THE DSE MODULE SPECIFICATION CHART BELOW HAS BEEN CREATED TO MAKE IT SIMPLE TO FIND A MODULE WITHIN OUR RANGE THAT MATCHES YOUR REQUIRED FEATURES. ONCE YOU HAVE SELECTED THE APPROPRIATE MODULE (S) FOR YOUR APPLICATION YOU WILL BE ABLE TO FIND ADDITIONAL INFORMATION ON THE PRODUCT (S) WITHIN THE BROCHURE. THE BROCHURE ALSO PROVIDES THE PART NUMBER FOR THE TECHNICAL DATA SHEETS FOR EACH PRODUCT. THESE CAN BE FOUND ON OUR WEBSITE AND WILL PROVIDE YOU WITH FULL MODULE SPECIFICATIONS, WIRING DIAGRAMS AND FEATURES.

**CHART KEY**
**PC** denotes Personal Computer
**FP** denotes Front Panel of Module
**PC/FP** denotes Personal Computer or Front Panel of Module

**PRODUCT TECHNICAL INFORMATION**

DSE

# DSE MODULE SPECIFICATION CHART


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**YOUR LOCAL DISTRIBUTOR**

| | DSEULTRA® | | | | | | | | DSECONTROL® | | | | DSEPOWER® | | | | DSEMARINE® | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **DSE PRODUCT NO.** | **3110** | **4410** | **4420** | **6110** | **6120** | **703** | **704** | **705** | **7210** | **7220** | **7310** | **7320** | **7510** | **7520** | **7560** | **850** | **5310M** | **5510M** |
| Digital inputs | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 2 | 6 | 6 | 8 | 8 | 9 | 9 | 9 | - | 6 | 9 |
| Analogue inputs | - | 1 | 1 | 1 | 1 | - | - | - | 3 | 3 | 4 | 4 | 3 | 3 | - | - | 3 | 3 |
| Outputs | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 5 | - | 5 | 7 |
| AMF function | - | - | ■ | - | ■ | - | ■ | ■ | - | ■ | - | ■ | - | ■ | ■ | - | - | - |
| Generator breaker control | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | - | ■ | ■ |
| Input configuration | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Output configuration | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Voltage measurement | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Current measurement | - | - | - | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Power measurement | - | - | - | - | - | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Expansion modules | - | - | - | - | - | - | - | - | - | - | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Remote communications | - | - | - | - | - | - | - | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Synchronising and mains (utility) parallel operation | - | - | - | - | - | - | - | - | - | - | - | - | ■ | ■ | ■ | - | - | ■ |
| Load-share capability | - | - | - | - | - | - | - | - | - | - | - | - | ■ | ■ | ■ | - | - | ■ |
| Alarm annunciation | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Multi-language support | ■ | ■ | ■ | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Event log | - | ■ | ■ | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| Maintenance alarm | - | - | - | - | - | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Scheduler | - | - | - | - | - | ■ | ■ | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| Configuration type | PC/FP | PC/FP | PC/FP | PC/FP | PC/FP | FP | FP | FP | PC/FP | PC/FP | PC/FP | PC/FP | PC/FP | PC/FP | PC/FP | PC | PC/FP | PC/FP |
| UL approved | - | - | - | - | - | ■ | ■ | ■ | - | - | - | - | - | - | - | - | ■ | ■ |
| UL listed | ■ | ■ | ■ | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | - | - |
| PCT approved (Russia and CIS countries) | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |
| PC configurable | ■ | ■ | ■ | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| IP rating | IP65 | IP65 | IP65 | IP65 | IP65 | IP41 | IP41 | IP41 | IP65 | IP65 | IP65 | IP65 | IP65 | IP65 | IP65 | - | IP55 | IP55 |
| NEMA rating | 12 | 12 | 12 | 12 | 12 | 2 | 2 | 2 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | - | 4 | 4 |
| Electronic engine support | ■ | ■ | ■ | ■ | ■ | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | - | - | ■ | ■ |
| Audible alarm | - | - | - | - | - | - | - | - | ■ | ■ | ■ | ■ | ■ | ■ | ■ | - | ■ | ■ |

## ENGINE AND GENERATOR CONTROL MODULES

DSEULTRA®
DSECONTROL®
DSEPOWER®
DSEMARINE®
DSEEXTRA®
DSENET®


Mixed Sources
Product group from well-managed forests and other controlled sources
FSC www.fsc.org



055-032 11/06 (3)

**WELCOME TO THE LATEST EDITION OF OUR PRODUCT TECHNICAL INFORMATION BROCHURE. DESIGNED TO HELP YOU UNDERSTAND THE KEY FEATURES AND BENEFITS OF DSE'S LATEST CONTROL SOLUTIONS, PRODUCTS AND SERVICES.**

**OUR EXTENSIVE RANGE OF NEW CONTROL SOLUTIONS HAS ENABLED US TO STRENGTHEN OUR POSITION AS THE NUMBER-ONE GENERATOR CONTROL SUPPLIER WITHIN THE INDUSTRY. WE ARE NOW SUPPLYING IN EXCESS OF 250,000 CONTROL MODULES PER YEAR ACROSS THE GLOBE.**

# OUR MISSION IS TO BUILD SUCCESSFUL LONG-TERM RELATIONSHIPS

## WE WORK CLOSELY WITH OUR CUSTOMERS AND PARTNERS TO UNDERSTAND THEIR NEEDS, DELIVER ADVANCED CONTROL SOLUTIONS AND PROVIDE UNRIVALLED SUPPORT SERVICES.

It is our ability to match customer requirements at all levels of generator control that makes us stand out as truly unique within the industry. DSE has worked hard to create its next generation of products, designed to fulfill customers' needs by combining advanced functionality with reliability and simple module operation. For complete quality assurance, our products are supplied with a full manufacturer's warranty as standard.

Our collection of control modules now includes Manual Start Controllers, Auto Start Controllers, Auto Mains (Utility) Failure Controllers, Auto Transfer Switch Controllers, Load-Share Controllers, Module Expansion Devices, Battery Chargers and Communications Software.

We are confident that by the time you have read through this brochure you will have identified the perfect control solution for your business. By selecting DSE as your preferred control supplier you will be in good company, our control solutions are already used by some of the largest OEMs throughout the world.

If you would like to discuss any aspect of the controllers or services we offer, we would be delighted to hear from you.

