

INSTRUCTION MANUAL

LOAD MANAGER MARK II

A START-UP AND SHUT DOWN LOAD SEQUENCER
AND AUTOMATIC LOAD SHEDDING SYSTEM WITH
INTEGRAL RELAYS FOR 8 LOADS



MODEL # 091-60A

INPUT: 12VOLTS, D.C.
OUTPUT LOAD: 30 AMPERES, MAXIMUM

3 YEAR WARRANTY



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INTRODUCTION

The Load Manager Mark II is a device which:

1. Sequentially energizes and deenergizes relays which are mounted inside the unit at approximately 1/2 second intervals in order to reduce transients in a vehicle's electrical system.
2. Detects when the vehicle's electrical load is greater than the output of the alternator. When this occurs, loads are sequentially deenergized until the alternator output is equal to the load.

The Load Manager Mark II contains the following features:

1. An electrical input which changes the Load Manager Mark II from an automatic load shedding device to operation only as an automatic load sequencer.
2. An automatic override of the Load Manager Mark II which operates all the relays simultaneously by connecting one input to ground.
3. An adjustable time delay from 2 to 16 seconds which prevents load shedding until the timeout occurs. This timer starts when the Load Manager Mark II detects an overload. If the battery voltage returns to normal before the timeout, the timer is reset and no loads are shed.
4. An indicator panel which includes a Power ON LED indicator and a Load Reduce indicator. This provides the vehicle's driver with the information that the Load Manager Mark II is in operation and that the loads are in the process of being shed.
5. Internally mounted relays that eliminate the need to supply separate relays in the vehicle. The loads are wired to the relay contacts at the top of the unit using standard 1/4" quick disconnect terminals. Each relay output is rated at 30 amperes maximum at 12 volts.

LOAD MANAGER PROGRAMMING

Recognizing that priorities may change after an installation is made, the Load Manager Mark II is designed so that the sequence of load removal may be easily altered.

At installation, the highest priority load is wired to relay K1 which is operated by terminal 3. The second highest priority load is wired to relay K2, which is operated by terminal 4. A total of 8 relays, decreasing in priority are operated by terminals 5, 6, 7, 8, 9, & 13. See Figure 4 - Schematic, Installation.

Upon start-up, when the Load Manager Mark II operates as a sequential loading device, the loads are applied in priority order with the highest priority first.

When the Load Manager feature is enabled and excessive electrical loads cause a drop in battery voltage, the Load Manager Mark II will deenergize loads at approximately 2 second intervals starting with the lowest priority. Loads will be removed until the voltage sensed returns to normal. The exact interval between load removals depends on the degree of the overload and the capacity of the batteries. With only a slight overload and large batteries the time interval is extended.

After installation the user may vary the priority by altering the switch setting from the BASIC SETTINGS illustrated on Figure 3 - Relay Wiring Connections.

Caution: There are 5 switches, each with 5 levers. Only one lever on each switch may be in the "ON" Position.

Each switch controls the operation of a relay. The actuation sequence of a particular relay is controlled by the individual levers of each switch. Lever #5 is the lowest priority, while lever #1 is the highest. It is thus possible to arrange the relay operating priority for the 5 lowest priority relays.

NOTE

The Load Manager Mark II contains the load switching relays. The manual switches wired by the installer control the 12 volt supply to these relays.

THE RELAY CONTACT CAPACITY IS 30 AMPS. DO NOT EXCEED.

LOAD MANAGER SETTINGS

The standard setting on Load Manager Mark II may not be optimum for all applications. The Configuration Switch, S6, sets the initial time delay and the initial shed voltage for the unit. On the Configuration Switch, levers 1-3 are used for time settings. Levers 5 and 6 are for voltage settings.

To prevent false voltage readings, the Load Manger Mark II, delays the shedding or adding of loads. The initial delay time is factory set for four seconds. By adjusting levers 1-3 on the Configuration Switch, the user may vary the initial time delay from 2 to 16 seconds. Figure 1 below indicates how to alter the initial delay time.

	Lever 1	Lever 2	Lever 3	Time Delay
Factory Setting	on	on	on	2±.5 sec
	off	on	on	4±.5 sec
	on	off	on	6±.5 sec
	off	off	on	8±.5 sec
	on	on	off	10±.5 sec
	off	on	off	12±.5 sec
	on	off	off	14±.5 sec
	off	off	off	16±.5 sec

Figure 1
Configuration Switch, S6, InitialTime Delay Settings

Subsequent time delays for additional load shedding is factory set for 2 seconds and is not adjustable.

Load Reduce will start at the Initial Shed Voltage. The Factory Setting, for the Initial Shed Voltage, is 12.3VDC. For the first load to go off, the voltage must be 12.3 VDC or lower for the duration of the time delay. Recovery, that is reapplication of a load will not occur until the voltage is .2 VDC higher than the shed voltage. A time delay prevents the instantaneous operation of the output relay. After shedding the first load the Load Manager waits 2 seconds before making a decision to shed more loads. If the sensed voltage is .2 volts less than that at the previous shed point and maintains this lower voltage for 2 seconds, the next load will be shed. This continues until sufficient loads are shed so that there is no further decrease in sensed voltage. Figure 2 below indicates the switch settings required to vary the Initial Shed Voltage. Loads are reapplied when the voltage rises and is maintained for a suitable time.

