

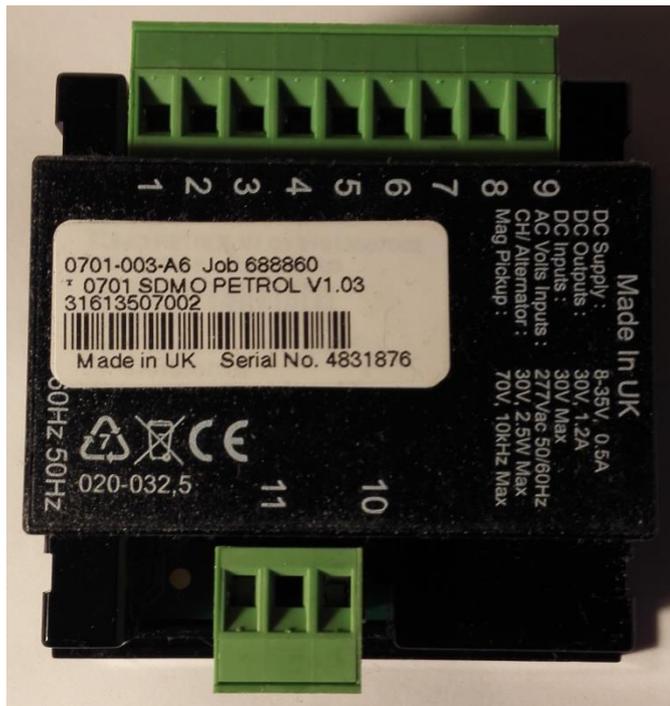


**SDMO MICS MODYS  
PETROL GENSET  
Controller 0701 003-A6 (APM202)  
OPERATORS MANUAL**



## SDMO MICS MODYS (APM202) PETROL

### 1.1 DIMENSIONS AND MOUNTING



#### 1.1.1 DIMENSIONS

72 mm x 72 mm x 38 mm

#### 1.1.2 PANEL CUTOUT

68 mm x 68 mm

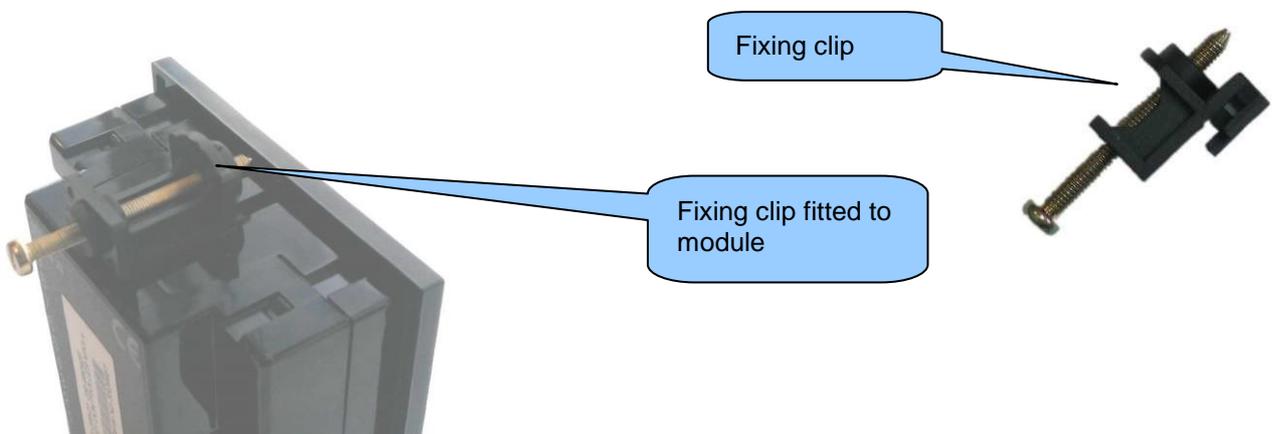
#### 1.1.3 WEIGHT

0.08 kg

#### 1.1.4 FIXING CLIPS

The module is held into the panel fascia using the supplied fixing clips.

