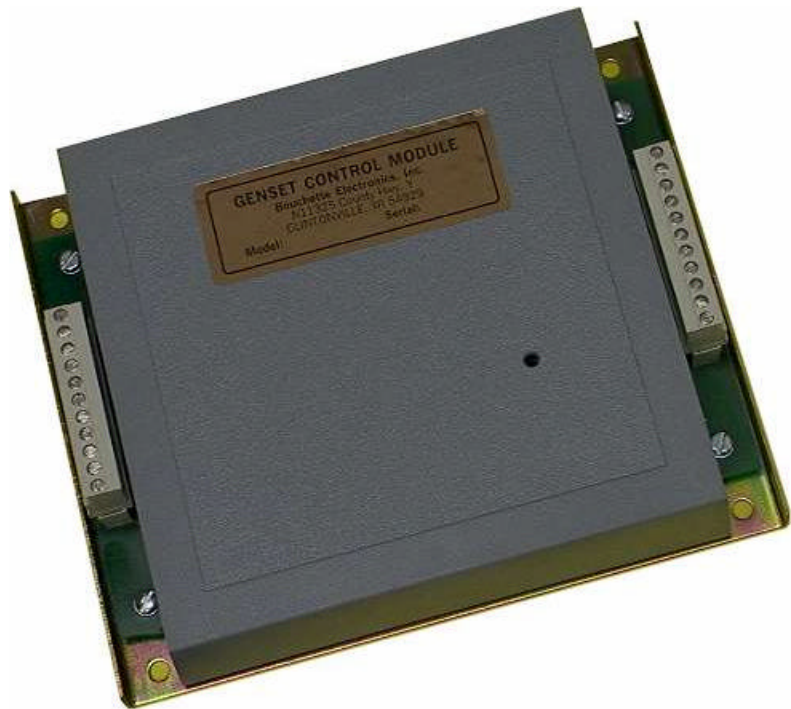


GENSET CONTROL MODULE—LEVEL 1

A121C2M2 / A241C2M2

Features:

- Models for both 12V and 24V systems.
- One model for both spark ignition and diesel engines.
- 4-alarm light outputs with lamp-test provisions.
- Starting mode: single-cycle crank limiter.
- User selectable time delays for engine start and oil pre-circulation.
- Loss of speed signal protection for crank motor circuit.
- Special logic permits re-starting of hot engine.
- Pluggable terminal blocks for ease in installation.



General Description:

The Genset Control Module is a microprocessor based control system which provides complete automatic control of standby generator set engines. Fuel solenoid and/or ignition control and cranking control are via heavy duty industrial type relay contacts. Engine temperature, crank disconnect speed, overspeed, and oil pressure monitoring are obtained from engine mounted sensor contacts. Pre-circulation of oil and/or fuel before engine start is provided (if used) by a pilot relay control contact.

A121C2M2 / A241C2M2 Specifications

Input Voltage: Model A121C2M2: 12VDC nominal, 16VDC max; transient and reverse polarity protected. (Typical: Pickup at 10VDC, Dropout at 6VDC.)
Model A241C2M2: 24VDC nominal, 32VDC max; transient and reverse polarity protected. (Typical: Pickup at 14VDC, Dropout at 9VDC.)

Supply Current: 0.4A maximum plus alarm light burden.

Relay Load Contacts: FS & CS: 10A at 28VDC, inductive; AR: 2A at 28VDC, resistive.

Alarm Light Load: 150mA maximum each output (incandescent inrush is permitted.)

Shutdown Input Contacts: 3 (See operating instructions for start-up override times.)
Overspeed: (normally open; closed on fault.)
Low Oil Pressure: (open while engine is running; closed at rest or at fault.)
Hi Water Temperature: (normally open; closed on fault.)

Engine Crank Disconnect Speed Input Contact: Frequency: 1
Crank Disconnect: (open at zero speed; closed above crank disconnect speed.)

Crank Control: Single-cycle crank limiter: continuous 48 sec. crank period (non-adjustable.)

Time Delay (optional): Delay on start from remote signal: 10 seconds (non-adjustable.)

Shielding: Internal EMI shielding provided.

