DSE8610MKII
SYNCHRONIZING & LOAD SHARING MODULE

DSE8610 MKII

The DSE8610 MKII represents the latest in complex load sharing & synchronizing control technology. The module has been designed to allow the operator to start, stop and synchronize the generator, and if required, transfer the load to the generator either manually or automatically.

KEY LOAD SHARE FEATURES:

- Peak lopping/sharing (with appropriate DSE mains controller)
- Sequential set start
- Manual voltage/frequency adjustment
- R.O.C.O.F. and vector shift protection
- Generator load demand
- Automatic hours run balancing
- Mains (Utility) decoupling
- Mains (Utility) decoupling test mode
- Dead bus sensing
- Bus failure detection
- Direct governor and AVR control
- Volts and frequency matching
- kW and kvar load sharing
- Dead bus synchronising

GENERAL SPECIFICATIONS

DISPLAY	4-LINE, BACK LIT LCD TEXT DISPLAY
CONTINUOUS VOLTAGE RATING	5V TO 35V
MAXIMUM OPERATING CURRENT	530 mA @ 12V 280 mA @ 24V
MAXIMUM STANDBY CURRENT	320 mA @ 12V 160 mA @ 24V
TEMPERATURE RATING	-22˚F TO +158˚F
CHARGE FAIL/EXCITATION RANGE	0V TO 35V
CRANKING DROPOUTS	0V FOR 50 MIL. SEC.
MAGNETIC PICKUP	VOLTAGE RANGE +/-0.5V TO 70V
ELECTRO-MAGNETIC COMPATIBILITY	BS EN 61000-6-2 BS EN 61000-6-4
ELECTRICAL SAFETY	BS EN 60950
VIBRATION	BS EN 60068-2-6
HUMIDITY	BS EN 60068-2-30 BS EN 60068-2-78
SHOCK	BS EN 60068-2-27
INGRESS PROTECTION	IP65
HOURS COUNTER	YES
MAXIMUM SYNCHED GENSETS	32

VOLTAGE & FREQUENCY SENSING

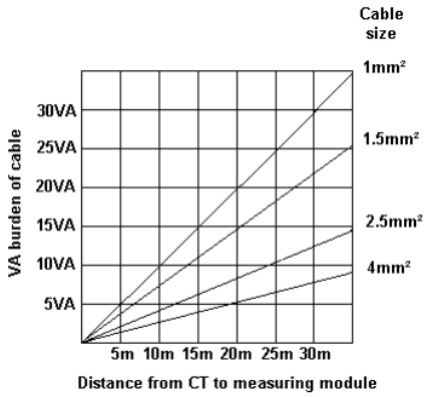
MEASUREMENT TYPE	True RMS Conversion
SAMPLE RATE	40 kHz
HARMONICS	Up to 21st or Better
NOMINAL CT SECONDARY RATING	1A and 5A
MAXIMUM CONTINUOUS CURRENT	5A
OVERLOAD MEASUREMENT	15A
ABSOLUTE MAXIMUM OVERLOAD	50A for 1 Second
BURDEN	0.5VA (0.02Ω current shunts)
COMMON MODE OFFSET	70V peak plant ground to CT common terminal under fault condition
RESOLUTION	25mA
ACCURACY	±1% OF NOMINAL

TERMINAL SPECIFICATION

CONNECTION TYPE	TWO PART CONNECTOR: • MALE PART FITTED TO MODULE • FEMALE PART SUPPLIED IN MODULE PACKAGING CASE
MINIMUM CABLE SIZE	20 AWG
MAXIMUM CABLE SIZE	13 AWG

VA RATING OF THE CTS

The VA burden of the module on the CTs is 0.5 VA. However, depending upon the type and length of cabling between the CTs and the module, CTs with a greater VA rating than the module are required.



BUILT IN AVR COVERNOR CONTROL

GOVERNOR CONTROL OUTPUT

MINIMUM LOAD IMPEDANCE	500Ω
GAIN VOLTAGE	0V to 10V DC
OFFSET VOLTAGE	0V to 10V DC
VOLTAGE RANGE	-5V to 10V DC
MAX COMMON MODE VOLTAGE	±1kV
RESOLUTION	< 1mV
ACCURACY	±1%

AVR CONTROL OUTPUT

MINIMUM LOAD IMPEDANCE	500Ω
GAIN VOLTAGE	0V to 10V DC
OFFSET VOLTAGE	0V to 10V DC
VOLTAGE RANGE	-5V to 10V DC
MAX COMMON MODE VOLTAGE	±1kV
RESOLUTION	< 1mV
ACCURACY	±1%

DSE CONFIGURATION SUITE

Provides complete user-friendly configuration and easy-to-use high-level system control & monitoring.