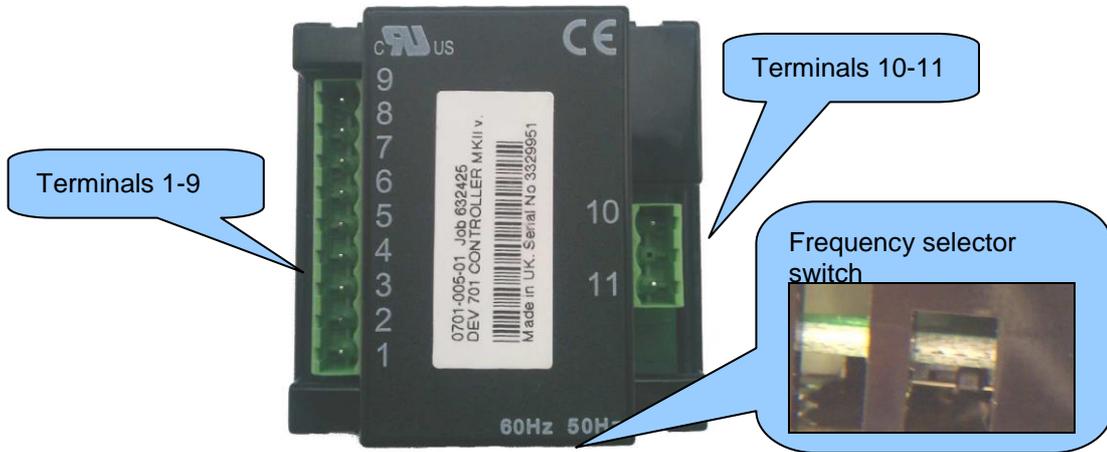
- Withdraw the fixing clip screw (turn anticlockwise) until only the pointed end is protruding from the clip.
- Insert the three 'prongs' of the fixing clip into the slots in the side of the module case.
- Pull the fixing clip backwards (towards the back of the module) ensuring all three prongs of the clip are inside their allotted slots.
- Turn the fixing clip screws clockwise until they make contact with the panel fascia.
- Turn the screws a little more to secure the module into the panel fascia. Care should be taken not to over tighten the fixing clip screws.



## 2 INSTALLATION

The DSE 0701 003-A6 controller is designed to be mounted on the panel fascia. For dimension and mounting details, see the section entitled *Specification, Dimension and mounting* elsewhere in this document.

