GenControl.co.uk
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Development and manufacture of engine control modules

3 Attempt Automatic Petrol Engine Control Module   AECM105   **IP67 rated**

DESCRIPTION

The Model AECM105 is an Automatic Engine Control Module designed to automatically [remotely from an ATS panel] or/and manually start and stop a petrol generator engine (with auto choke). It will indicate the operational status and fault conditions, automatically shut down the engine and indicate the start engine failure by a flashing **START FAIL** LED on the front panel. Other faults are indicated by steady LED.

Operation of the module is via 2 position <u>maintained</u> switch [**RST**] mounted on a wall or any other suitable place with ON-OFF positions. Wireless control of the module is via key fob [optional].

START THE ENGINE

CONDITION: RST switch is closed

The ignition coil cut off relay R4 will energize breaking connection between terminals 12 and 11, the fuel relay R2 will energize connecting terminals 14 and 3, the starter relay R1 will energize for 5 sec connecting terminals 14 and 1. If the engine has not fired by the end of 1st attempt, the starter is turned off for a resting period of 10 sec. The sequence will then repeat up to a maximum number of start attempts. Following a successful start, (100~240V sensed on generator output via terminals 15 and 16), the start relay is de-energized and latched out to prevent reengagement of the starter with the engine running.

STOP THE ENGINE

CONDITION: RST switch is open.

Stop sequence: the fuel relay R2 will de-energize, the ignition cut off relay R4 will de-energize and reinstate the link between terminals 12 and 11 making generator to stop.

WIRELESS CONTROL UP TO 100M [optional]
*CONDITION: **RST** switch is open*

Make sure there are no metal doors/walls/other metal shields between you and controlled module. Any metal or brick wall can significantly reduce the working distance.
Press "A" button on a key fob for 1 sec and release it. The generator should try to start within a few seconds. If your generator doesn't respond - try to come closer to the receiver- AECM105.
To stop the engine-press "B" button.

IMPORTANT!

The starter relay [R1] can only energize for 2nd and 3rd crank cycle if "Engine Running" state is not sensed via 15 and 16 input [AC alternator frequency analysing], to confirm that the engine is stationary.

Please make sure that terminals 15 and 16 are always connected to AC alternator (generator AC output).

Relay outputs are provided for:

- Fuel Solenoid output [R2]
- Starter Motor output [R1]
- Ignition coil cut off output [R4]

The relays R2 and R1 supply positive plant supply out.

Configurable inputs are available for:

- Low Oil Pressure (optional). Also used to indicate "Low Fuel" when generator stops upon not sensing AC frequency.
- High Engine Temperature.
- Wired Remote Start.
- AC alternator monitor.
- Emergency Stop input to give protection expansion.

Multiple alarm channels are provided to monitor the following:

- Low oil pressure [**LOW OIL** LED] optional
- High engine temperature [**HET/GL** LED]
- Fail to Start [**ST FAIL** LED]
- Emergency stop button [**E STOP** LED]

The AECM105 series modules have been designed for a wall mounting in sealed to IP67 ABS enclosure.

AECM105 Technical Data [default settings]

DC Supply: generator battery 12VDC/24VDC (6…40Vdc)
Max. Standby Current: 10 mA @ 12 V
Alternator Input Range: 300 VAC max
Number of attempts: 3 (user-configurable prior to order)
Crank duration: 5 sec (user-configurable prior to order)
Pause between each attempt: 10 sec (user-configurable prior to order)
Hold-off timer* set for: 7 sec (user-configurable prior to order)
Starter relay output: 10A max
Fuel solenoid output 10A max
Ignition coil cut off relay output: 10A max
Dimensions: 158x90x65mm
Operating Temperature Range: -30 to +70°C.
Humidity Range Operating: 20 - 80% (non-condensing)

