DSEGenset®

DSEAts®

DSEControl®

DSE®

DEEP SEA ELECTRONICS

DSE890 MKII 4G Gateway
Operator Manual

Document Number: 057-304

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CULTURE OF QUALITY

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DSE890 MKII 4G Gateway Operator Manual

Amendments Since Last Publication

Issue No.	Comments
1	Initial Release

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

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Section **Page**

1 INTRODUCTION

This document details the installation requirements of the DSE890 MKII 4G DSEGateway®.

The manual forms part of the product and must 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.* Any future updates of this document are included on the DSE website at www.deepseaelectronics.com.

The DSEGateway® is setup using a PC and a network cable as detailed later in this document. The DSEGateway® is used in conjunction with supported DSE Modules to provide internet based monitoring and control via DSEWebNet®. The DSEWebNet® is accessed using a PC and/or SmartPhone (App or Web browser) with an internet connection. This allows viewing of live and historic data as well as control.

Communication between the DSEGateway® and DSEWebNet® server is via GSM or Ethernet based internet connectivity. Additionally, the DSEGateway® includes GPS (satellite location) functionality. This is most suited for remote and/or mobile locations.

For details on accessing the DSEGateway® using the DSEWebNet® system, refer to DSE publication *057-168 DSEWebNet® Software Manual* available from the DSE website at; www.deepseaelectronics.com.

1.1 CLARIFICATION OF NOTATION

Clarification of notation used within this publication.

NOTE:	**Highlights an essential element of a procedure to ensure correctness.**
CAUTION!	**Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.**
WARNING!	**Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.**

1.2 GLOSSARY OF TERMS

Term	Description
CAN	Controller Area Network. Vehicle standard to allow digital devices to communicate to one another.
BMS	Building Management System. A digital/computer based control system for a building's infrastructure.
GPS	Global Positioning System. A device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position.
GSM	Global System for Mobile Communications. A standard which describes the protocols for second-generation (2G) digital cellular networks used by mobile devices such as mobile phones and tablets.
GPRS	General Packet Radio Services. Wireless communication service that provides continuous connection to the Internet for mobile phones and computer users.
LTE	Long-Term Evolution. A standard for wireless broadband communication for mobile devices and data terminals, based on the GSM with increases in capacity and speed.
SIM	Subscriber Identity Module. The small card supplied by the GSM/CDMA provider that is inserted into the cell phone, GSM modem or DSEGateway® device to give GSM connection.
SMS	Short Message Service. The text messaging service of mobile/cell phones.
WCDMA	Wideband Code Division Multiple Access. A spread-spectrum modulation technique which uses channels whose bandwidth is much greater than that of the data to be transferred. Instead of each connection being granted a dedicated frequency band just wide enough to accommodate its envisaged maximum data rate, WCDMA channels share a much larger band.

1.3 BIBLIOGRAPHY

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

1.3.1 INSTALLATION INSTRUCTIONS

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

DSE Part	Description
053-247	DSE890 MKII 4G Gateway Installation Instructions

1.3.2 MANUALS

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

DSE Part	Description
057-165	DSE890 & DSE891 Operators Manual
057-235	DSEWebNet Smart Device Software Manual
057-156	DSE334 Configuration Suite PC Software Manual
057-237	DSE335 Configuration Suite PC Software Manual
057-267	DSEE100 Configuration Suite PC Software Manual
057-251	DSEE400 Configuration Suite PC Software Manual
057-203	DSEE800 Configuration Suite PC Software Manual
057-187	DSEL400 & DSEL401 Configuration Suite PC Software Manual
057-222	DSEL401 MKII Configuration Suite PC Software Manual
057-186	DSEP100 Configuration Suite PC Software Manual
057-178	DSE4310 & DSE4320 Configuration Suite PC Software Manual
057-093	DSE4410 & DSE4420 Configuration Suite PC Software Manual
057-172	DSE4510 & DSE4520 Configuration Suite PC Software Manual
057-258	DSE4510 MKII & DSE4520 MKII Configuration Suite PC Software Manual
057-201	DSE4610 & DSE4620 Configuration Suite PC Software Manual
057-114	DSE6010 & DSE6020 Configuration Suite PC Software Manual
057-223	DSE6010 MKII & DSE6020 MKII Configuration Suite PC Software Manual
057-096	DSE6110 & DSE6120 Configuration Suite PC Software Manual
057-224	DSE6110 MKII & DSE6120 MKII Configuration Suite PC Software Manual
057-290	DSE6110 MKIII & DSE6120 MKIII Configuration Suite PC Software Manual
057-117	DSE7110 & DSE7120 Configuration Suite PC Software Manual
057-185	DSE7110 MKII & DSE7120 MKII Configuration Suite PC Software Manual
057-077	DSE72xx & DSE73xx Configuration Suite PC Software Manual
057-243	DSE7310 MKII & DSE7320 MKII Configuration Suite PC Software Manual
057-160	DSE7410 & DSE7420 Configuration Suite PC Software Manual
057-262	DSE7410 MKII & DSE7420 MKII Configuration Suite PC Software Manual
057-119	DSE8610, DSE8620 & DSE8660 Configuration Suite PC Software Manual
057-238	DSE8610 MKII Configuration Suite PC Software Manual
057-257	DSE8660 MKII Configuration Suite PC Software Manual
057-127	DSE8710 & DSE8760 Configuration Suite PC Software Manual
057-164	DSE8810 Configuration Suite PC Software Manual
057-174	DSE8860 Configuration Suite PC Software Manual

1.3.3 TRAINING GUIDES

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

DSE Part	Description
056-006	Introduction to Comm’s
056-080	MODBUS
056-121	DSE890 MKII 4G Gateway Quick Set-up Guide

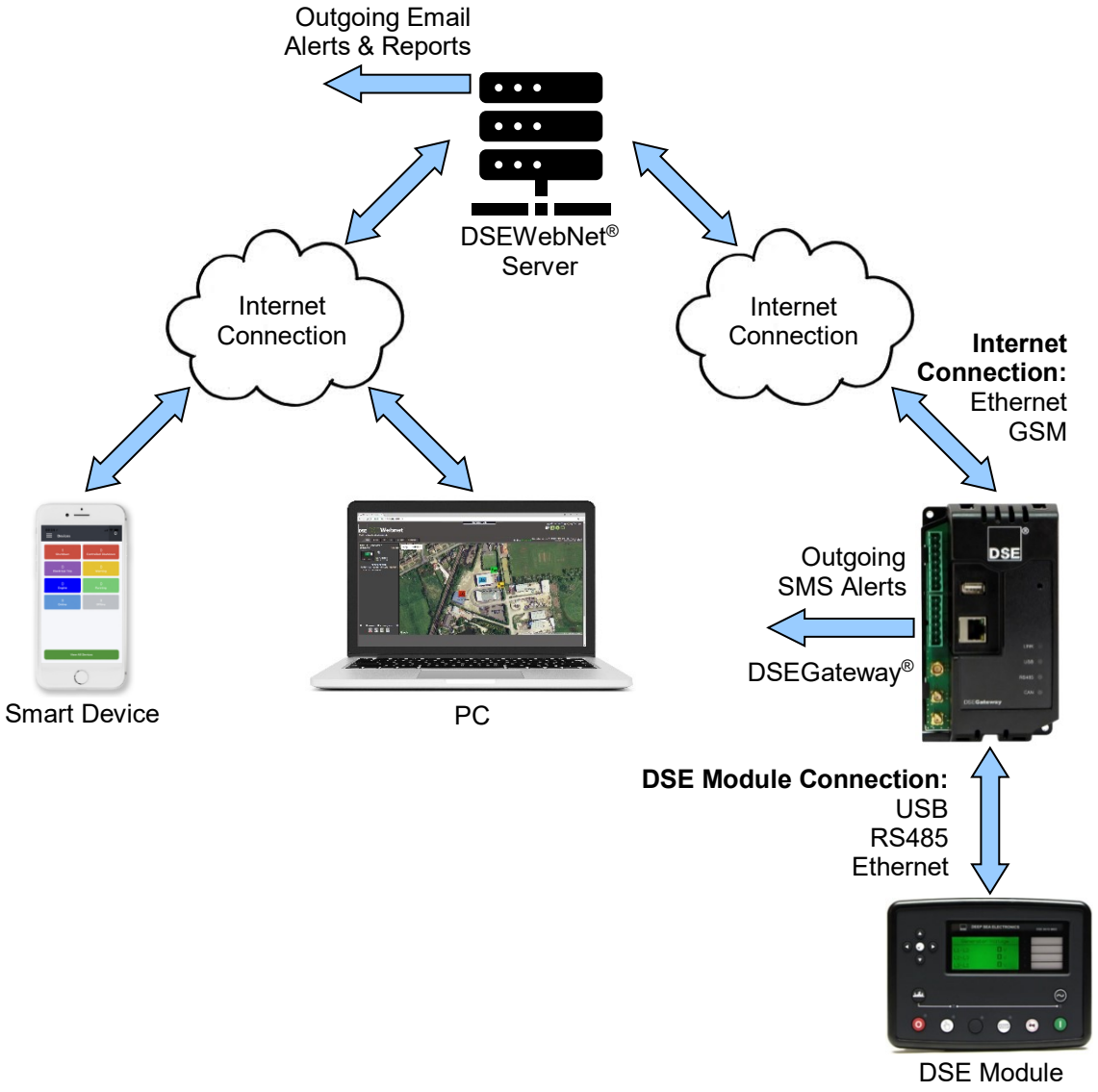
2 SPECIFICATION

2.1 SYSTEM OVERVIEW

The DSEGateway® connects to the DSEWebNet® Server using an internet connection provide by the ethernet or GSM (2G, 3G or 4G mobile internet) connections. The DSEGateway® connects to the DSE module via USB, RS485 and ethernet.

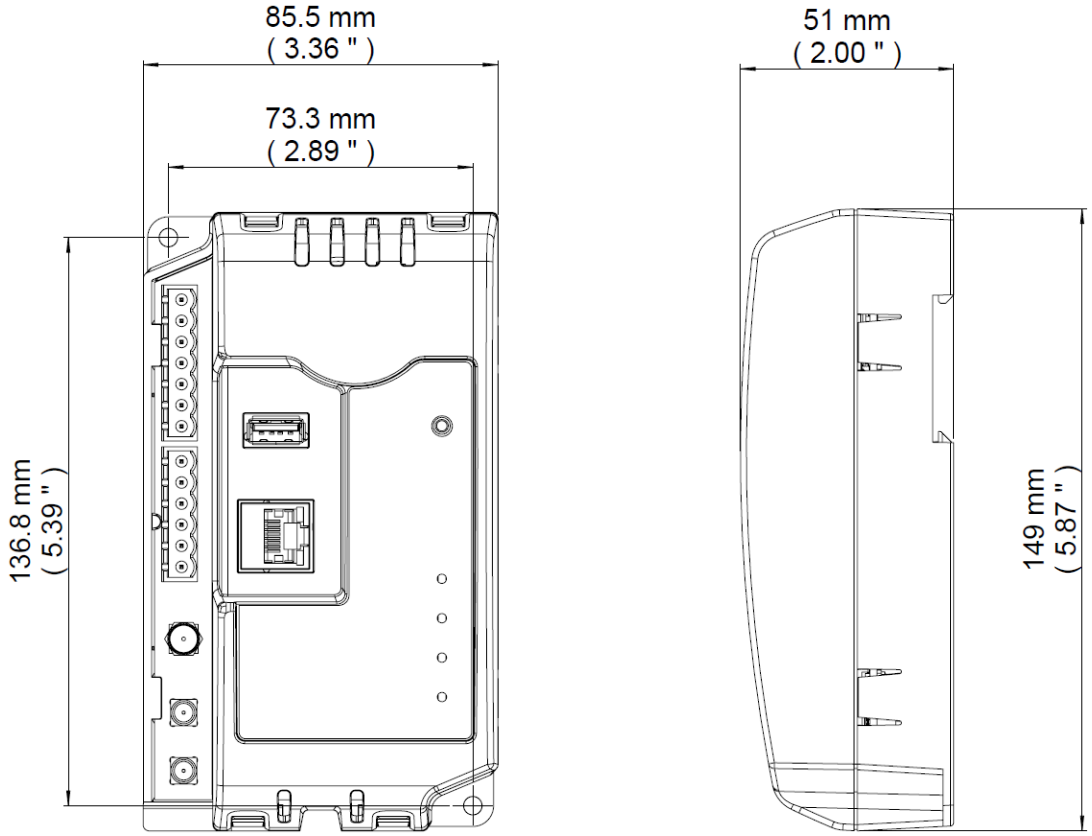
The DSEWebNet® is accessed at www.dsewebnet.com using a PC with a supported internet browser or via the DSEWebNet® App on supported smart devices. This enables the user to perform remote control and live monitoring of the connected DSE modules. The user is also able to configure the DSEWebNet® to send SMS alerts from the DSEGateway's SIM card and Email Alerts/Reports from the DSEWebNet® Server.

Below is an overview depicting how this is achieved…



2.2 DIMENSIONS AND MOUNTING

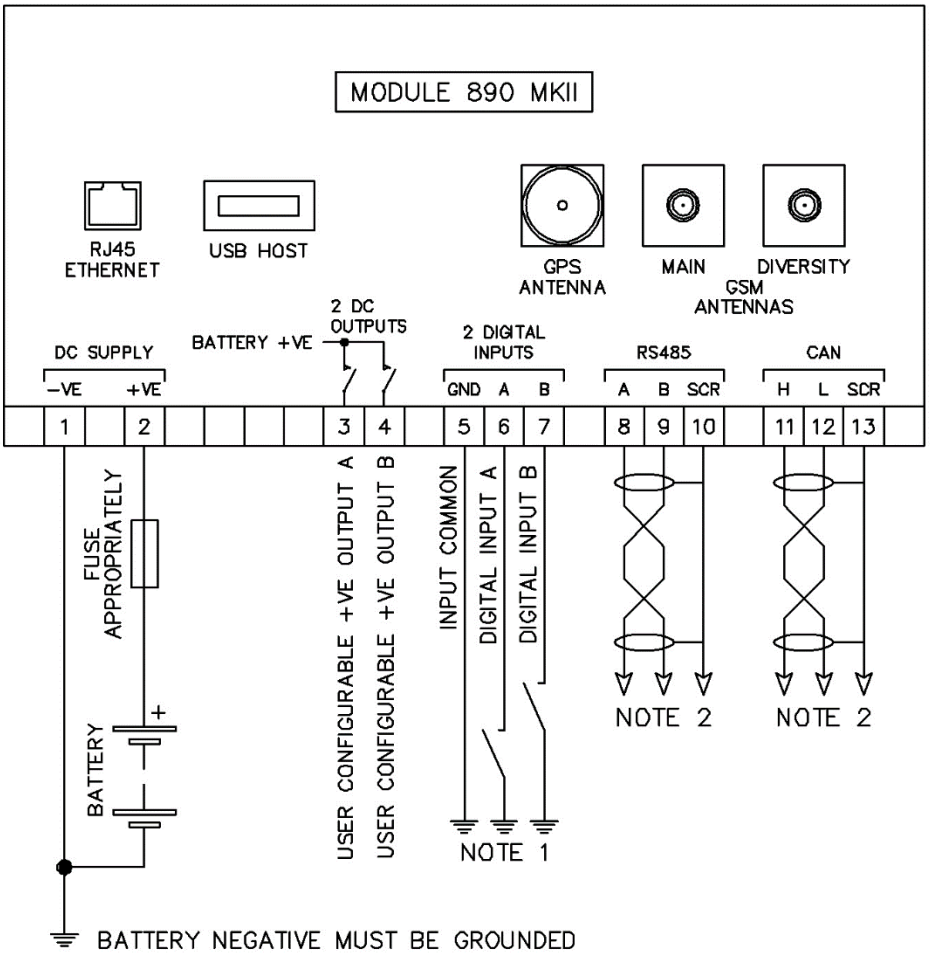
The DSEGateway® is designed to be mounted within a control panel, either on the panel DIN rail utilising the integral mounts, or chassis mounted utilising the mounting holes.



Description	Specification
Overall Size	85 mm X 149 mm X 51 mm (3.35 ” X 5.85 ” X 2.01 ”)
Mounting Type	DIN rail or chassis mounting, indoor use only.
DIN Rail Width	EN 50022: 35 mm (1.4 “)
Mounting Holes	M4 (0.25 ")
Mounting Hole Centres	73 mm X 137 mm (2.89 ” X 5.39 ”)
Operating Temperature	-30 °C to 60 °C (-22 °F to 140 °F)
Operating Temperature for UL Certification	-30 °C to 50 °C (-22 °F to 122 °F)
Storage Temperature	-40 °C to 80 °C (-40 °F to 176 °F)
Weight	0.25 kg (0.55 lbs)

2.3 TYPICAL WIRING DIAGRAM

NOTE: For UL Approvals, a UL listed limited power supply suited for 8 V_{DC} to 36 V_{DC} must be used.