- Free software download and no maintenance fees.
- Customize applications.
  - Control order information of displays
  - Suppress unwanted instrumentation
  - Program configurable inputs and outputs

- Download event logs
- SCADA feature for troubleshooting or monitoring. Provides all the data from controller to a computer. When used with virtual LEDs, detailed event troubleshooting is possible
  - Mimic Mode provides a mimic of the control module and allows the operator to change the control mode of the module from a PC.
  - Show status on inputs and outputs
  - Virtual LEDs can be set to aid troubleshooting
  - Shows power, voltage kW, engine data, alarms, enhanced CANbus, etc.
  - Event log
  - Adjust date and time in module
  - Monitor PLC functionality
  - Configures multiple sets part of the same system

CONFIGURABLE INPUTS AND OUTPUTS

- Configurable outputs provide opportunities to integrate the generator control into other systems like building control and security systems. - For example, generator available, generator fault, louver controls, etc.
- Expandable through the DSE webnet modules.

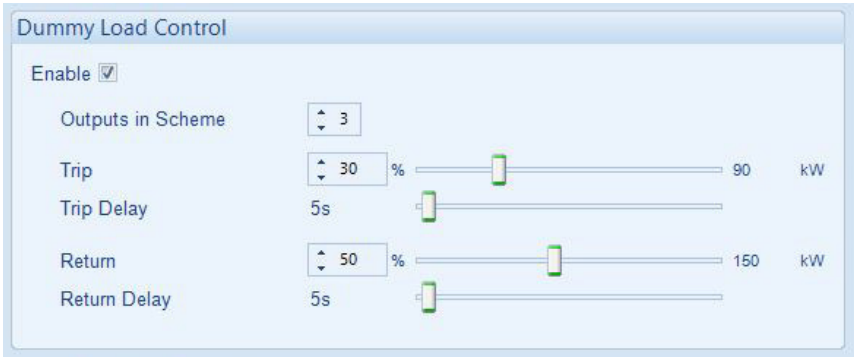
DIGITAL INPUTS A TO H	NEGATIVE SWITCHING
ANALOG INPUTS A & F	CONFIGUREABLE AS: NEGATIVE SWITCHING DIGITAL INPUT 0V TO 10V SENSOR 4 MA TO 20MA SENSOR RESISTIVE SENSOR
ANALOG INPUTS B, C, D, & E	CONFIGURABLE AS: NEGATIVE SWITCHING DIGITAL INPUT RESISTIVE SENSOR
OUTPUTS A & B (FUEL & START)	15A DC SUPPLY VOLTAGE
AUXILIARY OUTPUTS E, F, G, H, I, & J	2A DC @ SUPPLY VOLTAGE

DUMMY LOAD/LOAD SHEDDING CONTROL

If the load is low, 'dummy loads' (typically resistive load banks) are introduced to ensure the engine is not too lightly loaded. Conversely, as the load increases towards the maximum rating of the set, non essential loads are shed to prevent overload of the generator.

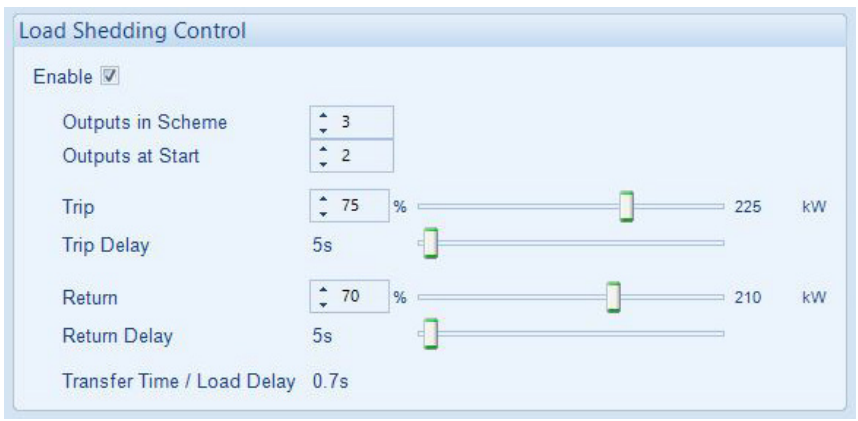
DUMMY LOAD CONTROL

- Allows for a maximum of five dummy load steps.
- If the generator load falls below the Dummy Load Control Trip setting (kW), the Dummy Load Control Trip Delay begins.
- If the generator load remains at this low level for the duration of the timer, the first Dummy Load Control output is energized. This is used to energize external circuits to switch in a resistive load bank.
- When the generator load rises above the Dummy Load Return level, the Dummy Load Return Delay begins.
- If the generator load remains at these levels after completion of the timer, the 'highest' active Dummy Load Control output is de-energized. This continues until all Dummy Load Control outputs have been de-energized.
- When the generator enters a stopping sequence for any reason, all the Dummy Load Control outputs de-energize at the same time as the generator load switch is signaled to open.



