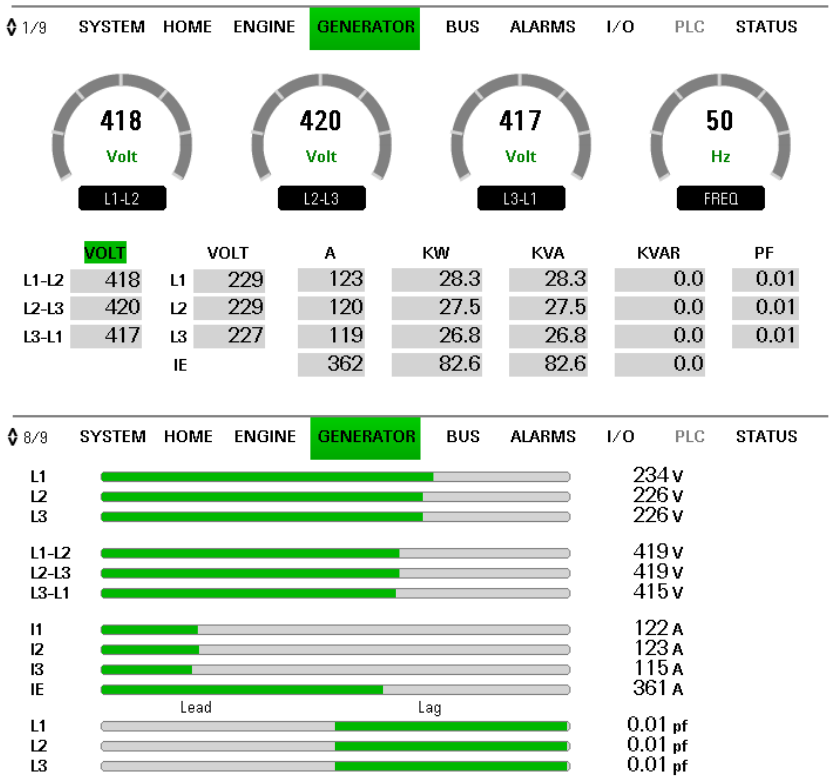
4.3.3 GENERATOR

NOTE: Not applicable to DSE8660 MKII or DSE8680 modules.

The Generator section contains generator instruments measured from the viewed DSE controller.

Press the ***Instrumentation Scroll*** buttons to cycle between the parameters. The instrumentation values are displayed in the form of either analogue meters or bar graphs depending on DSE8003 MKII configuration. The meters or bar graphs change accordingly depending on what parameter is being viewed.

Examples of Generator data are shown below.

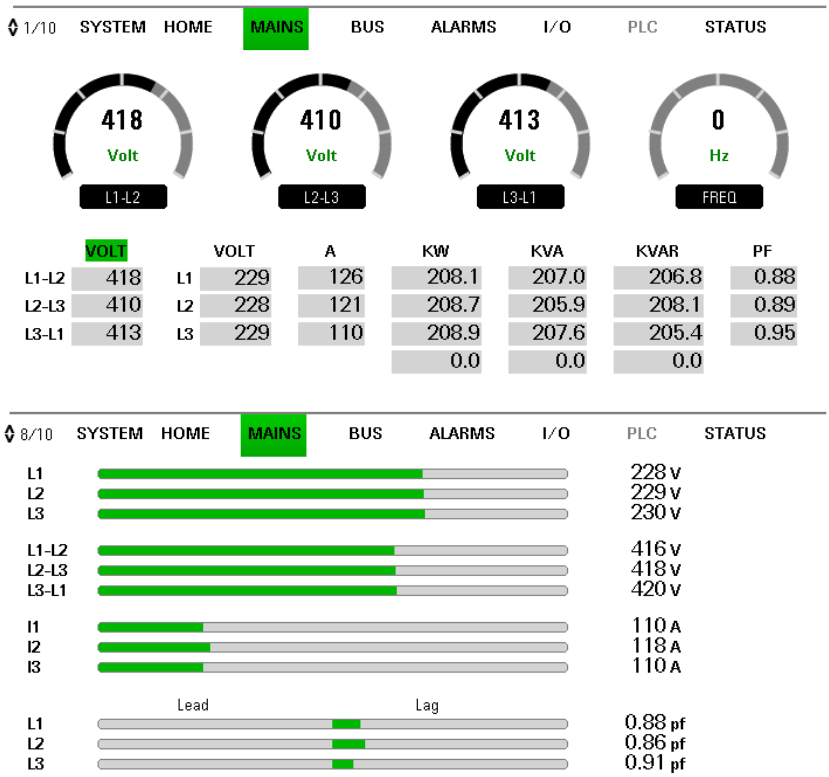


4.3.4 MAINS

NOTE: Not applicable to DSE8610 MKII modules.

The Mains section contains generator instruments measured from the viewed DSE controller. Press the ***Instrumentation Scroll*** buttons to cycle between the parameters. The instrumentation values are displayed in the form of either analogue meters or bar graphs depending on the DSE8003 MKII configuration. The meters or bar graphs change accordingly depending on what parameter is being viewed.