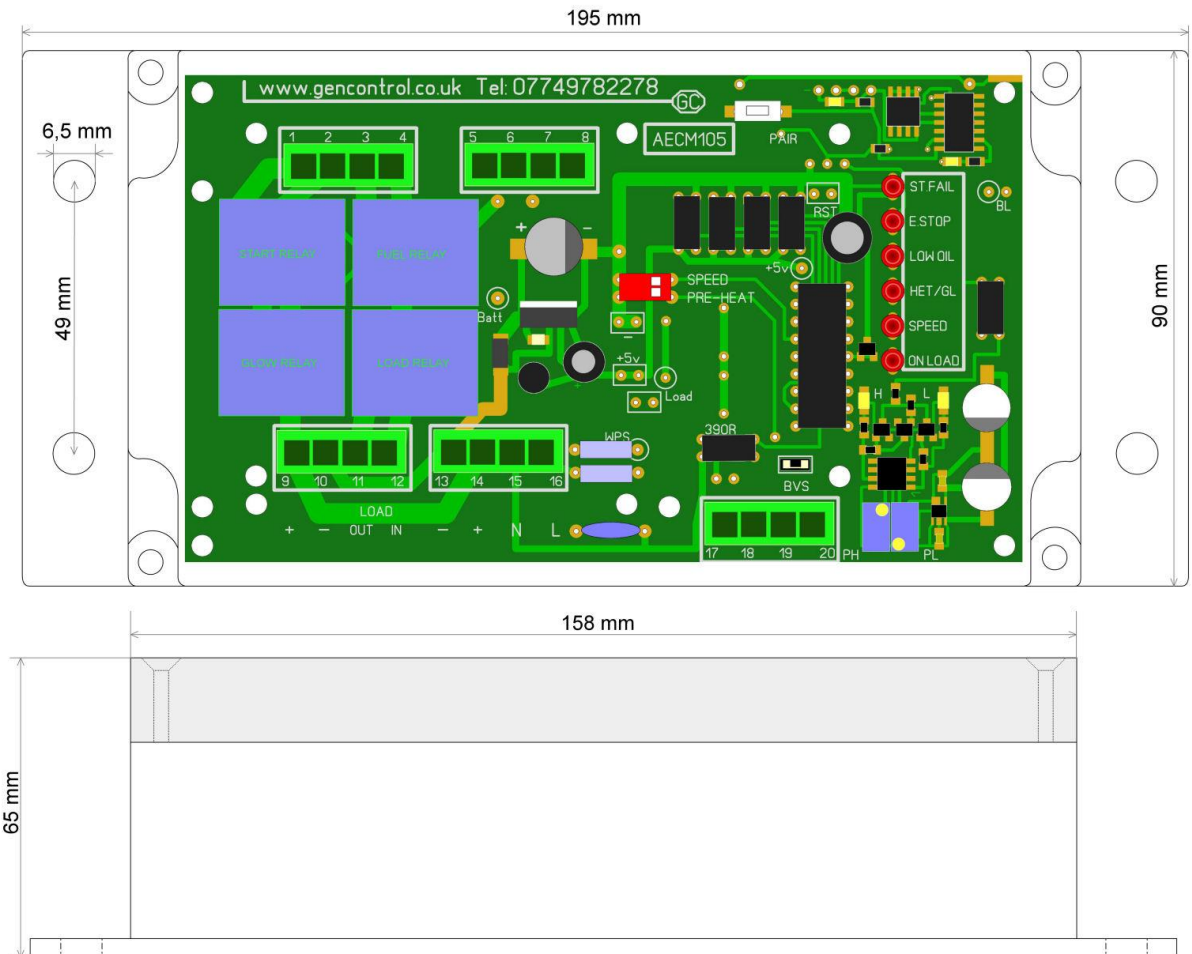### Wireless transmitter/receiver specification

Receiver: internally fitted pcb.
Transmitter/Receiver working frequency: 315/433Mhz
Number of channels: 2
Encoding type: fixed code
Receiver sensitivity:>-105dB