Ambient Temperature: -25° F to +140° F

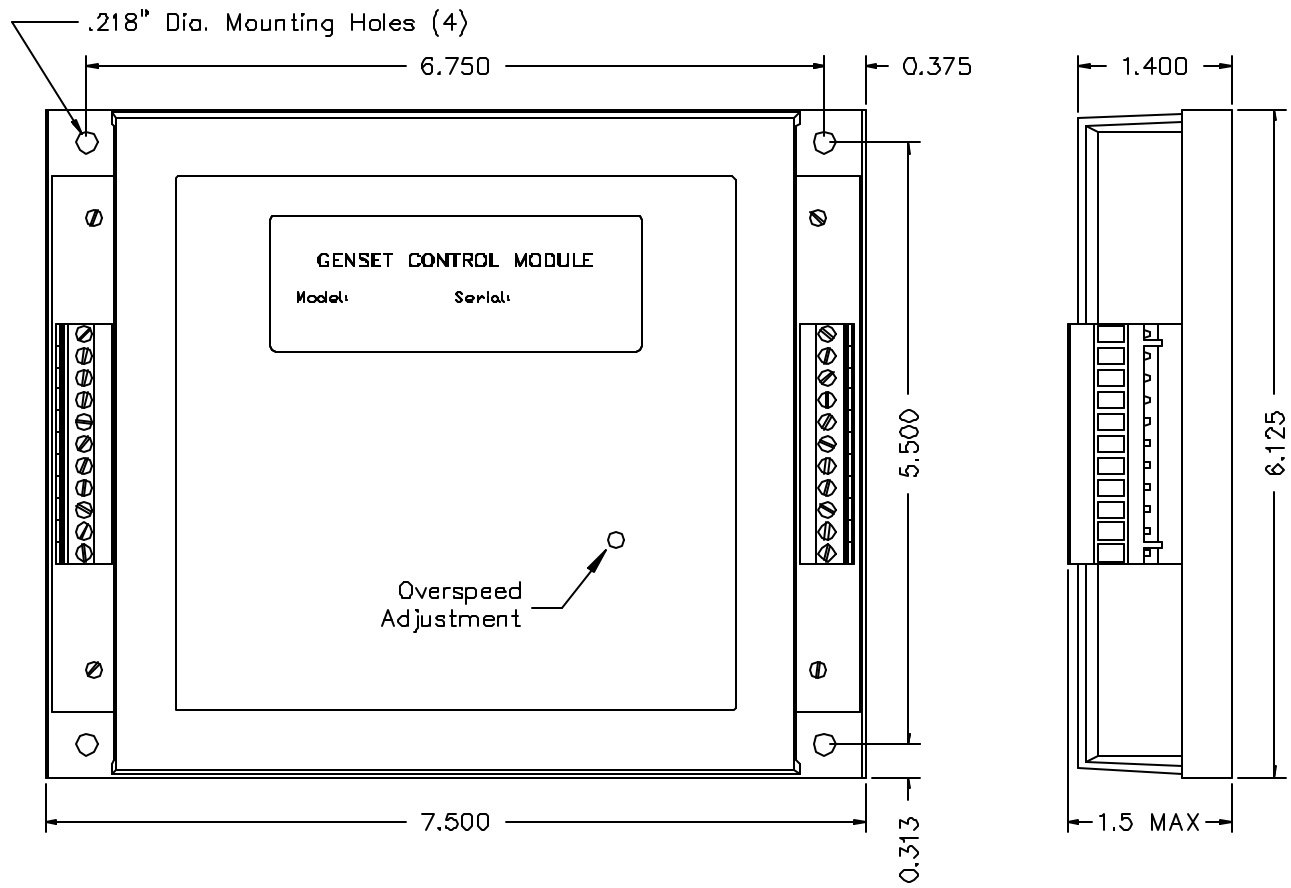
Finish: PC Board: Protected with moisture/fungus proof varnish.
Chassis: Zinc plated / yellow dichromate.
Cover: ABS plastic.

Terminal Blocks: Industrial vertical plug-in type header for ease in installation.

Bouchette Electronics, Inc.

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A121C2M2 / A241C2M2 Dimensions



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GENSET CONTROL MODULE — LEVEL 1

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Control Switch Inputs

The following operator panel controls are wired into the microprocessor through the front-mounted terminal blocks:

1. Run/Stop/Auto Switch.

a. “Run” position causes the engine to start and run immediately.

b. “Auto” position allows the unit to be controlled via any remote single-pole dry-type contact (transfer switch, remote start switch, etc.). Contact closure causes the unit to start and run, while contact opening causes the unit to shut down. *Also see Time Delay Select for time delay options.*

c. “Stop” position de-energizes the control module for immediate shutdown.

