

DSEULTRA[®] STARTING WITH QUALITY.

DSE3110

MANUAL & AUTO START CONTROL MODULE



The DSE3110 can be utilised as a Manual or Auto Start Module for single gen-set applications and forms part of DSE's next generation of control modules. The module has been designed to work with electronic and non electronic engines providing advanced engine monitoring and protection features.

The DSE3110 includes a backlit LCD display which clearly shows the status of the engine at all times. The module monitors engine speed, frequency, voltage and run hours and also displays the warning and shutdown status of the engine.

The module includes six digital inputs and four outputs. Two of the outputs are configurable. The module can either be programmed using the front panel or by using the DSE Configuration Suite PC software.

The module is available in two variants: Magnetic Pick-up and Canbus.

CAN – For use with CAN engines only. Optional frequency (Hz) sensing from main AC alternator for gen-set applications.

MPU – For use with traditional (non-CAN) engines only. Optional frequency (Hz) sensing from main AC alternator for gen-set applications. Optional Magnetic Pickup speed sensing.

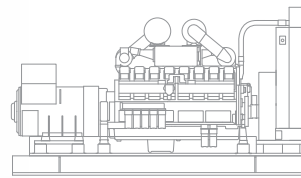
FEATURES

- Back-lit LCD display
- Remote start input
- Electronic engine enabled (option)
- Magnetic pick-up (option)
- Full engine monitoring and protection
- PC programmable
- Protected Solid State Outputs (PSS)
- 6 Digital Inputs
- 4 Outputs (4 configurable on Canbus version, 2 configurable on Magnetic Pick-up version)

BENEFITS

- Hours counter provides accurate information for monitoring maintenance and warranty periods
- Multiple engine parameters are monitored simultaneously
- Suitable for engine only applications
- Module can be configured to suit individual applications
- IP65 rating offers advanced resistance to water ingress (optional gasket required)

NEW RELEASE



ELECTRONIC ENGINE CAPABILITY

- No need for additional metering equipment
- Wide range of engines can be specified
- Uses the DSE Configuration Suite PC Software for simplified programming

OPERATION

MANUAL MODE

- The engine is started using the Start **I** button on the front of the module.
- Once pressed the module instructs the engine to initiate its pre-heat sequence and then start the engine.
- To stop the engine the Stop **O** button on the front of the module should be pressed.

AUTOMATIC MODE

- The Auto **AUTO** button needs to be pressed to put the unit in Auto Mode.
- The module start sequence is initiated by the activation of the remote start input.
- The pre-heat sequence is then initiated and the engine is started.
- To stop the engine the remote start signal needs to be removed or the Stop **O** button on the module needs to be pressed.



SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8V to 35V Continuous

CRANKING DIP PROTECTION
Able to survive 0V for 50mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries

CHARGE FAIL/ EXCITATION
8V to 35V fixed power source 2.5W

MAXIMUM SHUTDOWN CURRENT
1.5mA at 12V 1.5mA at 24V

NOMINAL STANDBY CURRENT
23mA at 12V 18mA at 24V

MAXIMUM OPERATING CURRENT
35mA at 12V 30mA at 24V

ALTERNATOR INPUT

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

MAGNETIC PICKUP

VOLTAGE RANGE
0.5V RMS minimum

FREQUENCY RANGE
10,000 Hz (max)

OUTPUTS

OUTPUT A (FUEL)
2 Amp DC at supply voltage

OUTPUT B (START)
2 Amp DC at supply voltage

AUXILIARY OUTPUTS C,D
2 Amp DC at supply voltage

DIMENSIONS

OVERALL
98mm x 79mm x 40mm
3.9" x 3.1" x 1.6"

PANEL CUT-OUT
80mm x 68mm
3.1" x 2.7"

MAXIMUM PANEL THICKNESS
8mm 0.3"

TESTING STANDARDS

ELECTRICAL SAFETY/ ELECTROMAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment

BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

DEEP SEA ELECTRONICS PLC

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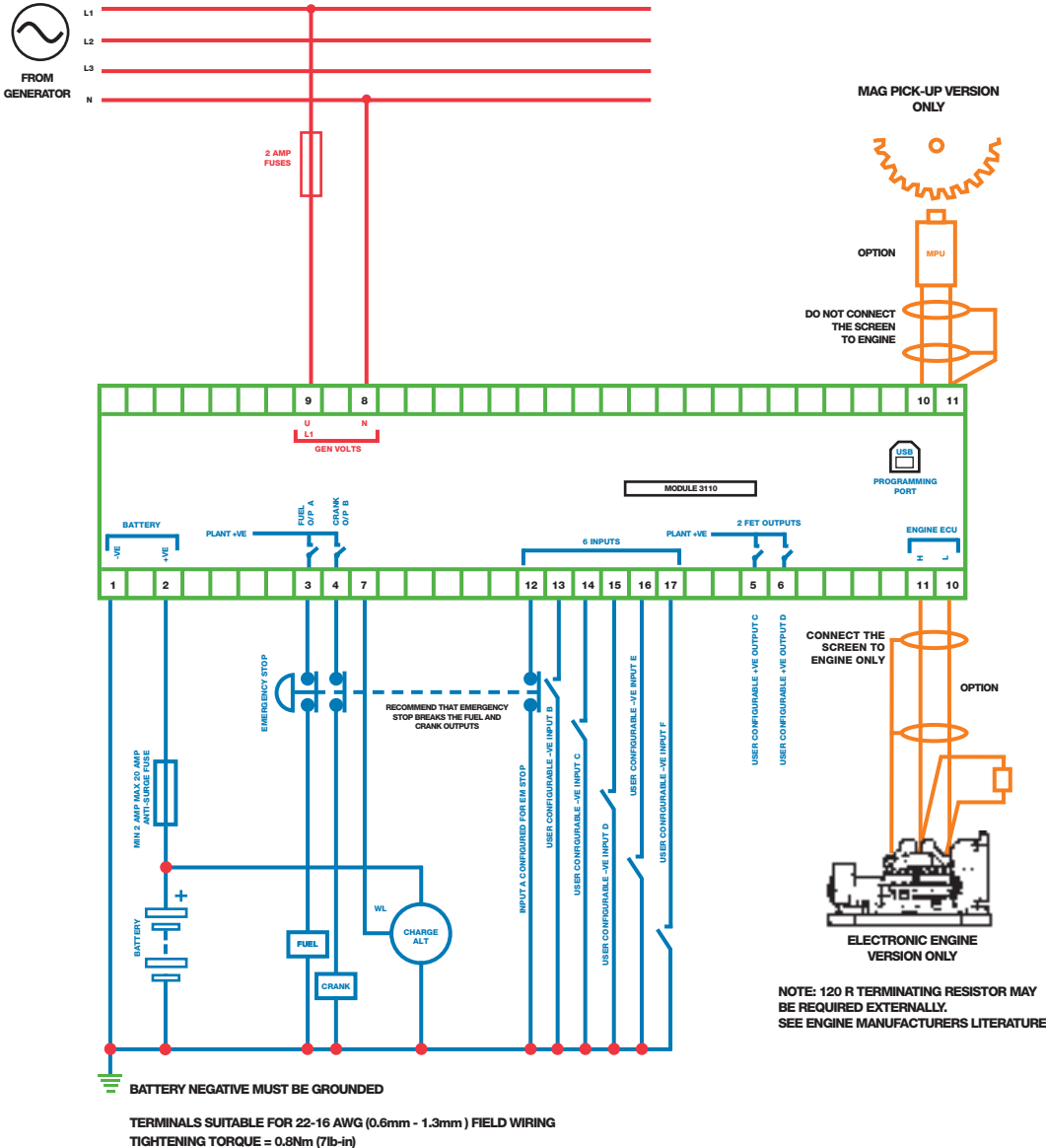
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DSE3110



TESTING STANDARDS

ENVIRONMENTAL

TEMPERATURE

BS EN 60068-2-1
Cold Temperature -30°C
BS EN 60068-2-2
Hot Temperature +70°C

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5Hz to 8Hz @ +/-7.5mm, 8Hz to 500Hz @ 2gn

HUMIDITY

BS 2011 part 2.1 60068-2-30
Test Cb Ob Cyclic
93% RH @ 40°C for 48 hours

SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15gn in 11ms

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529
IP65 (Front of module when installed into the control panel with the supplied sealing gasket)

ELECTRONIC ENGINE COMPATIBILITY

- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- Generic
- Plus additional manufacturers

RELATED MATERIALS

TITLE

DSE3110 Installation Instructions
DSE3110 Manual
DSE3110 PC Software Manual

PART NO'S

053-050
057-086
057-087

DEEP SEA ELECTRONICS PLC maintains a policy of continuous development and reserves the right to change the details shown on this data sheet without prior notice. The contents are intended for guidance only.