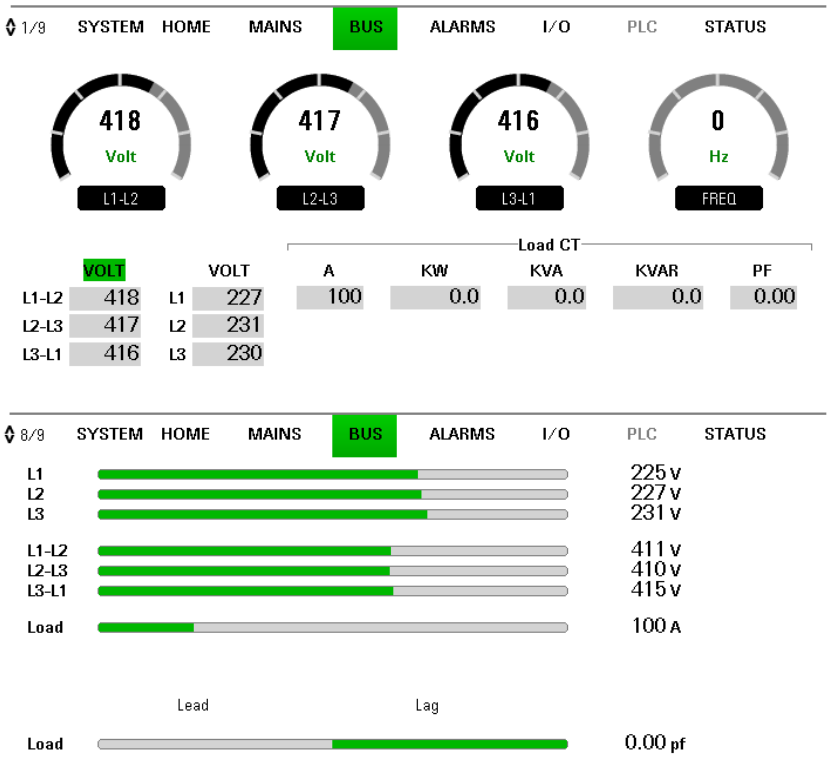
Examples of Mains data are shown below.



4.3.5 BUS

The Bus section contains generator instruments measured from the viewed DSE controller. Press the ***Instrumentation Scroll*** buttons to cycle between the parameters. The instrumentation values are displayed in the form of either analogue meters or bar graphs depending on DSE8003 MKII configuration. The meters or bar graphs change accordingly depending on what parameter is being viewed.

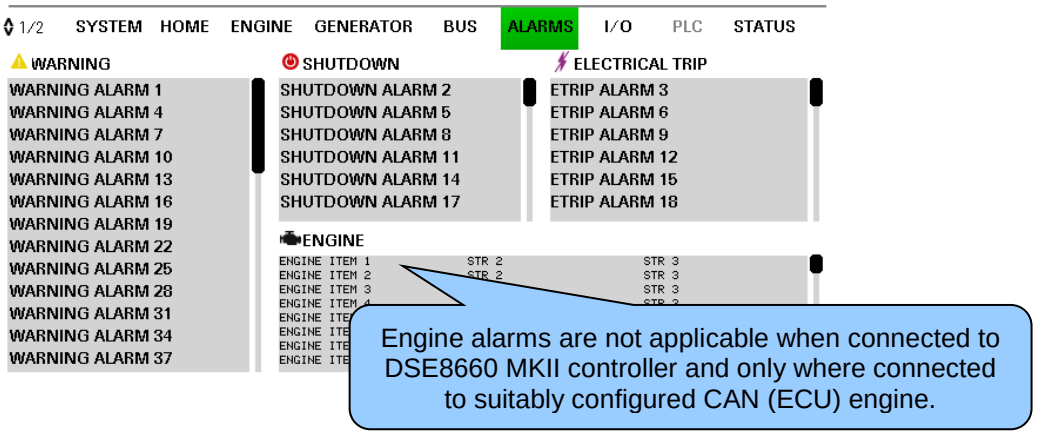
Examples of Bus data are shown below.



4.3.6 ALARMS

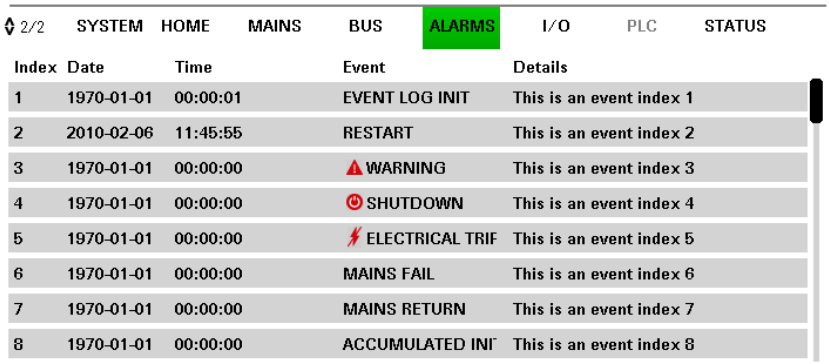
There are two screens on the alarms page, one displaying the current alarms and another displaying the event log.

The alarms displays any current warnings, electrical trip and shutdown alarms and any CAN engine DTCs that are present.



Press the ***Instrumentation Scroll***  to change between current alarms and the event log page.

The event log display a list of events. The number of events displayed depends on the space available with the chosen font. The event log page will display the event index, event type, date, time and number of hours run for each event. Electronic engine diagnostic trouble codes are displayed as single events in the event log.



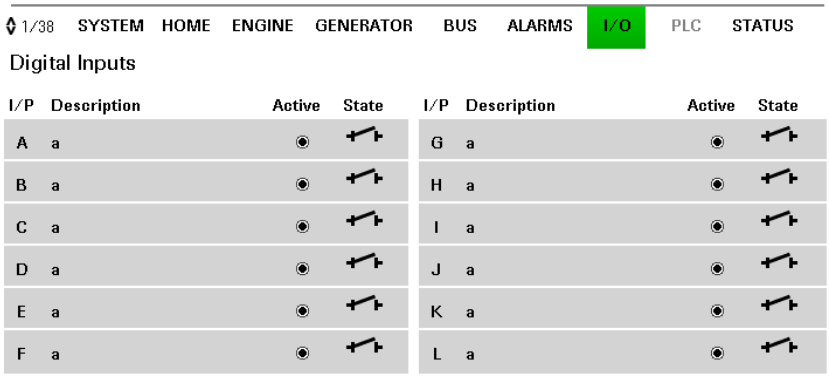
4.3.7 I/O

The I/O (Input/Output) section includes numerous screens that present the configuration and status of the inputs and outputs for the module and the DSE2130, DSE2131, DSE2133, DSE2152, DSE2157 and DSE2548 expansion units attached.