2. Lamp Test Push-Button.

Energizes all alarm lights simultaneously. This feature is disabled with the Run/Stop/Auto selector switch in the “Stop” position, and has no other effect on unit operation.

Relay Functions

1. Master Control Relay (FS).

Operates the fuel solenoid, etc.

2. Cranking Control Relay (CS).

Controls engine cranking functions.

3. Auxiliary Relay (AR).

Provides contact (2-amp. maximum) for pilot control of remote oil (or fuel) pump .

Safety Shutdown Inputs

1. Low Oil Pressure (LOP) Shutdown.

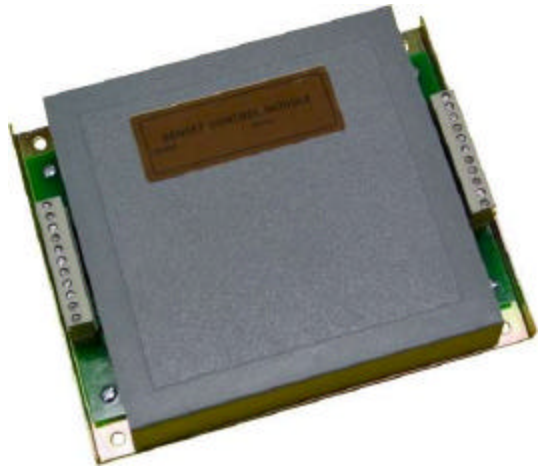
Monitoring of oil pressure begins 12-seconds after the unit starts and remains in effect until the unit is shut down. Except as noted, closure of this contact while engine is running results in an engine fault shutdown with light indication. The LOP signal is derived from an oil pressure sensor switch mounted on the engine.

2. High Water Temperature (HWT) Shutdown.

The engine coolant temperature sensor monitoring begins immediately with the start signal. However, if the water temperature is excessive prior to start, (i.e., heat soak after shutdown), the unit is permitted to start and the high temperature condition is permitted to exist for up to 60-seconds after the unit is running, before an engine fault shutdown with light indication occurs. If the high temperature condition is corrected within that time period, the microprocessor circuit reverts to normal monitoring. Except as noted, closure of this contact while engine is running results in an engine fault shutdown with light indication. The HWT signal is derived from a temperature sensor switch mounted on the engine.

3. Overspeed (OS) Shutdown.

Monitoring of overspeed input begins immediately with the start signal, and remains in effect until the unit is shut down. Closure of this contact while the engine is running results in an engine fault shutdown with light indication. The OS signal is derived from the contact of a speed switch which is located on the engine.



Cranking Control

1. Overcrank (OC) Protection.

This feature provides a single, non-adjustable, crank period of 48-seconds. Failure of the engine to start within that time results in an “overcrank” engine fault shutdown with light indication.

2. Engine Crank Disconnect Contact.

The cranking termination speed is obtained from the contact of a speed switch which is located on the engine.

Internal protection against loss of engine speed is programmed in after the unit has started normally. In the event the speed signal indicates the engine has stopped running (via an open crank disconnect contact), the unit will be shutdown with an “overcrank” light indication.

Time Delay Select

Delay-On-Start timing feature: The control module may be field-converted to include this feature by grounding the “TDI” terminal on the control. This feature will energize the auxiliary relay (AR) and delay the start-up of the engine for 10-seconds after the Run Contact is closed. The start delay is intended to allow a remote oil pump and/or fuel pump to pre-circulate oil (or fuel) in the engine prior to engine cranking.



Caution: “Overcrank” indication can mean a loss of frequency input signal during the previous run period. Attempting to re-start the engine without any frequency input signal can destroy the starter motor, which can cause serious personal injury. The frequency signal source is a key component in this system and must be checked out thoroughly whenever an “overcrank” shutdown occurs, since the control module only provides an indication of loss of signal during startup.