### 2.1 USER CONNECTIONS



### 2.2 TERMINAL DESCRIPTION

#### 2.2.1 DC SUPPLY, FUEL AND START OUTPUTS

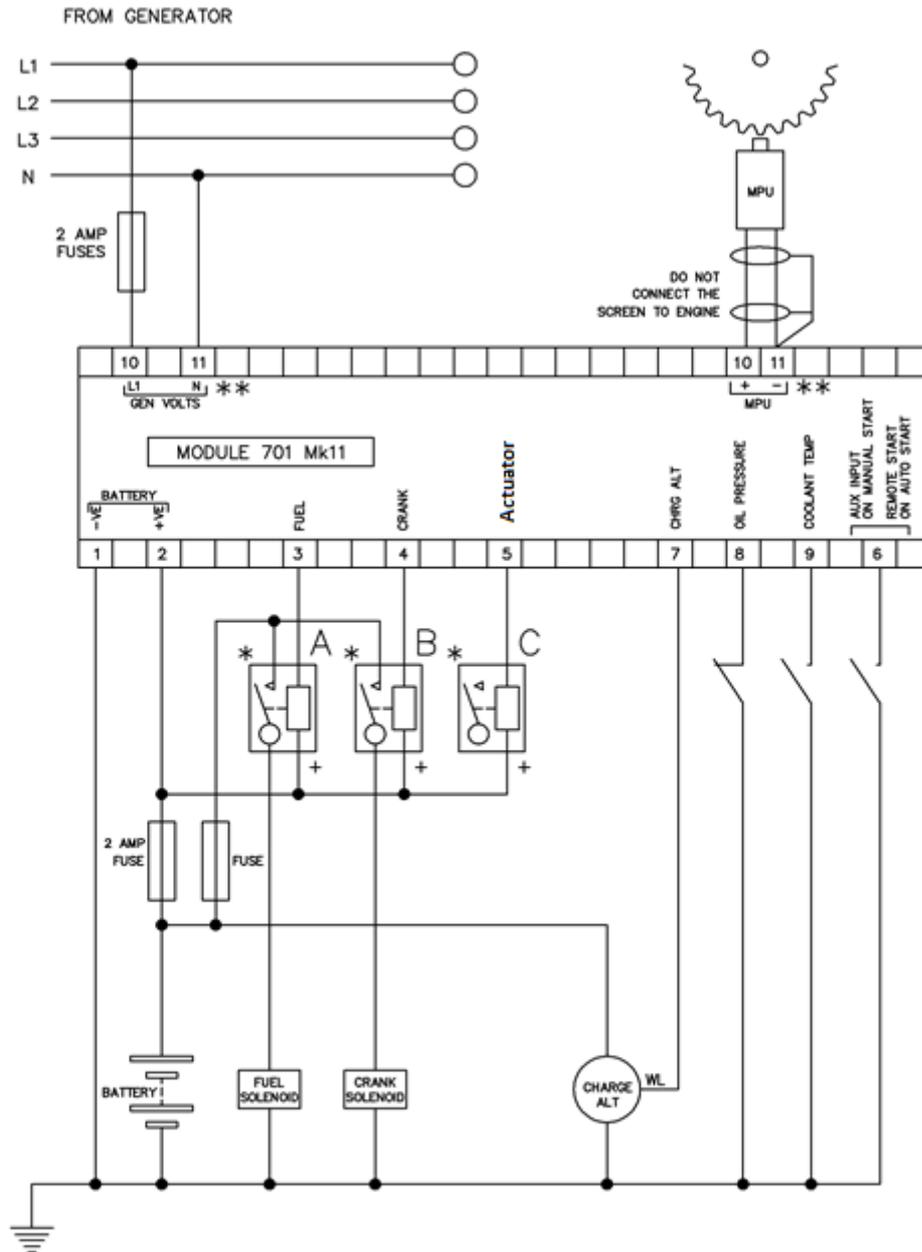
Icon	PIN No	DESCRIPTION	CABLE SIZE	NOTES
	1	DC Plant Supply Input (Negative)	1.0 mm <sup>2</sup> AWG 18	
	2	DC Plant Supply Input (Positive)	1.0 mm <sup>2</sup> AWG 18	(Recommended Maximum Fuse 15A anti-surge) Supplies the module (2A anti-surge requirement) and all output relays
	3	Output A (FUEL)	0.5mm <sup>2</sup> AWG 20	Plant Supply Negative from terminal 1 1.2 A rated.
	4	Output B (CRANK)	0.5mm <sup>2</sup> AWG 20	Plant Supply Negative from terminal 1 1.2 A rated.
	5	Output C (AIR ACTUATOR)	0.5mm <sup>2</sup> AWG 20	Plant Supply Negative from terminal 1 1.2 A rated.
	6	Remote start	0.5mm <sup>2</sup> AWG 20	Configurable Input
	7	Charge fail / excite	1.0mm <sup>2</sup> AWG 18	
	8	Oil Pressure	0.5mm <sup>2</sup> AWG 20	Connect to Oil Pressure Switch
	9	Coolant Temperature	0.5mm <sup>2</sup> AWG 20	Connect to Coolant Temperature switch
	10	Signal +	1.0 mm <sup>2</sup> AWG 18	Magnetic pickup Positive / Frequency Hz or RPM sensing
	11	Signal -	1.0 mm <sup>2</sup> AWG 18	Magnetic pickup Negative / Frequency Hz or RPM sensing

# SDMO MICS MODYS (APM202) PETROL

## TYPICAL WIRING DIAGRAMS

As every system has different requirements, these diagrams show only a TYPICAL system and do not intend to show a complete system.