Press the ***Instrumentation Scroll***  to cycle through the active I/O screens starting with the DSE8xxx's Inputs followed by outputs and expansion modules.

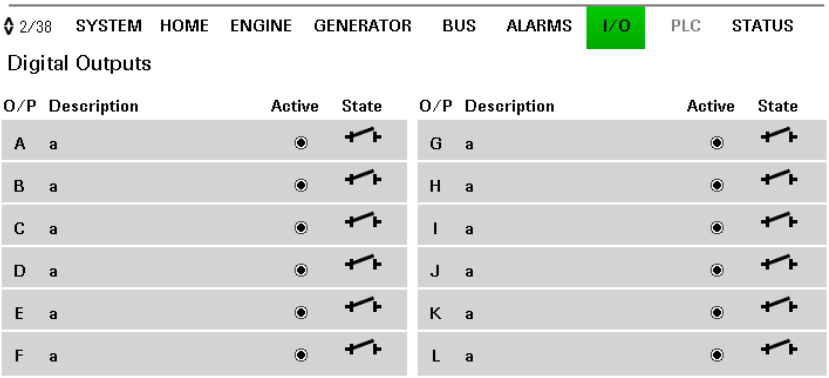
4.3.7.1 DIGITAL INPUTS

The digital inputs screen displays the status of each digital inputs on the module. The screen shows the configuration description and the currently active and open/closed status of the digital inputs.



4.3.7.2 DIGITAL OUTPUTS

The digital outputs screen displays the status of each digital outputs on the module. The screen shows the configuration description and the currently active and open/closed status of the digital outputs.

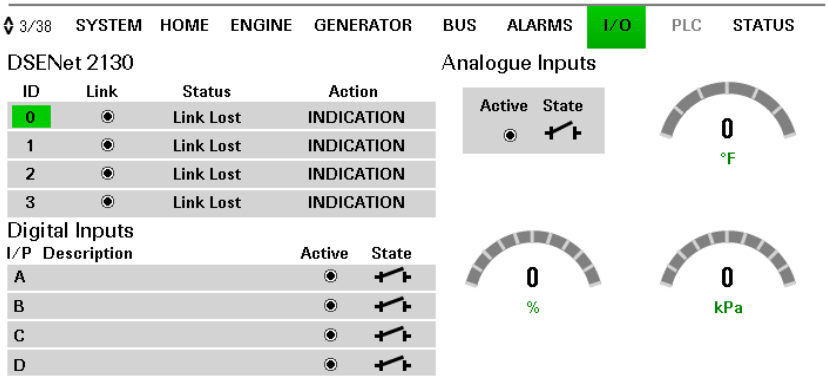


4.3.7.3 DSE2130 EXPANSION MODULE

The DSE2130 screen displays the status of each DSE2130 device connected to the module with the currently selected unit highlighted in blue. The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost.

For the selected DSE2130 unit, the screen shows the configuration description and the currently active and open/closed status of the digital inputs and the configuration description and current values of the analogue inputs. If an analogue input is configured as a digital input, a dial displayed with a low/high message instead of the value.

Press the ***Instrumentation Scroll***  to select the required DSE2130 module.

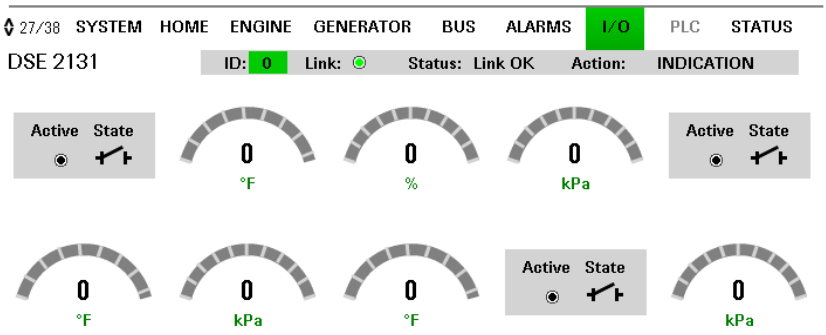


4.3.7.4 DSE2131 EXPANSION MODULE

The DSE2131 screen displays the status of each DSE2131 device connected to the module. The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost.

For the selected DSE2131 unit, the screen shows the configuration description and the configuration description and current values of the analogue inputs. If an analogue input is configured as a digital input, a dial displayed with a low/high message instead of the value.

Press the ***Instrumentation Scroll***  to select the required DSE2131 module.

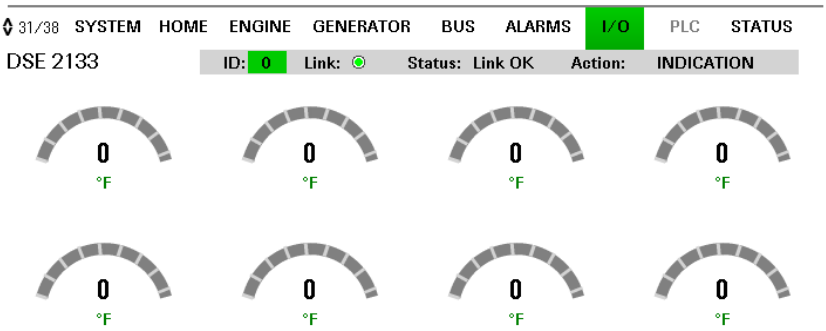


4.3.7.5 DSE2133 EXPANSION MODULE

The DSE2133 screen displays the status of each DSE2133 device connected to the module. The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost.