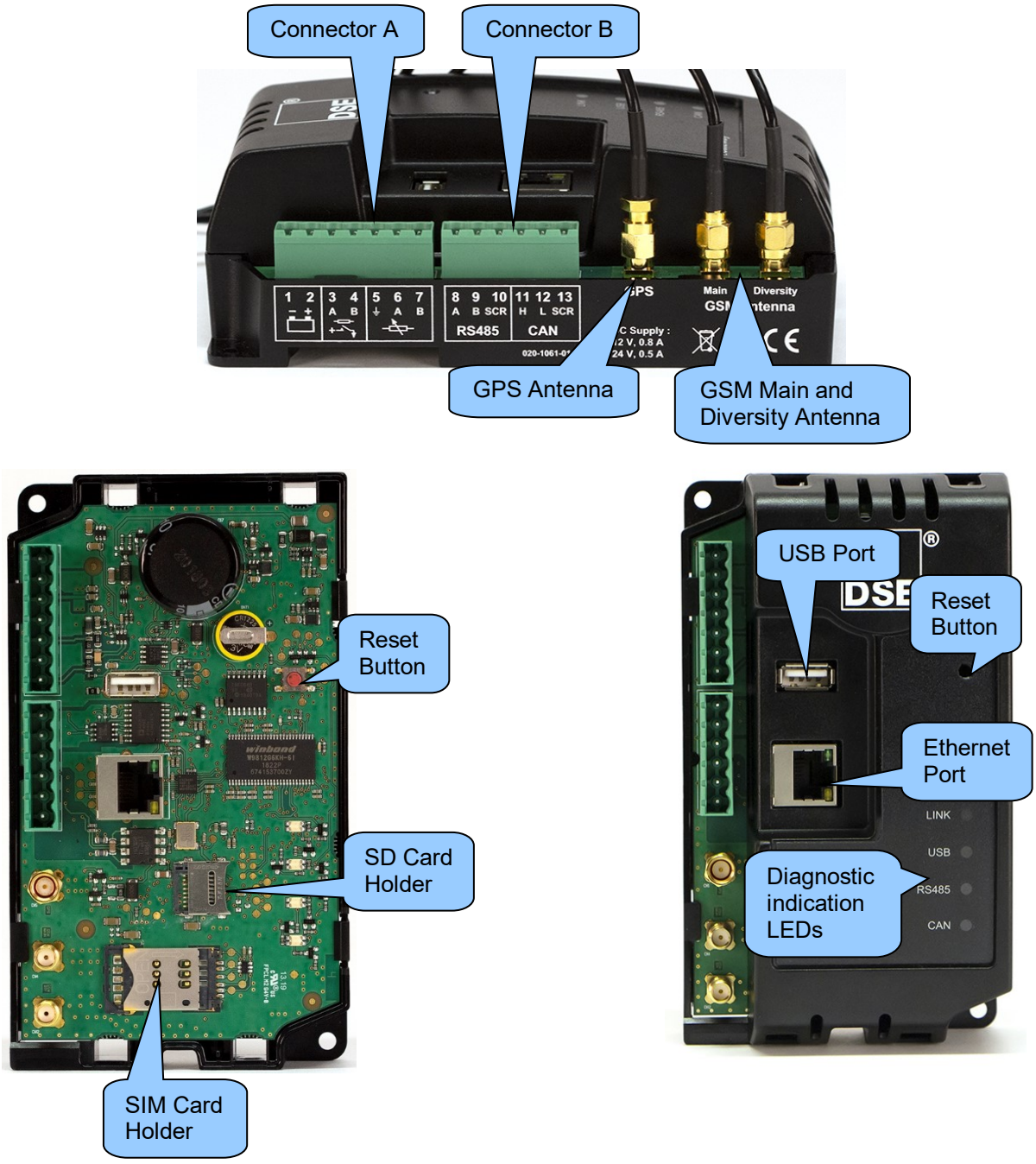
BATTERY NEGATIVE MUST BE GROUNDED

NOTE 1. THESE GROUND CONNECTIONS MUST CONNECTED TO THE SAME GROUND AS BATTERY NEGATIVE.

NOTE 2. IF THE MODULE IS FIRST OR LAST UNIT ON THE LINK, IT MUST BE FITTED WITH A 120 OHM TERMINATION RESISTOR ACROSS THE A AND B OR H AND L TERMINALS.

2.4 USER CONNECTIONS

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



2.4.1 TERMINAL SPECIFICATION

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 20)	
Maximum Cable Size	2.5 mm² (AWG 13)	
Tightening Torque	0.5 Nm (4.5 lb-in)	
Wire Strip Length	7 mm (9/32 ”)	

2.4.2 CONNECTOR A – DC SUPPLY, DIGITAL INPUTS AND DIGITAL OUTPUTS

	Pin No	Description	Cable Size	Notes
	1	DC Plant Supply Input (Negative)	0.5 mm² AWG 20	Connect to ground where applicable.
	2	DC Plant Supply Input (Positive)	0.5 mm² AWG 20	Supplies the module and DC Outputs A & B
	3	Digital Output A	0.5 mm² AWG 20	Plant Supply Positive from terminal 2. 2 A DC rated.
	4	Digital Output B	0.5 mm² AWG 20	Plant Supply Positive from terminal 2. 2 A DC rated.
	5	Digital Input Earth	0.5 mm² AWG 20	Ground Return Feed For Digital Input’s.
	6	Digital Input A	0.5 mm² AWG 20	Switch To Negative.
	7	Digital Input B	0.5 mm² AWG 20	Switch To Negative.

2.4.2.1 POWER SUPPLY REQUIREMENTS

NOTE: For UL Approvals, a UL listed limited power supply suited for 8 V_{DC} to 36 V_{DC} must be used.

Range	Specification
Minimum Supply Voltage	8 V continuous.
Cranking Dropouts	Able to survive 0 V for 100 ms providing the supply was at least 8 V before the dropout and recovers to 8 V afterwards.
Maximum Supply Voltage	36 V continuous.
Power Up Current	3 A transient inrush at initial power up.
Maximum Standby Current	207 mA at 12 V 113 mA at 24 V
Maximum Operating Current	755 mA at 12 V 376 mA at 24 V

2.4.2.2 DIGITAL INPUTS

Description	Specification
Number	2 Digital Inputs
Arrangement	Volt Free Contact between terminal and digital input ground
Low Level Threshold	2.1 V minimum
High Level Threshold	6.6 V maximum
Maximum Input Voltage	+50 V DC with respect to plant supply negative.
Minimum Input Voltage	-24 V DC with respect to plant supply negative
Contact Wetting Current	7 mA typical.
Open Circuit Voltage	12 V typical

2.4.2.3 DIGITAL OUTPUTS

Description	Specification
Type	Supplied from DC supply terminal 2. Manually operated in the *Site I/O* section of the DSEWebNet® System.
Rating	2 A resistive at plant supply.

2.4.3 CONNECTOR B – RS485 AND CAN

	Pin No	Description	Cable Size	Notes
RS485	8	RS485 Port A (+)	0.5 mm² AWG 20	Connect to RXD+ and TXD+ Use only 120 Ω CAN or RS485 approved cable
	9	RS485 Port B (-)	0.5 mm² AWG 20	Connect to RXD- and TXD- Use only 120 Ω CAN or RS485 approved cable
	10	RS485 Port Screen	Shield	Use only 120 Ω CAN or RS485 approved cable
CAN	11	CAN Port H	0.5 mm² AWG 20	Use only 120 Ω CAN or RS485 approved cable
	12	CAN Port L	0.5 mm² AWG 20	Use only 120 Ω CAN or RS485 approved cable
	13	CAN Port Screen	Shield	Use only 120 Ω CAN or RS485 approved cable

2.4.3.1 CAN CONNECTION

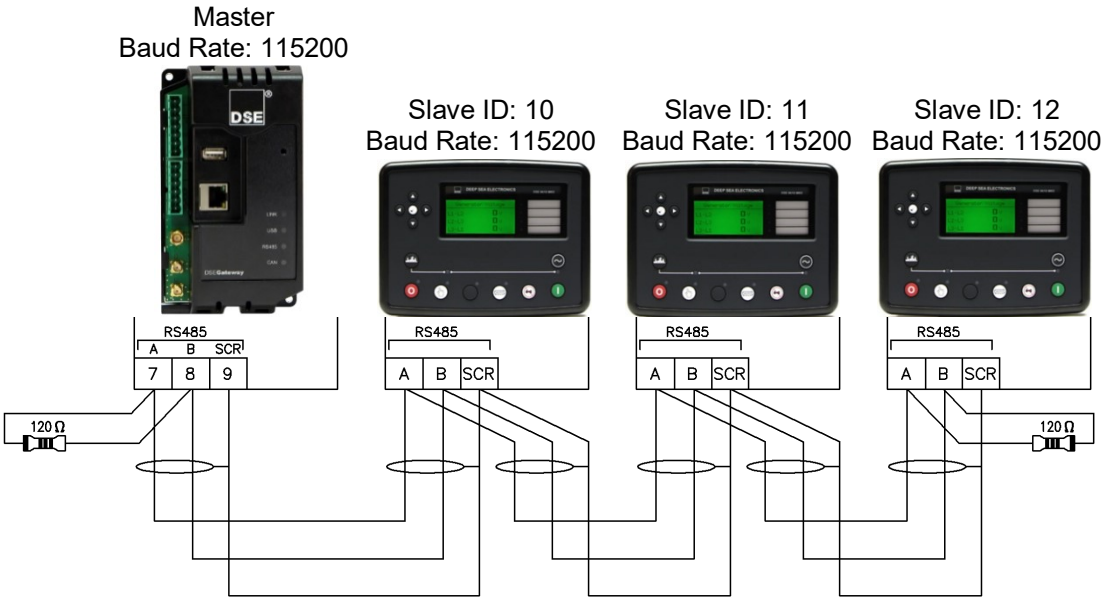
NOTE: All communication ports can be used at the same time.

The CAN connection is currently not utilised and is intended for future development.

2.4.3.2 RS485 CONNECTION

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

This socket provides support for connection to a maximum of 5 (five) DSE Modules in a daisy chain RS485 network. Ensure termination resistors (120 Ω) are fitted as shown to the ends of the link as per RS485 standard.



RS485 Specification

Description	Specification
RS485 Serial Port	Isolated Data connection 2 wire + common Half Duplex Data direction control for Transmit (by s/w protocol) Max Baud Rate 115200 baud subject to configuration External termination required (120 Ω) Max distance 1.2 km (¾ mile)

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	1.2 km (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.

2.4.4 USB CONNECTION

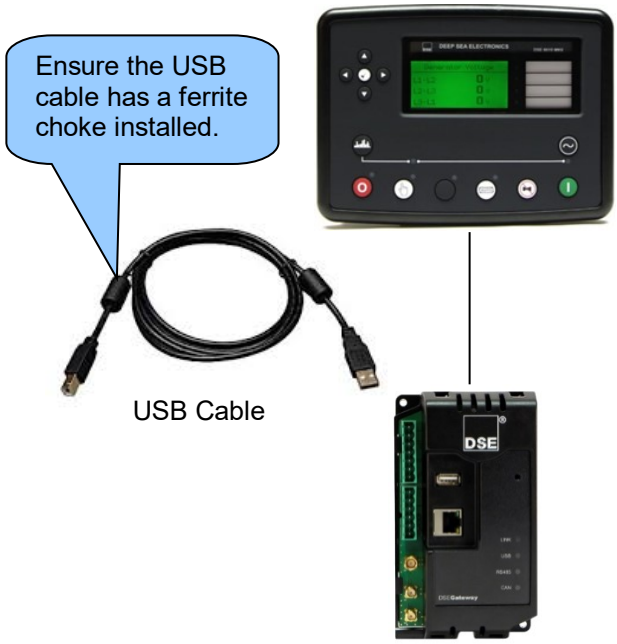
NOTE: DSE advise against the use of USB when used in close proximity to sources of electro- magnetic interference.

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

NOTE: DSE stock a 1 m (3.3 feet) USB type A to type B cable with ferrite chokes, DSE Part Number: 016-180. Alternatively, they are purchased from any PC or IT store.

This USB type A socket provides a connection to one DSE Module. Firmware updates and configuration files are also installed via the USB port using a USB memory stick.

Use USB type A to USB type B cable with ferrite choke.



USB Specification

Description	Specification
USB Host Port	Type A USB 2.0

Cable Specification

Description	Specification
USB Cable	Type A to type B USB 2.0 (sometimes known as 'printer cable') screened cable with ferrite chokes. Max distance 5 m (16 feet) recording only

USB Memory Stick Requirements

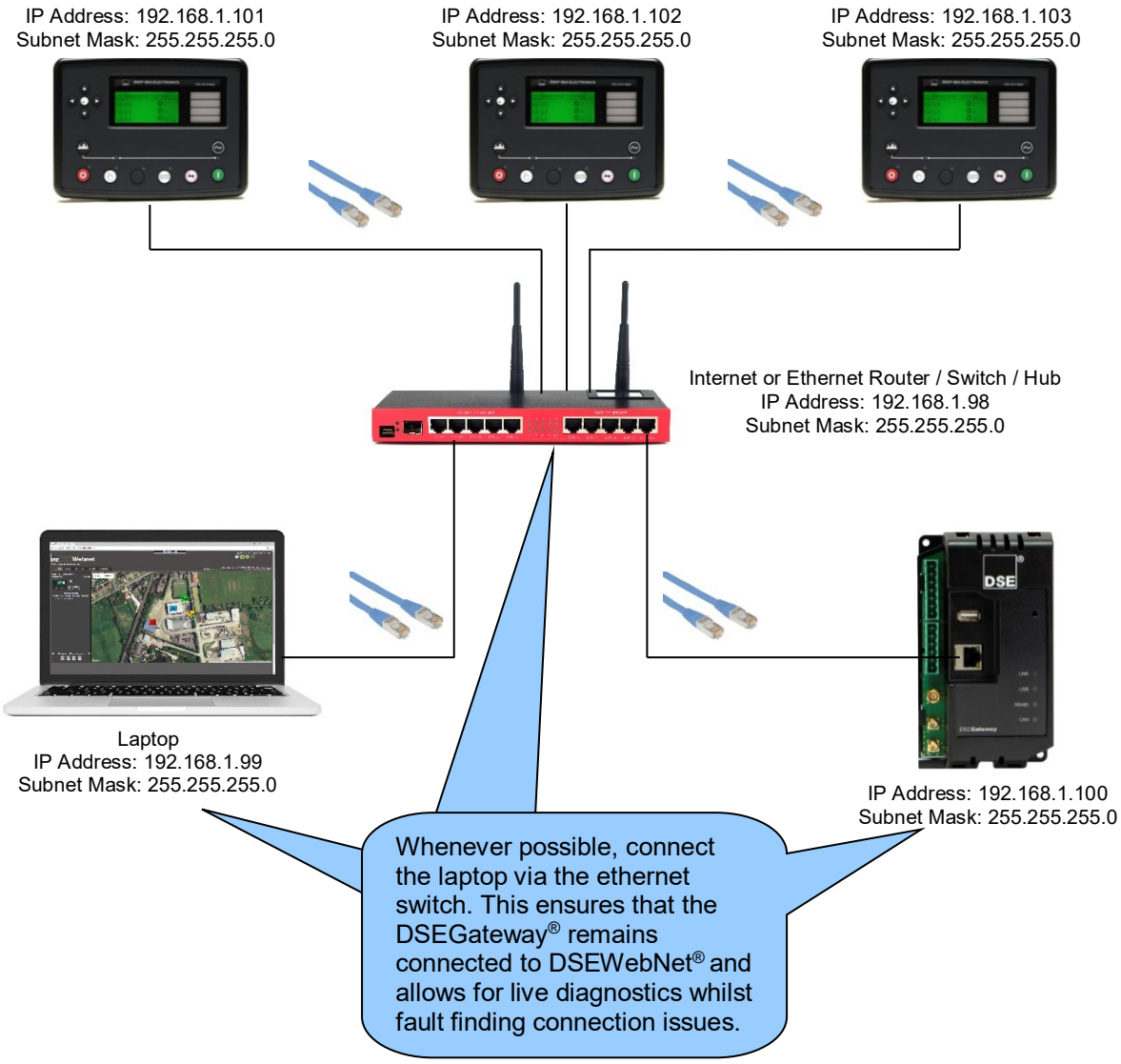
Description	Specification
USB Memory Stick	Up to a maximum 16 GB size and formatted to FAT.

2.4.5 ETHERNET CONNECTION

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

The Ethernet port is utilised to allow configuration of the Gateway, connection the internet and connection to the associated Modules.

An example utilising all three types on an isolated network connection is shown below…



Ethernet Specification

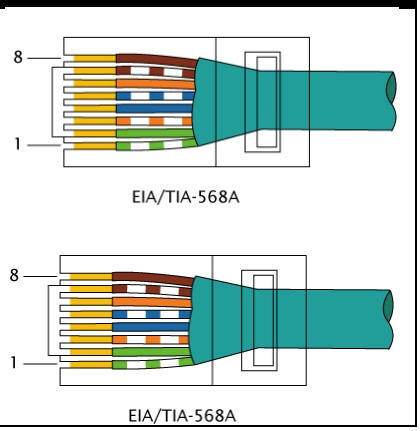
Description	Specification
Ethernet	Auto Detecting 10/100 Mbit port.

Cable Specification

NOTE: DSE Stock a 2m (2yds) Ethernet Cable – Part number 016-137. Alternatively they can be purchased from any PC or IT store.
As the ethernet port is auto detecting, a 'straight through' or 'crossover' cable can be used.
The diagram information below covers a 'straight though' type cable.

Ethernet connection utilises a standard Ethernet cable with RJ45 connectors

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

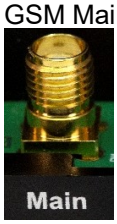
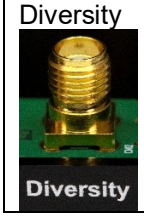


2.4.6 GSM CONNECTIONS

NOTE: For details on how to configure the GSM setting, refer to section entitled *Quick Set Up Guide* elsewhere in this document.

NOTE: DSE stock a combined 4G LTE (Main & Diversity) and GPS Antenna with 3 m length of cable which is suitable for this purpose. Part number: 020-1053.

The DSEGateway® connects to the GSM through the use of an antenna. This allows for a more powerful signal strength. The connections are shown below.

	Connector	Required Antenna Cable Connector
GSM Main 	SMA FEMALE (Outside thread, female central receptacle)	SMA MALE (Inside thread, male central pin)
GSM Diversity 	SMA FEMALE (Outside thread, female central receptacle)	SMA MALE (Inside thread, male central pin)

2.4.6.1 SUPPORTED FREQUENCY BANDS

The WCMDA (3G) operating parameters and frequency bands that are supported by the DSEGateway® are listed below.