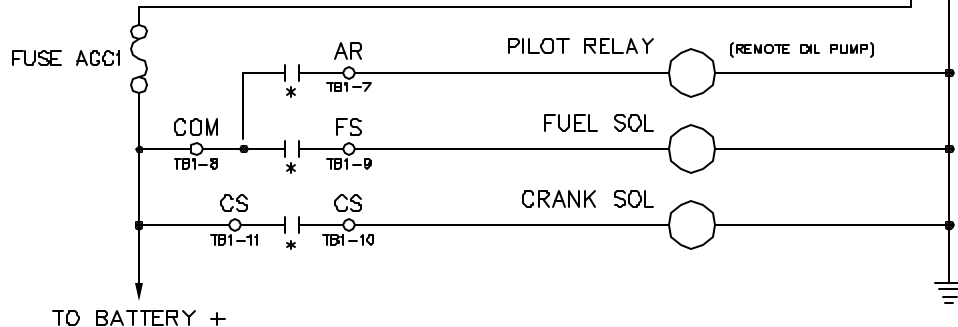
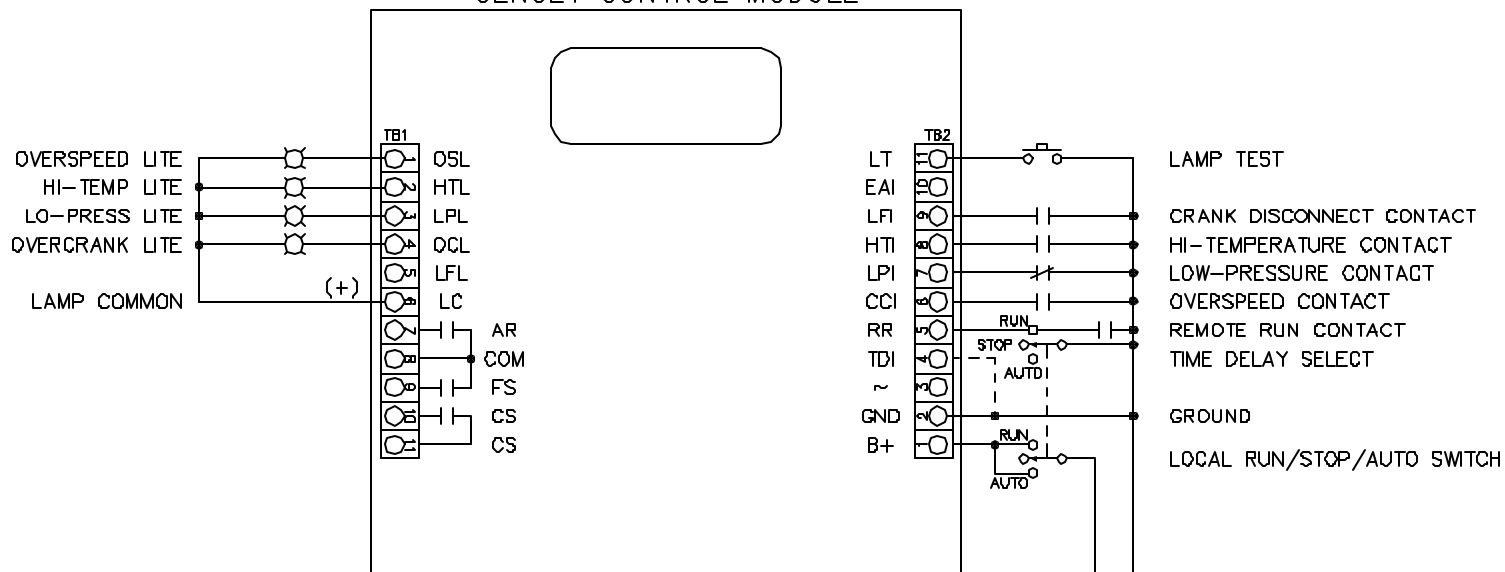
Resetting A Fault Shutdown

A shutdown with alarm, due to any fault condition, will prevent any subsequent operation of the generator set. The Run/Stop/Auto selector switch on the operator control panel must be momentarily placed in the “Stop” position to reset these functions.

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GENSET CONTROL MODULE



* RELAYS FS, CS,
& AR ARE INSIDE
THE GENSET CONTROL

NO FREQUENCY SENSING
(CRANK DISCONNECT AND OVERSPEED CONTACT INPUTS
OBTAINED FROM 2-ELEMENT SYNCHRO-START SPEED SWITCH.)

Bouchette Electronics, Inc. N11325 County Highway Y Clintonville, WI 54929			
TITLE CONNECTION DIAGRAM A121C2M2 / A241C2M2 CONTROL			
DATE	DWN BY	CHK	SCALE
08/25/04	DSB	TJB	NONE
P/N	CAD REF	DWG NO	
(v103)	PCB107	E229-1	