



## FEATURES

- **Micro-processor based design**
- **Automatic Engine Starting and Stopping with three start attempts and automatic crank disconnect**
- **Automatic Shutdown on fault condition**
- **High visibility LED indicators for Low Oil Pressure, High Engine Temp, Overspeed, Underspeed, fail to start, charge fail and two auxiliary LEDs**
- **Configurable via front panel**
- **Simple pushbutton controlled operation**
- **Configurable Digital Inputs**
- **Configurable Solid State Outputs**
- **Configurable Timer Settings**
- **Solid State Fuel and Crank outputs**
- **Load switch output capability**
- **External Remote Start input**
- **LED Alarm indication**
- **Integral tamperproof engine hours run counter**
- **Start DelayTimer**
- **Stop Delay Timer**
- **Energise to Stop timer**
- **Pre-heat Timer**
- **Over Speed Shutdown**
- **Optional Underspeed Protection**
- **Low Oil Pressure Shutdown**
- **High Engine Temp Shutdown**
- **Optional Crank Disconnect from Oil Pressure**

## DESCRIPTION

The 4110 is an engine auto start and protection module including integral LCD tamperproof engine hours run counter. It utilises advanced surface mount construction techniques to provide a compact, yet highly specified module.

Operation is via three pushbuttons mounted on the front panel with STOP, MANUAL and AUTO positions.

## OPERATION

**Stop mode** - This is used to stop the engine when it is running and to cancel 'Auto' mode. It is also used to reset any Shutdown Alarm conditions.

**Manual mode** - This mode is used to manually start and run the engine, which can then be stopped by pressing the Stop button.

**Auto mode** - This selects the automatic mode of operation, in which the module will await the remote start signal. Once received, the module will initiate its pre-configured Start Sequence, observing the start delay timer before starting the engine. When the remote start signal is removed, the module will initiate its pre-configured Stopping Sequence.

Parameter settings can be adjusted using the front panel pushbuttons once in Configuration Mode. Access to the settings is via a small 'Configuration Switch' on the rear of the module (see diagram overleaf), and enables changes to be made in the field. Selection of the Configuration Mode is indicated by rapid flashing of the 'Auto' LED.

The module is designed with DSE's proven experience and uses modern construction to provide a high level of reliability and suitability for the intended operating environment. Issues such as environmental compliance and EMC have been carefully engineered into the design. Advanced features such as protected solid state outputs mean that there are no moving parts or contacts to burn out.



## SPECIFICATION

### DC Supply:

8V to 35V Continuous.

### Cranking Dropouts:

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

### Max. Current:

150mA (12V), 250mA (24V)

### Typical Current

20mA (12V and 24V)

### Alternator Input Range:

75V (ph-N) to 277V (ph-N) 3 Phase 4wire AC (+20%)

### Alternator Input Frequency:

50 - 60 Hz at rated engine speed (Minimum: 75V AC Ph-N) (Crank Disconnect from 15V Ph-N @ 20Hz) Overspeed +14% (+24% overshoot) Underspeed -20%

### Start & Fuel Outputs:

1.2 Amp DC at supply voltage. Switches to battery negative when active.

### Auxiliary Outputs:

1.2 Amp DC at supply voltage. Switches to battery negative when active.

### Dimensions:

171mm x 115mm x 49mm (6¾" x 4½" x 2")