This data sheet is printed on 9lives 55 Silk, which is produced with 55% recycled fibre from both pre and post-consumer sources, together with 45% virgin ECF fibre.



DSECONTROL[®] MONITORING WITH INTELLIGENCE.



DSE7110 & DSE7120

AUTO START & AUTO MAINS FAILURE CONTROL MODULES



The DSE7110 and DSE7120 are control modules for single gen-set applications. The modules incorporate a number of advanced features to meet the most demanding on-site applications.

The DSE7110 is an Automatic Start Control Module and the DSE7120 is an Auto Mains (Utility) Failure Control Module. The DSE7120 includes the additional capability of being able to monitor a mains (utility) supply. Both modules have been designed to start and stop diesel and gas generating sets that include electronic and non-electronic engines.

Both modules are simple to operate and feature a user friendly menu layout for improved clarity. Enhanced features include a real time clock for improved event monitoring and a 132 x 64 pixel LCD display.

FEATURES

- Real time clock
- 132 x 64 pixel LCD display
- USB connectivity
- Five key menu navigation
- Configurable via PC software
- Front panel editor
- LED and LCD alarm indication
- Engine exercise mode
- Configurable start & fuel outputs
- Automatic load transfer
- Seven configurable inputs
- Eight configurable outputs
- Configurable timers and alarms
- Magnetic pick-up and CAN
- Improved programmable event log (5) showing date and time
- Alternative configuration
- Charge alternator fail warning and shutdown alarms with user programmable delay
- Sleep mode
- Easy access diagnostics page via PC, shows summary of output states
- Front panel editing of scheduler

BENEFITS

- 132 x 64 pixel ratio makes information easy to read
- Real time clock provides accurate event logging
- PC software is license free
- Set maintenance periods can be configured to maintain optimum engine performance
- Advanced PCB layout ensures high module reliability

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8V to 35V Continuous

CRANKING DIP PROTECTION
Able to survive 0V for 50mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries

CHARGE FAIL/ EXCITATION
0V to 35V fixed power source 2.5W

MAXIMUM STANDBY CURRENT
80mA at 12V 40mA at 24V

MAXIMUM OPERATING CURRENT
300mA at 12V 150mA at 24V

ALTERNATOR INPUT

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES

3 phase 4 wire Delta
3 phase 4 wire
3 phase 3 wire
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

MAINS/UTILITY INPUT (DSE7120 ONLY)

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES

3 phase 4 wire Delta
3 phase 4 wire
3 phase 3 wire
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

CT'S

BURDEN
0.5VA

PRIMARY RATING
1A - 8000A (user selectable)

SECONDARY RATING
5A secondary

ACCURACY OF MEASUREMENT
1% of full load rating

RECOMMENDATIONS
Class 1 required for instrumentation
Protection class required if using for protection

SPECIFICATION

MAGNETIC PICKUP

VOLTAGE RANGE

+/- 0.5V minimum (during cranking) to 70V peak

FREQUENCY RANGE

1kHz - 10kHz

OUTPUTS

OUTPUT A (FUEL)

15 Amp DC at supply voltage

OUTPUT B (START)

15 Amp DC at supply voltage

OUTPUTS C & D

8 Amp 250V (Volt free)

AUXILIARY OUTPUTS E,F,G,H

2 Amp DC at supply voltage

DIMENSIONS

OVERALL

240mm x 181.1mm x 41.7mm
9.4" x 7.1" x 1.6"

PANEL CUT-OUT

220mm x 160mm
8.7" x 6.3"
Max panel thickness 8mm (0.3")

ENVIRONMENTAL TESTING STANDARDS

ELECTRICAL SAFETY

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

ELECTRO MAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the
Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the
Industrial Environment

TEMPERATURE (OPERATING)

BS EN 60068
Test Ab to +70°C 60068-2-2 Hot
Test Ab to -30°C 60068-2-1 Cold

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5Hz to 8Hz @ +/-7.5mm, 8Hz to 500Hz @ 2gn

HUMIDITY

BS 2011 part 2.1 60068-2-30
Test Cb Ob Cyclic
93% RH @ 40°C for 48 hours

SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15gn in 11ms

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529
IP65 - Front of module when installed into the
control panel with the supplied sealing gasket.