**ED SHEADER**
Chairman

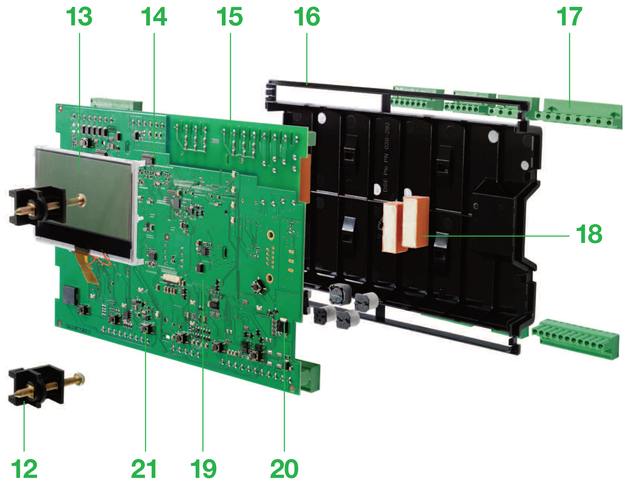




# THINKING INSIDE AND OUTSIDE THE BOX

## ADVANCED SINGLE-SET GENERATOR CONTROL

1 Robust case design
2 Four-key menu navigation
3 Breaker control buttons
4 Hard-wearing elastomer front
5 Durable membrane buttons
6 System status LEDs
7 Module insert label (customisable)
8 Module rubber gasket
9 Stylish curved design
10 Customer-configurable insert label
11 Solid module fixing points
12 Strong fixing clips
13 Bright clear LCD display
14 Arm core processor
15 Single board technology for reduced vibration
16 Durable module back with wiring fixing points
17 Easy-wire terminal blocks
18 High-powered FETs
19 95% surface mount technology
20 High component levels for increased reliability
21 Low-profile switch technology

PRODUCT
TECHNICAL
INFORMATION

# WHATEVER YOUR APPLICATION DEMANDS – WE HAVE THE SOLUTION

CONTENTS

THE EIGHT MODULES WITHIN THE DSEULTRA® SERIES HAVE BEEN DEVELOPED TO OFFER THE USER A RANGE OF CONTROL SOLUTIONS THAT PROVIDE DIFFERENT LEVELS OF ADVANCED METERING AND PROTECTIONS FOR SINGLE DIESEL AND GAS GENERATING SETS. DSEULTRA® INCLUDES MANUAL AND AUTO START CONTROLLERS, AUTO MAINS (UTILITY) FAILURE CONTROLLERS AND AN AUTO TRANSFER SWITCH CONTROLLER. ALL MODULES ARE COMPATIBLE WITH STANDARD ENGINES. THE DSE31XX, DSE44XX AND DSE61XX ARE PART OF OUR NEXT GENERATION OF GEN-SET CONTROLLERS, DESIGNED TO WORK WITH ELECTRONIC ENGINES.

THESE MODULES CAN BE PROGRAMMED USING EITHER THE FRONT PANEL OR THE DSE CONFIGURATION SUITE PC SOFTWARE. THE WIDE RANGE OF CONTROL MODULES AVAILABLE WITHIN THE SERIES ALLOWS THE USER TO SELECT THE RIGHT LEVEL OF CONTROL FOR EACH APPLICATION.

# DSEULTRA®
# STARTING WITH QUALITY

### MODULE FEATURES

**DSE3110**
- Electronic engine enabled
- Back-lit LCD display
- Six digital inputs
- Four outputs (two configurable on magnetic pick-up, four configurable on Canbus)
- Magnetic pick-up and Canbus versions
- Remote start input
- Monitors engine speed, frequency, voltage and run hours
- Engine warnings and shutdown status display
- USB connection
- PC programmable via DSE Configuration Suite software
- Protected solid state outputs (PSS)
- Suitable for engine-only applications
- IP65/NEMA 12 rated

**DSE4410**
- Electronic engine enabled
- Back-lit LCD display
- Six configurable digital inputs
- Six outputs (four configurable on magnetic pick-up, six configurable on Canbus version)
- Magnetic pick-up and Canbus versions
- Remote start input
- Monitors engine speed, oil pressure, frequency, voltage and run hours
- Fuel level display
- Engine warnings and shutdown status display
- PC programmable via DSE Configuration Suite software
- USB connection
- Protected solid state outputs (PSS)
- Dedicated emergency stop input
- Event log (5)
- Simple menu layout
- Suitable for engine-only applications
- IP65/NEMA 12 rated

**DSE4420**
As DSE4410 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSE6110**
- Electronic engine enabled
- Back-lit LCD display
- Six configurable digital inputs
- Six outputs (four configurable on magnetic pick-up, six configurable on Canbus version)
- Magnetic pick-up and Canbus versions
- Remote start input
- Monitors generator voltage, amps, frequency, engine speed, oil pressure, frequency, voltage and run hours
- Fail to start/fail to stop indication
- Fuel level display
- Engine warnings and shutdown status display
- PC programmable via DSE Configuration Suite software
- USB connection
- Protected solid state outputs (PSS)
- Dedicated emergency stop input
- Suitable for engine-only applications
- Simple menu layout
- Event log (10)
- IP65/NEMA 12 rated

**DSE6120**
As DSE6110 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSE703**
- Monitors engine speed, engine temperature, oil pressure, charge fail and fail to start
- Configurable engine pre-heat timer
- Front panel programming
- Dedicated remote start input
- Two configurable inputs
- Two configurable outputs
- Protected solid state outputs (PSS)
- LED indication
- Front panel mounting

**DSE704**
As DSE703 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSE705**
As DSE703 +
- Automatic mains (utility) supply monitoring
- Load changeover control
- Single/three-phase mains (utility) sensing

### DSEULTRA® SERIES BENEFITS
- Logical screen layouts for ease of use
- Comprehensive metering, provides constant information on gen-set status
- Modules can be used for engine-only applications*
- Engine run hours monitoring allows warranty periods to be tracked and regular maintenance scheduled
- Modules are user-configurable to adapt to different site requirements
- Modules remove the requirement for additional metering equipment
- Wide range of electronic engines can be specified
- Module configurations can be saved using PC software for downloading to new modules to improve set-up times

### ELECTRONIC ENGINE COMPATIBILITY
(Not DSE7XX)
- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- Generic
- Plus additional manufacturers

*Refer to individual module data sheets for exact specifications.