WCDMA Operating Mode	Specification
CS (Voice)	Yes
PS (Data)	Yes
HSDAP Cat	1 to 12
HSUPA Cat	1 to 12
Tx Diversity	Yes
Tx MIMO	Yes

WCDMA Band	Frequency
Band 1 (BC1)	2100 MHz
Band 2 (BC2)	1900 MHz
Band 4 (BC4)	2100 MHz / 1700 MHz
Band 5 (BC5)	850 MHz
Band 8 (BC8)	900 MHz
Band 9 (BC9)	1700 MHz
Band 19 (BC19)	800 MHz

The LTE (4G) operating parameters and frequency bands that are supported by the DSEGateway® are listed below.

LTE Operating Mode	Specification
3GPP Rel. No.	LTE Rel 9
3GPP UE Cat.	CAT1
Upload Modulation	SC-FDMA
Download Modulation	OFDMA
Tx Diversity	Yes
Tx MIMO	Yes

LTE FDD Band	Frequency
Band 1 (BC1)	2100 MHz
Band 2 (BC2)	1900 MHz
Band 3 (BC3)	1800 MHz
Band 4 (BC4)	1700 MHz
Band 5 (BC5)	850 MHz
Band 7 (BC7)	2600 MHz
Band 8 (BC8)	900 MHz
Band 12 (BC12)	700 MHz
Band 18 (BC18)	850 MHz
Band 19 (BC19)	850 MHz
Band 20 (BC20)	800 MHz
Band 28 (BC28)	700 MHz

2.4.7 GPS CONNECTION

NOTE: DSE stock a combined 4G LTE (Main & Diversity) and GPS Antenna with 3 m length of cable which is suitable for this purpose. Part number: 020-1053.

The DSEGateway® attains a GPS signal through the use of an antenna. This allows for a more powerful signal strength. The connections are shown below.

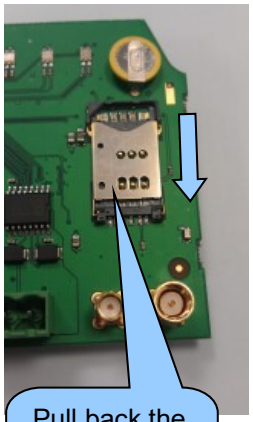
	Connector	Required Antenna Cable Connector
GPS 	SMA MALE (Inside thread, male central pin)	SMA FEMALE (Outside thread, female central receptacle)

2.4.8 STANDARD SIM CARD HOLDER

The DSEGateway® uses the *Standard* SIM card size (15 mm X 25 mm) to enable connection to a GSM (internet over GSM) network. 2G, 3G or 4G SIM cards are supported.

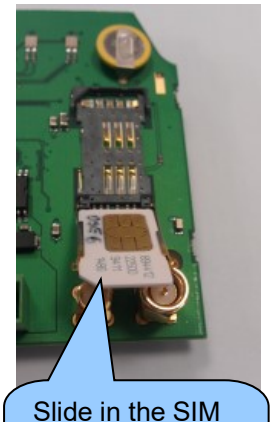
2.4.8.1 HOW TO INSERT THE GSM SIM CARD

1.

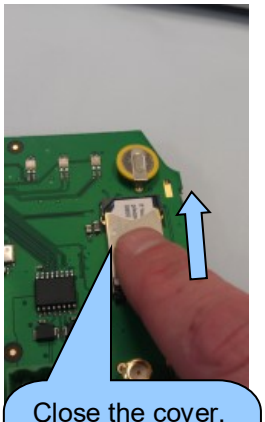


2.

3.

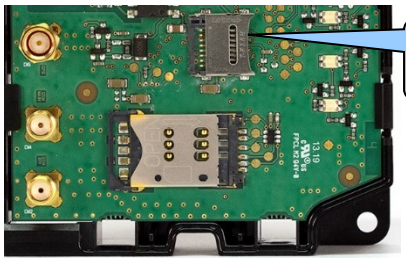


4.



2.4.9 MICROSD CARD HOLDER

The microSD Card Holder is currently not utilised and is intended for future development.



2.5 DSEWEBNET® CONNECTION PROTOCOL

NOTE: The DSEGateway® must have a module connected when connecting to DSEWebNet® for the first time.

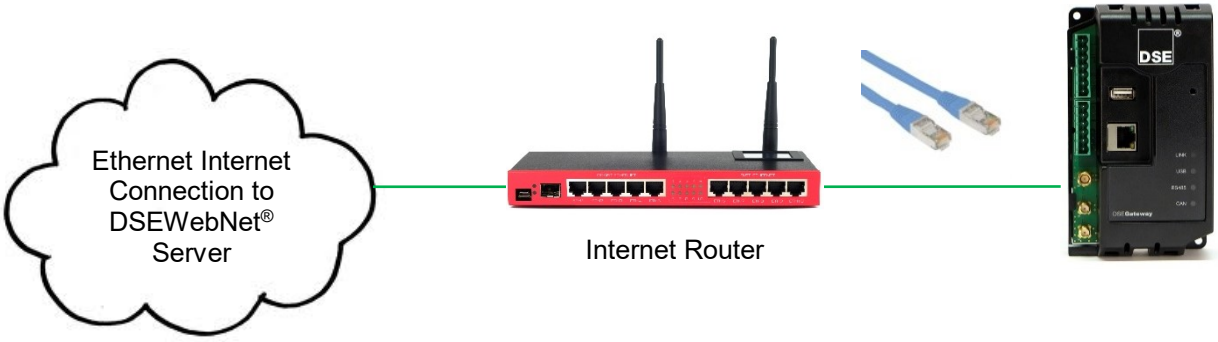
The DSEGateway® communicates with the DSEWebNet® Server at regular (configurable) intervals to upload its logged data to the using an internet connection.

The Internet connection is attained via the Ethernet and / or the GSM connection.

2.5.1 VIA ETHERNET

NOTE: For further details on how to the configure the DSEGateway® Ethernet settings see section entitled *Network* within the *Configuration* section elsewhere in this document .

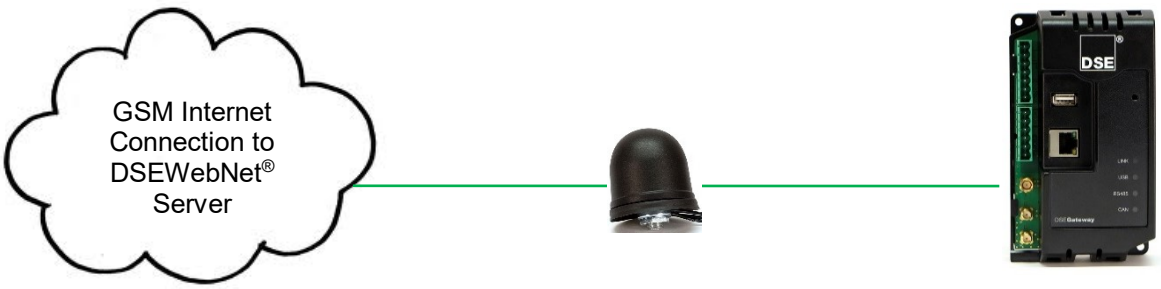
The DSEGateway® can be connected to DSEWebNet® via an internet router or network provided. The connection details need to be obtained via the network provider or IT manager of the associated network.



2.5.2 VIA GSM

NOTE: For further details on how to the configure the DSEGateway® GSM settings, see section entitled *GSM* within the *Configuration* section elsewhere in this document .

A 4G GSM SIM card can be fitted into the DSEGateway®. this provides GRPS connection to the DSEWebNet® Server. The DSEGateway® is designed to work with all GSM Data enabled SIM Cards (2G, 3G, 4G). The DSEGateway® needs to be configured using the associated network settings. These settings are obtained by contacting the SIM card supplier.



2.5.3 DSEWEBNET® SERVER CONNECTION INFORMATION

This sections contains information that may be useful to the I.T. or Network Managers on sites where the DSEGateway® is installed.

Item	Description
Transmission Protocol	Data is sent using HTTP (port 80), HTTPS (port 443) and WebSocket (port 83). All communications between the DSEGateway® and the DSEWebNet® server are initiated by the DSEGateway®. This allows bi-directional communication but ensures that the DSEGateway® does accept incoming data from unauthorised sources, except for when the MODBUS TCP passthrough has been enabled. All data sent from the DSEGateway® is hosted on the DSEWebNet® server and accessed using www.dsewebnet.com or the DSEWebNet® App.
Data Encryption	All the data is sent using a web socket protocol connection for real time data and http posts for historic data. The data from the DSEGateway® to the DSEWebNet® is not encrypted but is not human readable. i.e. numbers and letters only rather than words. The data from the DSEWebNet® to the device (e.g. PC or Smart Phone) is encrypted using TLS encryption which prevents packet sniffing or injection. The DSEWebNet® webpage opens an outbound connection on port 443 which is the standard for TLS/SSL connections to the DSEWebNet® server. When the DSEGateway® is connecting to the DSEWebNet® server using GSM, the registration process uses a HTTPS connection.
Access Security	The users on the DSEWebNet® have a different php session with “session takeover” attack prevention taken in to account. The passwords for the DSEWebNet® accounts are hashed in bcrypt format.

2.5.4 FIREWALL SETTINGS

To allow the DSEGateway® to communicate with the DSEWebNet® Server it is important that any network firewalls do not block access to the relevant ports.
This is particularly important with wired connection to the internet however usually GSM networks do not include a network firewall.

The DSE Server names and port numbers are listed below, where ## is replaced with a numeric and alphabetic character:

Domain Name	Port
www.dsewebnet.com	80
Realtime##.dsewebnet.com	83
historic##.dsewebnet.com	80

The image below details the specific server Domain addresses shown on the DSEGateway® *Network* tab.

To provide the best possible service, it is recommended that any firewall is configured to allow access to all subdomains on the *dsewebnet.com* domain as follows:

Domain name	Ports
*.dsewebnet.com	80, 83

2.6 BROWSER COMPATIBILITY

2.6.1 GOOGLE CHROME

The DSEGateway® management pages are optimised for Google Chrome web browser.

2.6.2 INTERNET EXPLORER

Internet Explorer 10 and above

The DSEGateway® management pages are optimised for Internet Explorer 10 and above.

Internet Explorer 9 and earlier

Internet Explorer 9 and earlier versions are not supported.

2.6.3 SAFARI

The DSEGateway® management pages are optimised for Safari.

2.6.4 SMARTPHONE BROWSERS

Smartphone browsers are not supported by the DSEGateway® management pages.

2.7 MODULE COMPATIBILITY

At the time of printing, the following devices are currently compatible with the DSEGateway® and DSEWebNet®. For up to date information regarding device compatibility contact DSE technical support:

Tel: +44 1723 890099
Fax: +44 1723 893303
Email: support@deepseaelectronics.com

DSE Module
DSE334
DSE335
DSEE100
DSEE400
DSEE800
DSEL400
DSEL401, DSEL401 MKII
DSEP100
DSE4310, DSE4310 NC
DSE4320, DSE4320 NC
DSE4410 CAN, DSE4410 MPU
DSE4420 CAN, DSE4420 MPU
DSE4510, DSE4510 NC, DSE4510 RT, DSE4510 RTH, DSE4510 MKII
DSE4520, DSE4520 NC, DSE4520 RT, DSE4520 RTH, , DSE4520 MKII
DSE4610, DSE4610 RTH
DSE4620, DSE4620 RTH
DSE6010 CAN, DSE6010 MPU, DSE6010 MKII
DSE6020 CAN, DSE6020 MPU, DSE6020 MKII
DSE6110 CAN, DSE6110 MPU, DSE6110 MKII, DSE6110 MKIII,
DSE6120 CAN, DSE6120 MPU, DSE6120 A3, DSE6120 MKII, DSE6120 MKIII,
DSE7110, DSE7110 MKII
DSE7120, DSE7120 MKII
DSE7210
DSE7220
DSE7310, DSE7310 MKII
DSE7320, DSE7320 MKII
DSE7410, DSE7410 MKII
DSE7420, DSE7420 MKII
DSE7450
DSE8610, DSE8610 MKI
DSE8620
DSE8660, DSE8660 MKII
DSE8710
DSE8760
DSE8810
DSE8860

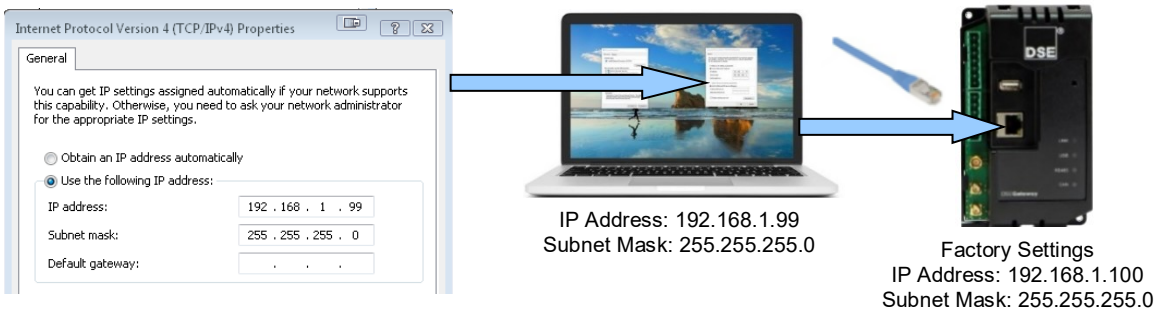
3 QUICK SET UP GUIDE

The following Quick Set Up Guide is intended to assist configuring the DSEGateway® and connecting to DSEWebNet®.

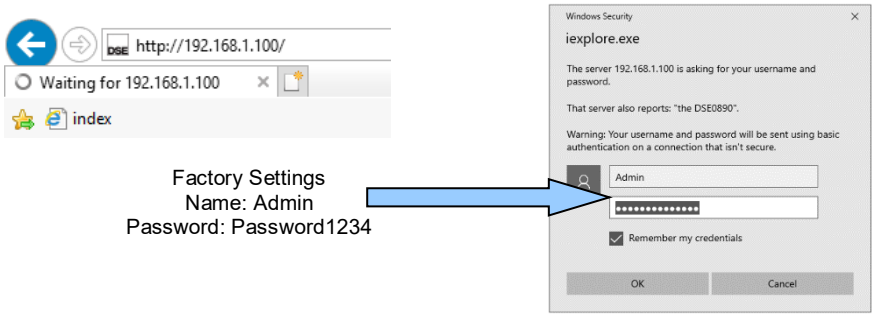
3.1 STEP ONE: CONNECT AND CONFIGURE THE DSEGATEWAY®

NOTE: Consult the company IT department before making changes to PC network settings.

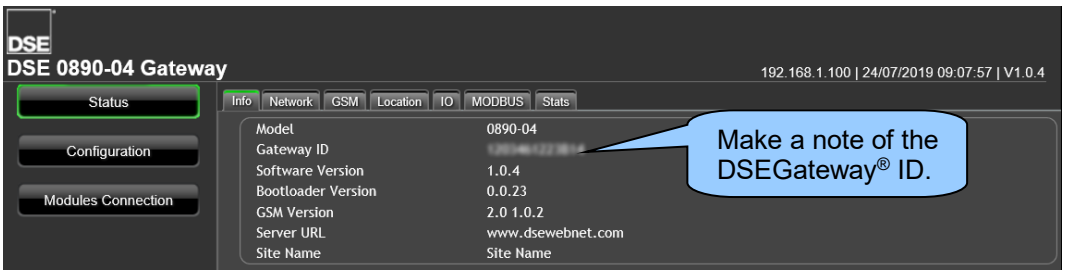
1. Connect the DSEGateway® Ethernet port directly to the PC Ethernet port using either a 'straight through' or 'crossover' network cable.
2. Configure your PC to be on a fixed IP address (192.168.1.99) as per below …



3. Using Google Chrome or Internet Explorer, navigate to the address of the DSEGateway® (192.168.1.100) and enter the username and password of the DSEGateway®…



4. It is now possible to view and configure the DSEGateway®. Make a note of the DSEGateway® ID number. This is required when adding the DSEGateway® to DSEWebNet®.

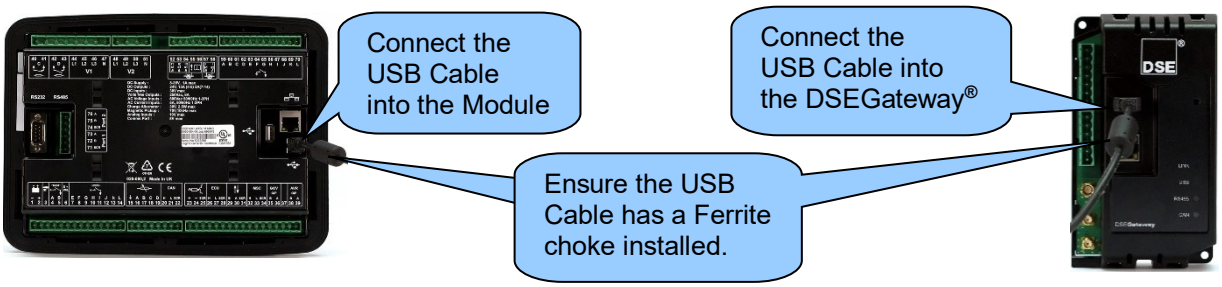


3.2 STEP TWO: CONNECT THE MODULE

NOTE: The DSEGateway® is configured to connect to a DSE Module via the USB port. If this is not the communication type to be used, see section entitled *Modules Connection* elsewhere within this document.

NOTE: DSE advise against the use of USB when used in close proximity to sources of electromagnetic interference.

