Deep Sea Electronics Plc

600 Series CONTROL MODULES

MODEL 606 COMPREHENSIVE AMF MODULE

DESCRIPTION

The Model 606 is an **Automatic Mains Failure and Engine Control Module**, which has been designed to allow the OEM to meet most of the industry's complex specifications.

The module is used to automatically start the generator in the event of a mains failure, and transfer the load when the engines operating criteria are met, then stop the engine on mains restoration, indicating the operational status and fault conditions, automatically shutting down the engine and indicating the engine failure by means of an LCD display and flashing LED's on the front panel.

Selected operational sequences, timers and alarms can be altered by the customer (with suitable security passwords entered). Alterations to the system are made by using the RS232 interface and a PC or in a more limited way via the front panel pushbuttons.

This interface also provides real time diagnostic and (optional) **telemetry facilities** to monitor the operation of the system either locally or remotely via a modem. Full remote PC controlled operation of the module is also featured.

Operation of the module is via **pushbutton controls** (with security locking facility) mounted on the front panel with STOP/RESET, AUTO, TEST, ALARM MUTE, MANUAL and START pushbuttons. The pushbuttons feature 'selected' LED indications. Further pushbuttons provide LAMP TEST, LCD PAGE SELECT and DISPLAY SCROLL functions. Alterations to the module configuration can be made to limited degree using the front panel push-buttons in the absence of a PC in the field.

The 606 module provides **metering and alarm facilities** via the LCD display with the following instrumentation displays, access via the LCD PAGE SELECT push-button:-

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
Engine Oil Temperature
Engine Temperature
Plant battery Volts
Fuel Level
Engine Hours Run
Mains Volts L1-N, L2-N, L3-N
Mains Volts L1-L2, L2-L3, L3-L1
Mains Frequency Hz
Generator kVA L1,L2,L3, Total
Real Time Clock and Current Scheduled Exercise settings

Description continues overleaf...

FEATURES

- ☑ **Advanced Micro-processor based Design**
- ☑ **Automatic Engine Starting and Stopping**
- ☑ **Automatic Shutdown on Fault Condition**
- ☑ **Back-lit LCD Display**
- ☑ **PC Configurable via MS-Windows based software**
- ☑ **Provides Engine Instrumentation Gauges**
- ☑ **Provides Generator Output Instrumentation**
- ☑ **Provides Alarm and Status Information**
- ☑ **Simple Push-button Controlled Operation**
- ☑ **Remote telemetry and control via MS-Windows**
- ☑ **Modem Communications**
- ☑ **Configurable Digital Inputs**
- ☑ **Configurable Relay Outputs**
- ☑ **Configurable Timer Settings**
- ☑ **Configurable Alarm Trip Points**
- ☑ **Full Event logging and data capture facilities**
- ☑ **Audible and LED Alarm indication**
- ☑ **Pre-Alarm facility on monitored values**
- ☑ **Built in configurable Exercise Scheduler**
- ☑ **Mimic Diagram Status Display Panel**

DESCRIPTION - CONTINUED

The metering displays are supplemented further by **LCD display pages** covering operating status and alarms. The selected page is displayed :-
Status Page
Instruments Page (INS)
Alarm Page
Event Log Page
LED indication is provided for Telemetry Active, Remote Start, System Lock, Mains out of limits, Safety on, Fault warning, Electrical trip, Fault shutdown, Fail to start, Low oil pressure, High engine temperature, Under/Overspeed, Generator Under/Over volts and Emergency stop alarm.
Microprocessor control allows for **enhanced operation**, the module features a comprehensive list of timers and pre-configured sequences. This allows complex specifications to be easily met. Configurable expansion facilities are also provided .
The module accepts the following **digital inputs**;
16 Fully configurable warning or shutdown inputs
4 Analogue inputs re-configurable to read digital switches
Emergency Stop Input - A N/C DC positive input
With the exception of the Emergency Stop Input, these are configurable to be either N/C or N/O contacts connected the -Ve DC. The fully configurable auxiliary inputs are provided to give protection expansion or control extra functions. These can be selected to be warning or shutdown inputs either immediate or held off during start up.
Multiple alarm channels are provided to monitor the system including the following:-
Under/Over Generator Volts
Over-current
Under/Over Generator Frequency
Under/Overspeed
Charge Fail
Emergency Stop
Low oil pressure
High engine temperature
High oil temperature
High/Low Fuel with transfer pump control
Fail to Start
Low/High DC Battery Volts
Fail to stop
Reverse Power
Earth Fault
Mains out of limits
Loss of speed sensing and programmable inputs as selected.
First up alarm is indicated by an LCD Message, LED indication and Audible Alarm. Pre-alarms of the above shutdowns are also provided to give advance warning of faults.
Relay outputs are provided for Fuel Solenoid Output, Start Output, Load Transfer Control Outputs and eight configurable outputs. The configurable relay functions can be selected from a range of different functions, conditions or alarms. Six of the relays are N/O contact type, two are C/O contact type.