Further wiring suggestions are available in the following DSE publications, available at [www.deepseapl.com](http://www.deepseapl.com) to website members.



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

\*\* NOTE. CONNECT EITHER MPU OR AC VOLTS FOR SPEED REFERENCE

## 2.3 DESCRIPTION OF CONTROLS

The following section details the function and meaning of the various controls on the controller.

### 2.3.1 DSE 0701 003-A6 KEYSWITCH CONTROLLER



ICON	DESCRIPTION	
	<b>OVERSPEED</b>	The engine speed has risen above the over speed pre alarm setting
	<b>ALARM CONDITION</b>	An external alarm condition has occurred. Example: Fail to Start
	<b>LOW OIL PRESSURE</b>	The controller detects that the engine oil pressure has fallen below the low oil pressure pre-alarm setting level after the <i>Safety On</i> timer has expired.
	<b>BATTERY UNDER VOLTAGE / BATTERY OVER VOLTAGE</b>	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
	<b>ENGINE HIGH TEMPERATURE</b>	The controller detects that the engine coolant temperature has exceeded the high engine temperature pre-alarm setting level after the <i>Safety On</i> timer has expired.
	<b>Air flap</b>	The led becomes illuminates when the Actuator air/configurable output is activate.

### 2.3.2 QUICKSTART GUIDE

This section provides a quick start guide to the controller's operation



### 2.3.3 CONTROLS

<p><b>Stop /Reset</b> This key switch position places the module into its Stop/Reset mode. This will clear any alarm conditions for which the triggering criteria have been removed. If the engine is running and the key switch is placed in Stop mode, the module will automatically de-energises the fuel output and the engine comes to a standstill. Should a <b>remote start signal</b> be present while operating in this mode, a remote start will not occur.</p>	<p><b>OFF</b></p>
<p><b>Run</b> This key switch position places the module into its RUN MODE. If the module has no input configured for a <b>remote start signal</b> this will place the module in the '<b>Manual</b>' mode. The preheat output will become active for the duration of the set time once placed in this position. If the module has an input configured for <b>remote start signal</b> this will place the module in the '<b>Automatic</b>' mode. To start the engine the input for <b>remote start signal</b> must be activated.</p>	<p><b>ON</b></p>
<p><b>Start</b> Pressing this button in RUN MODE with no <b>remote start signal</b> configured the engine will start and run.</p>	<p><b>START</b></p>

## 3 OPERATION

### 3.1 AUTOMATIC MODE OF OPERATION

Activate auto mode by turning the key switch to the **ON** position.

Auto mode will allow the generator to operate fully automatically, starting and stopping as required with no user intervention.

#### 3.1.1 WAITING IN AUTO MODE

If a starting request is made, the starting sequence will begin. Starting requests can be from the following sources:

- Activation of an auxiliary input that has been configured to *remote start*

#### 3.1.2 STARTING SEQUENCE

When the auxiliary input configured to *remote start* has been activated, the fuel relay is energised and if configured, the preheat output will become active for the configured time. Once the pre heat has finished the engine will be cranked. If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the

start sequence will be terminated ! **ALARM CONDITION LED** will start flashing.

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to the customers specification upon ordering but can be changed using the DSE Configuration Suite Lite PC Software in conjunction with the DSE813 USB Interface.

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed). After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

#### 3.1.3 ENGINE RUNNING

There is no indication on the module to depicted if the engine is running.

If all start requests are removed, the *stopping sequence* will begin.

#### 3.1.4 STOPPING SEQUENCE

As soon as the auxiliary input configured to *remote start* has been de-activated, the engine will stop instantly.