Connect the DSEGateway® to the associated DSE modules as shown below…



Cable Specification

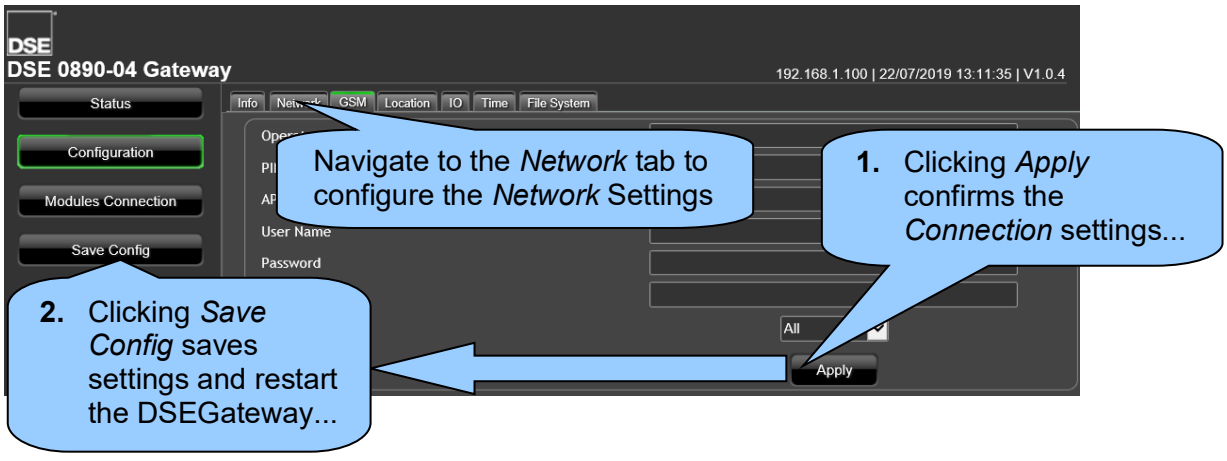
Description	Specification
USB Cable	USB 2.0 type A to type B screened cable (sometimes known as 'printer cable') with ferrite choke. Max distance 5 m (16 feet).

3.3 STEP THREE: CONFIGURE THE INTERNET CONNECTION

NOTE: GSM settings are obtainable by contacting the phone network provider or checking the SIM card packaging.

NOTE: For further details on how to configure the GSM connection see section entitled *Configuration GSM* elsewhere within this document. For further details on how to configure the ethernet connection see section entitled *Configuration GSM* elsewhere within this document.

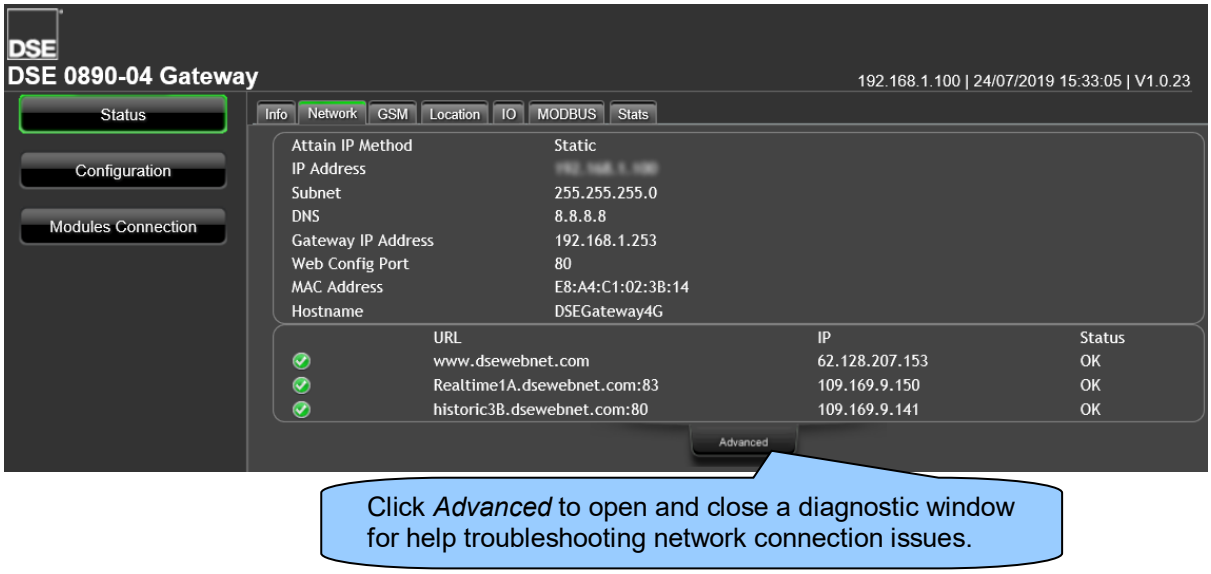
Configure the DSEGateway® to suit the phone or network requirements. These requirements vary according to the SIM Card provider.



3.4 STEP FOUR: CHECK CONNECTION

NOTE: The DSEGateway® must have a DSE Module connected when connecting to DSEWebNet® for the first time.

Ensure the DSEGateway® has connected to the DSEWebNet® servers by checking the *Network Advanced* diagnostic tab located in the DSEGateway® browser.



Typical Connection Process

Upon connection to the Internet the DSEGateway® attempts to connect to the DSEWebNet® Servers. The process is as follows…

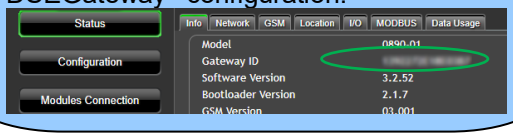
1. Upon completion of *Step Three: Configure The Internet Connection*, the DSEGateway® reboots.
2. For a short time (up to 5 mins), the *LINK* LED remains red.
3. The *LINK* LED illuminates green when connection to the DSEWebNet® server is established.
4. The DSEGateway® configures itself for the connected DSE module, after a short period the USB LED begins to flash.
5. The DSEGateway® and DSE module are now ready to be added to DSEWebNet®.

3.5 STEP FIVE: ADD THE DSEGATEWAY® TO DSEWEBNET®

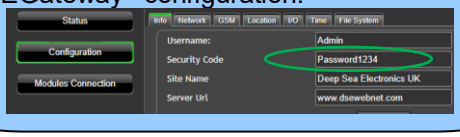
NOTE: To access DSEWebNet®, a user account is required. For full details on how Register and Login to DSEWebNet® account please see manual *DSEWebNet®* 057-168.

To add a DSEGateway® to the user's account, the *Gateway USB ID* and *Security Code* are required. This information is located in the DSEGateway® Status Configuration screens.

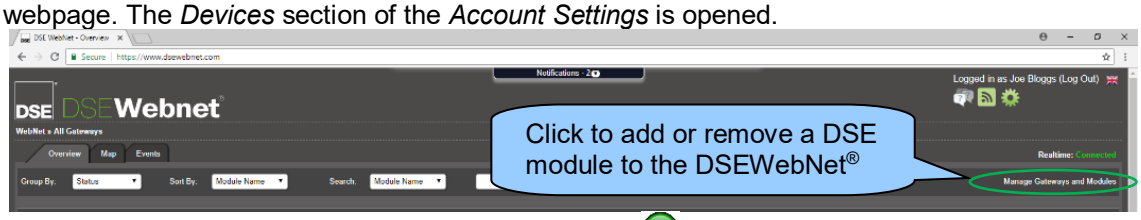
The DSEGateway® USB ID is located under the *Status Info* section of the DSEGateway® configuration.



The Security Code is located under the *Configuration Info* section of the DSEGateway® configuration.

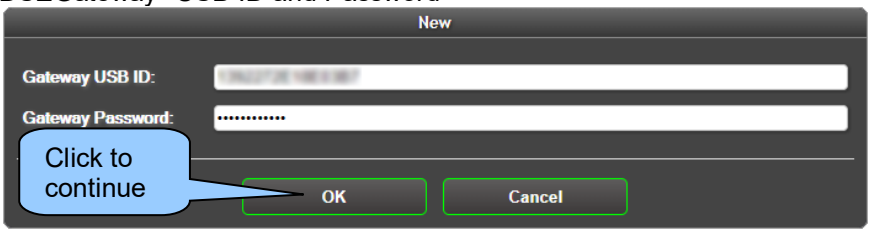


1. Launch a compatible internet browser and navigate to the website: ***www.dsewebnet.com*** and login into DSEWebNet®.
2. Click on *Manage Gateways and Modules* located on the top right hand corner of the webpage. The *Devices* section of the *Account Settings* is opened.

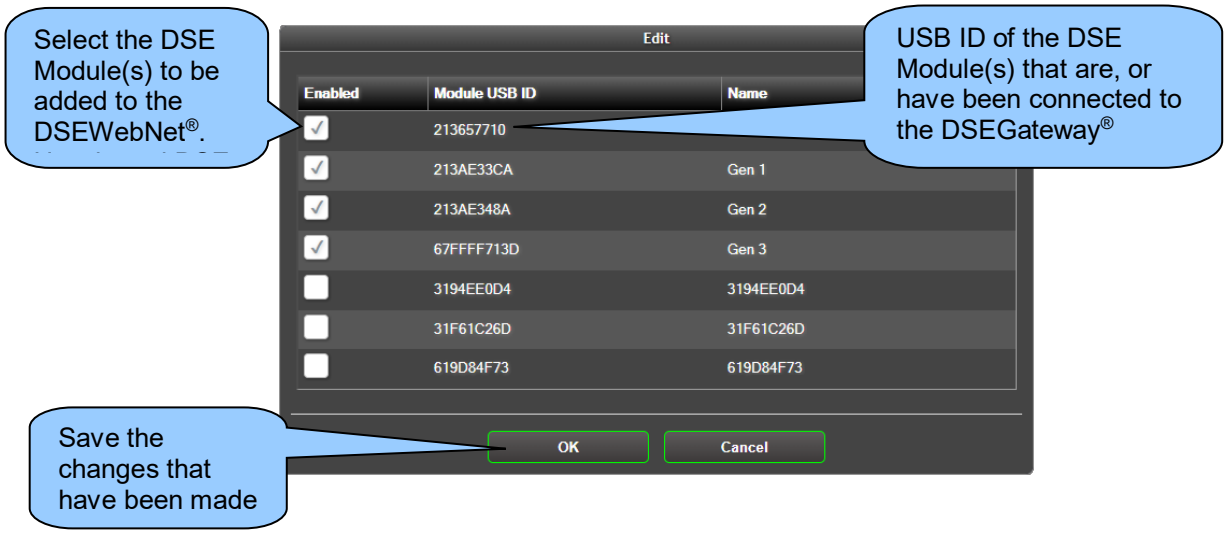


3. To add a DSEGateway® to the account, click the *Plus* button located on the top right hand corner of the webpage. The *Add New Gateway* option is opened

4. Enter the DSEGateway® USB ID and Password

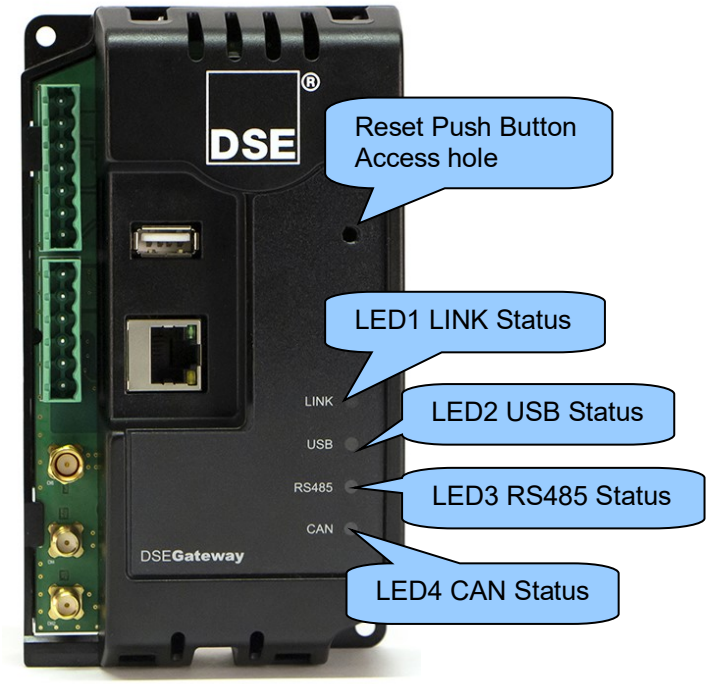


5. Select the Module to be added. DSEWebNet® uses the Module's *USB ID*.



4 CONTROLS AND INDICATIONS

The DSEGateway® facia has four indication LED's as well as a Reset button.



4.1 RESET PUSHBUTTON

The Reset Push Button is accessible by removing the front cover or by accessing the small hole on the DSEGateway® facia. The Reset Push Button is used to both power cycle the DSEGateway® and Reset the DSEGateway® back to factory settings. Briefly Pressing and releasing the Push button reboots the gateway. Pressing and holding the reset button resets the DSEGateway® back to factory settings : The procedure is as follows…

1. Press and hold the *Reset* pushbutton.
2. All LEDs illuminate yellow for a short time.
3. All LEDs extinguish for a short time.
4. LEDs illuminate one at a time – LED4, LED3, LED2, LED1.
5. All LEDs illuminate yellow.
6. Reset has completed, now release the reset push button.

Once reset, the DSEGateway® must be reconfigured. Refer to section entitled *Quick Reference Guide* elsewhere in this document for further details.

4.2 LED INDICATIONS

LED	Function	Colour	Action
1	LINK Status	Red	No connection to DSEWebNet® Server
		Green	Connected to DSEWebNet® Server and all configured ports are OK
2	USB Status	Red	No Unit Detected
		Green	Data transfer OK
3	RS485 Status	Red	No Unit Detected
		Green	Data transfer OK
4	CAN Status	Red	No Unit Detected
		Green	Data transfer OK

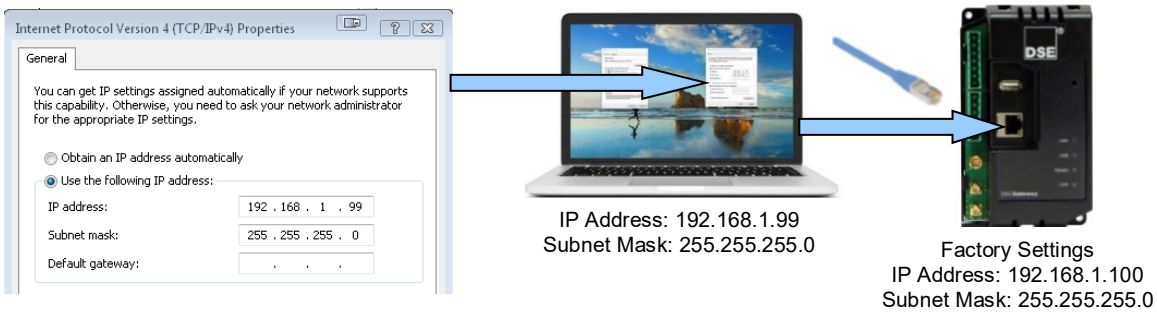
5 USER PAGES

The DSEGateway® is setup and configured using a PC with web browser and a ‘straight through’ or ‘crossover’ network cable.

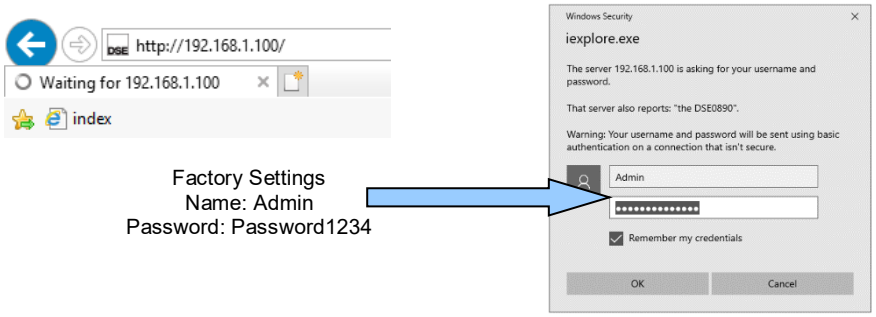
5.1 CONNECTING TO THE DSEGATEWAY® MANAGEMENT PAGES

NOTE: Consult the company IT department before making changes to PC network settings.

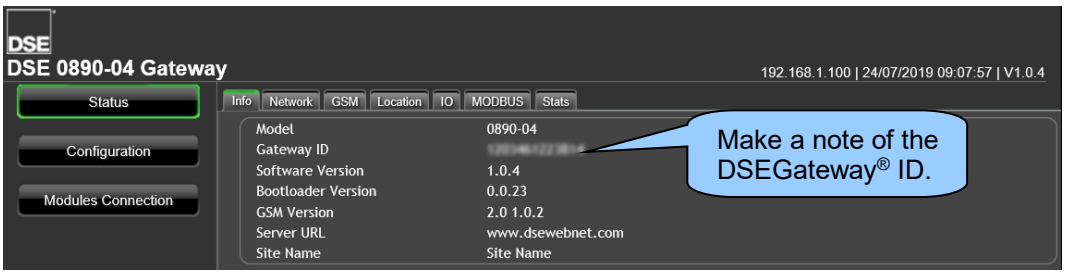
1. Connect the DSEGateway® Ethernet port directly to the PC Ethernet port using either a ‘straight through’ or ‘crossover’ network cable.
2. Configure your PC to be on a fixed IP address (192.168.1.99) as per below …



3. Using Google Chrome or Internet Explorer, navigate to the address of the DSEGateway® (192.168.1.100) and enter the username and password of the DSEGateway®…



4. It is now possible to view and configure the DSEGateway®. Make a note of the DSEGateway® ID number. This is required when adding the DSEGateway® to DSEWebNet®.



5.2 STATUS

The *Status* pages show information that is be used for diagnostics and give a level of confidence that the system is working as expected. Along with DSEGateway® software information, it also indicate the state of the various communication ports in use.