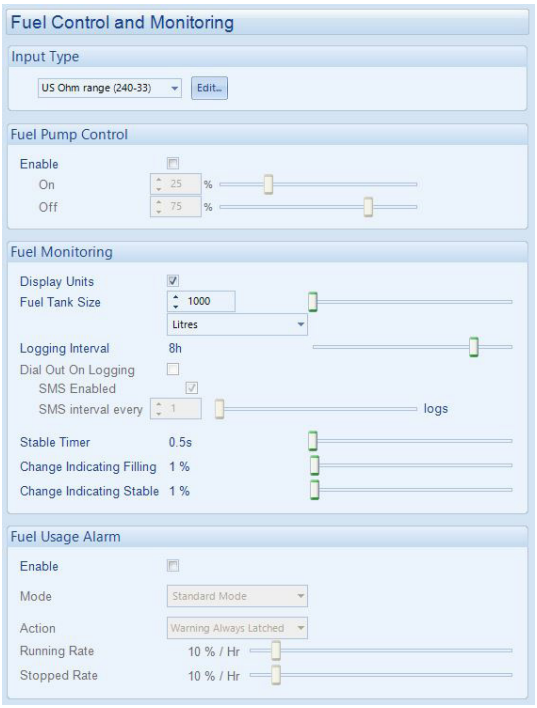
LOAD SHEDDING CONTROL

- Allows for maximum of five load shedding steps.
- When the generator is about to take load, the configured number of the Load Shedding Control outputs at Start will energize. This is used to ensure the initial loading of the generator is kept to a minimum, below the Load Acceptance specification of the generator.
- The generator is then placed on load. The Load Shedding Control scheme begins.
- When the generator load exceeds the Load Shedding Trip level, the Trip Delay timer will start.
- If the generator load is still high when the timer expires, the first Load Shedding Control output energizes.
- When the generator load has been above the trip level for the duration of the timer, the 'next' Load Shedding Control output energizes and so on until all Load Shedding Control outputs are energized. When the generator load falls below the Load Shedding Return level, the Return Time starts.
- If the generator load remains below the Load Shedding Return level when the timer expired, the 'highest' Load Shedding Control output de-energizes. This process continues until all outputs have been de-energized.
- When the generator enters a stopping sequence for any reason, all the Load Shedding Control outputs de-energize at the same time as the generator load switch is signaled to open.



FUEL CONTROL

The DSE8610 can assist applications in providing a robust suite of fuel control and monitoring features. The DSE8610 can monitor the fuel level in a WINCO supplied tank or a customer supplied tank using a resistance style fuel level sender. Based upon this fuel level monitoring more advanced fuel control is configurable.



MANUAL & AUTOMATIC FUEL PUMP CONTROL

- Becomes active when the fuel level falls below the fuel pump control on setting and is normally used to transfer fuel from the bulk tank to the day tank.
- If the output is already active it becomes inactive when the Fuel level is above the Fuel Pump Control OFF settings.
- A digital output configured for Fuel Pump Control energizes when the fuel level falls below the configured On setting and de-energizes when the fuel level exceeds the configured Off setting.

FUEL LEVEL ALARMS

- Low fuel level is set as a warning.
- High fuel can be set.

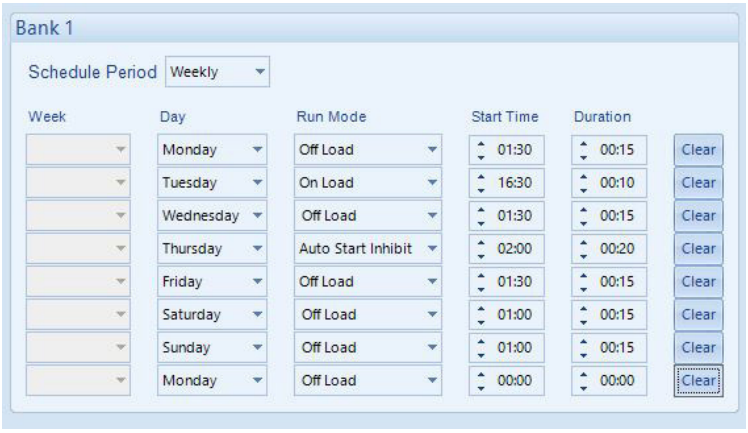
FUEL USAGE MONITOR

- Generators running unattended in remote sites are at risk to have fuel stolen.
- The generator can have an alarm set for whenever it uses more fuel than a set tank percentage when stopped and when running alerting the generator set owner to potential losses.