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* During engine cranking and for a short time afterwards the protective hold-off timer is active and the relevant alarms inputs are inhibited. This enables the engine to start and achieve normal running conditions. Once the timer has expired, the inputs are enabled providing normal protection from the module.
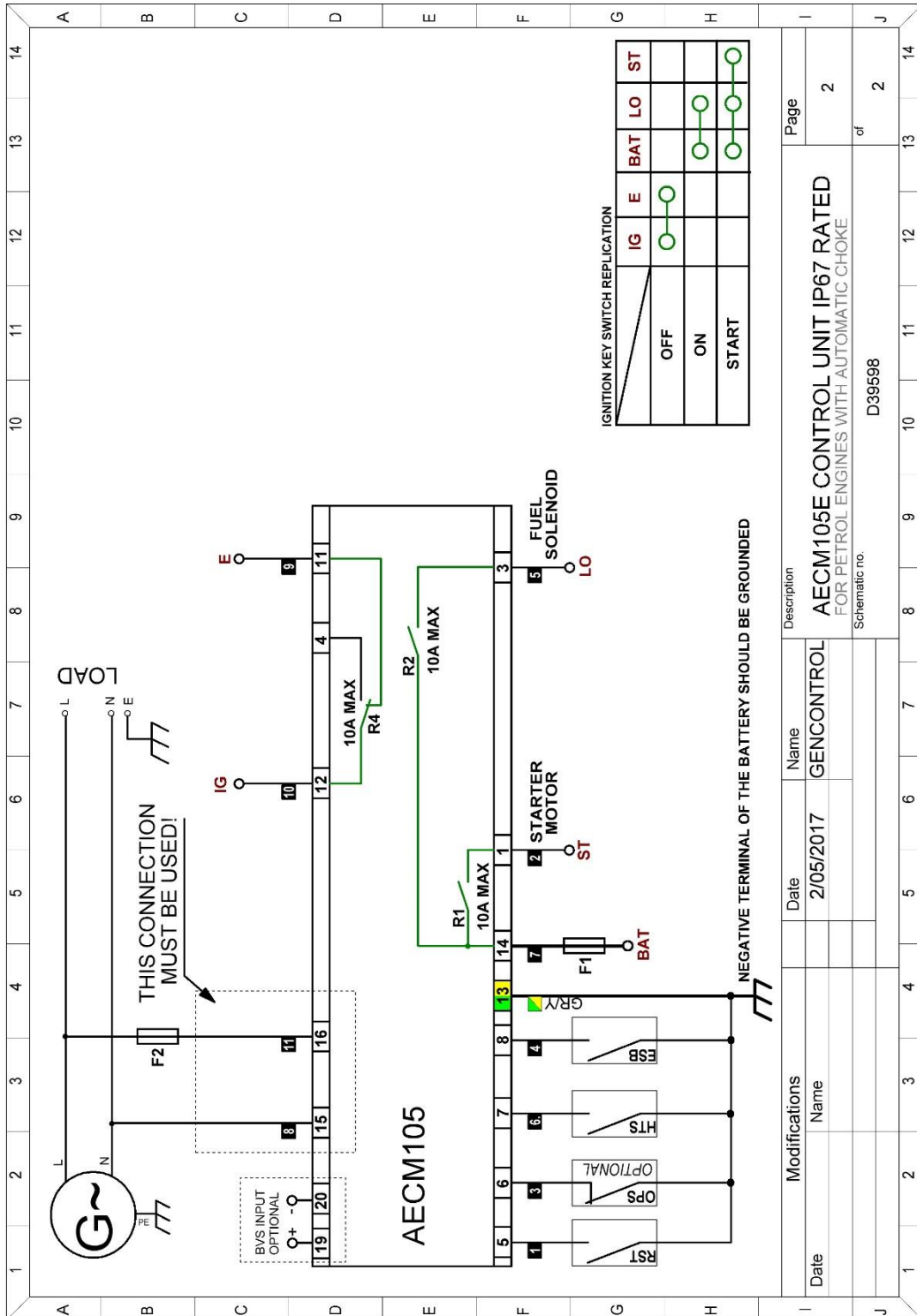
AECM105 for Petrol Powered Engine/ generator

Dimensions

Wiring Diagram

IGNITION KEY SWITCH REPLICATION

	IG	E	BAT	LO	ST
OFF					
ON					
START					

LOAD

THIS CONNECTION MUST BE USED!