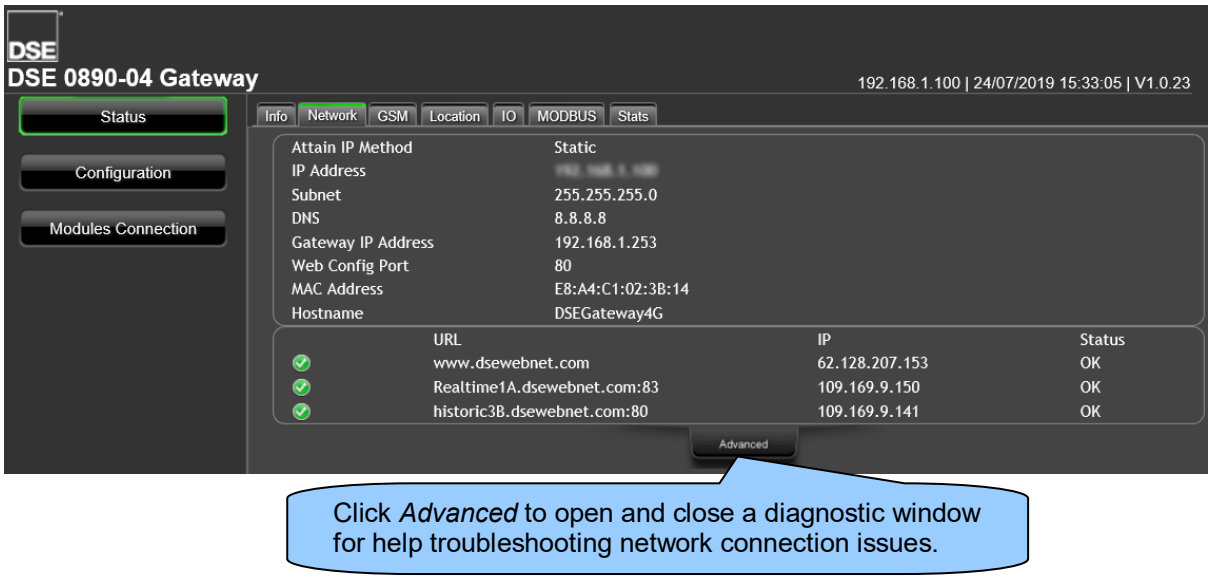
The information is separated into subtabs:

5.2.1 INFO

Parameter	Description
Model	The model number of the DSEGateway®.
Gateway ID	The identification number of the DSEGateway®. This is used when adding the DSEGateway® to the DSEWebNet® Server.
Software Version	The software version of the DSEGateway®.
Bootloader Version	The software bootloader version of the DSEGateway®.
GSM Version	The GSM version of the DSEGateway®.
Server URL	Shows the configured address that the DSEGateway® is configured to communicate with. The DSEWebNet® Server is located at www.dsewebnet.com.
Site Name	The name of the DSEGateway®. This is configured under *Configuration Info* tab.

5.2.2 NETWORK

Shows the current network settings in use on the DSEGateway® and status of the connection to the DSEWebNet® Services.



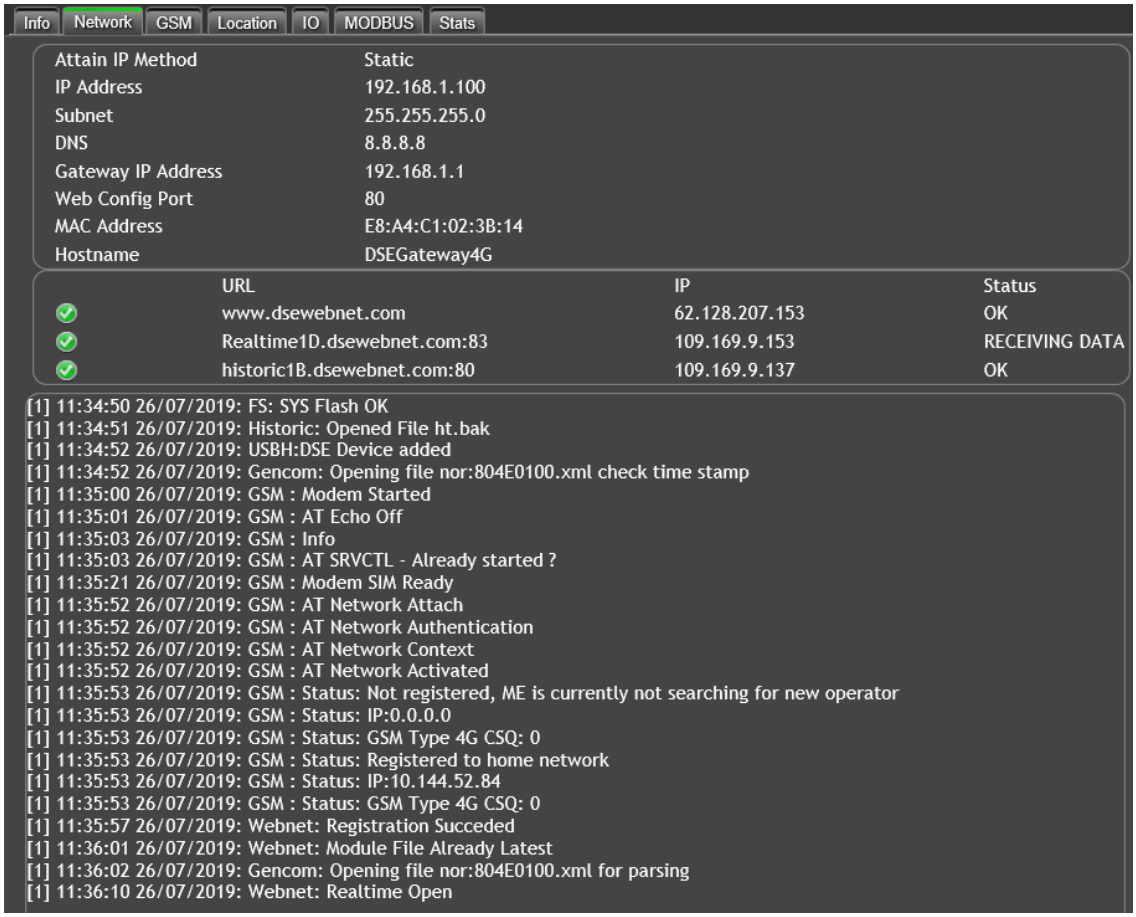
Click *Advanced* to open and close a diagnostic window for help troubleshooting network connection issues.

Parameter	Description
Attain IP Method	Shows the type of IP address assigned to the DSEGateway® Ethernet Port. ***Static***: Static IP address, manually entered. ***DHCP***: IP address assigned by the network DHCP server.
IP Address	IP address currently being used by the DSEGateway®'s Ethernet Port.
Subnet	Subnet Mask for the DSEGateway®'s Ethernet Port.
DNS	DNS (Domain Name Service) setting for the DSEGateway®'s Ethernet Port.
Gateway IP Address	The IP address location of the internet router currently used by the DSEGateway®'s Ethernet Port to communicate with the DSEWebNet® Server.
Web Config Port	The TCP Port Number currently in use by the DSEGateway®'s Ethernet Port to serve the Web Management Pages.
MAC Address	Unique Hardware Identification number of the DSEGateway®'s Ethernet Port.
Hostname	Shows the currently configured Hostname of the DSEGateway®'s Ethernet Port.
URL, IP, Status	Shows the status of connection to the DSEWebNet® Server. = The connection is made to the respective port of the DSEWebNet® Server. = The respective port of the DSEWebNet® Server cannot be reached. This may be a local firewall issue.

5.2.2.1 ADVANCED

The advanced section shows diagnostic information that may assist DSE Technical Support in the case of connection issues. The information displayed relates to DSEGateway® sent and received commands between the Modules, the DSEWebNet® Servers and the phone network.

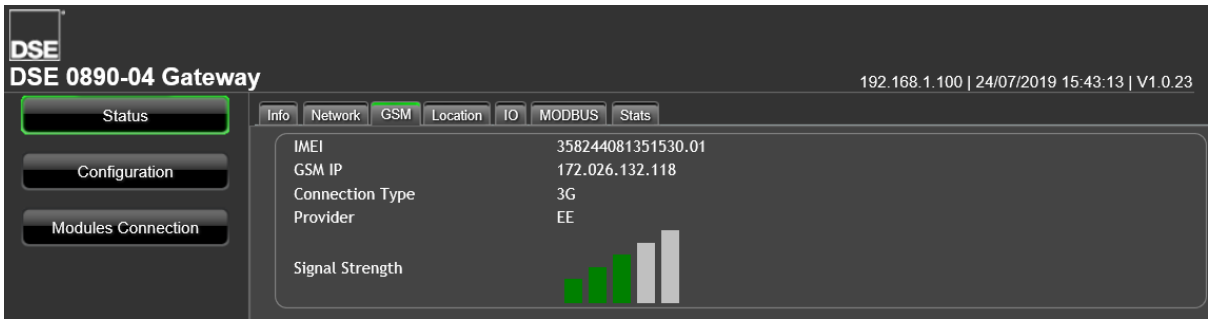
Example showing a successful connection to the DSEWebNet® server using GSM



For details of required firewall settings to allow connection to the DSEWebNet® server, see section entitled *DSEWebNet® Connection Protocol* elsewhere in this document.

5.2.3 GSM

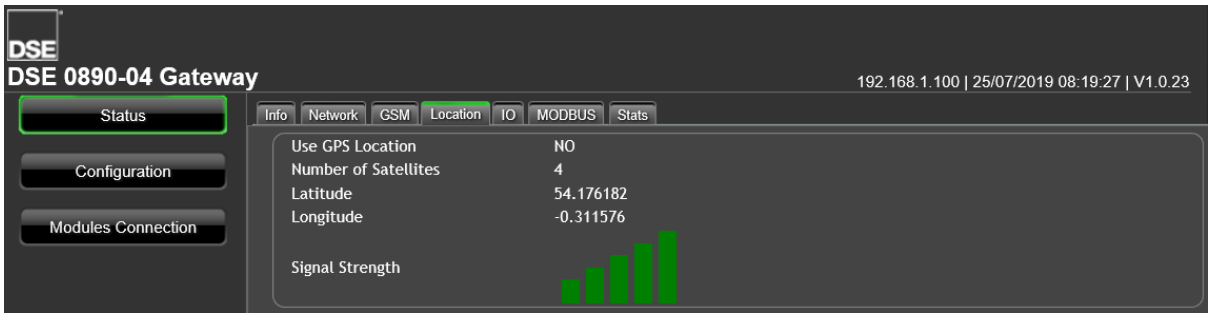
Provides diagnostic information for the GSM connection.



Parameter	Description
IMEI	IMEI number of the GSM communications device integrated within the DSE890 DSEGateway®.
GSM IP	IP address obtained from the GSM network provider. Unless a specifically purchased fixed IP address has been obtained from the SIM card provider, this number is dynamically provided by the GSM network operator.
Connection Type	Type of connection made to the GSM network. This changes from area to area depending upon local network provision.
Provider	The name of the GSM network currently connected.
Signal Strength	A representation of the GSM signal strength. This does not represent the quality of the GSM (cellular internet) connection. No green bars indicates poor reception. Move the antenna to a better location.

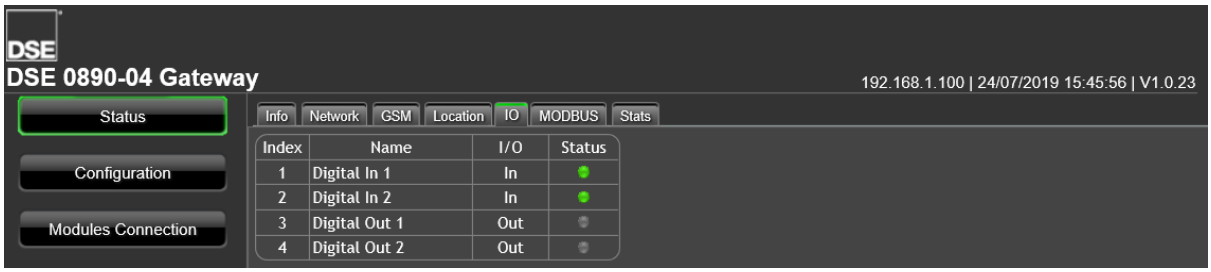
5.2.4 LOCATION

Shows the current location of the DSEGateway®.
This is either a fixed or GPS devised location, depending upon configuration. When configured to Use GPS location the DSEGateway® requires a connection a minimum of 3 satellites.



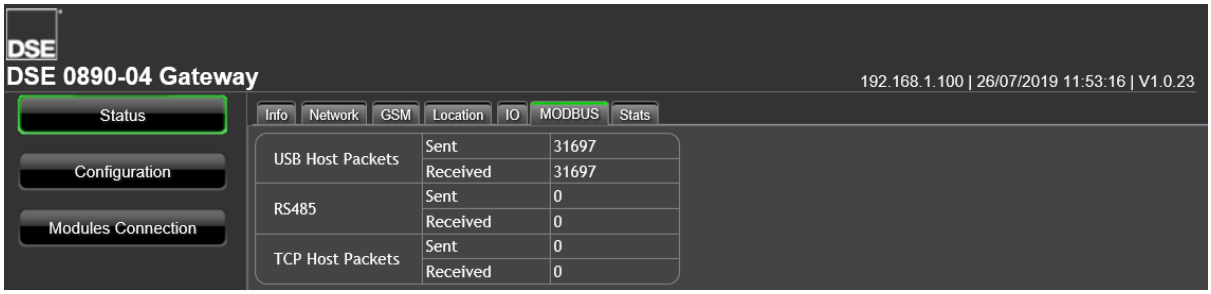
5.2.5 I/O

Shows the state of the DSEGateway® I/O (Inputs/Outputs).
These are configured in the *Configuration* | *I/O* tab.



5.2.6 MODBUS

Shows the status of the data transfer between the DSEGateway® and the connected Module(s).
When operating correctly, the packets *Received* increment as the packets *Sent* increase.
Unconfigured ports show 0 (zero) for both *Sent* and *Received* as no communications takes place.



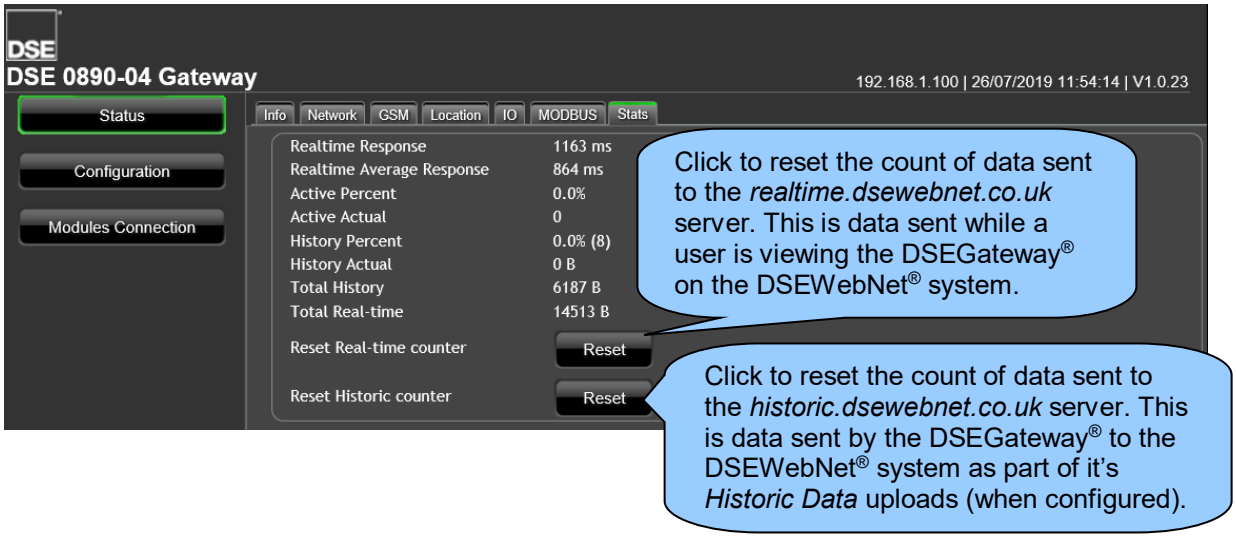
5.2.7 STATS

NOTE: Statistics vary according to the DSE Module connection *Data Resolution* configuration. For further details, refer to section entitled *Modules Connection* elsewhere within this document.

Shows the amount of data sent and received by the DSEGateway® to the DSEWebNet® server.

All data is buffered within in the DSEGateway® memory until such a point that the data is required to be sent to the DSEWebNet® servers. The frequency of transmission varies according to the DSEGateway® Module *Data Resolution* configuration as well as signal strength and network quality. Data is also buffered during a loss of connection. This is useful when determining if the correct package has been purchased from the SIM Card or internet provider.

The DSEGateway® connects to two different servers. These are referred to as the Realtime and Historic servers. The Realtime server handles all live data such as battery voltage, fuel level, live voltage etc. The Historic server handles events which is used for Event Triggers and Reports. The parameters below detail the statistic between the DSEGateway® and the DSEWebNet® Servers.



Parameter	Description
Realtime Response	The time taken to send a message to the DSEWebNet® server and get a response. This gives an indication of how good the connection is. A typical response on Ethernet should be less than 100 ms. A typical response on GSM should be less than 2000 ms.
Realtime Average Response	The average speed of response between the DSEGateway® and the DSEWebNet® Realtime server since the connection was established. This gives an indication of how good the connection is. A typical response on Ethernet should be less than 100 ms. A typical response on GSM should be less than 2000 ms.
Active Percent	The total percentage of the Realtime data buffer used. The realtime buffer only accumulates if there is a connection to the DSEWebNet® Realtime server. All data is discarded if the connection is lost. If the Realtime buffer reaches 100%, the DSEGateway® replaces the oldest data with the newest data. This occurs if too much data is trying to be transmitted, change the *Data Resolution* setting to *Low* or *Snapshot* with a long interval.
Active Actual	The total data stored within the Realtime buffer. This is used for diagnostics by DSE Technical Support.