### 3.2 MANUAL OPERATION

Manual mode allows the operator to start and stop the set manually. Manual mode is active when the key switch is turned to the **ON** position.

As soon as the key switch is in the **ON** position, the Fuel Relay is energised and the Pre Heat Relay if configured will become energised for the configured time.

#### 3.2.1 WAITING IN MANUAL MODE

To begin the starting sequence, press the **START** button, the start sequence begins immediately.

### 3.2.2 STARTING SEQUENCE

The engine will start to crank.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *crank rest* duration after which the next start attempt is made. Should this sequence continue beyond the set number of attempts, the

start sequence will be terminated and the **!** **ALARM CONDITION** LED will start flashing. LED will start flashing.

When the engine fires, the starter motor is disengaged. Speed detection is factory configured to the customers specification upon ordering but can be changed using the DSE Configuration Suite Lite PC Software in conjunction with the DSE813 USB Interface.

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed). After the starter motor has disengaged, the *Safety On* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

### 3.2.3 ENGINE RUNNING

There is no indication on the module to depicted if the engine is running.

If the key switch is turned to the **OFF** position, the *stopping sequence* will begin.

### 3.2.4 STOPPING SEQUENCE

As soon as the key switch is turned to the **OFF** position, the engine will stop instantly.

## 4 PROTECTIONS

### 4.1 SHUTDOWN

A flashing LED indicates a shutdown alarm. Shutdowns are critical alarm conditions that stop the engine and draw the operator's attention to an undesirable condition.

Shutdown alarms are latching. The fault must be removed and the key switch turned to the **OFF** position to reset the module.

### 4.2 WARNING

A steady LED indicates a warning alarm. Warnings are non-critical alarm conditions and do not affect the operation of the generator system, they serve to draw the operators attention to an undesirable condition. Warning alarms are self-resetting when the fault condition is removed.

LEDs	Reason
<b>LOW OIL PRESSURE</b>	The engine oil pressure has fallen below the low oil pressure trip setting level after the <i>Safety On</i> timer has expired.
<b>ENGINE HIGH TEMPERATURE</b>	The engine coolant temperature has exceeded the high engine temperature trip setting level after the <i>Safety On</i> timer has expired.
<b>OVERSPEED</b>	The engine speed has exceeded the pre-set trip
<b>UNDERSPEED</b>	The engine speed has fallen below the pre-set trip after the <b>Safety On</b> timer has expired.
<b>BATTERY UNDER VOLTAGE / BATTERY OVER VOLTAGE</b>	The DC supply has fallen below or risen above the low/high volts setting level.

## 5 COMMISSIONING

### 5.1 PRE-COMMISSIONING

Before the system is started, it is recommended that the following checks are made:-

- The unit is adequately cooled and all the wiring to the controller is of a standard and rating compatible with the system. Check all mechanical parts are fitted correctly and that all electrical connections (including earths) are sound.
- The unit **DC** supply is fused and connected to the battery and that it is of the correct polarity.
- Make all checks on the engine and alternator as detailed by their respective manufacturer documentation.
- Check all other parts in the system according to the manufacturer documentation.
- Thoroughly review the configuration of the DSE controller and check that all parameters meet the requirements of your system.
- +To check the start cycle operation, take appropriate measures to prevent the engine from starting (disable the operation of the fuel solenoid). After a visual inspection to ensure it is safe to proceed, connect the battery supply. Turn the key switch into the **ON** position and then press the **START** button and the start sequence will commence.
- The starter will engage and operate for the pre-set crank period. After the starter motor has attempted to start the engine the explanation mark will illuminate.
- Restore the engine to operational status (reconnect the fuel solenoid). Turn the key switch to the **OFF** position and then to the **ON** and press the **START** button. This time the engine will start and the starter motor will disengage automatically. If not then check the engine is fully operational (fuel available, etc.) and the fuel solenoid is operating. The engine will now run up to operating speed. If not, and an alarm is present, check the alarm condition for validity, and check input wiring. The engine will continue to run for an indefinite period.
- Fully commission the engine/alternator and any other parts in the system as detailed in the respective manufacturer documentation. This could include load bank testing, load acceptance, breaker control and more