For the selected DSE2133 unit, the screen shows the configuration description and the configuration description and current values of the analogue inputs.

Press the ***Instrumentation Scroll***  to select the required DSE2133 module.

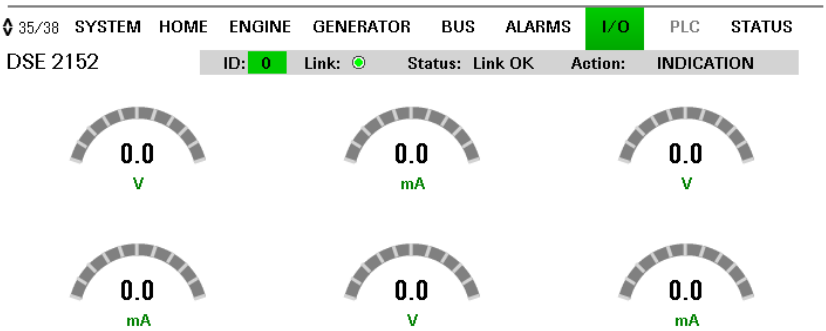


4.3.7.6 DSE2152 EXPANSION MODULE

The DSE2152 screen displays the status of all attached DSE2157 device connected to the module.

The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost. For the selected DSE2152 unit, the screen shows the configuration description and the configuration description and current values of the analogue outputs.

Press the ***Instrumentation Scroll***  to select the required DSE2152 module.

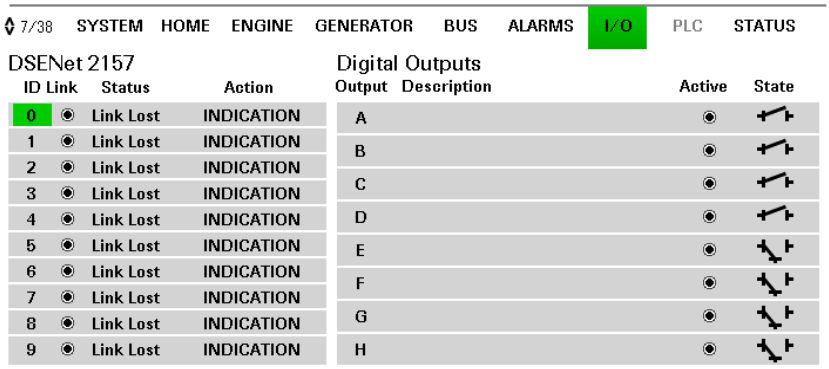


4.3.7.7 DSE2157 EXPANSION MODULE

The DSE2157 screen displays the status of all attached DSE2157 device connected to the module with the currently selected unit highlighted in blue.

The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost. For the selected DSE2157 unit, the screen shows the configuration descriptions and the current active and open/closed status of the digital outputs.

Press the ***Instrumentation Scroll***  to select the required DSE2157 module.

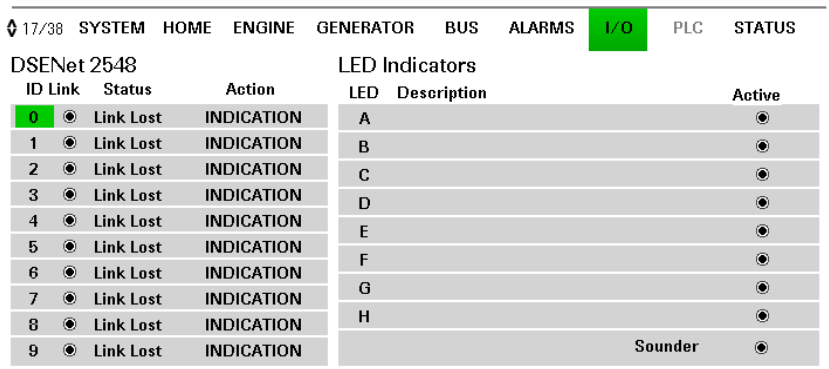


4.3.7.8 DSE2548 EXPANSION MODULE

The DSE2548 screen displays the status of all attached DSE2548 device connected to the module with the currently selected unit highlighted in blue.

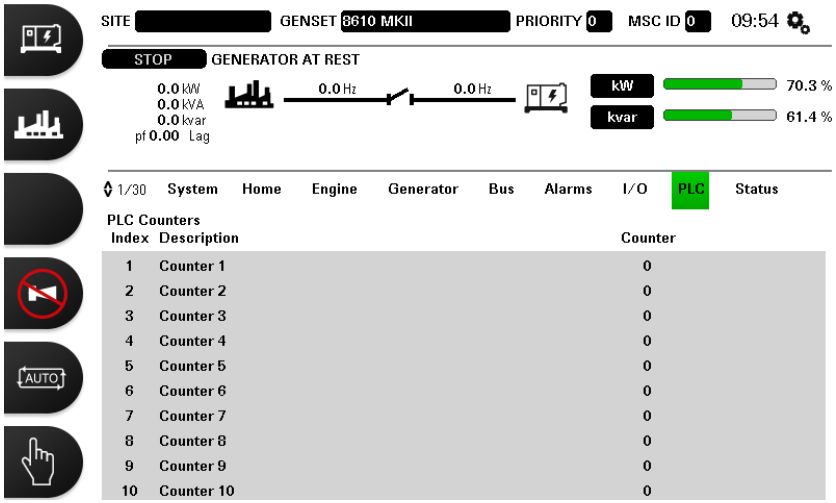
The alarm action is displayed when a Link Lost situation is present for the relevant unit. The Link lamp is green for good communication or grey for link lost. For the selected DSE2548 unit, the screen shows the configuration descriptions and the current active and on/off status of the LEDs and sounder.