AECM105

FUEL SOLENOID

STARTER MOTOR

NEGATIVE TERMINAL OF THE BATTERY SHOULD BE GROUNDED

Description		AECM105E CONTROL UNIT IP67 RATED		Page	2
		FOR PETROL ENGINES WITH AUTOMATIC CHOKE			
		Schematic no.	D39598	of	2

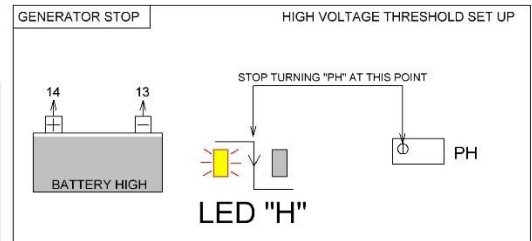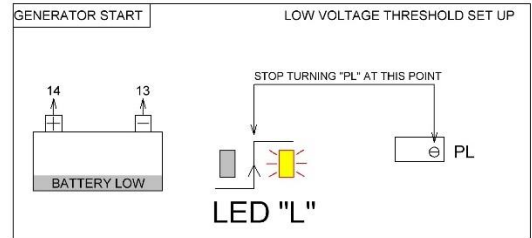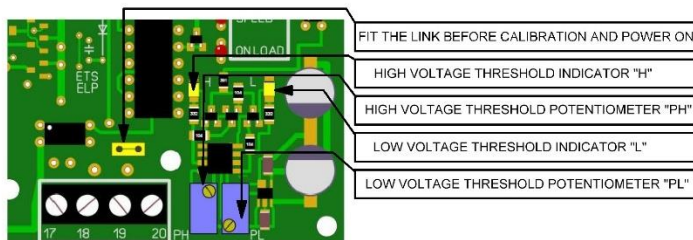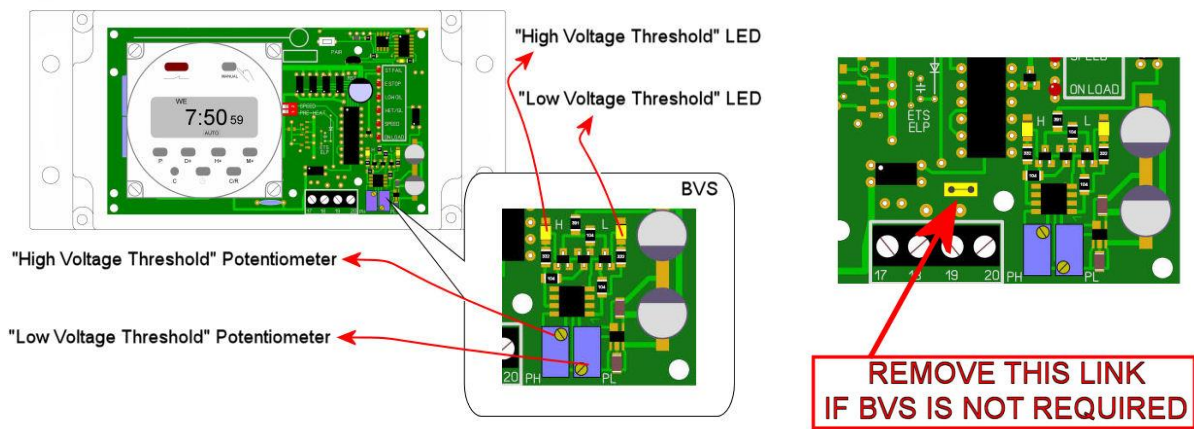| Modifications			Name	GENCONTROL	
Name		Date			
Date		2/05/2017			