OPERATION

The modules are operated via the START, STOP, AUTO and MANUAL soft touch membrane buttons on the front panel. The DSE7120 also has a TEST button. Both modules include load switch buttons. The main menu system is accessed using the five navigation buttons to the left of the LCD display.

CONFIGURATION

The modules can be configured using the front panel buttons and by using the DSE Configuration Suite PC software and a USB lead.

INPUTS & OUTPUTS

Analogue inputs are provided for oil pressure, coolant temperature and a further flexible input. These connect to conventional engine mounted resistive sensor units to provide accurate monitoring and protection facilities. They can also be configured to interface with digital switch type inputs for low oil pressure and high coolant temperature shutdowns. Six user configurable digital inputs are also included.

Outputs are provided for fuel solenoid, start solenoid and six additional configurable outputs. On these configurable outputs a range of different functions, conditions or alarms can be selected.

INSTRUMENTATION

The modules provide advanced metering facilities, displaying the information on the LCD display. The information can be accessed using five menu navigation buttons to the left of the display.

DSE7110	DSE7120
Generator Volts L1-N, L2-N, L3-N Generator Volts L1-L2, L2-L3, L3-L1 Generator Amps L1,L2,L3 Generator Frequency Hz Engine Speed RPM Engine Oil Pressure Fuel Level % (optional) Engine Temperature Plant Battery Volts Engine Hours Run Charge Alternator Voltage Number of engine starts	Generator Volts L1-N, L2-N, L3-N Generator Volts L1-L2, L2-L3, L3-L1 Generator Amps L1,L2,L3 Generator Frequency Hz Engine Speed RPM Engine Oil Pressure Fuel Level % (optional) Engine Temperature Plant Battery Volts Engine Hours Run Mains Volts L1-N, L2-N, L3-N Mains Volts L1-L2, L2-L3, L3-L1 Mains Frequency Hz Charge Alternator Voltage Number of engine starts
EXTENDED INSTRUMENTATION FROM ELECTRONIC ENGINES (WHERE AVAILABLE)	
Oil temperature Coolant pressure Turbo pressure Inlet manifold temperature Exhaust temperature Fuel Consumption Atmospheric pressure Fuel temperature Fuel used	Oil temperature Coolant pressure Turbo pressure Inlet manifold temperature Exhaust temperature Fuel Consumption Atmospheric pressure Fuel temperature Fuel used

EVENT LOG

The modules include a comprehensive event log that shows the most recent 5 alarm conditions. This feature is enhanced by the real time clock, as it allows each alarm condition to be stamped with the date and time. The event log displays the fault condition, time and date all on one page.