## DSEULTRA®
## CASE STUDY
## ITALY
## – EUROPE


A COLLECTION OF SINGLE-SET GENERATING SYSTEMS WERE INSTALLED AT A LARGE INDUSTRIAL SITE SITUATED ON THE SOUTHERN COAST OF ITALY.

Ten stand-alone gen-sets were installed. The site required a simple-to-use control that could be operated locally and remotely from a separate location. The installation also required a module that could be programmed via a PC and could display basic engine information for manual recording by the workers on site.

The **DSE3110** was selected due to its advanced design, compact enclosure and ability to clearly show engine information on its LCD display. The 3110 also meets IP65/NEMA12 ratings, making it ideal for harsh industrial environments.


**DSE3110**
Auto/Manual Start Controller
Data sheet No. 055-064


**DSE4410**
Auto Start Controller
Data sheet No. 055-068


**DSE4420**
Auto Mains (Utility) Failure Controller
Data sheet No. 055-068


**DSE6110**
Auto Start Controller
Data sheet No. 055-069


**DSE6120**
Auto Mains (Utility) Failure Controller
Data sheet No. 055-069


**DSE703**
Auto Start Controller
Data sheet No. 055-034


**DSE704**
Auto Mains (Utility) Failure Controller
Data sheet No. 055-042


**DSE705**
Auto Transfer Switch Controller
Data sheet No. 055-043

THE FOUR MODULES WITHIN THE DSECONTROL® SERIES DELIVER ADVANCED CONTROL OF SINGLE DIESEL AND GAS GENERATING SETS. THEY HAVE BEEN DEVELOPED TO PROVIDE THE USER WITH AN INTELLIGENT, POWERFUL UNIT THAT IS EXTREMELY SIMPLE TO INSTALL, PROGRAM AND USE. ALL MODULES WITHIN THE SERIES ARE ELECTRONIC ENGINE COMPATIBLE AND THE 73XX PROVIDES FULL COMMUNICATIONS THROUGH RS232 AND RS485. THE MODULES CAN BE PROGRAMMED USING EITHER THE FRONT PANEL OR THE DSE CONFIGURATION SUITE PC SOFTWARE. THE OPTION OF SELECTING MODULES WITH OR WITHOUT COMMUNICATIONS ALLOWS THE USER TO SELECT THE RIGHT MODULE FOR EACH APPLICATION. DSECONTROL® INCORPORATES A NUMBER OF INDUSTRY-LEADING FEATURES, INCLUDING DUAL MUTUAL STANDBY AND AUTO VOLTAGE SENSING. ITS HIGH LEVEL OF IN-BUILT MONITORING PROVIDES FULL INFORMATION ON THE STATUS OF THE GENERATING SET AT ALL TIMES.

# DSECONTROL®
# MONITORING WITH INTELLIGENCE

**MODULE FEATURES**

**DSE7210**
- Backed up real-time clock
- Back-lit LCD display
- Event log (30)
- USB connectivity
- Five key menu navigation
- Durable soft-touch membrane buttons
- Engine exercise mode
- Electronic engine enabled
- Six configurable digital inputs
- Six outputs (all configurable)
- Remote start input
- Monitors generator voltage, amps and frequency, engine speed, oil pressure, coolant temperature, frequency, voltage and run hours
- Monitors KVA, KW, KVAr, KWh, KVAh, KVArh
- Fail to start/fail to stop indication
- Fuel level display
- Engine warnings and shutdown status display
- PC programmable via DSE Configuration Suite software
- Protected solid state outputs (PSS)
- Dedicated emergency stop input
- Simple menu layout
- IP65/NEMA 12 rated
- Configurable display languages
- Dual mutual standby
- Auto voltage sensing
- Unbalanced load protection
- Phase rotation
- Edison delta topology
- Water heater/cooler control
- Dual function stop and panel lock input

**DSE7220**
As DSE7210 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSE7310**
- Backed up real-time clock
- Back-lit LCD display
- Event log (50)
- USB connectivity
- Five key menu navigation
- Durable soft-touch membrane buttons
- Engine exercise mode
- Electronic engine enabled
- Eight configurable digital inputs
- Six outputs (all configurable)
- Remote start input
- Monitors generator voltage, amps and frequency, engine speed, oil pressure, coolant temperature frequency, voltage and run hours
- Monitors KVA, KW, KVAr, KWh, KVAh, KVArh
- Fail to start/fail to stop indication
- Fuel level display
- Engine warnings and shutdown status display
- PC programmable via DSE Configuration Suite software
- Protected solid state outputs (PSS)
- Dedicated emergency stop input
- Simple menu layout
- IP65/NEMA 12 rated
- Configurable display languages
- Configurable timers and alarms
- Modbus RTU
- Magnetic pick-up
- SMS messaging
- RS232 and RS485 communication (user selectable)
- Multiple date and time maintenance scheduler
- Configurable display pages
- Trend analysis
- Dual mutual standby
- Auto voltage sensing
- Unbalanced load protection
- Phase rotation
- Edison delta topology
- Water heater/cooler control
- Dual function stop and panel lock input
- Earth fault trip
- Works with DSENet® expansion devices
- Ethernet communications

**DSE7320**
As DSE7310 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSECONTROL® BENEFITS**
- Logical screen layouts and menu navigation for ease of use
- Comprehensive metering, provides constant information on gen-set status
- Real-time clock provides accurate event logging
- Engine run hours monitoring allows warranty periods to be tracked and regular maintenance to be scheduled
- Ethernet communications provide low-cost advanced remote monitoring
- Full integration into building management systems can be achieved
- Module design and advanced PCB layout provide outstanding levels of quality
- Modules are user-configurable to adapt to different site requirements
- Wide range of electronic engines can be specified
- Module configurations can be saved using PC software for downloading to new modules to improve set-up times
- DSE Configuration Suite PC software is license free

**ELECTRONIC ENGINE COMPATIBILITY**
- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- Generic
- Plus additional manufacturers

## DSECONTROL®
## CASE STUDY
## TANZANIA – AFRICA

**VODACOM PTY IS AN AFRICAN TELECOMS COMPANY PROVIDING GSM CELLULAR NETWORK SERVICES TO MORE THAN 23 MILLION CUSTOMERS.**

A recent project was developed to improve emergency standby power facilities at hundreds of Vodacom base stations throughout Tanzania, ensuring uninterrupted network coverage and reducing maintenance costs.