Press the ***Instrumentation Scroll***  to select the required DSE2548 module.



4.3.8 PLC

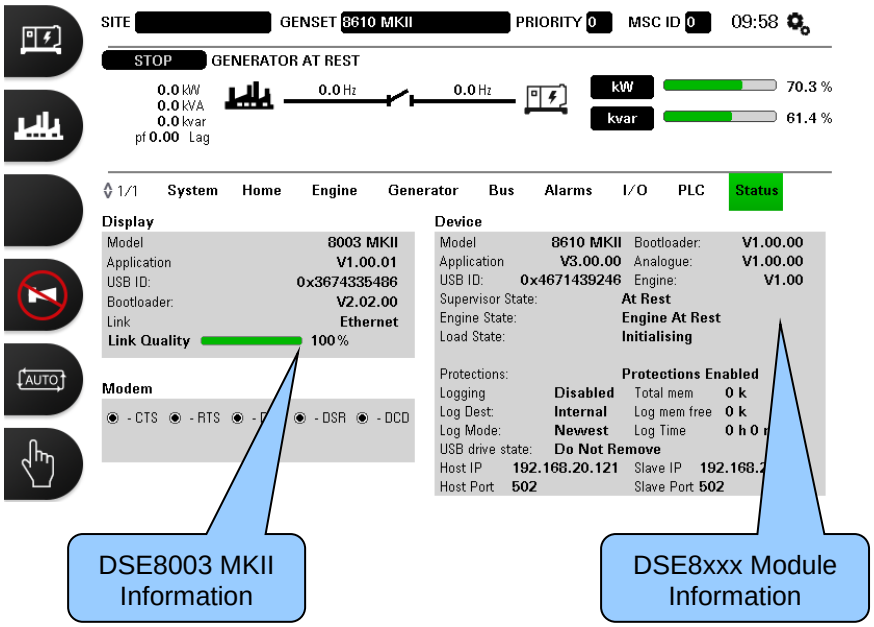
This shows the current configuration and the current value held by the DSE8xxx module's *PLC Counters*, *PLC Timers*, *PLC Registers* and *PLC Stores*. This allows the operator to monitor



4.3.9 STATUS

4.3.9.1 COMMUNICATION AND MODULE INFORMATION

This page shows the status and configuration of the communication ports in use by the DSE8003 MKII.

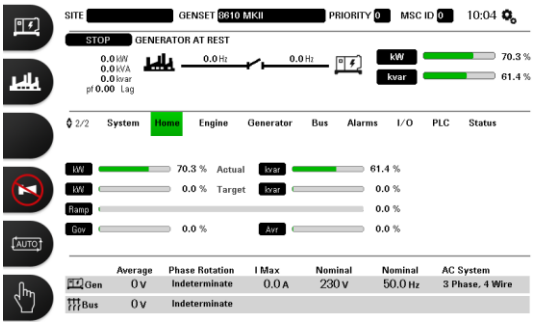


4.3.9.2 **COMMISSIONING SCREENS**

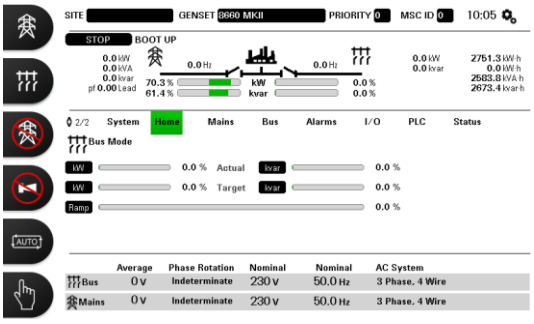
An optional commissioning screen is available via an option in the running editor.

When enabled, press the ***Instrumentation Scroll***  to change between the two pages.

Example Connected to DSE8610 MKII



Example Connected to 8660 MKII



5 OPERATION

NOTE: For further details on module specific operation, refer to their operators manual. Refer to section entitled *Bibliography* elsewhere in the document for a list of applicable operators manual.

The following description details the sequences followed by a module containing the standard '*factory configuration*'.

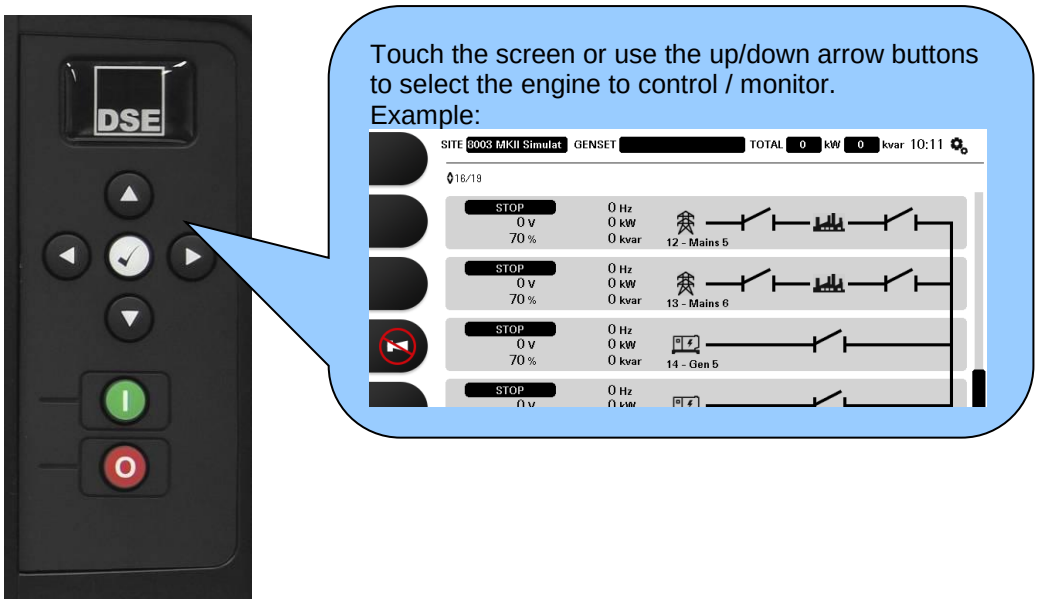
Remember that if you have purchased a completed generator set or control panel from your supplier, the module's configuration will probably have been changed by them to suit their particular requirements.