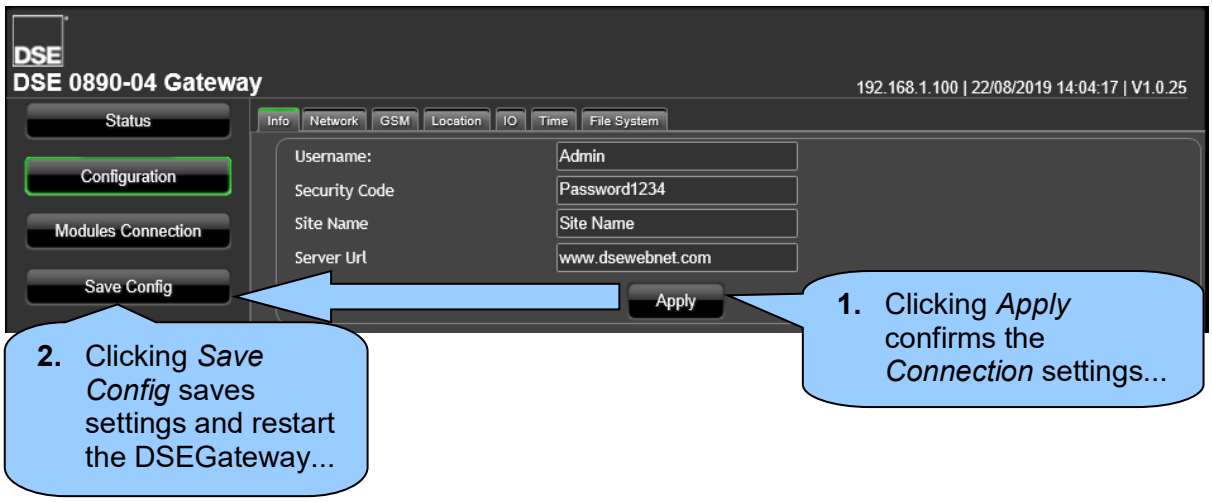
Parameter descriptions continued overleaf…

Parameter	Description
History Percent	The total percentage of the historic data buffer used. The historic buffer accumulates if there is a connection to the DSEWebNet® historic server. If the connection is lost, the DSEGateway® continues to buffer the historic data for 5 minutes before discarding the data. If the historic buffer reaches 100%, the DSEGateway® replaces the oldest data with the newest data. This occurs if too much data is trying to be transmitted, reduce the *Historic Upload Internal* or change the *Data Resolution* setting to *Low* or *Snapshot* with a long interval.
History Actual	The total data stored within the Historic buffer. This is used for diagnostics by DSE Technical Support.
Total History	The Total amount of Historic data sent from the DSEGateway®. This combined with the *Total Real-time* data value is useful to estimate the size of data package required.
Total Real-time	The Total amount of Realtime data sent from the DSEGateway®. This combined with the *Total History* data value is useful to estimate the size of data package required.

5.3 CONFIGURATION

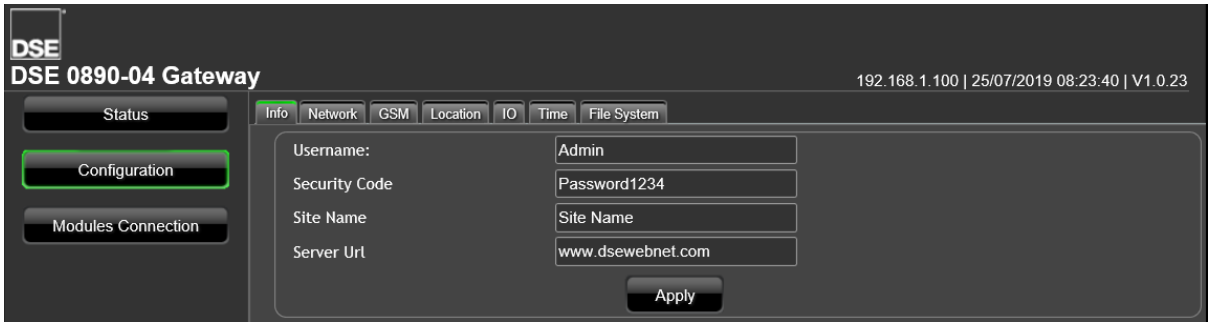
The *Configuration* pages allow the User to configure the DSEGateway® to suit the application.

Upon changing a parameter on any of the pages, the *Apply* button must be pressed before exiting the current page. This stores the new settings and allows settings on other pages to be changed. A new button, *Save Config* becomes available after *Apply* is clicked.



5.3.1 INFO

NOTE: For increased security, it is advised that the *Username* and *Security Code* are changed from their default settings.

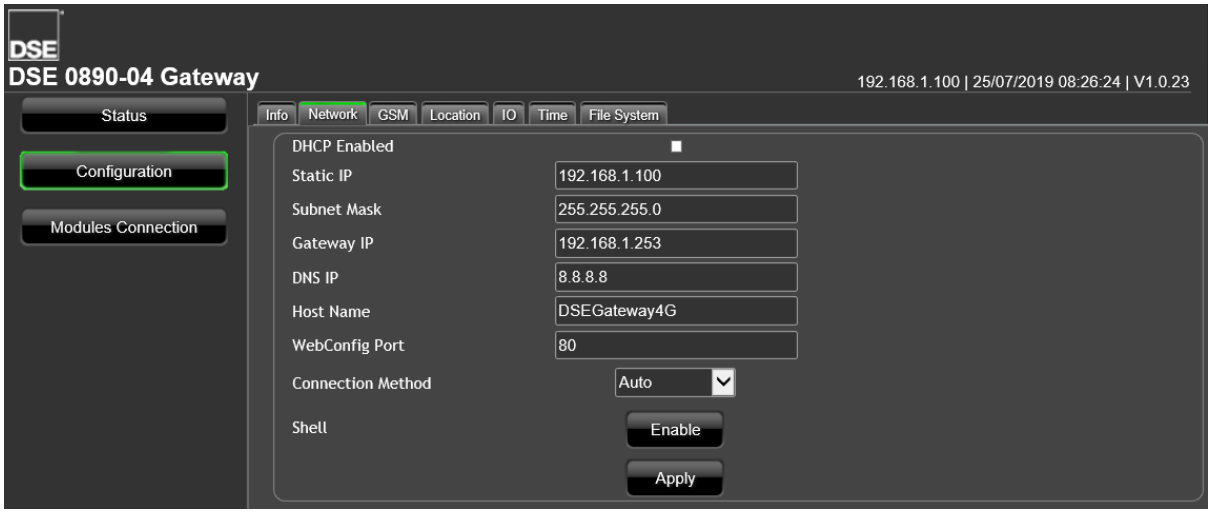


Parameter	Description
Username	**NOTE: Username is CASE SENSITIVE.** Factory setting: Admin
Security Code	**NOTE: Security Code is CASE SENSITIVE.** Factory setting: Password1234 The *Security Code* is required to gain access to these management pages and also to add connected devices to the DSEGateway®.
Site Name	A name to easily identify the site. This name is shown when viewing the map of sites on the DSEWebNet® server.
Server URL	Address of the DSEWebNet® server. The DSEWebNet® Server is located at www.dsewebnet.com.

5.3.2 NETWORK

NOTE: Consult with the IT/Network manager of the site that the DSEGateway® is connected to before making any changes to these settings.

Use this page to Configure the Network settings that the DSEGateway® is connecting to.

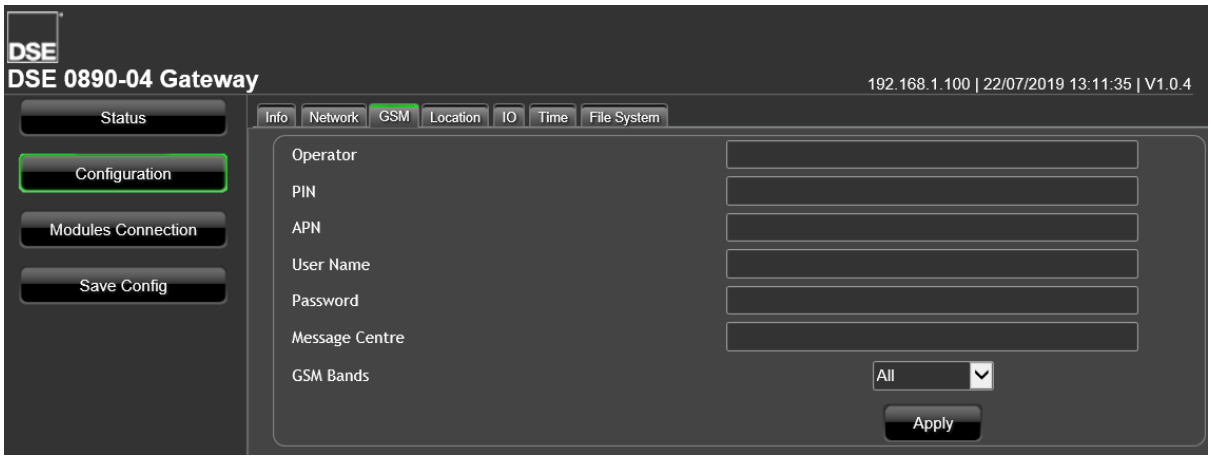


Parameter	Description
DHCP Enabled	Shows the type of IP address assigned to the DSEGateway® Ethernet Port. ☑ = The DSEGateway® requests network settings from a DHCP server. ☐ = The DSEGateway®'s network settings must be entered manually.
Static IP Address	IP address currently being used by the DSEGateway®'s Ethernet Port (Factory Setting 192.168.1.100).
Subnet Mask	Subnet Mask for the DSEGateway®'s Ethernet Port. Factory Setting 255.255.255.0).
Gateway IP Address	The IP address location of the internet router currently used by the DSEGateway®'s Ethernet Port to communicate with the DSEWebNet® Server (192.168.1.253).
DNS	DNS (Domain Name Service) setting for the DSEGateway®'s Ethernet Port (Factory set to Google DNS IP 8.8.8.8).
Hostname	Shows the currently configured Hostname of the DSEGateway®'s Ethernet Port.
Web Config Port	The TCP Port Number currently in use by the DSEGateway®'s Ethernet Port to serve the Web Management Pages.
Connection Method	***Auto:*** The DSEGateway® connection method automatically switches *GSM* or *Ethernet* depending on which connection is available. When both connections methods are available the DSEGateway® connects via Ethernet ***GSM:*** The DSEGateway® connection method is via *GSM* ***Ethernet:*** The DSEGateway® connection method is via *Ethernet*
Shell	Enables *Advanced* diagnostics mode. Contact DSE Technical Support for more information.

5.3.3 GSM

NOTE: GSM settings are obtainable by contacting the SIM provider. These are obtainable by contacting the phone network provider or checking the SIM packaging.

Configure the DSEGateway® to suit the phone network requirements.



Parameter	Description
Operator	Name of the GSM network operator. If the box is left empty, the DSEGateway® connects to the first available network the SIM card sees as available. Therefore in most cases it is beneficial to leave this box empty. However if a specific GSM network operator connection is required (e.g. for low cost tariffs), enter the exact name as provided by the SIM card supplier.
PIN	**NOTE: When using the SIM card from a mobile phone, this is the PIN code of the SIM card, NOT the PIN code of the mobile phone!** PIN of the SIM card (where used).
APN	GSM Access Point Name, provided by the SIM card supplier.
Username Password	GSM login details, provided by the SIM card supplier.
Message Centre	SMS message centre number, provided by the SIM card provider.
GSM Bands	Select the GSM Band used for the internet connection. This forces the DSEGateway® to only connect on the desired GSM connection. This is used to ensure that best GSM band is used for the fastest connection speed available. ***All:*** The DSEGateway® connects to either the 2G, 3G or 4G connection. ***2G + 4G:*** The DSEGateway® only connects to internet via a 2G or 4G connection. ***3G + 4G:*** The DSEGateway® only connects to internet via a 3G or 4G connection. ***4G:*** The DSEGateway® only connects to internet via a 4G connection. ***3G:*** The DSEGateway® only connects to internet via a 3G connection. ***2G + 3G:*** The DSEGateway® only connects to internet via a 2G or 3G connection. ***2G:*** The DSEGateway® only connects to internet via a 2G connection.

Parameter descriptions continued overleaf…

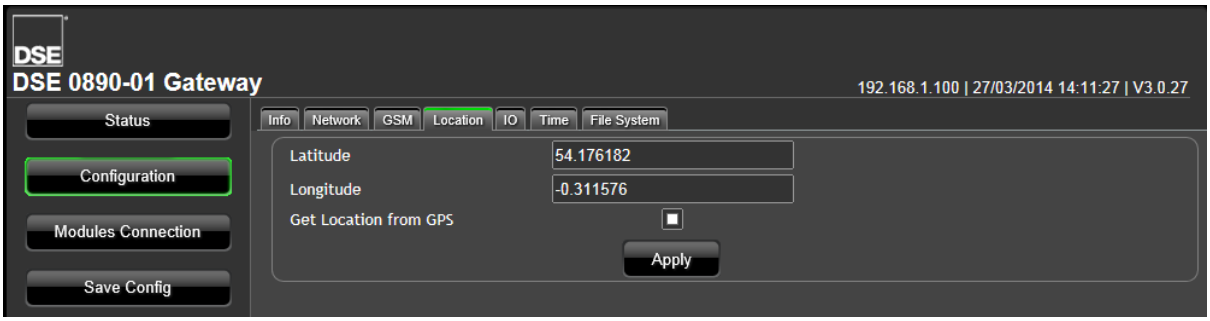
For testing purposes it is possible send an SMS from the DSEGateway® using the Send SMS feature.

Parameter	Description
Phone Number	**NOTE: The phone number entered must be prefixed with the correct country code, for example a UK phone number of 07700 900900 would be +44 7700 900900 (UK area code).** Enter the Phone Number which the SMS message is to be sent to.
Message	Enter the SMS message to be sent to the *Phone Number* for testing purposes.

5.3.4 LOCATION

This is the location of the DSEGateway® and is not the location of the connected DSE modules, this is configured elsewhere. For further details, see section entitled *Module Connection* elsewhere in this document.

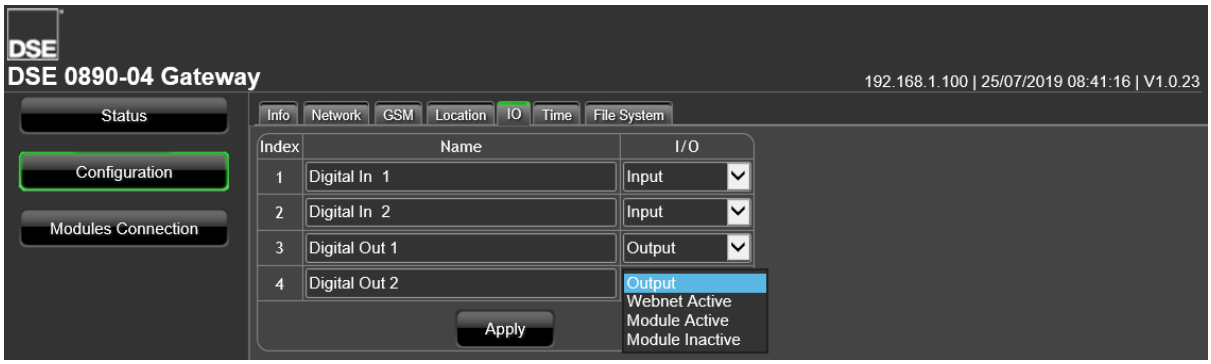
This location is used by the DSEWebNet® when placing the DSEGateway® Icon onto the world map as shown below.



Parameter	Description
Latitude Longitude	**NOTE: Latitude and Longitude must be entered as decimal values (not degrees, minutes, seconds).** Manually entered location of the DSEGateway®. Locations **East** of the Greenwich Meridian = **positive** Locations **West** of the Greenwich Meridian = **negative** Locations **North** of the Equator = **positive** Locations **South** of the Equator = **negative** **For example:** 54.18º N, 0.31º W is entered as Latitude: 54.18 Longitude: -0.31
Get Location From GPS	☑ **=** GPS is used to determine the site location for positioning the site on the World map in the DSEWebNet® server. Additionally this location is used for the Geofence function, to alert users when the DSEGateway® moves outside the configured Geofence. If no GPS signal is located, the manually entered location is used. ☐ **=** Location is manually entered.

5.3.5 IO

Allows configuration of the DSEGateway® I/O (Inputs/Outputs) The DSEWebNet® system is used to activate/deactivate the Outputs and show the status of the inputs.