### Charge Fail:

12V = 8V CF 24V = 16V CF

### Operating Temperature Range:

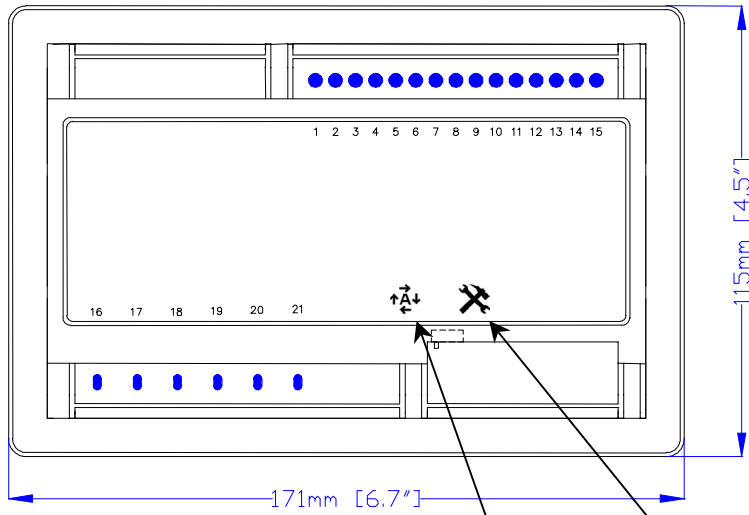
-30°C to +70°C

### Engine hours run counter:

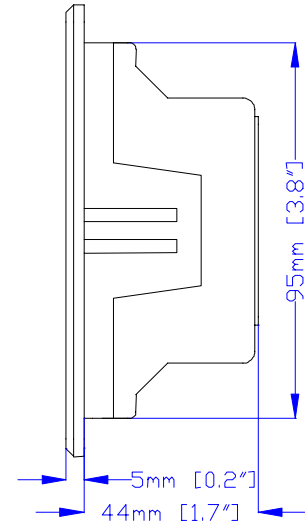
Tamperproof, LCD  
0 - 99,999.9 hours

*The 4100 series modules have been designed for **front panel mounting**. The module is fitted into the cutout, and is held with clips.*

## DIMENSIONS

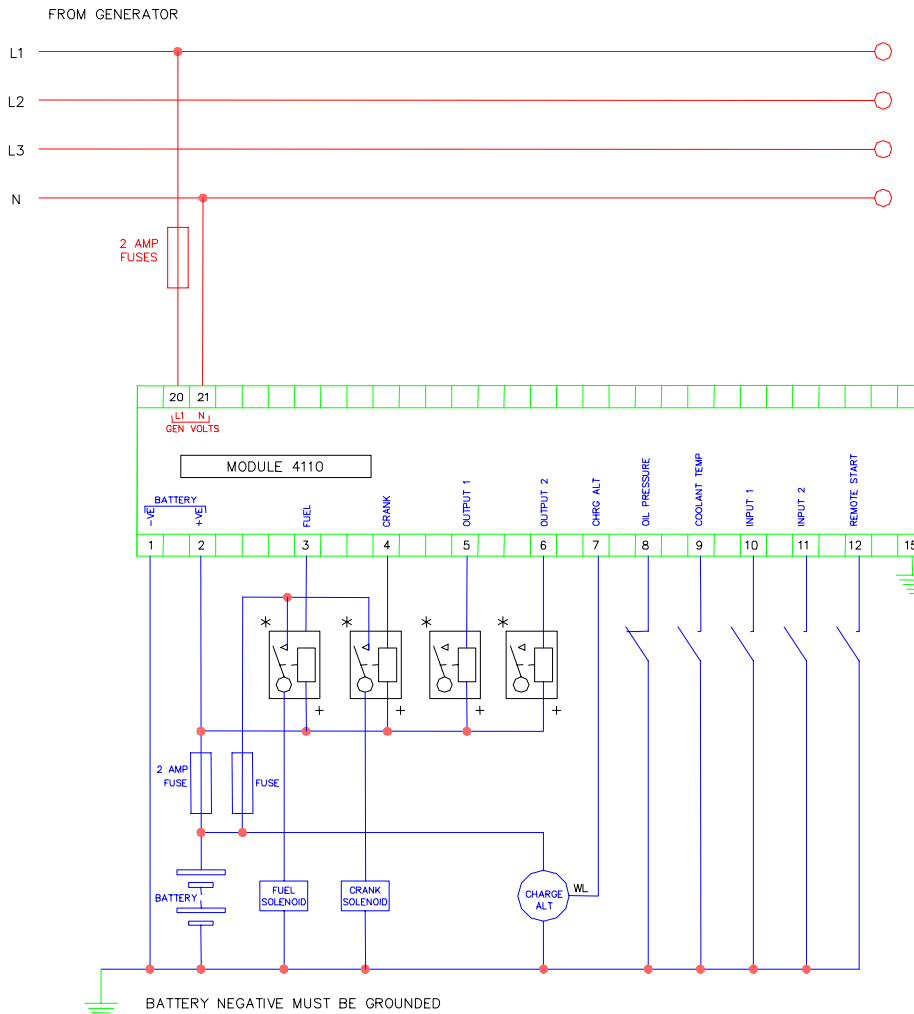


Configure mode selector switch position : Normal mode Configure mode



**Panel Cut Out :**  
154mm x 98mm (6.1 x 3.9")

## TYPICAL CONNECTIONS



BATTERY NEGATIVE MUST BE GROUNDED  
 TERMINALS SUITABLE FOR 22-16 AWG (0.6mm<sup>2</sup> - 1.3mm<sup>2</sup>) FIELD WIRING  
 TIGHTENING TORQUE = 0.8Nm (7lb-in)  
 \* NOTE. ALL THE OUTPUTS ARE SOLID STATE AND ARE NEGATIVE SWITCHING

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