Always refer to your configuration source for the exact sequences and timers observed by any particular module in the field.

5.1 QUICKSTART GUIDE

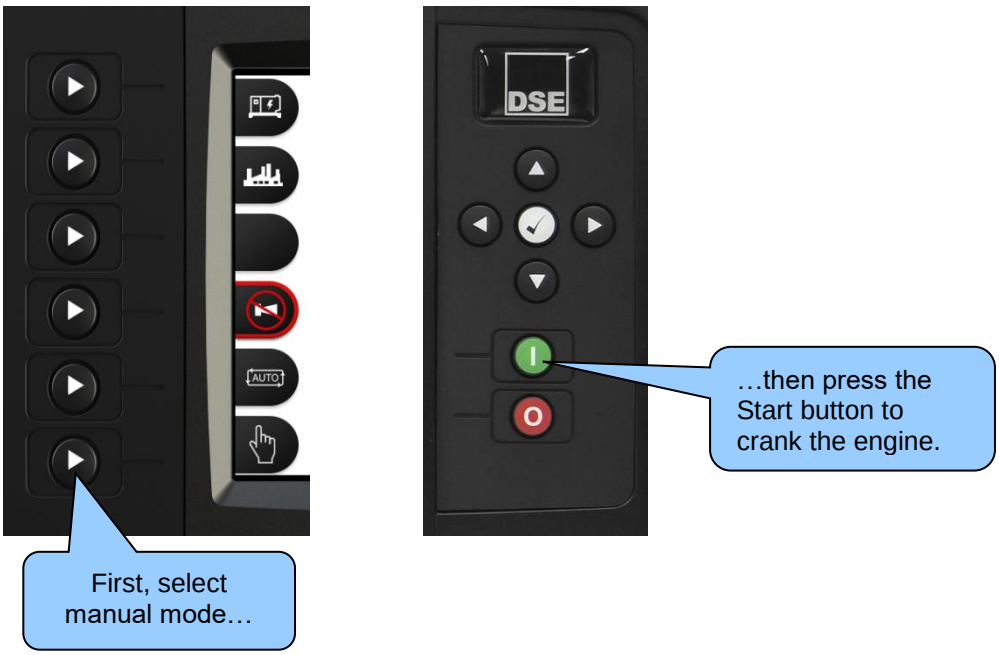
This section provides a quick start guide to the module's operation.

5.1.1 SELECTING THE ENGINE



5.1.2 STARTING THE ENGINE

Select the desired engine as shown above.



5.1.3 STOPPING THE ENGINE

Select the desired engine as shown above.

5.2 MANUAL FUEL PUMP CONTROL

NOTE: Manual fuel pump control is not applicable to DSE8x60 controller.

- Navigate to the Engine Page (1/3) when viewing a DSE Controller using the ***Next & Previous Page*** buttons and locate *Fuel Level.*

- The ***Manual Fuel Pump Icon*** is shown on the display to indicate that this feature is available (when ***Manual Fuel Pump Control*** is enabled in the module's configuration).

- The function of the ***Tick*** button is now changed. Press and hold the ***Tick*** button to energise the transfer pump. The pump starts two seconds after the button is pressed.

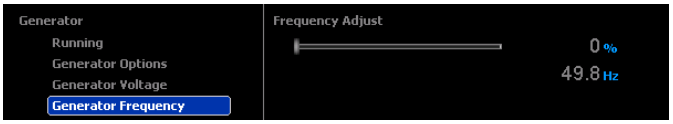
- Release the ***Tick*** button to de-energise the transfer pump.

5.3 MANUAL SPEED CONTROL

NOTE: Manual speed control is not applicable to DSE8660 MKII controller.

- Navigate to the DSE controller and press and hold the ***Tick*** button to enter the Running Editor

- Navigate to the Generator | Generator Frequency section



- Press the ***Tick*** button to enter edit mode

- Press ***Instrumentation Scroll*** to change the engine speed.

- Press the ***Tick*** button again to exit the editor and leave the engine running at the newly selected speed.

6 PROTECTIONS

When an alarm is present, the Audible Alarm will sound and a marker is displayed next to the mute button.

The audible alarm is silenced by pressing the ***Alarm Mute / Lamp Test***  button. The Alarm popup box is colour coded to indicate the level of the alarm. To clear the alarm popup box, press the ***Tick***  button.

Alarm Level	Colour/Title Graphic
Warning	Warning
Electrical Trip	Electrical Trip
Shutdown	Shutdown
ECU Code	Engine

Engine alarms are not applicable when connected to DSE8x60 controller and where connected to suitably configured CAN (ECU) engine.