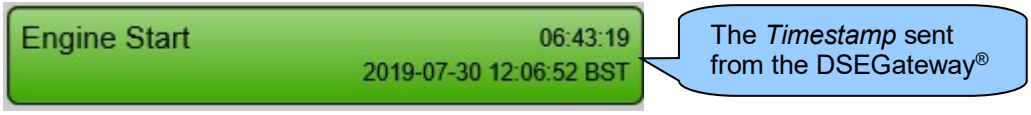
Index	Description
Name	Enter the name that to identify the I/O channel on the DSEWebNet® system.
1 2	Terminals 6 and 7 are digital inputs and are configured as: ***Input:*** Connect the digital input to the digital input ground terminal to activate.
3 4	Terminals 3 and 4 are Outputs and are configured as ***Output:*** Active when manually driven by the DSEWebNet® ***WebNet Active:*** Actives when the connection to the DSEWebNet® Realtime Server is active ***Module Active:*** Actives when the connection to the associated Module is active ***Module Inactive:*** Actives when the connection to the associated Module is inactive

5.3.6 TIME

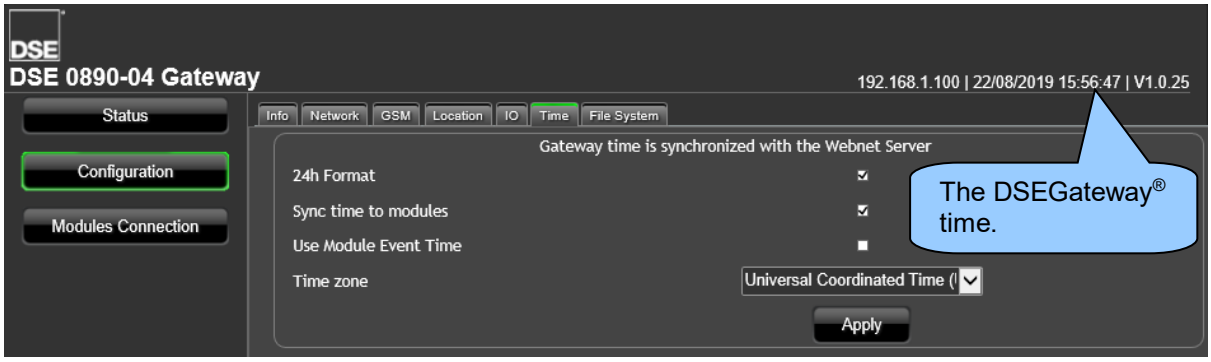
NOTE: The *Time* shown on the DSEGateway® is automatically synchronised with the time of the DSEWebNet® upon connection.

Before being transmitted to the DSEWebNet® servers, all DSE Module events are allocated a *Timestamp* by the DSEGateway®. This *Timestamp* varies depending on how the DSEGateway® is configured.

Below is an example of the *Timestamp* shown on DSEWebNet®…



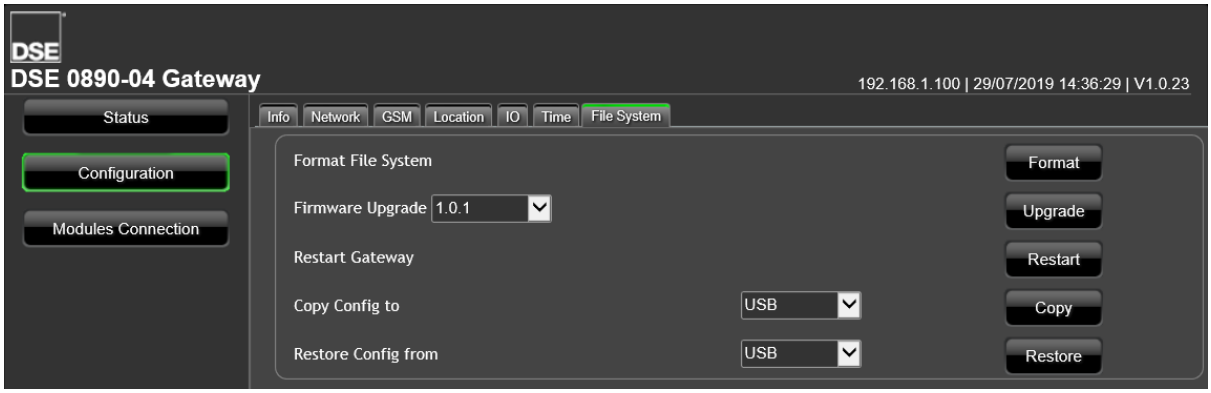
The DSEGateway® is configured as per below…



Parameter	Description
24h Format	☐ = The Time Format is displayed on the DSEGateway® in 12h format. ☑ = The Time Format is displayed on DSEGateway® in 24h format.
Sync Time to Modules	☐ = The connected Modules are not synchronised with the DSEGateway® clock ☑ = The connected Modules are synchronised with the DSEGateway® clock. This ensures all Modules and the DSEGateway® display the same time.
Use Module Event Time	☐ = The time displayed on DSEWebNet® relates to the time at which the DSEGateway® read the event from the Module. ☑ = The time displayed on DSEWebNet® relates to the time at which the Event took place according to the Modules event log.
Time Zone	The Time Zone that is displayed on the DSEGateway® web browser. This has no effect on the *Timestamp* shown on DSEWebnet®.

5.3.7 FILE SYSTEM

The *File System* menu allows for management of the DSEGateway® *Internal File System*. The *Internal File System* stores the DSEGateway® firmware, DSE Module description file and DSEGateway® configuration file.



Parameter	Description
Format File System	The DSEGateway® File System contains templates instructing the DSEGateway® how to communicate with connected DSE Modules. Initially, this file system is empty. The DSEGateway® downloads templates as required depending upon which Modules are connected to it. This operation is automatic. Occasionally it is desired to erase any stored templates from the DSEGateway®, which forces the download of new templates when required. This is performed if updates are made to the templates and DSE Technical Support advise this to be done.
Firmware Upgrade	Allows "Over The Air" (OTA) updates to the firmware of the DSEGateway®. Select the required version and click *Upgrade*. This requires an active connection to the DSEWebNet® service ideally over Ethernet.
Restart Gateway	Reboots the DSEGateway®. This is necessary after a Firmware Upgrade.
Copy Config	**NOTE: Only one Configuration file is stored on the DSEGateway® Internal File Memory System.** Copy's the DSEGateway® configuration file to either: ***USB:*** A USB memory device inserted into the DSEGateway®'s USB port. ***Filesystem:*** The DSEGateway®'s internal memory.
Restore Config from	**NOTE: When restoring the Configuration File, it must be named as *BACKUP.BIN*** Restores the DSEGateway® configuration either: ***USB:*** A USB memory device inserted into the DSEGateway®'s USB port. ***Filesystem:*** The DSEGateway®'s internal memory.

5.4 MODULES CONNECTION (ADDING AND REMOVING MODULES)

5.4.1 DSEWEBNET

NOTE: The DSEGateway® supports a maximum of 5 DSE Modules.

NOTE: The *Module Connection* port is used for both *Modbus Passthrough* and DSEWebNet®. Whilst the *Module Passthrough* port is open, all traffic between the DSEWebNet® and the DSE Module is suspended. Once the port closes all DSEWebNet® traffic resumes.

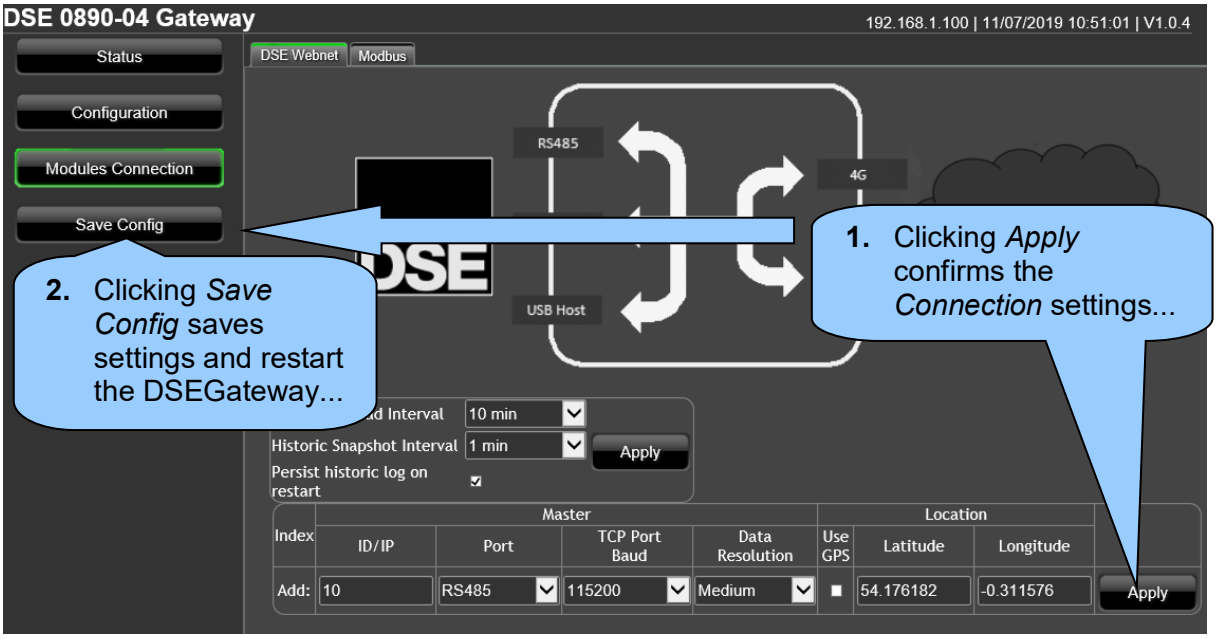
NOTE: Any disconnected communication Ports must be deleted from the *Modules Connection* configuration.

To ensure newly added Modules are recognised by the DSEGateway®, the following steps must be followed.

The DSEGateway® is factory set to accept connection via the USB port. If this is not the comm's type to be used, the entry must be deleted in the *Module Connections* page of the DSEGateway®. It must then be re-configured to suit the communication type required (RS485 or Ethernet). The process below explains how this can be achieved.

1. Connect to the DSEGateway® configuration page as described in the *Quick Set-up Guide* section of this document.
2. Select *Modules Connection* and configure each port to match the controller being connected.
3. Click *Apply* then *Save config*. The DSEGateway® then automatically reboots.
4. Check the *Modules Connection* page to ensure the settings have taken effect.

Parameters shown overleaf…



Parameter	Description
Historic Upload Interval	Determines the period at which the DSEGateway® uploads its data log to the DSEWebNet® server. Shorter upload intervals increase the number of connections to the DSEWebNet® Server and may increase data costs depending upon the service contract with the internet provider.
Historic Snapshot Interval	Where *Data Resolution* is configured to be *Snapshot*, this determines the period at which the DSEGateway® uploads a snapshot of the instrumentation to the DSEWebNet® server. Shorter upload intervals increase the number of connections to the DSEWebNet® Server and may increase data costs depending upon the service contract with the internet provider.

5.4.1.1 MASTER

These are the settings of the DSEGateway® port that is used to connect to the DSE Module).

Parameter	Description
ID / IP	When *Port* is set to *Ethernet* – IP address of the connected Module When *Port* is set to *RS485* – Modbus slave address of the selected Module. Where multiple devices are connected (RS485), a unique ID must be used for each Module.
Port	This is the port that is connected to the DSE Module. ***RS485:*** Connection to one or more RS485 enabled Modules using suitable RS485 connection cable. ***Ethernet:*** Connection to an Ethernet network of one or more Modules. ***USB:*** Single connection to a supported DSE Module by USB A – USB B cable.
TCP Port/Baud	When *Port* is set to *Ethernet* – TCP port to use for Modbus (usually 502). Each separate entry must use a unique port number. When *Port* is set to *RS485* – Baud rate of the selected Module.
Data Resolution	This sets the level at what the DSEGateway® considers as a change in value. The DSEGateway® monitors the Module's data and changes are logged in its internal memory. Selecting a higher resolution level increases the amount of logged data, hence increasing the amount of data that is sent to the DSEWebNet® server. This may increase data costs depending upon the service contract with the internet provider. Data is logged where the value changes by the configured amount. If there is no change in the data, there is no data to record in the log. Any logged data is uploaded to the DSEWebNet® Server at the *Historic Upload Interval.* This may result in 'empty' reports if there is no logged data to upload.

Data Resolution	*High*	*Medium*	*Low*	*Snapshot*
Factory setting	1%	5%	10%	See Below

Snapshot: Where *Data Resolution* is configured to be *Snapshot*, this determines the period at which the DSEGateway® uploads a snapshot of the instrumentation to the DSEWebNet® server, regardless of how much it has changed. This setting prevents 'empty reports' that occur where no data is logged due to values changing by small amounts, below the setting of the Data Resolution.

5.4.1.2 LOCATION

Parameter	Description
Use GPS	This is the location of the DSE module and is not the location of the connected DSEGateway®, this is configured elsewhere. For further details, see section entitled *Configuration* elsewhere in this document . This location is used by the DSEWebNet® when placing the DSE module's con onto the world map as shown below.  ☐ **=** Location of the DSE module is entered manually. Where multiple Modules are connected to the DSEGateway®, it may be more appropriate to enter the location of each device manually. This allows each Module to show on the map at its specific location instead of showing all Modules at the same location as the DSEGateway® ☑ **=** GPS location is transmitted to the DSEWebNet® Server. The value depends on the DSEGateway® Configuration (fixed or use location). This is used for live tracking and the *Geofence* feature of the DSEWebNet® system.
Latitude Longitude	Manually entered location of the selected Module. This is useful in cases where the Module is located some distance from the Gateway. For example the generator house may be at one side of a site, with the DSEGateway® located in the IT department. Manually entering the location of the generator house shows this location on the DSEWebNet® map, rather than the location of the IT department. Manually entered location (in degrees) of the DSE Module. Locations **East** of the Greenwich Meridian = **positive** Locations **West** of the Greenwich Meridian = **negative** Locations **North** of the Equator = **positive** Locations **South** of the Equator = **negative** **For example** 54.18º N, 0.31º W is entered as Latitude: 54.18 Longitude: -0.31

5.4.2 MODBUS

NOTE: This section is only used when setting up the DSEGateway® to operate as a communications protocol convertor.

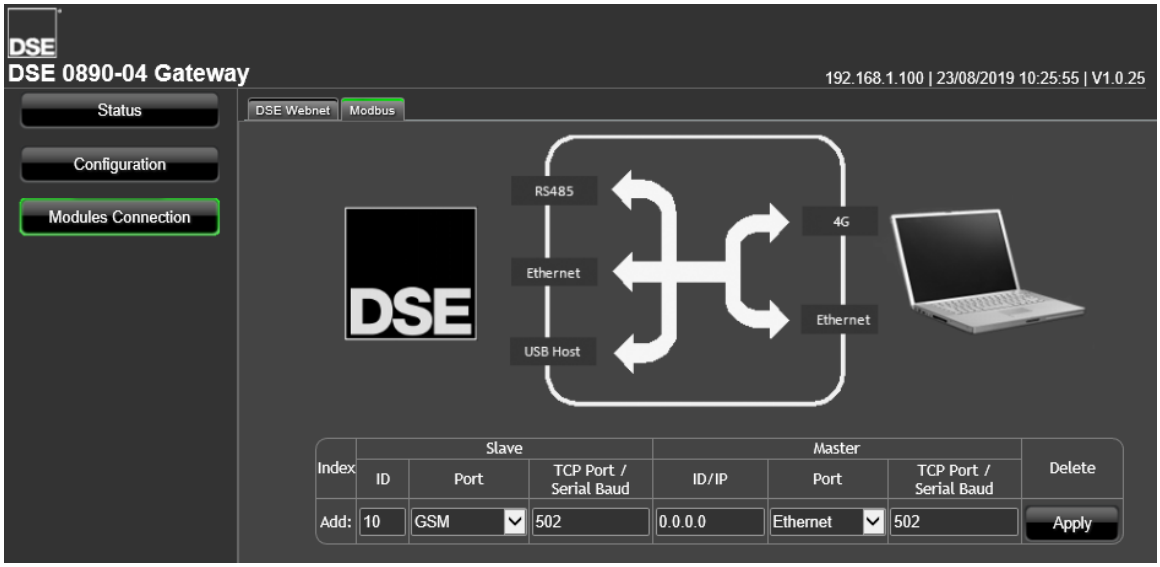
NOTE: The DSEGateway® supports a maximum of 5 DSE Modules.

NOTE: The *Module Connection* port is used for both *Modbus Passthrough* and DSEWebNet®, however whilst ever the *Module Passthrough* port is open, all traffic to DSEWebNet® is suspended in respect of the connected DSE Module.

NOTE: DSE recommend the use of fixed IP address when configuring a connection via an Internet connection. Failure to connect via a fixed IP address could result in the IP address changing according to network requirements and without prior notification. Contact your network or simcard provider for more details.

This page is used to configure the DSEGateway® as a Modbus Gateway to allow conversion across the various ports.

It can be used for example to set *USB* as a Modbus master to connect to any DSE Module fitted with a USB port and supporting the DSE Configuration Suite SCADA function.



5.4.2.1 SLAVE

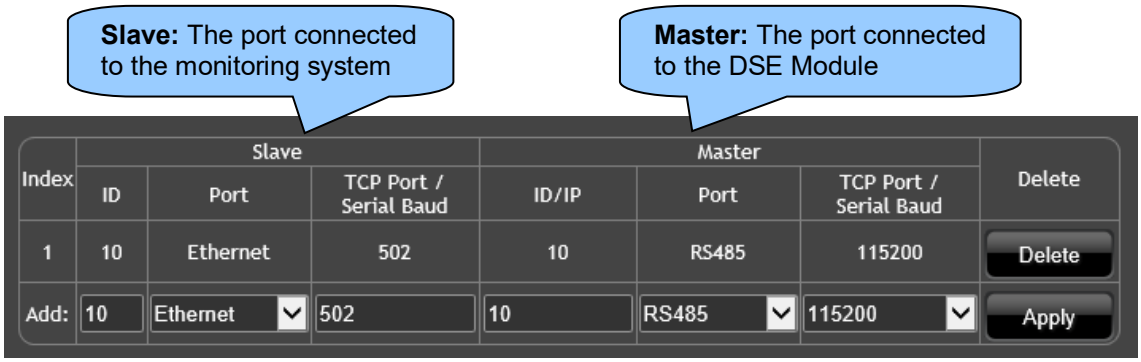
These are the settings of the DSEGateway® port that is connected to the monitoring device.

Parameter	Description
ID	Modbus slave address of the selected DSEGateway® port.
Port	This is the MODBUS slave port that is connected to the MODBUS Master (for example PC, Building Management System or PLC). ***GSM:*** Connection to the master via GSM. ***Ethernet:*** Connection to an Ethernet network accessible by the MODBUS master.
TCP Port/Serial Baud	When **Port** is set to *Ethernet,* configure the TCP port to be used for Modbus (usually 502).