The project managers chose the DSE7320 Automatic Mains (Utility) Failure control module as it offered comprehensive remote control and monitoring features and a powerful range of engine protections that matched demanding industry requirements. The sites also required dual mutual standby and auto voltage sensing, which the DSE7000 series offers as standard.

All base stations were fitted with two gen-sets (with DSE7320s) operating in standby mode, using remote monitoring by RS232 and GPRS communications via the Oracle server at Vodacom's head office.


**DSE7320**
Auto Mains (Utility) Failure Controller (Communications and Expansion)
Data sheet No. 055-051
DSENet® Compatible

**DSE7210**
Auto Start Controller
Data sheet No. 055-050

**DSE7220**
Auto Mains (Utility) Failure Controller
Data sheet No. 055-050

**DSE7310**
Auto Start Controller
(Communications and Expansion)
Data sheet No. 055-051
DSENet® Compatible

THE THREE MODULES WITHIN THE DSEPOWER® SERIES HAVE BEEN DESIGNED TO PROVIDE THE USER WITH LOAD-SHARING FUNCTIONALITY THAT IS SIMPLE TO INSTALL, PROGRAM AND USE. THE SERIES CONSISTS OF AN AUTO START, AUTO MAINS (UTILITY) FAILURE AND AN AUTO TRANSFER SWITCH AND MAINS (UTILITY) CONTROL MODULE. THE DSE7510/7520 ARE COMPATIBLE WITH ELECTRONIC ENGINES AND ARE PROGRAMMED USING THE FRONT PANEL EDITOR AND DEDICATED DSE75XX PC SOFTWARE. DSE'S LOAD-SHARE CONTROLLERS PROVIDE THE USER WITH ADVANCED METERING AND PROTECTIONS AND DELIVER MARKET-LEADING LOAD-SHARE TECHNOLOGY. THE SERIES CAN COMBINE UP TO 16 GENERATORS AND 16 MAINS (UTILITY) SUPPLIES TO A MAXIMUM OF 20 IN ONE SYSTEM WHEN USING THE DSE7510 AND DSE7560 CONTROLLERS. THE SERIES' LOAD-SHARE FEATURES INCLUDE ROCOF AND VECTOR SHIFT, AUTOMATIC HOURS RUN BALANCING, GENERATOR SPEED, VOLTAGE ADJUSTMENT AND PHASE LOCKING.*

# DSEPOWER®
# SHARING WITH SIMPLICITY

**MODULE FEATURES**

**DSE7510**
- Nine configurable inputs
- Seven outputs (five configurable)
- Monitors generator voltage, amps and frequency, engine speed, oil pressure, coolant temperature frequency, voltage and run hours
- Back-lit LCD display
- RS232 and RS485 remote communications
- Modbus RTU
- Engine exercise timer
- Fuel level
- Multiple display languages
- LED indicators
- Event log
- PC software programmable
- Front panel programmable
- Configurable alarm timers
- Configurable start and stop timers
- SMS alert messaging
- Remote monitoring
- Magnetic pick-up

**LOAD-SHARE FEATURES**
- No-break transfer
- Peak shaving/peak lopping
- Sequential set start
- KW on mains (utility) level
- Mains (utility) decoupling test mode
- Manual speed/frequency adjust
- Phase locking
- Bus coupler control
- ROCOF and vector shift
- Generator load demand
- Automatic hours run balancing
- Dead bus sensing
- Existing load share line interfacing (DSE123 required)
- Direct governor and AVR communication
- Volts and frequency matching
- KW and KVAr load sharing
- Manual voltage adjust
- Auto ID negotiation

**DSE7520**
As DSE7510 +
- Full mains (utility) monitoring
- Load transfer between mains (utility) and generator

**DSE7560**
- Multiple language options
- Back-lit LCD display
- Configurable timers
- Nine configurable inputs
- Five outputs (two configurable)
- Peak lopping control for DSE7510
- Peak shaving
- No break return
- Mains (utility) fail monitoring
- Load switching control push-button inputs
- Event log
- Front panel programmable
- PC software programmable
- Full remote control and telemetry
- Load demand scheme
- Automatic hours run balancing

**DSEPOWER® BENEFITS**
- Logical screen layouts and menu navigation for ease of use
- Comprehensive metering, provides constant information on gen-set status
- Real-time clock provides accurate event logging
- Engine run hours monitoring allows warranty periods to be tracked and regular maintenance to be scheduled
- Full integration into building management systems can be achieved
- Module design and advanced PCB layout provide outstanding levels of quality
- Modules are user-configurable to adapt to different site requirements

- Wide range of electronic engines can be specified
- Seamless transfer between mains (utility) and generators
- Modules meet the demands of different load-share environments
- Module configurations can be saved using PC software for downloading to new modules to improve set-up times
- Dedicated PC software is license free

**TYPICAL LOAD-SHARE APPLICATIONS**
- Single generating sets in parallel with the mains (utility)
- Multiple generating sets in parallel with the mains (utility)
- Multiple generating sets in parallel with multiple mains (utility)
- Multiple generating sets in parallel with multiple mains (utility) supplies, feeding multiple loads

**ELECTRONIC ENGINE COMPATIBILITY**
- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- Generic
- Plus additional manufacturers

*Refer to individual module data sheets for exact specifications.

## DSEPOWER®
## CASE STUDY
## SIERRA LEONE – AFRICA

**A LOAD-SHARING SYSTEM WAS INSTALLED AT THE SIERRA LEONE CEMENT CORPORATION LTD ON THE WEST COAST OF AFRICA.**

Four gen-sets were set up with **DSE7510** controllers as an automatic load-sharing system with load-demand scheme. The load-demand scheme allows sets to come on-line in a chosen sequence, when load demand reaches pre-determined levels. Each controller will monitor the bus and will come on (or off) line according to the priority order.

The load-demand scheme is used to ensure engines are not run to maximum capacity for long periods of time, leading to reduced engine stress and a longer life. Changes to the load level settings can easily be made via a PC and DSE user-friendly Windows® based software. Changes to the priority sequence and other parameter settings can also be made in the same way.