## 6 FAULT FINDING

SYMPTOM	POSSIBLE REMEDY
Unit is inoperative Read/Write configuration does not operate	Check the battery and wiring to the unit. Check the DC supply. Check the DC fuse.
Unit shuts down	Check DC supply voltage is not above 35 Volts or below 9 Volts Check the operating temperature is not above 70°C. Check the DC fuse.
Intermittent Magnetic Pick-up sensor fault	Ensure that Magnetic pick-up screen only connects to earth at one end, if connected at both ends, this enables the screen to act as an aerial and will pick up random voltages. Check pickup is correct distance from the flywheel teeth.
Low oil Pressure fault operates after engine has fired	Check engine oil pressure. Check oil pressure switch and wiring. Check configured polarity (if applicable) is correct (i.e. Normally Open or Normally Closed)
High engine temperature fault operates after engine has fired.	Check engine temperature. Check switch and wiring. Check configured polarity (if applicable) is correct (i.e. Normally Open or Normally Closed) .
Common fault operates	Check relevant switch and wiring of fault indicated by LED. Check configuration of input.
Fail to Start is activated after preset number of attempts to start	Check wiring of fuel solenoid. Check fuel. Check battery supply. Check battery supply is present on the Fuel output of the controller. Check the speed-sensing signal is present on the controller's inputs. Refer to engine manual.
Continuous starting of generator when in <b>RUN</b>	Check that there is no signal present on the "Remote Start" input. Check configured polarity is correct.
Generator fails to start on receipt of Remote Start signal.	Check signal is on "Remote Start" input. Confirm correct configuration of input  Check that the oil pressure switch is indicating low oil pressure to the controller. Depending upon configuration, then set will not start if oil pressure is not low.
Pre-heat inoperative	Check wiring to engine heater plugs. Check battery supply. Check battery supply is present on the Pre-heat output of controller. Check pre-heat configuration is correct.
Starter motor inoperative	Check wiring to starter solenoid. Check battery supply. Check battery supply is present on the Starter output of controller. Ensure that the Emergency Stop input is at Positive. Ensure oil pressure switch or sensor is indicating the "low oil pressure" state to the controller.
Controller appears to 'revert' to an earlier configuration	When editing a configuration using the PC software it is vital that the configuration is first 'read' from the controller before editing it. This edited configuration must then be "written" back to the controller for the changes to take effect.

 **NOTE:-** The above fault finding is provided as a guide check-list only. As the controller is configurable for a range of different features, always refer to the source of your controller configuration if in doubt.

## 7 MAINTENANCE, SPARES, REPAIR AND SERVICING

The DSE701 MKII controller is *Fit and Forget*. As such, there are no user serviceable parts within the controller. In the case of malfunction, you should contact your original equipment manufacturer (OEM).

## 8 WARRANTY

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

## 9 DISPOSAL

### 9.1 WEEE (WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT)

Directive 2002/96/EC

If you use electrical and electronic equipment you must store, collect, treat, recycle and dispose of WEEE separately from your other waste.



### 9.2 ROHS (RESTRICTION OF HAZARDOUS SUBSTANCES)

Directive 2002/95/EC: 2006

To remove specified hazardous substances (Lead, Mercury, Hexavalent Chromium, Cadmium, PBB & PBDE's)

Exemption Note: Category 9. (Monitoring & Control Instruments) as defined in Annex 1B of the WEEE directive will be exempt from the RoHS legislation. This was confirmed in the August 2005 UK's Department of Trade and Industry RoHS REGULATIONS Guide (Para 11).

Despite this exemption, DSE has been carefully removing all non RoHS compliant components from our supply chain and products.

When this is completed, a Lead Free & RoHS compatible manufacturing process will be phased into DSE production.

This process is almost complete and is being phased through different product groups.