SPECIFICATION

DC Supply:
8 to 35 V Continuous.
Cranking Dropouts:
Able to survive 0 V for 50 mS, providing supply was at least 10 V before dropout and supply recovers to 5V. *This is achieved without the need for internal batteries.*
Max. Operating Current:
800 mA at 12 V. 390 mA at 24 V.
Typical Standby Current:
500 mA at 12 V. 260 mA at 24 V.
Typical Running Current:
580 mA at 12 V. 300 mA at 24 V.
Typical Sleep Current:
<1mA with no Datalog hardware fitted
12mA with Datalog hardware fitted
Alternator Input Range:
15 - 300 V ac RMS (Phase to Neutral)
Alternator Input Frequency:
50 - 60 Hz at rated engine speed.
Magnetic Pick-up Voltage Input Range:
0.5 V to 70 V Peak to Peak
Magnetic Input Frequency:62Hz to 10,000 Hz at rated engine speed.
Start Relay Output:
16 Amp DC at supply voltage.
Fuel Relay Output:
16 Amp DC at supply voltage.
Auxiliary Relay Outputs:
Relays 5-8: 8 Amp DC at supply voltage
Relays 1-4,9&10: 5 Amp DC at supply voltage
Dimensions:
298 X 216 X 105
Charge Fail / Excitation Range:
0 V to 35 V
Operating Temperature Range:
-15 to +55°C

The 600 series modules have been designed for **front panel mounting**. The module is fitted into the cut-out with the fixing clips removed. These are then fitted from the rear. Connection is via locking plug and socket connectors.

TELEMETRY

The 606 module provides the user with the option of full telemetry facilities via the Link 600 Software (optional). The module is accessed via it's RS232 port (No.2), this is either connected to the PC directly or via a suitable modem.

The optional PC software is MS-windows based and allows the operator to control the module from a remote location, operating the push-buttons and viewing the LCD and LED's in the same manner as a local operator.

The remote operator can also view the instrumentation, Alarm and Data log details, and the relay and input status. All access is password controlled so un-authorised operators cannot log onto the system.

The PC software also contains the off-line configuration editing software, this allow the user to change configuration parameters affecting the operation of the module with-out even leaving the office (via a suitable RS232/Modem link).

Additionally in the event of the module detecting an alarm condition, it will initiate a modem dial out to the host PC to inform the remote operator of the problem; giving identification of the module followed by the alarm event and the time and date of occurrence.

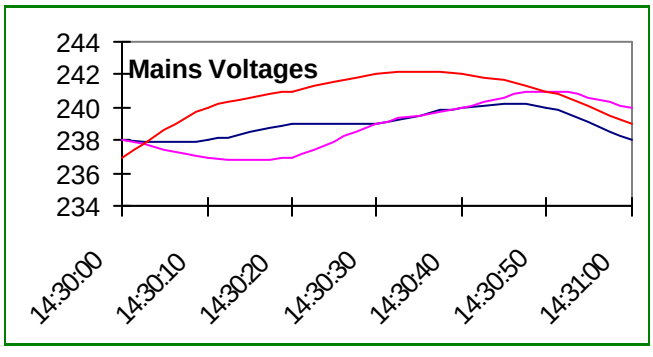
DATA LOG & EVENT CAPTURE

While the standard module features **event capture facilities**, accessing the module via the Telemetry link can provide the operator with a detailed **data log**. This allows the operator to closely monitor the performance of the generator and create trend logs etc.