RELATED MATERIALS

TITLE

7110 Installation Instructions
7120 Installation Instructions
7110 / 7120 Operator Manual
PC Configuration Suite Manual

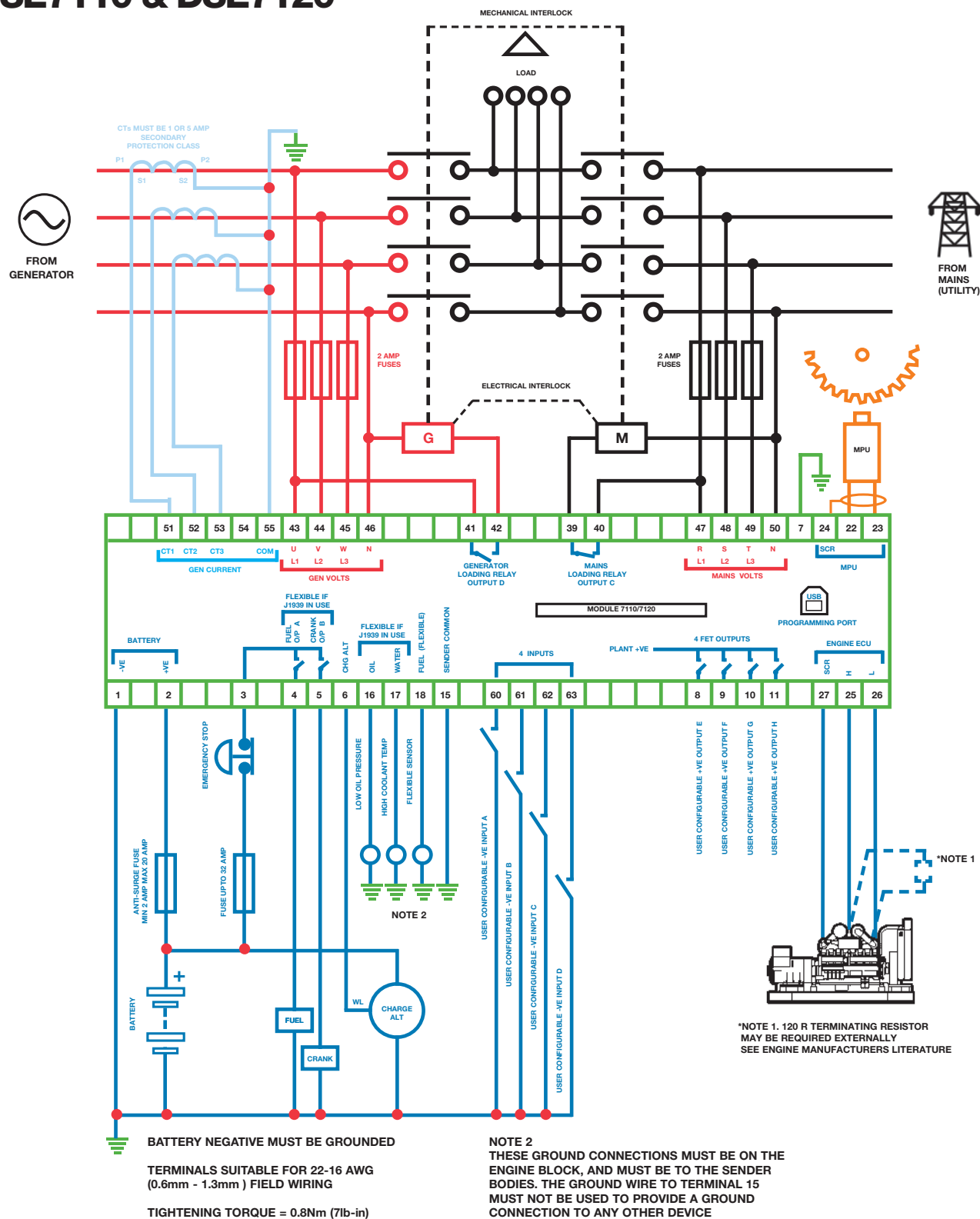
PART NO'S

053-080
053-081
057-113
057-117

ELECTRONIC ENGINE COMPATABILITY

- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- IVECO
- Generic
- Plus additional manufacturers

DSE7110 & DSE7120



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DSECONTROL[®] MONITORING WITH INTELLIGENCE.



DSE7310 & DSE7320

AUTO START & AUTO MAINS (UTILITY) FAILURE CONTROL MODULES (COMMUNICATIONS & EXPANSION)



The DSE7310 and DSE7320 are control modules for single gen-set applications. The modules have been developed from the successful DSE5310 and DSE5320 Series and incorporate a number of advanced features to meet the most demanding on-site applications.

The DSE7310 is an Automatic Start Control Module and the DSE7320 is an Auto Mains (Utility) Failure Control Module. Both modules have been designed to start and stop diesel and gas generating sets that include electronic and non-electronic engines. The DSE7320 includes the additional capability of being able to monitor a mains (utility) supply.

Both modules include USB, RS232 and RS485 ports as well as dedicated DSENet[®] terminals for expansion device connectivity.

The modules are simple to operate and feature a user-friendly menu layout for improved clarity. Enhanced features include a real time clock for enhanced event and performance monitoring, ethernet communications for low cost monitoring, mutual standby (DSE7310 only) to reduce engine wear and tear and preventative maintenance features to detect engine part faults prior to a major problem occurring.