BVS (optional)

The BVS (Battery Voltage Sensor) allows the AECM (Automatic Engine Control Module) to start and run the engine automatically when your engine starting battery is ready to be charged. The BVS monitors two voltage thresholds: Low Voltage Threshold (LVT) and High Voltage Threshold (HVT). When controlled voltage becomes equal to LVT the BVS tells the AECM to start and run the engine until it measures the HVT. Please note that BVS usually controls the engine starting battery voltage which is also a power supply to the AECM105. Should you wish to control an independent battery (not an engine starting battery!) please contact us prior to order. In this case terminals #19 and #20 become available for you. The BVS input is designed to control DC voltage from 6Vdc to 30Vdc max. and we can pre-set your specific voltage HVT and LVT for you. This BVS enabled control module comes with following BVS thresholds:

Start the engine @ 11.8 Vdc (23.6Vdc for 24V battery)

Stop the engine @ 13.8 Vdc (27.6Vdc for 24V battery)

Please note: you can always re-calibrate these thresholds on-site.

"High Voltage Threshold" LED
"Low Voltage Threshold" LED
"High Voltage Threshold" Potentiometer
"Low Voltage Threshold" Potentiometer
BVS

REMOVE THIS LINK IF BVS IS NOT REQUIRED

FIT THE LINK BEFORE CALIBRATION AND POWER ON
HIGH VOLTAGE THRESHOLD INDICATOR "H"
HIGH VOLTAGE THRESHOLD POTENTIOMETER "PH"
LOW VOLTAGE THRESHOLD INDICATOR "L"
LOW VOLTAGE THRESHOLD POTENTIOMETER "PL"

GENERATOR START   LOW VOLTAGE THRESHOLD SET UP
14   13
BATTERY LOW
STOP TURNING "PL" AT THIS POINT
PL
LED "L"

GENERATOR STOP   HIGH VOLTAGE THRESHOLD SET UP
14   13
BATTERY HIGH
STOP TURNING "PH" AT THIS POINT
PH
LED "H"

NOTE

It is advisable to use an adjustable DC power supply unit (0V to 30V adjustable voltage output), instead of real battery to speed up the process of calibration.

HOW TO SET UP THE BVS LOW THRESHOLD

Disable AECM105 by applying Emergency Stop Button "ESB".
This prevents the engine from accidental start up during calibration process of BVS
Connect your discharged (ready to be charged) engine starting battery to terminals #13 (wire GR/Y) and #14 (wire 7)
Start turning "PL" (very slowly) clockwise/anticlockwise* until LED "L" changes its state from OFF to ON
Stop turning immediately when you notice this change.

HOW TO SET UP THE BVS HIGH THRESHOLD

Connect your fully charged engine starting battery to terminals #13 (wire GR/Y) and #14 (wire 7)
Start turning "PH" (very slowly) clockwise/anticlockwise* until LED "H" changes its state from ON to OFF
Stop turning immediately when you notice this change.
Enable AECM105 by switching off Emergency Stop Button.

The accuracy of these adjustments could be as good as ±0.1 V
*Note: the direction of turning depends on previous threshold settings and is usually clockwise, however sometimes it needs to turn anti-clockwise.

Q1: Which way do I need to turn the pot?

A: To increase your high voltage threshold- turn the pot "PH" anticlockwise.
To increase your low voltage threshold-turn the pot "PL" clockwise.

For instance: your current low voltage threshold is 11.8Vdc. You would like to change it to 12.5Vdc. Discharge your battery down to 12.5Vdc, disable AECM via Emergency Stop Button, connect your battery to terminals 13 and 14 (wires #GR/Y and #7), start turning "PL" clockwise until you see the LED"L" switched On, stop turning "PL" immediately when you notice this change. Enable AECM via Emergency Stop Button.

Q2: How many turns these potentiometers have?
A: Up to 30 turns.