**DSE7560**
Auto Transfer Switch and Mains (Utility) Controller
Data sheet No. 055-067

**DSE7520**
Auto Mains (Utility) Failure and Instrumentation Controller
Data sheet No. 055-066


**DSE7510**
Auto Start Controller
Data sheet No. 055-065

**THE DSEMARINE® SERIES CONSISTS OF TWO MODULES. BOTH ARE AUTO-START CONTROLLERS, ONE IS DESIGNED TO CONTROL SINGLE GENERATING SETS AND THE OTHER IS A LOAD-SHARE CONTROLLER FOR MULTIPLE GENERATING SETS. THE MODULES ARE COMPATIBLE WITH ELECTRONIC ENGINES AND HAVE BEEN DESIGNED TO BE SIMPLE TO INSTALL, PROGRAM AND USE. PROGRAMMING CAN BE DONE USING THE FRONT PANEL OR BY USING OUR DEDICATED PC SOFTWARE. BOTH MODULES HAVE BEEN CLASSIFIED AS TYPE-APPROVED PRODUCTS BY DNV. THEY INCLUDE REMOTE COMMUNICATION FUNCTIONALITY AND CAN BE CONFIGURED TO SEND SMS MESSAGES TO PRE-PROGRAMMED NUMBERS TO DELIVER ENGINE WARNING AND SHUTDOWN INFORMATION.**

# DSEMARINE®
# ON-BOARD WITH CONFIDENCE

**MODULE FEATURES**
**DSE5310M**
- Automatic load transfer
- RS232 or RS485 remote communications
- Modbus RTU
- Six inputs
- Five outputs (three configurable)
- Back-lit LCD display
- Configurable alarms and timers
- Dedicated emergency stop input
- LED alarm indication
- Multiple language options
- PIN protected programming
- Power save mode
- Monitors generator voltage, amps and frequency, engine speed, oil pressure, coolant temperature frequency, voltage and run hours

**DSE5510M**
- Nine configurable inputs
- Seven outputs (five configurable)
- Monitors generator voltage, amps and frequency, engine speed, oil pressure, coolant temperature, frequency, voltage and run hours
- Back-lit LCD display
- RS232 and RS485 remote communications
- Modbus RTU
- Engine exercise timer
- Fuel level
- Multiple display languages
- Voltage measurement
- LED indicators
- Event log
- PC software programmable
- Front panel programmable
- Bus failure detection
- Configurable alarm timers
- Configurable start and stop timers
- Automatic seamless load transfer
- SMS alert messaging
- Remote monitoring
- Magnetic pick-up

**DSE5510M**
**LOAD-SHARE FEATURES**
- ROCOF and vector shift
- Automatic starting and stopping of generator on load demand
- Automatic hours run balancing
- Dead bus sensing
- Existing load-share lines interface capability
- Direct communication to governor and AVR
- Volts and frequency matching
- KW and KVAr load sharing with multiple generators

**DSEMARINE® BENEFITS**
- Logical screen layouts and menu navigation for ease of use
- Comprehensive metering, provides constant information on gen-set status
- Real-time clock provides accurate event logging
- Engine run hours monitoring allows warranty periods to be tracked and regular maintenance scheduled
- Full integration into building management systems can be achieved
- Module design and advanced PCB layout provide outstanding levels of quality
- Modules are user-configurable to adapt to different site requirements
- Wide range of electronic engines can be specified
- Seamless transfer between mains (utility) and generators
- Modules meet the demands of different load-share environments
- Module configurations can be saved using PC software for downloading to new modules to improve set-up times
- Dedicated PC software is license free

**ELECTRONIC ENGINE COMPATIBILITY**
- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- Generic
- Plus additional manufacturers

## DSEMARINE®
## CASE STUDY
## ALASKA – USA

**A 200FT STERN TRAWLER (OCEAN PEACE) BASED AT DUTCH HARBOUR IN ALASKA NEEDED TO IMPROVE ITS POWER CAPABILITY FOR PROPULSION, TRAWLING AND FISH PROCESSING.**

DSE's Marine Load-Sharing Controllers were chosen to control three existing generators as part of the ship's major refurbishment programme.

The generators previously operated independently on a split bus system, placing uneven loads on the engines, leading to engine stress and reducing engine life.

The generators were retro-fitted with DSE5510M and DSE5560 controllers. This enabled the load to be shared equally between the gen-sets, keeping engine stress to a minimum. The use of a DSE5560 allowed power from the ship's main engine to be monitored so that the ship's electrical load could be transferred to the generators when required.


**DSE5310M**
Auto Start Controller (Electronic engine enabled)
Data sheet No. 055-056


**DSE5510M**
Auto Start Controller (Electronic engine enabled)
Data sheet No. 055-057

**DSEEXTRA® IS A COLLECTION OF SEVEN EXPANSION DEVICES AND FIVE ADVANCED SWITCH-MODE BATTERY CHARGERS, WHICH CAN BE USED ACROSS A WIDE RANGE OF APPLICATIONS. THE EXPANSION DEVICES HAVE BEEN CAREFULLY DESIGNED AND MANUFACTURED TO ENABLE USERS TO MATCH THEM WITH THEIR HOST CONTROL MODULES TO MEET THE MOST DEMANDING CONTROL REQUIREMENTS, INCLUDING SITES WHERE HIGH LEVELS OF INPUTS/OUTPUTS ARE REQUIRED.**

**THE COLLECTION OF SWITCH-MODE BATTERY CHARGERS OFFERS COMPACT CHARGER DESIGNS THAT INCORPORATE THE WIDE RANGE OF FEATURES AND FUNCTIONALITY THAT DSE CUSTOMERS HAVE COME TO EXPECT. ADVANCED DESIGN TECHNOLOGY HAS PRODUCED A RANGE OF EXTREMELY RELIABLE CHARGERS, ABLE TO WITHSTAND EXTREME OPERATING ENVIRONMENTS WITH NO COMPROMISE ON PERFORMANCE. WITH CHARGERS RANGING FROM 2-10 AMP, DSE CATERS FOR A WIDE RANGE OF BATTERY TYPES.**

# DSEEXTRA®
# BATTERY CHARGERS AND EXPANSION MODULES

## MODULE FEATURES

### DSE810
- USB/RS232 versions
- Links between module and PC
- Works with DSE710/DSE720/ DSE5510/DSE5520/DSE5560/ DSE52XX/DSE53XX
- Supplied with software CD

### DSE123
- Works with DSEPower® series
- Expands existing analogue load-share lines
- Converts analogue information into digital format
- Compatible with third-party load-share equipment
- Link lost LED indication

### DSE130
- Works with DSEPower® series
- Eight digital inputs
- Two analogue inputs
- Four-way connection socket for integrating DSE549
- Remote signalling
- Control panel mounting

### DSE157
- Works with DSEPower® series
- Extends host module output capabilities
- Eight configurable relay contacts
- Plug and socket host connection
- Two DSE157s can be linked together
- DIN rail mounting