FEATURES

- Backed up real time clock
- 132 x 64 pixel LCD display
- Configurable display languages
- Five-key menu navigation
- Fully configurable via PC software
- LED and LCD alarm indication
- Engine exercise mode
- Configurable start & fuel outputs
- kWh monitoring
- Automatic load transfer
- Eight configurable digital inputs
- Six configurable outputs
- Configurable timers and alarms
- Modbus RTU
- Magnetic pick-up
- Selected front panel programming
- Multiple date and time exercise scheduler
- SMS messaging (additional external modem required)
- Power save mode
- User selectable RS232 & RS485 communications
- DSENet[®] compatible
- Ethernet communications via DSE860/865
- Multiple date and time maintenance scheduler
- Configurable display pages
- Programmable load shedding/acceptance
- Preventative maintenance
- kW overload protection
- Unbalanced load protection
- Flexible sender input
- Configurable SCADA output page
- True dual mutual standby with load balancing timer (DSE7310 only)
- Fan control for additional cooling
- 'Protections Disabled' facility
- Fuel usage monitoring and low fuel alarm
- Support for up to three remote display units
- Automatic sleep mode
- Easy access, configurable diagnostics page shows summary of output states
- Improved programmable event log (250) showing date and time
- Manual fuel pump control
- 3 alternative configurations
- Multiple date and time scheduler
- 3 Programmable Maintenance alarms with comms alert
- Customisable status screens
- Low fuel level alarm delay
- Charge alternator fail warning and shutdown alarms with user programmable delay
- Independent Earth fault trip
- Sleep mode
- Load switching (Load shedding and dummy load outputs)
- Manual speed trim (on CAN engines that support this feature)
- Additional display screens to help with modem diagnostics
- Security levels – PC software has password system to control access to PC software features
- Operator configurable virtual LEDs visible in SCADA

NEW FEATURES

- Additional programmable logic
- Improved modem diagnostics
- Remote control sources (10) can be accessed via SCADA
- Additional electrical trip options
- Additional start delay functions
- Oil pressure values from additional engines
- Front panel editing of scheduler
- Displays kW as % of rated kW setting

SPECIFICATION

DC SUPPLY

CONTINUOUS VOLTAGE RATING
8V to 35V Continuous

CRANKING DIP PROTECTION
Able to survive 0V for 50ms, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries

CHARGE FAIL/ EXCITATION
0V to 35V fixed power source 2.5W

MAXIMUM STANDBY CURRENT
160mA at 12V 80mA at 24V

MAXIMUM OPERATING CURRENT
340mA at 12V 160mA at 24V

ALTERNATOR INPUT

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES
3 phase 4 wire
3 phase 3 wire
3 phase 4 wire Delta
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

MAINS/UTILITY INPUT (DSE7320 ONLY)

RANGE
15V - 333V (L-N) 50Hz - 60Hz
(Minimum 15V AC Ph-N)

ACCURACY
1% of full scale true RMS sensing

SUPPORTED TOPOLOGIES
3 phase 4 wire
3 phase 3 wire
3 phase 4 wire Delta
Single phase 2 wire
2 phase 3 wire L1 & L2
2 phase 3 wire L1 & L3

CT'S

BURDEN
0.5VA

PRIMARY RATING
1A - 8000A (user selectable)

SECONDARY RATING
1A or 5A secondary (user selectable)

ACCURACY OF MEASUREMENT
1% of full load rating

RECOMMENDATIONS
Class 1 required for instrumentation
Protection class required if using for protection

SPECIFICATION

MAGNETIC PICKUP

VOLTAGE RANGE

+/- 0.5V minimum (during cranking) to 70V peak

FREQUENCY RANGE

10,000 Hz (max)

OUTPUTS

OUTPUT A (FUEL)

15 Amp DC at supply voltage

OUTPUT B (START)

15 Amp DC at supply voltage

OUTPUTS C & D

8 Amp 250V (Volt free)

AUXILIARY OUTPUTS E,F,G,H

2 Amp DC at supply voltage

DIMENSIONS

OVERALL

240mm x 181.1mm x 41.7mm
9.4" x 7.1" x 1.6"

PANEL CUT-OUT

220mm x 160mm
8.7" x 6.3"
Max panel thickness 8mm (0.3")

ENVIRONMENTAL TESTING STANDARDS

ELECTRICAL SAFETY

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

ELECTRO MAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the
Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the
Industrial Environment

TEMPERATURE (OPERATING)

BS EN 60068
Test Ab to +70°C 60068-2-2 Hot
Test Ab to -30°C 60068-2-1 Cold

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5Hz to 8Hz @ +/-7.5mm, 8Hz to 500Hz @ 2gn

HUMIDITY

BS 2011 part 2.1 60068-2-30
Test Cb Ob Cyclic
93% RH @ 40°C for 48 hours

SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15gn in 11ms

BENEFITS

- 132 x 64 pixel ratio makes information easy to read
- Real time clock provides accurate event logging
- PC software is license free
- Set maintenance periods can be configured to maintain optimum engine performance
- Ethernet communications provides advanced remote monitoring at low cost
- Modules can be integrated into building management systems
- Preventative maintenance avoids expensive engine down time
- Advanced PCB layout ensures high reliability
- Robust design
- Extensive performance monitoring

OPERATION

The modules are operated via the START, STOP, AUTO and MANUAL soft touch membrane buttons on the front panel. The DSE7320 also has a TEST button. Both modules include load switch buttons. The main menu system is accessed using the five navigation buttons to the left of the LCD display.