Event Log:-

19
Apr 98 14:34:14

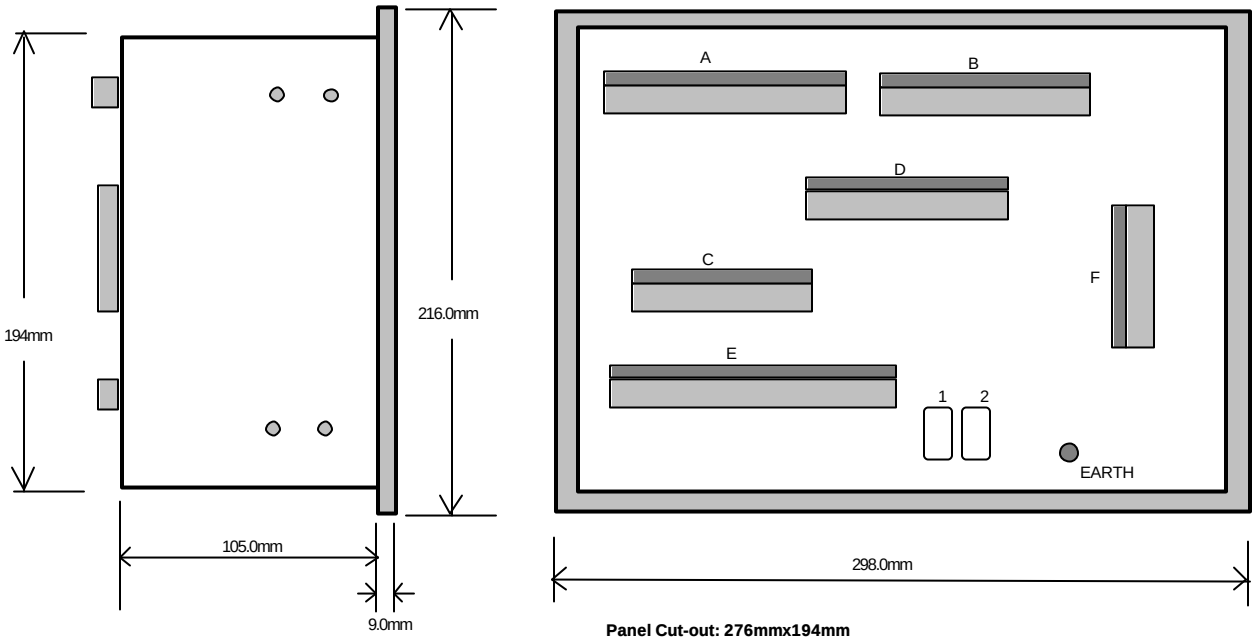
Data-Log:-



BUILT-IN FUNCTIONS

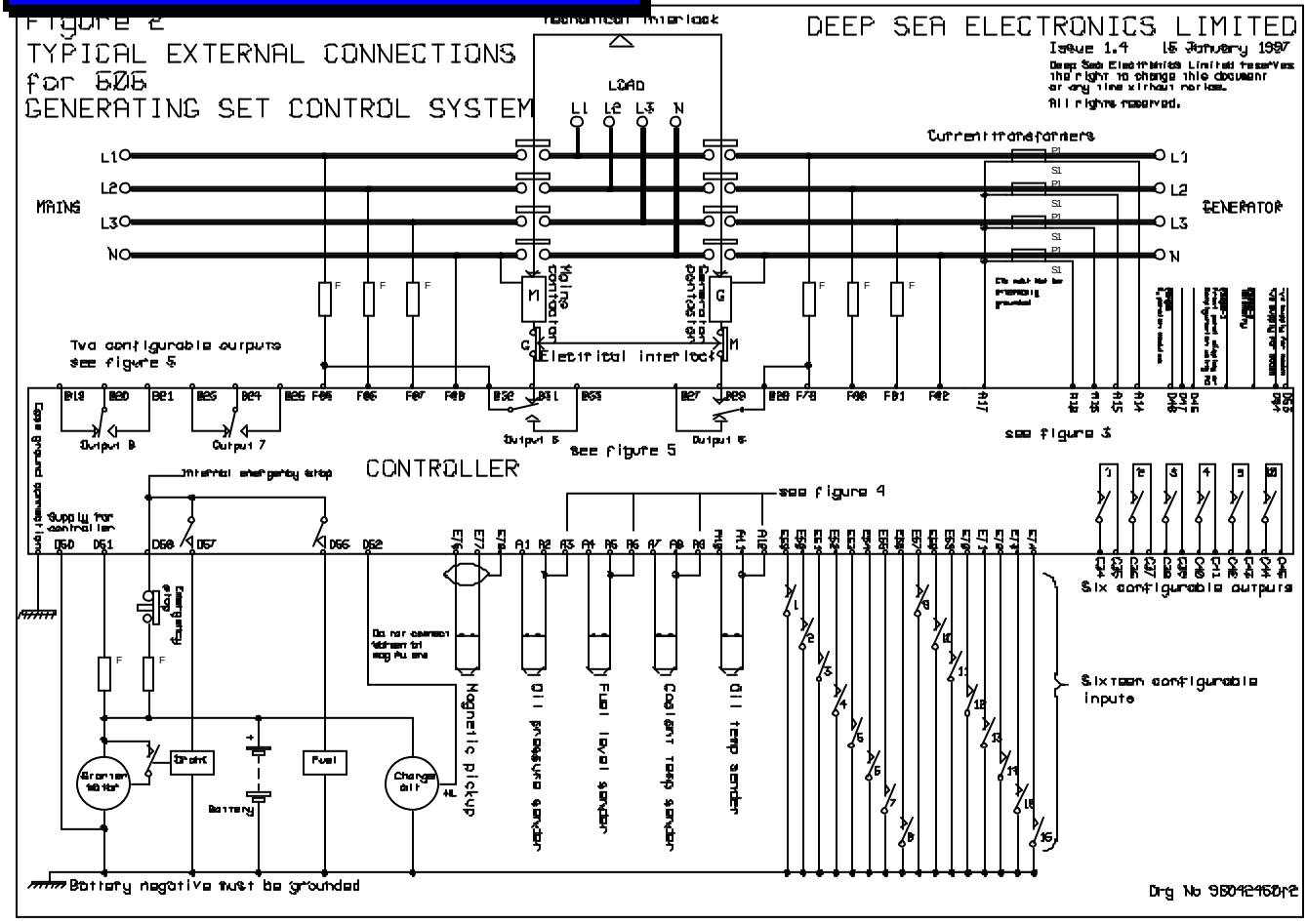
- ☑ **1 or 3 Phase Mains Under/Over Volts Detection**
- ☑ **1 or 3 Phase Mains Under/Over Frequency Detection**
- ☑ **Alternator Under/Over Volts Warning/Shutdown**
- ☑ **Alternator Under/Over Freq. Warning/Shutdown**
- ☑ **Under/Over Speed Warning/Shutdown**
- ☑ **Low Oil Pressure Warning/Shutdown**
- ☑ **High Coolant Temp Warning/Shutdown**
- ☑ **High Oil Temp Warning/Shutdown**
- ☑ **Low Battery Volts Warning/Pre-warning**
- ☑ **High Battery Volts Warning/Pre-warning**
- ☑ **Over-current Warning/Electrical Trip/Shutdown**
- ☑ **Reverse Power Warning/Electrical Trip/Shutdown**
- ☑ **Earth Fault Warning/Shutdown**
- ☑ **Low Fuel Level Warning/Transfer Pump On**
- ☑ **High Fuel Level Warning/Transfer Pump Off**
- ☑ **Start Delay and Mains Return Timer**
- ☑ **Pre-heat/Oil Pre-lube and Safety on timers**
- ☑ **Adjustable crank cycle/attempts**
- ☑ **Warm up and cooling Timers**