### DSE545
- Works with DSEPower® series
- Horizontal panel mount
- Eight configurable LEDs
- 50-metre range from host module
- Two DSE545s can be linked together
- FCC 68 cable for quick installation
- DC power supply LED indicator
- Link lost LED indicator

### DSE548
- Works with DSEPower® series
- Vertical panel mount
- Eight configurable LEDs
- 50-metre range from host module
- Two DSE548s can be linked together
- FCC 68 cable for quick installation
- DC power supply LED indicator
- Link lost LED indicator

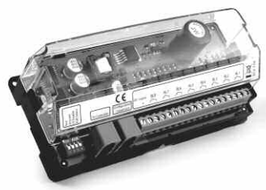
### DSE549
- Connects to the DSE130 input expansion module
- 16 LED indicators
- Alarm sounder
- Mute and LED test buttons
- Meets NFPA 110 Level 1
- 1000 metre range from host module
- Power and link-lost LEDs
- Pre-printed front label

### DSE9130/9150/9255/9140/9260
- Multi-stage intelligent charging
- Low output ripple
- Full protection
- Boost mode
- Power-save mode
- Charge fail output
- Minimum 80% operating efficiency

**DSE810**
Module Programming Device
Data sheet No. 055-005

**DSE123**
Load Share Lines Interface
Data sheet No. 055-044

**DSE130**
Input Expansion Control Module
Data sheet No. 055-047



**DSE157**
Output Relay Expansion Module
Data sheet No. 055-045

**DSE545**
LED Expansion Control Module
Data sheet No. 055-049

**DSE548**
LED Expansion Control Module
Data sheet No. 055-049

**DSE549**
Remote Annunciator Control Module
Data sheet No. 055-048

**DSE9130**
5 Amp 12 Volt Switch Mode Battery Charger
Data sheet No. 055-059

**DSE9150**
2 Amp 12 Volt Switch Mode Battery Charger
Data sheet No. 055-059

**DSE9255**
5 Amp 24 Volt Switch Mode Battery Charger
Data sheet No. 055-059

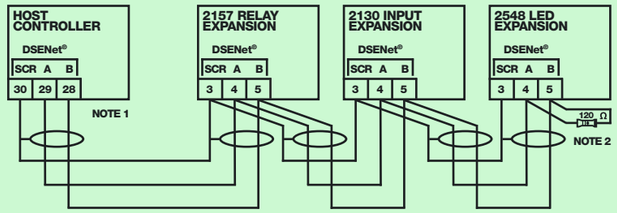
**DSE9140**
10 Amp 12 Volt Battery Charger
Data sheet No. 055-073

**DSE9260**
10 Amp 24 Volt Battery Charger
Data sheet No. 055-073

**DSENET® IS AN INNOVATIVE COLLECTION OF EXPANSION DEVICES DESIGNED TO CONNECT AND OPERATE ACROSS A NUMBER OF MODULES IN THE DSE RANGE. THE SERIES CONSISTS OF A RANGE OF 'PLUG AND PLAY' EXPANSION DEVICES DESIGNED TO QUICKLY ENHANCE INSTALLATIONS.**

**ONE OF THE UNIQUE FEATURES OF DSENET® IS THAT MULTIPLE EXPANSION DEVICES CAN BE CONNECTED TO ONE HOST CONTROL MODULE, ENABLING EXTREMELY HIGH LEVELS OF EXPANSION TO TAKE PLACE.**

### TYPICAL DSENET® CONFIGURATION




**NOTE 1**
**AS A TERMINATING RESISTOR IS INTERNALLY FITTED TO THE HOST CONTROLLER, THE HOST CONTROLLER MUST BE THE FIRST UNIT ON THE DSENet®**

**NOTE 2**
**A 120 OHM TERMINATION RESISTOR MUST BE FITTED TO THE LAST UNIT ON THE DSENet®**

# DSENET®
# EXPANDING WITH EASE

### MODULE FEATURES

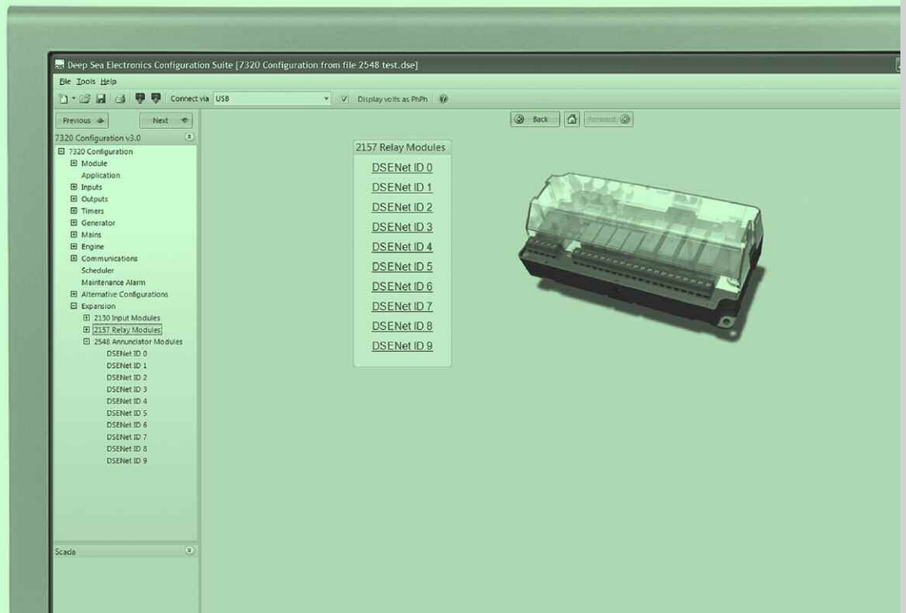
**DSE2130**
- Works with the DSEControl® series
- Eight digital inputs
- Four digital inputs can be configured to become analogue
- Power on/link-lost LED
- Connect four DSE2130s to one host controller
- Maximum of 32 additional inputs
- One kilometre (0.6 mile) range

**DSE2157**
- Works with the DSEControl® series
- Eight configurable relay contacts with LED indicators (four normally open/four change over)
- Ten DSE2130s can be connected to one host controller
- Maximum of 80 additional outputs
- Power on/link-lost LED
- Terminal strip connection
- One kilometre (0.6 mile) range