6.1 PROTECTIONS DISABLED

NOTE: Protections Disabled function is not applicable to the DSE8x60 controller

User configuration of the DSE8x10 and DSE8x20 controller is possible to prevent Shutdown / Electrical Trip alarms from stopping the engine.
Under such conditions, *Protections Disabled* will appear on the module display to inform the operator of this status.

This feature is provided to assist the system designer in meeting specifications for “Warning only”, “Protections Disabled”, “Run to Destruction”, “Battle Short mode” or other similar wording.

When configuring this feature in the PC software, the system designer chooses to make the feature either permanently active, or only active upon operation of an external switch. The system designer provides this switch (not DSE) so its location will vary depending upon manufacturer, however it normally takes the form of a key operated switch to prevent inadvertent activation. Depending upon configuration, a warning alarm may be generated when the switch is operated.

The feature is configurable in the PC configuration software for the module. Writing a configuration to the controller that has “Protections Disabled” configured, results in a warning message appearing on the PC screen for the user to acknowledge before the controller’s configuration is changed. This prevents inadvertent activation of the feature.

6.1.1 INDICATION / WARNING ALARMS

Under Indication or Warning alarms:

- The module operation is unaffected by the *Protections Disabled* feature. See sections entitled *Indications* and *Warnings* elsewhere in this document.

6.1.2 SHUTDOWN / ELECTRICAL TRIP ALARMS

NOTE: Shutdown alarms are not applicable to the DSE8x60 controller

NOTE: The EMERGENCY STOP input and shutdown alarm continues to operate even when *Protections Disabled* is activate.

Under Shutdown or Electrical Trip alarm conditions (excluding Emergency Stop):

- The alarm is displayed on the screen as detailed in the section entitled *Shutdown alarm*s elsewhere in this document.
- The set continues to run.
- The load switch maintains its current position (it is not opened if already closed)
- ***Shutdown Blocked*** also appears on the LCD screen to inform the operator that the Protections Disabled feature has blocked the shutdown of the engine under the normally critical fault.
- The ‘shutdown’ alarm is logged by the controllers *Event Log (*if configured to log shutdown alarms) and logs that the Shutdown was prevented.

6.2 WARNINGS

Warnings are non-critical alarm conditions and do not affect the operation of the generator system, they serve to draw the operators attention to an undesirable condition.

In the event of an alarm the LCD will jump to the alarms page, and display all active warnings and shutdowns.

By default, warning alarms are self-resetting when the fault condition is removed. However enabling 'all warnings are latched' will cause warning alarms to latch until reset manually. This is enabled using the DSE Configuration Suite PC Software with a DSE8xxx series controller.

Not applicable to DSE8x60 controller: If the module is configured for, **CAN** and receives an "error" message from the engine control unit, 'Can ECU Warning" is shown on the module's display and a warning alarm is generated.

6.3 ELECTRICAL TRIPS

NOTE: Shutdown and Electrical Trip alarms can be disabled by user configuration. See the section entitled *Protections Disabled* elsewhere in this document.

Electrical trips are latching and stop the Generator but in a controlled manner. On initiation of the electrical trip condition the module will de-energise the **'Close Generator/Bus'** Output to remove the load from the generator. Once this has occurred the module will start the Cooling timer and allow the engine to cool off-load before shutting down the engine. The alarm must be accepted and cleared, and the fault removed to reset the module.

Electrical trips are latching alarms and stop the Generator. To reset the fault, press the ***Stop/Reset Mode***  button.

6.4 SHUTDOWNS

NOTE: Shutdown and Electrical Trip alarms can be disabled by user configuration. See the section entitled *Protections Disabled* elsewhere in this document.

NOTE: Shutdown alarms are not applicable to the DSE8x60 controller

Shutdowns are latching alarms and stop the Generator. To reset the fault, press the ***Stop/Reset Mode***  button.

NOTE: The alarm condition must be rectified before a reset will take place. If the alarm condition remains, it will not be possible to reset the unit (The exception to this is the Low Oil Pressure alarm and similar 'active from safety on' alarms, as the oil pressure will be low with the engine at rest).

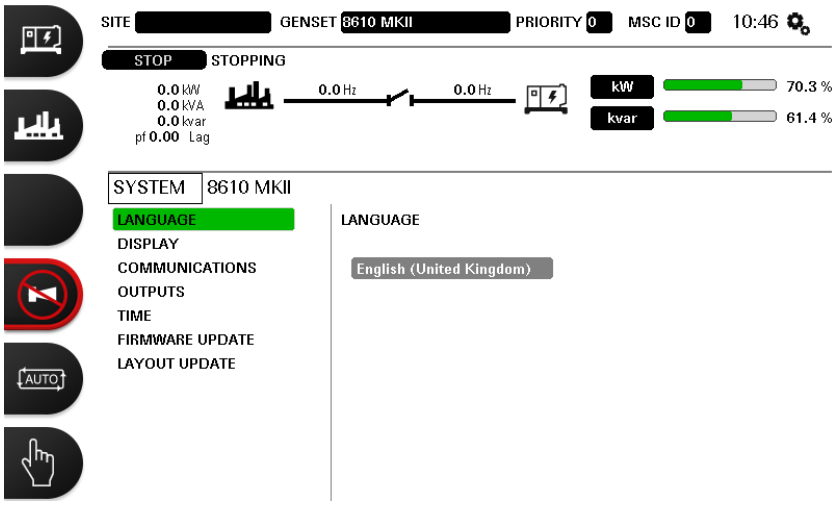
7 FRONT PANEL CONFIGURATION

7.1 ACCESSING THE DSE8003 MKII RUNNING EDITOR

To enter the DSE8003 MKII running editor, make sure the System overview page is being viewed, press the settings icon in the top right hand corner of the display or press and hold the ***Tick*** button to enter.