- ☑ **Contactor transfer delay and pulse timers**
- ☑ **In-built logic for Smoke Limit and Governor Gain**
- ☑ **External remote start input (On load/Off load)**
- ☑ **Manual Restore to mains function**
- ☑ **Auto start inhibit function**
- ☑ **System lock security function**
- ☑ **Alternator Volts/Freq. Trip Inhibit function**
- ☑ **Immediate Mains Drop-out Function**
- ☑ **Alternator Load inhibit Function**
- ☑ **Analogue Sender Fault Alarm**
- ☑ **Louvre and Air-flap control output**
- ☑ **Circuit Breaker or Contactor control capability**
- ☑ **Magnetic Pick-up or Alternator speed monitoring**
- ☑ **PC configuration (On-line or Off-Line)**
- ☑ **Event and Data Logging**
- ☑ **Full Remote Control and Telemetry via RS232**
- ☑ **Engine Instrumentation**
- ☑ **Alternator Output Instrumentation**
- ☑ **Mains Supply Instrumentation**

CASE DIMENSIONS



Panel Cut-out: 276mmx194mm

TYPICAL CONNECTIONS



Deep Sea Electronics Plc
Mountside Park, Queen Margarets Road,
Scarborough, YO11 2RH. ENGLAND
Tel:- +44 (0)1723 377566 Fax:- +44 (0)1723 354453 E-Mail:- sales@deepseaplc.com