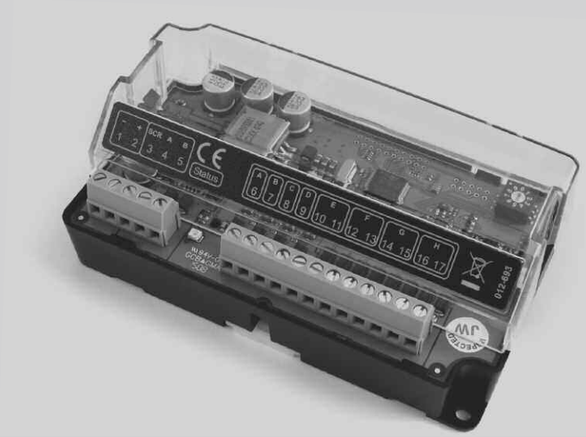
**DSE2548**
- Works with DSEControl® series
- Eight configurable LEDs
- Ten DSE2548s can be linked together
- Maximum of 80 LED indications
- Alarm sounder
- Alarm mute button
- Power on/link-lost LED

### DSENET® BENEFITS
- Instant expansion capability
- Flexible set-up options
- One host controller can accept multiple expansion devices
- Different expansion devices can be connected to one host control module at the same time
- DSENet® uses designated connection terminals, leaving RS232/RS485 available for other uses

### COMPATIBLE CONTROL MODULES
- DSE7310
- DSE7320




# THIS LEVEL OF EXPANSION IS A FIRST IN THE INDUSTRY



**DSE2130**
Input Expansion Module
Data sheet No. 055-060

**DSE2157**
Output Expansion Module
Data sheet No. 055-061


**DSE2548**
LED Expansion Module
Data sheet No. 055-062

**DSE HAS ESTABLISHED AN ENVIABLE REPUTATION OVER THE PAST 30 YEARS FOR ITS COMPREHENSIVE TRAINING PROGRAMMES, DELIVERED ACROSS THE GLOBE. THE COMPANY'S DEDICATED TECHNICAL SUPPORT REPRESENTATIVES BASED ACROSS FOUR CONTINENTS NOW PROVIDE TRAINING COURSES ON SUBJECTS FROM INSTALLING AND OPERATING BASIC MANUAL START UNITS TO CONFIGURING AND SYNCHRONISING MULTIPLE GEN-SETS USING DSE LOAD-SHARE MODULES.**

Standard courses are run frequently at DSE's offices in the UK and USA. The company also offers bespoke courses tailored specifically to meet customers' needs. These can be held either at the customer's premises or at an alternative pre-arranged location. Regular training events are also held globally attracting large audiences, with attendees from OEMs, service companies and panel builders.

The DSE website is an excellent reference point for information on the extensive range of DSE products. A number of in-depth training documents and guides can be downloaded on a wide range of subjects, 24 hours a day. The training documentation is regularly updated and all the latest course content is published for all registered site members to download.

If you would like to enquire about DSE training courses, please contact us – we will be delighted to discuss your requirements.

# DSE TRAINING


**DSE850 MULTI-SET COMMUNICATIONS SOFTWARE HAS BEEN DESIGNED TO WORK WITH THE DSEPOWER® SERIES LOAD-SHARE CONTROL MODULES. THE SOFTWARE IS SCHEDULED TO BECOME COMPATIBLE WITH ADDITIONAL DSE CONTROLLERS IN THE NEAR FUTURE.**

The DSE ethernet controller is connected to the internet and all DSE control modules that are on site. The ethernet controller requires a fixed internal IP address that can be configured to be visible over the internet. Once the IP address is accessible over the internet, sites can be viewed from any internet connection in the world.

The system has been designed to display information on a maximum of 16 gen-sets and four mains (utilities) or 24 gen-sets with no mains (utilities). The software is easy to set up and DSE controllers can easily be added to the system using the software's intuitive 'Add Controller' page.

The ethernet device includes RS232 and RS485 communications ports. The data taken from the DSE controllers is refreshed every 1-11 seconds (depending on connection speed).


**DSE850**
Multi-Set communications Device
Data sheet No. 055-072

# DSE850 MULTI-SET COMMUNICATIONS SOFTWARE

**KEY FEATURES**
- Clear alarms and re-start generators
- Log into the system from any location worldwide
- User-configurable data logging
- RS232 and RS485 communications ports
- Multi and single-set compatible
- Multiple alarm trigger levels

**KEY BENEFITS**
- View site status quickly and easily
- Software can be used to identify engine trends
- Multiple sites can be monitored from one location
- Allows basic fault finding to take place before attending site

**CASE STUDY**
**MITSUBISHI HEAVY INDUSTRIES – JAPAN**



**DSE HAS BEEN WORKING WITH MITSUBISHI FOR MORE THAN EIGHT YEARS. INITIALLY APPROACHED WITH A PRODUCT SPECIFICATION FOR A SPECIALIST GENERATOR CONTROL MODULE, WE IMMEDIATELY BEGAN TO ESTABLISH MITSUBISHI'S EXACT REQUIREMENT. AFTER A THOROUGH CONSULTATION AND DESIGN PROCESS WE PROVIDED A CONTROL MODULE THAT PRECISELY MATCHED THE ORIGINAL SPECIFICATION. DSE WAS THEN SELECTED AS MITSUBISHI'S SOLE CONTROL-MODULE SUPPLIER.**

The relationship with Mitsubishi has continually evolved since its inception, and the original control module has now been upgraded. In 2008, Mitsubishi changed to its second-generation control module. The new solution, a customised version of the DSE7000 series, has been developed to meet Mitsubishi's control requirements over the coming years.

The advanced technology and comprehensive functionality of the new control product has given Mitsubishi additional confidence in DSE's control modules. The new controller has provided Mitsubishi with a unique solution for its marketplace.

# CUSTOM PRODUCTS

**DSE HAS BUILT UP AN ENVIABLE REPUTATION FOR CREATING PRODUCTS TO MEET THE TOUGH DEMANDS OF DIFFERENT AREAS OF THE GENERATOR INDUSTRY. AS WELL AS DEVELOPING THESE PRODUCTS, THE COMPANY SPECIALISES IN CREATING CUSTOMISED CONTROL SOLUTIONS. TO DATE, THE COMPANY HAS DEVELOPED A NUMBER OF SPECIALIST PRODUCTS FOR A WIDE RANGE OF COMPANIES. DSE IS CURRENTLY WORKING WITH A COLLECTION OF THE WORLD'S LARGEST OEMS, PROVIDING THEM WITH RELIABLE SOLUTIONS FOR THEIR APPLICATIONS.**

DSE's 30-year experience in the generator control industry enables us to share our broad knowledge of controller development for the benefit of our customers, ensuring they get the most from their bespoke product. Whether you require a unique Auto Start/Auto Mains (Utility) or Auto Transfer Switch Controller, DSE has the experience and resources to deliver outstanding solutions tailored to meet the needs of your business.