When in the running editor mode, the instrumentation area of the screen is replaced with the running editor display, as shown below.

The running editor display area is split into two, the left hand side shows the running editor items available for editing and the right hand side shows the current value.



Press the ***Instrumentation Scroll*** buttons to select the section you wish to view/change.

Press the ***Next & Previous Page*** buttons to select which parameter to view/change within the currently selected section.

To edit the parameter, ***Tick*** button to enter edit mode. The parameter begins to flash to indicate that you are editing the value.

Press the ***Instrumentation Scroll*** buttons to change the parameter to the required value.

Press ***Tick*** button to save the value. The parameter ceases flashing to indicate that it has been saved.

Press and hold the ***Tick*** button to exit the editor.

Section		Parameter	Selection
Language			English
			Configurable Language
Display	Units	Pressure	kPA
			PSI
			Bar
		Temperature	°F
			°C
		Volume	Litre
			Gallons (US)
			Gallons (UK)
	Display Options	Graphics	Bars
			Meters
		Commissioning Screen	Enable
			Disable
		Bus Breaker Present	Enable
			Disable
		Tier 4 Screen	Enable
			Disable
	Backlight	Backlight Level	%
	Alarms	External Alarm Alert	Enable
			Disable
Communication	Mode		Layout File (Multiset Mode)
			Internal Config (Singleset Mode)
	Slave Setup	Channel	RS232
			RS485
			Ethernet
		Slave ID	
	RS232/RS485		Baud Rate
	Slave IP Setup		Slave Port
			Slave IP
	Host Port		Host Port
	Host IP Setup	DHCP Enable	Enable
			Disable
		Host IP	
		Subnet Mask	
		Gateway IP	
		DNS IP	
	Advanced	Inactivity Timeout	Seconds
		Packet Timeout	Milliseconds
		Multiset Control	Enable/Disable
		MAC Address	
	Sounder	Multiset Sounder	Enable/Disable

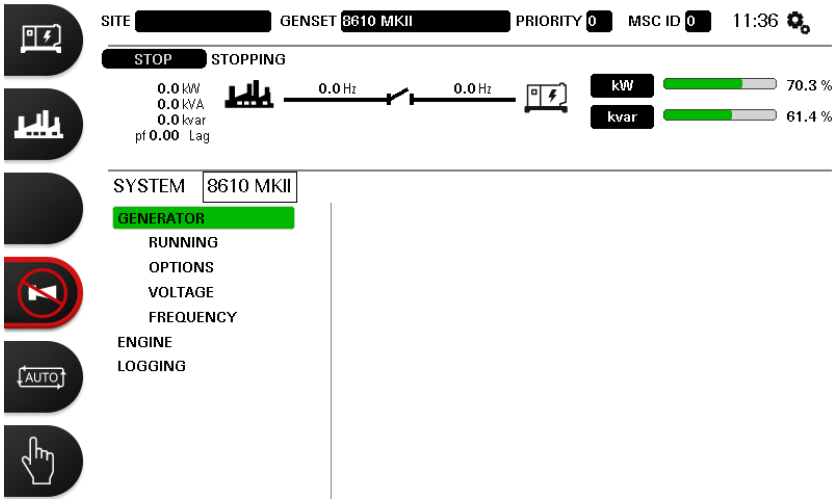
Section		Parameter	Selection
Outputs	Output A	Output Source	Communications Link Lost
			Emergency Stop
			Common Warning
			Common Shutdown
			Common Electrical Trip
			Common Alarm
			Combined Maintenance Alarm
			Audible Alarm
			Not Used
	Output B	Output Source	Communications Link Lost
			Emergency Stop
			Common Warning
			Common Shutdown
			Common Electrical Trip
			Common Alarm
			Combined Maintenance Alarm
			Audible Alarm
			Not Used
Time	Module Time		HH:MM:SS
	Module Date		MM/DD/YYYY or DD/MM/YYYY
	Date Format		ISO 8601 “YYY-MM-DD”
			Middle-endian “MM/DD/YYYY”
			Little-endian “DD/MM/YYYY”
	Time Synchronise		Enable
			Disable
Firmware Update	Version		
Layout Update	Files		Available Files

7.2 ACCESSING THE DSE8XXX CONTROLLER RUNNING EDITOR

NOTE: For further details on available parameters in a module's Running Editor, refer to their installation instructions. Refer to section entitled *Bibliography* elsewhere in the document for a list of applicable installation instructions.

To enter the a DSE8xxx controller's running editor, ensure the *System* page is being viewed with the DSE8xxx controller selected or one of the DSE8xxx controller's instrument pages.

Then press the settings icon in the top right hand corner of the display or press and hold the ***Tick*** button to enter.



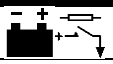
8 MAINTENANCE, SPARES, REPAIR AND SERVICING

The controller is *Fit and Forget*. As such, there are no user serviceable parts within the controller. In the case of malfunction, you should contact your original equipment manufacturer (OEM).

8.1 PURCHASING ADDITIONAL CONNECTOR PLUGS FROM DSE

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

8.1.1 INDIVIDUAL PLUGS

Module Terminal Designation		Plug Description	Part No.
1-5		5 way 5.08mm	007-445
RS485	**A, B, SCR**	3 way 5.08mm	007-1746
		PC Configuration interface lead (USB type A – USB type B)	016-125

8.2 PURCHASING ADDITIONAL FIXING CLIPS FROM DSE

Item	Description	Part No.
	Module Fixing Clips (Packet Of 4)	020-294

8.3 PURCHASING ADDITIONAL SEALING GASKET FROM DSE

Item	Description	Part No.
	Module Silicon Sealing Gasket	020-509

9 WARRANTY

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

10 DISPOSAL

10.1 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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