CONFIGURATION

The modules can be configured using the front panel buttons or by using the DSE Configuration Suite PC software and a USB lead.

COMMUNICATIONS

The DSE7310 & DSE7320 have a number of different communication capabilities.

SMS Messaging

When the module detects an alarm condition, it has the ability to send an SMS message to a dedicated mobile number (s), notifying an engineer of the exact time, date and reason why the engine failed (GSM Modem and SIM Card required).

Remote Communications

When the module detects an alarm state, it dials out to a PC notifying the user of the condition (Modem required).

Remote Control

The module can be controlled remotely using either a GSM Modem, Ethernet via DSE860/865 or via RS485. Using a modem allows the module to be controlled from any distance. Using RS485 limits the distance to 1km (0.6 miles).

Building Management

The module has been designed to be integrated into new and existing building management systems, using RS485.

PC Software

The module has the ability to be configured and monitored from a remote PC, using the PC software and a USB lead.

INPUTS & OUTPUTS

Analogue inputs are provided for oil pressure, coolant temperature and fuel level. These connect to conventional engine mounted resistive sensor units to provide accurate monitoring and protection facilities. They can also be configured to interface with digital switch type inputs for low oil pressure and high coolant temperature shutdowns. Eight user configurable digital inputs are also included, plus one flexible sender. Outputs are provided for fuel solenoid, start solenoid and six additional configurable outputs. On these configurable outputs a range of different functions, conditions or alarms can be selected.

INSTRUMENTATION

The modules provide advanced metering facilities, displaying the information on the LCD display. The information can be accessed using the five-key menu navigation to the left of the display.

7310	7320
Generator Instruments Volts, Hz, Amps, kW, kVA, Pf, kWh, kVAh, kVAh, kVAh	Generator Instruments Volts, Hz, Amps, kW, kVA, Pf, kWh, kVAh, kVAh, kVAh
Engine Instruments RPM, Oil Pressure, Coolant Temperature, Hours Run, Charging Voltage, Battery Volts.	Engine Instruments RPM, Oil Pressure, Coolant Temperature, Hours Run, Charging Voltage, Battery Volts.
Electronic Engines Enhanced Instrumentation and Engine ECU diagnostics via electronic engine interface.	Electronic Engines Enhanced instrumentation and Engine ECU diagnostics via electronic engine interface.
	Mains/Utility Instruments Volts, Frequency, Amps (optional when CT's are fitted load side of the line)

DSENET®

DSENet® is a collection of expansion modules that have been created to work with DSENet® compatible control modules. DSENet® allows up to 20 different expansion devices to be used at a time. The expansion modules available are:

- DSE2157 Relay Output Expansion Module
- DSE2130 Input Expansion Module
- DSE2548 Annunciator Module
- DSE2510 Remote Display
- DSE2520 Remote Display

EVENT LOG

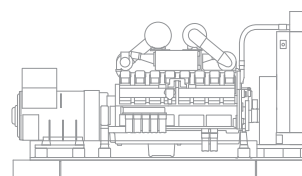
The module includes a comprehensive event log that shows the most recent 250 alarm conditions and the date and time that they occurred. This function assists the user when fault finding and maintaining a generating set.

ELECTRONIC ENGINE COMPATABILITY

- CAT
- Cummins
- Deutz
- John Deere
- MTU
- Perkins
- Scania
- Volvo
- IVECO
- Generic
- Plus additional manufacturers

RELATED MATERIALS

TITLE	PART NO'S
DSE7xxx Manual	057-074
DSE72xx/73xx PC	
Software Manual	057-077
DSE2130 Data Sheet	053-060
DSE2157 Data Sheet	053-061
DSE2548 Data Sheet	053-062
DSE860/865	
Data Sheet	055-071
DSE2510/20	
Data Sheet	055-074



ELECTRONIC ENGINE CAPABILITY

DSE7310 & DSE7320