MGS is Mitsubishi Generator Series. Product design by Mitsubishi Heavy Industries.
General machinery and special vehicle headquarters: Sagamihara, Japan.
All Mitsubishi and MGS Trademarks appear from photographs taken from units ordered by Mitsubishi.

**DSE HAS MORE THAN 30 YEARS OF DEDICATED EXPERIENCE IN THE GENERATOR CONTROLS INDUSTRY. OUR WIDE RANGE OF CONTROL MODULES ARE DESIGNED TO MEET THE HIGH-LEVEL DEMANDS OF SPECIFIC INDUSTRIES, OFFERING A RANGE OF FLEXIBLE, USER-FRIENDLY SOLUTIONS. OUR EXPERTISE IN RECOGNISING AND MATCHING SPECIFIC MARKET REQUIREMENTS WITH APPROPRIATE AND RELIABLE CONTROL SOLUTIONS ENSURES THAT CUSTOMER DEMANDS ARE CONSTANTLY MET. BELOW ARE EXAMPLES OF KEY INDUSTRIES IN WHICH DSE PLAYS A VITAL ROLE.**

# SPECIALISTS IN ALL INDUSTRY SECTORS

**TELECOMS**
The telecoms market is extremely competitive, as leading companies strive to offer an uninterrupted network service. Supporting equipment must therefore be highly reliable as base stations are often located in remote areas, making service and maintenance visits costly, with 'down time' causing potential breaks in the service. DSE systems have been used by many leading telecoms companies around the world, including BT, SabaFon, Vodacom PTY, Orange, Dhiraagu and many more.

**RENTAL**
Equipment for the rental market must be adaptable to suit a wide variety of uses and be effective in different and sometimes extreme environmental conditions, such as high/low temperature, saturated humidity, vibration and electro-magnetic interference. Modules must be robust enough to withstand tough end-user demands. DSE's control systems are designed to meet the demands of the rental market and a number of standard module features have been developed to make control of rental sets as simple as possible. DSE control systems have been used at the Olympic Games, Ryder Cup, Rugby World Cup, Winter Olympic Games, FIFA Football World Cup, European Football Championships and the Glastonbury Music Festival, to name but a few.

**TOURISM AND LEISURE**
Tourism and leisure is essential to the world's economy and for many countries is a vital source of income. A reliable power supply is essential to facilitate normal operation of hotels, shopping areas, bars, restaurants, nightlife and sports & recreational facilities. Our systems are being used throughout the tourism and leisure industry in countries from South Africa, Cuba and Venezuela to North America, Turkey and Greece. These systems provide prime and standby power control.

**HEALTHCARE**
Hospitals around the world require reliable power supplies in environments such as operating theatres and intensive-care units, as well as for vital equipment such as X-ray machines, MRI scanners and life-support systems. DSE has control modules throughout its DSEULTRA®, DSECONTROL® and DSEPOWER® series that automatically monitor mains (utility) supplies. Upon detection of a failure, they start up the generator to take the building load. These systems have become the controller of choice for hospitals and healthcare authorities in multiple locations around the world.

DSE'S CONFIGURATION SUITE IS A MODULAR SOFTWARE PLATFORM DEVELOPED TO PROVIDE A TOOL FOR PROGRAMMING OUR PC SOFTWARE-COMPATIBLE CONTROL MODULES*. AS WITH ALL DSE PRODUCTS THE CONFIGURATION SUITE IS DESIGNED WITH THE USER IN MIND AND IS EXTREMELY SIMPLE TO INSTALL AND OPERATE. CONFIGURATIONS CAN EASILY BE DOWNLOADED AND UPLOADED BETWEEN MODULES AND COMPUTERS. THE SOFTWARE IS INTELLIGENT IN ITS DESIGN, ONLY DISPLAYING THE PARAMETERS REQUIRED FOR THE MODULE BEING PROGRAMMED.

BY CREATING A SOFTWARE PLATFORM THAT IS GENERIC ACROSS DSE CONTROL MODULES, THE USER CAN BECOME FAMILIAR WITH ITS STRUCTURE AND BE CONFIDENT WHEN IT COMES TO PROGRAMMING, NO MATTER WHAT MODULE IS BEING USED. ALL FUTURE DEVELOPMENTS THAT HAVE A REQUIREMENT FOR PC SOFTWARE CONFIGURATION WILL BE DESIGNED TO WORK WITH THE CONFIGURATION SUITE.

# DSE CONFIGURATION SUITE SOFTWARE

**KEY FEATURES**
- Stores multiple configurations
- Fast connection between PC and control modules
- Logical screen layouts
- Software is license free
- Software communicates with control modules via industry-standard USB cable
- Windows XP and Vista compatible
- Logical screen layouts make it easy to configure modules
- Latest versions of the software can be downloaded direct from the DSE website


*Refer to individual module data sheets for DSE Configuration Suite software compatibility.

# ENVIRONMENTAL TESTING STANDARDS

## OUR CONTROL MODULES HAVE ALL PASSED THE ENVIRONMENTAL TESTING STANDARDS LISTED BELOW

**ELECTRO-MAGNETIC COMPATIBILITY**
BS EN 61000-6-2
EMC Generic Immunity Standard (Industrial)

BS EN 61000-6-4
EMC Generic Emission Standard (Industrial)

**ELECTRICAL SAFETY**
BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

**TEMPERATURE**
BS EN 60068-2-1
Cold temperature -30°C

BS EN 60068-2-2
Hot temperature +70°C

**HUMIDITY**
BS EN60068-2-30
Test Db cyclic
93% RH @ 40°C for 48 hours

**VIBRATION**
BS EN 60068-2-6
Ten sweeps at one octave/minute in each of the three major axes
5Hz to 8Hz @ +/-7.5mm constant displacement
8Hz to 500Hz @ 2gn constant acceleration

**SHOCK**
BS EN 60068-2-27
Three half sine shocks in each of the three major axes
15gn amplitude, 11mS duration