SCHEDULER

Some applications require the generator set to be started and to run for specific time durations. The DSE8610 is equipped with a robust scheduler capable of automatically starting and stopping the generator set. This feature can be used to power a process automatically at the start of a shift or to run an application with fixed on off cycles when a dry contact input isn't available. When used in a standby application it is best to test the automatic starting using the transfer switch start contact.

- The controller contains an inbuilt exercise run scheduler, capable of automatically starting and stopping the set or inhibiting the set from starting. Up to 16 scheduled (in two banks of 8) start/stop/inhibiting start sequences can be configured to repeat on a 7-day or 28-day cycle.



COMMUNICATION PORTS

Each DSE8610 controller is equipped with an RS232 and RS485 serial communications port. These ports can be configured to communicate with a variety of building control, PLC or telematics systems. The flexibility of the system allows building management and fleet operators to integrate the generator into their existing systems rather than requiring the generator to be monitored by a separate computer system. The port allows for the sharing of all of the engine and generator information, alarms and controls to the remote device.

- The RS232 port on the controller supports the Modbus RTU protocol. RS232 is for short distance communication (max 15m) and is typically used to connect the controller to a telephone or GSM modem for more remote communications.
- The RS485 port on the series controller supports the Modbus RTU protocol. RS485 is used for point-to-point cable connection of more than one device (maximum 32 devices) and allows for connection to PCs, PLCs and Building Management Systems (to name just a few devices).
- RS232 and RS485 ports can be used simultaneously.

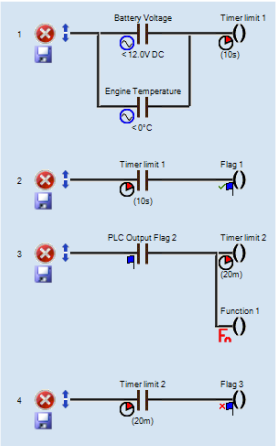
See WINCO document SP-228 for details on serial communication protocol.

INTERNAL PLC

The PLC programming allows functionality to be added to a DSE controller. The PLC takes existing functions in the controller and allows them to be tailored to suit a particular function.

Feature	DSE73xx MKII
Number Of Nodes	100
Counters	10
Timers	10
Plc Functions	20
User Plc Flags	20
Flag Test	✓
Flag Set, Reset, Drive, Toggle	✓
Calendar Test	✓
Instrumentation Test	✓
Button Press Test	✓
Import / Export Rungs	✓
Alarm Reset	✓
Label Space	1024
Editable Timer And Counter Names	✓

The PLC editor allows unique customization along with the necessary functionality that used to require external equipment to be controlled fully by the DSE8610. The example below is for a mobile unit which starts whenever the battery voltage gets low or the engine coolant temperature is too low. Once the unit starts it runs for a pre-determined amount of time and shuts back off waiting for the start signal.



Warning: It is the responsibility of the owner to verify that all PLC programs function as intended

DSENET EXPANSIONS

The DSENet allows for the connection of a variety of devices to increase the functionality of the generator control panel. This communication protocols operate on a separate net leaving the RS232 and RS485 free for communication with other devices.

DSE890WEBNET GATEWAY

- On-screen information presents real-time generator and system information.
- Location information can be provided by an external GPS antenna connected to the DSEWebnet gateway device.
- Designed for use on smart phones and tablet devices, the software has a fast response time so that you are able to monitor and control your DSE control module, anywhere in the world.
- You are able to view and control all modules that are connected to your DSEWebNet account.

DSE2510 MIMIC PANEL

- Copies the information on the control panel in a remote part of the building. Allows maintenance personnel to get current generator data without leaving the building.
- The remote display can be located up to a maximum of 1km away.
- The event log will record 250 events to facilitate easy maintenance, and an extensive number of fixed and flexible monitoring, metering and protection features are included.

DSE2548 LED OUTPUT EXPANSION MODULE

- 16 Configured LEDs. Works up to 0.6 miles away from host controller and up to 5 of these modules can be connected to host controller.
- Required for NFPA110 applications.

CONFIGURED LEDs:

- Over crank
- Low coolant temp
- High coolant warning
- High coolant alarm
- Low oil pressure warning
- Low oil pressure alarm
- Generator available
- Overspeed
- Low fuel
- Not in auto
- Battery over voltage
- Battery low voltage
- AC charge fail
- Common sender fail
- Emergency Stop
- Low coolant level

TYPICAL WIRING DIAGRAM