5.4.2.2 MASTER

These are the settings of the DSEGateway® port that is used to connect to the DSE Module.

Parameter	Description
ID	Modbus slave address of the connected DSE Module.
Port	**NOTE: Where multiple Ethernet connections are configured, each must utilise a unique port number.** This is the port that is connected to the DSE Module. ***RS485:*** Connection to one or more RS485 enabled Modules using suitable RS485 connection cable. ***Ethernet:*** Connection to an Ethernet network of one or more Modules. ***USB:*** Single connection to a supported DSE Module by USB A – USB B cable.
TCP Port/Serial Baud	When **Port** is set to *Ethernet* – TCP port to use for Modbus (usually 502). When **Port** is set to *RS485* – Baud rate of the selected Module.

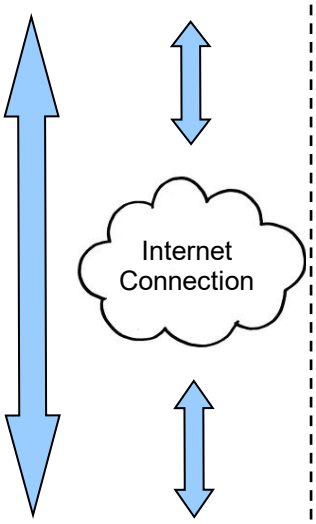


Index 1 is receiving MODBUS requests from the external monitoring system on **Ethernet, TCP Port 502.**
This is being transferred to the DSE Module via the **RS485** port using **Slave ID 10** and a **Baud Rate of 115200** on the DSEGateway®

5.4.2.3 EXAMPLE OF MODBUS PASSTHROUGH VIA ETHERNET OR GSM

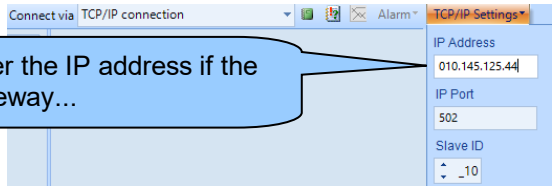
Below is a typical example of a Modbus passthrough allowing DSE Configuration Suite to Read and Write DSE Configuration files to the Module.

PC Configuration Suite



Slave Connection:
Ethernet
GSM

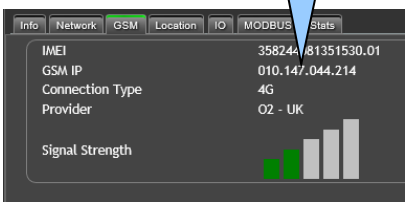
Master Connection:
USB
RS485
Ethernet



Enter the IP address if the Gateway...

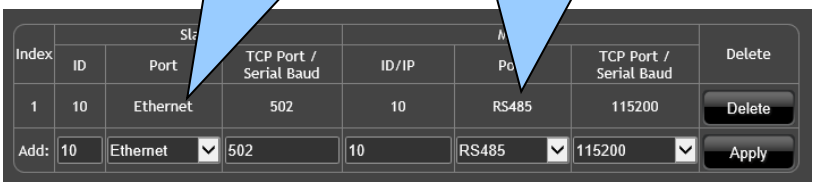
When connecting via GSM obtain the GSM IP address

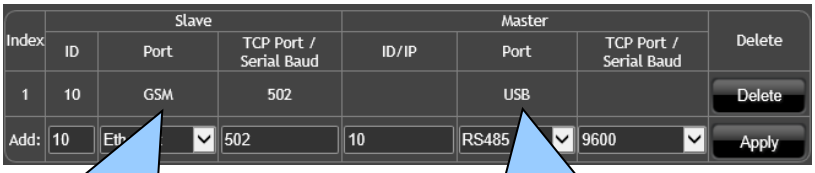
When connecting via Ethernet obtain the IP Address from the Network providor.



Slave: The port connected to the monitoring system via Ethernet.

Master: The port connected to the DSE via RS485





Slave: The port connected to the monitoring system via GSM

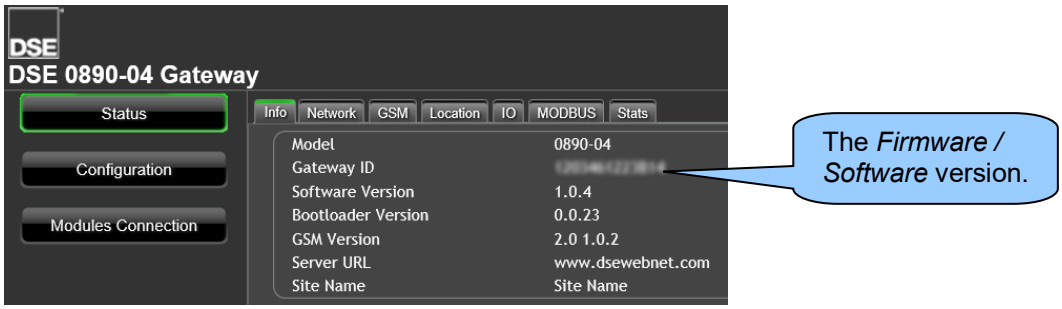
Master: The port connected to the DSE via USB

6 FIRMWARE UPGRADE

6.1 UPDATING THE FIRMWARE

During the lifecycle of the product the firmware may need to be upgraded. Updated Firmware files are released periodically from the Deep Sea Electronics Ltd website and hosted within the DSEGateway® webpage.

The *Firmware* version is found in the *Information* page located within the Status page of the DSEGateway®.



A USB memory stick formatted to *FAT* is also required. See Section entitled *How to Format a USB Flash Memory Stick to FAT*, elsewhere in this document.

To update the Firmware:

1. Place the following Firmware update files onto the USB memory stick.

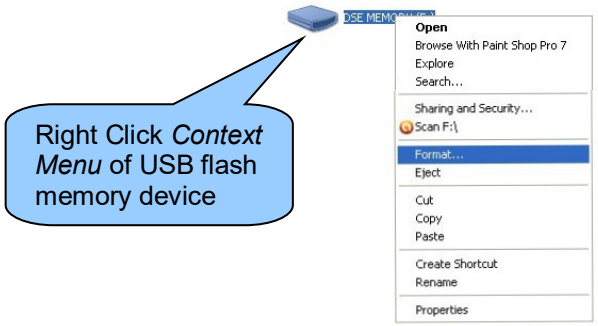
Description	DSEGateway
Firmware update files	A0890-04.pkg

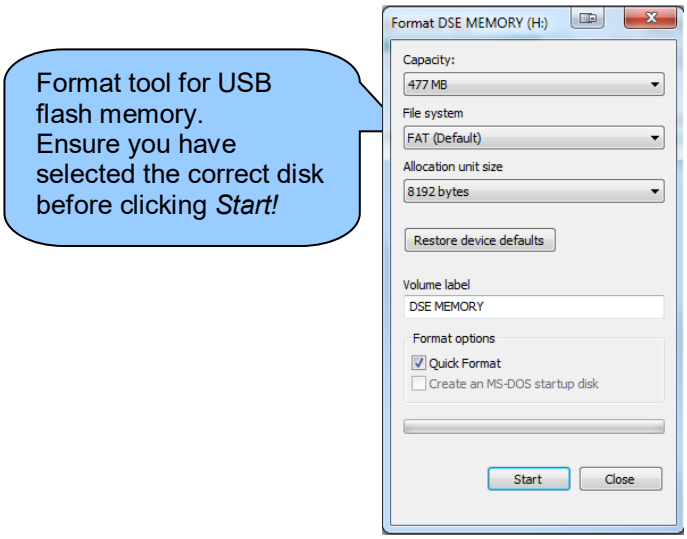
2. Insert the memory stick into the DSEGateway®.
3. Reboot the DSEGateway®.
4. Wait for the four status LEDs to stop cycling, then briefly remain green. The link LED status remain red whilst communications to DSEWebNet® are established.
5. Remove the USB memory stick.
6. The DSEGateway® Firmware has been updated.

6.1.1 HOW TO FORMAT A USB FLASH MEMORY STICK TO FAT

Before updating the DSEGateway® it is necessary to format a USB stick to suit the USB requirements of the Gateway. The instructions below detail how to do this…

- Insert memory stick into PC USB port.
- Browse to *Computer* in Windows Explorer.
- Identify the memory stick, *Right Click* the device and select *Format*.
- Select *FAT* and click *Start*.





7 FAULT DIAGNOSIS

7.1 FREQUENTLY ASKED QUESTIONS

Nature of Problem	Suggestion
Factory settings	IP Address: 192.168.1.100 Web Management Pages Port: 80 Username : Admin (case sensitive) Password : Password1234 (case sensitive)
I've forgotten my password and/or IP address	Press and hold the reset push button for five seconds. All LEDs illuminate yellow, then cycle and finally illuminate yellow again. Now release the button. The DSEGateway® is now set back to factory settings.
Management pages cannot be accessed via remote connection	The factory set LAN IP address is 192.168.100 Management pages are accessible via web browser on port 80. Check router and firewall settings are configured correctly to match this information. Remember that accessing the DSEGateway® remotely from the WAN (Ethernet) requires IP address of the broadband router to be entered into the PC browser. Port forwarding will also need to be configured. For easier trouble shooting, connect the DSEGateway® directly to a PC Ethernet port.
Management pages cannot be accessed via direct connection to PC	Check network connections. Check network settings. Ensure PC is on the same subnet as the DSEGateway® . Default IP address of the DSEGateway® is 192.168.1.100 – Set the PC to 192.168.1.99 then enter http://192.168.1.100 into the browser.
Communication port LEDs are flashing GREEN	This is normal. The ports flash green when data is successfully received from the connected Module.
Port LEDs illuminate RED for a few seconds at power up of the DSEGateway®.	During the start-up sequence, the status LED illuminate RED. This is normal and if port setup and connections are correct, change to GREEN once communication is underway.
Multiple LEDs remain RED	This means that at least one of the configured communications ports is not receiving data from the connected Module. Check all configured connections as for LED1, LED2 and LED3 detailed below.
LED1: LINK LED remains RED	Check connection to broadband modem. Check router and firewall settings. Check IP address, gateway, subnet mask and DNS settings Check status of connection to host Module. The DSEGateway® does not communicate with the DSEWebNet® server if communications to the Modules is not made.
LED2: USB LED remains RED	This means USB communications is not successful. Check settings of the DSEGateway®. Check USB cable is USB A to USB B type cable. Maximum length of USB cable is 6 m unless third party powered USB extender is used.

Continues overleaf…

Nature of Problem	Suggestion
LED3: RS485 LED remains RED	This means RS485 communications is not successful. Check baud rate and slave ID settings of the DSEGateway® and all connected Modules. Check RS485 cable is the correct type (recommended Belden 9841) with termination resistors correctly fitted at each end of the cable. Max length of RS485 cable is 1.2km where correct cable and termination resistors are fitted.
LED4: CAN	**NOTE: The CAN connection is currently not utilised and is intended for future development.**
GPS location is not accurate and/or GPS location moves around.	GPS location accuracy depends upon a lot of factors. Best accuracy (typically around 10 to 20 metres) is achieved when : • Using a separate antenna (not combined with GSM) • There is a clear view of the sky not obscured by the control panel roof, tree coverage or heavy clouds. • There are no buildings close by, minimising a wide angle view of the sky.
Unable to add a DSEGateway® device. "No connection" is reported.	Ensure the monitoring PC has access to *realtime.dsewenet.com.* Ask the IT department to allow this connection from the company internet connection.

7.2 ADVANCED CONNECTION TROUBLESHOOTING

NOTE: For further assistance when fault finding contact Deep Sea Electronics Technical Support; support@deepseaelectronics.com

If GSM or internet connection issues remain after installing the DSEGateway® navigate to the *Advanced* button located within the DSE *Network* Tab.

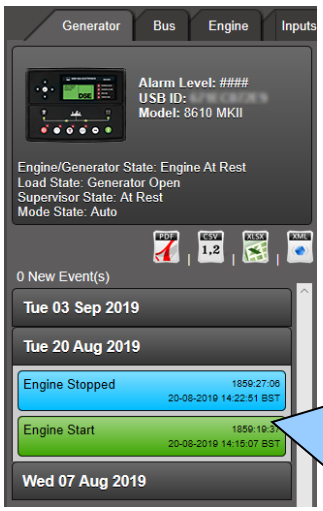
Some basic checks are shown below…

Connection to the DSEWebNet® Servers

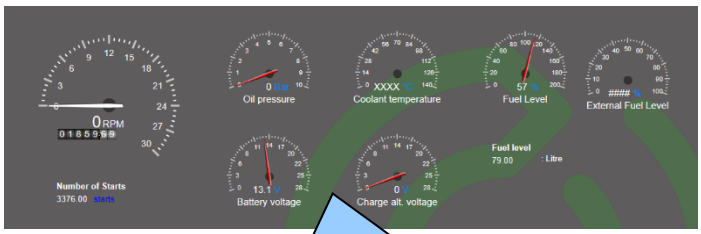
Check connection to the DSEWebNet® servers by ensuring Green Ticks against all DSEWebNet® Servers. Each server handles different data streams with the www.dsewebnet.com server gaining connection initially followed by the remaining Realtime and Historic servers.

	URL	IP	Status
✓	www.dsewebnet.com	62.128.207.153	OK
✓	Realtime1A.dsewebnet.com:83	109.169.9.150	OK
✓	historic3B.dsewebnet.com:80	109.169.9.141	OK

Connection	Description
www.dsewebnet.com	This server allows the DSEGateway® to be added to the DSEGateway® database. Module Description files and remote DSEGateway® configs are transmitted via the DSEWebNet® browser. ✗ = There is no connection to the DSEWebNet® server. The DSEGateway® is not able to register with DSEWebNet®. Suggests that the DSEGateway® is not able to access an internet connection. ✓ = Connection to the DSEWebNet® web browser page is established.
Realtime##.dsewebnet.com:83	The Realtime server transmits all live data such as battery voltage and engine speed. ✗ = There is no connection to the Realtime server, ensure port 83 is not blocked by a firewall. ✓ = Connection to the Realtime server is established.
historic##.dsewebnet.com:80	The Historic server transmits all DSE Module events such as *Engine Start / Stop* and *Mains Failure.* These events are then used as an indicator for a Trigger configured on DSEWebNet® ✗ = There is no connection to the Historic server, ensure port 80 is not blocked by a firewall. ✓ = Connection to the Realtime server is established.



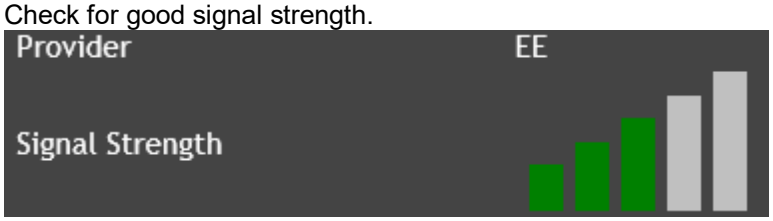
The Historic server transmits all DSE Module events such as *Engine Start / Stop* and *Mains Failure.* These events are then used as an indicator for a Trigger configured on DSEWebNet®



The Realtime server transmits all live data such as battery voltage and engine speed shown on DSEWebNet®

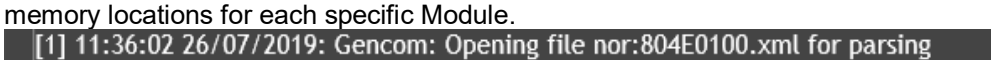
Connection to the GSM Network

Check connection to the GSM Network by navigating to *GSM* page located within the *Status* tab. Check for good signal strength.

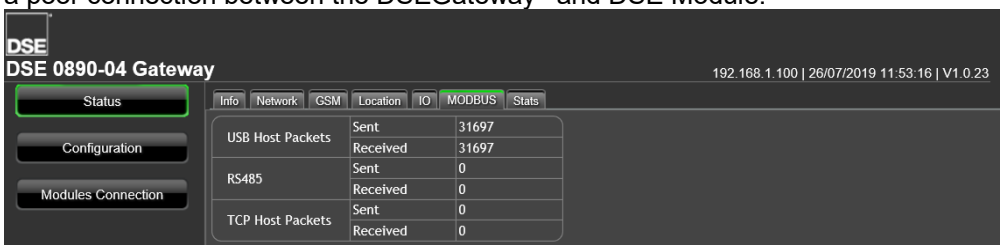


Check the DSEGateway® obtains an IP address assigned by the SIM provider…

Check the DSE Module Template file has downloaded correctly. The Module Template file allocates memory locations for each specific Module.



Check the DSE Module has a good connection by navigating to the *Modbus* Page located within the *Status* tab. The DSEGateway® should indicate matching data packet values. Failure to do so indicates a poor connection between the DSEGateway® and DSE Module.



8 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, contact your original equipment supplier (OEM).

8.1 PURCHASING ADDITIONAL PLUGS FROM DSE

If additional plugs are required, contact the DSE Sales department using the part numbers below.

Module Terminal Designation	Plug Description	Part No.
1 to 7 	7 way 5.08mm	007-447
8 to 13 **RS485** **CAN**	6 way 5.08mm	007-446

8.2 PURCHASING AN ADDITIONAL USB CABLE FROM DSE

If a USB cable is required, contact the DSE Sales department using the part numbers below.

Item	Description	Part No.
	USB type A to type B Cable with ferrites chokes, 1 m length. (DSEGateway® to Module).	016-180

8.3 PURCHASING AN ADDITIONAL ANTENNA DSE

If an antennae is required, contact the DSE Sales department using the part numbers below.

Item	Description	Part No.
	Combined 4G LTE (Main & Diversity) and GPS Antenna with 3 m length of cable.	020-1053

9 WARRANTY

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

10 DISPOSAL

10.1 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)

Electrical and Electronic equipment must be stored, collected, treated, recycled and disposed of separately from other waste.

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