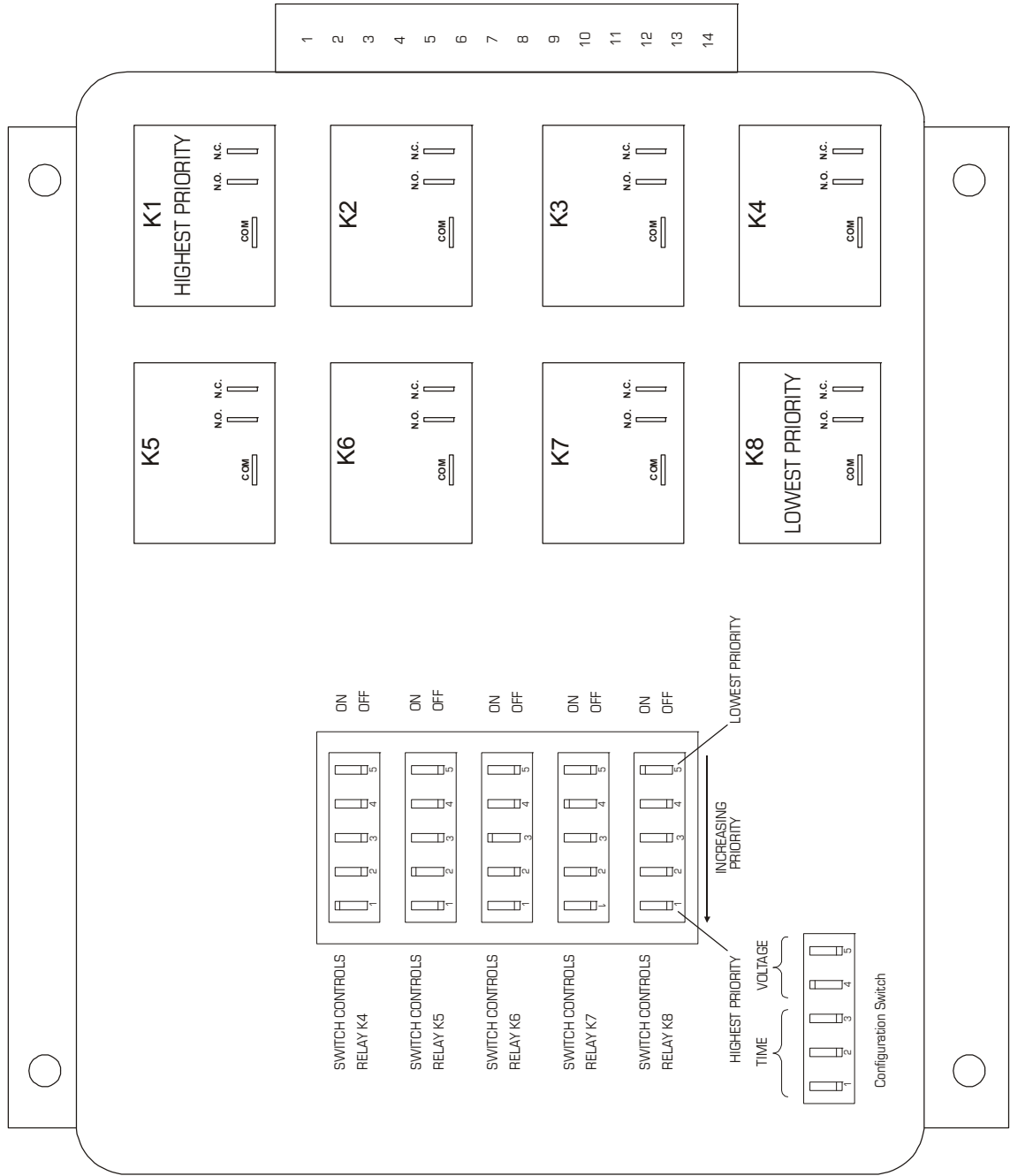
	Switch 4	Switch 5	Initial Shed Voltage
Factory Setting	on	on	12.30±.1
	off	on	12.15±.1
	on	off	12.00±.1
	off	off	11.85±.1

Figure 2
Configuration Switch S6, Threshold Voltage Setting

CAUTION

Changes to Configuration Switch, S6, will only take effect during power up. Remove power from pin one of Load Manager and reapply to change the setting on the Load Manger Mark II.

Figure 3 - Relay Wiring Connections
 Drawing #: A091-60-005



- Note 1. Wire COM. Terminal of each relay individually to a +12V supply using a wire size appropriate for the current load.
- 2. Relay Current is 30 Amperes Maximum

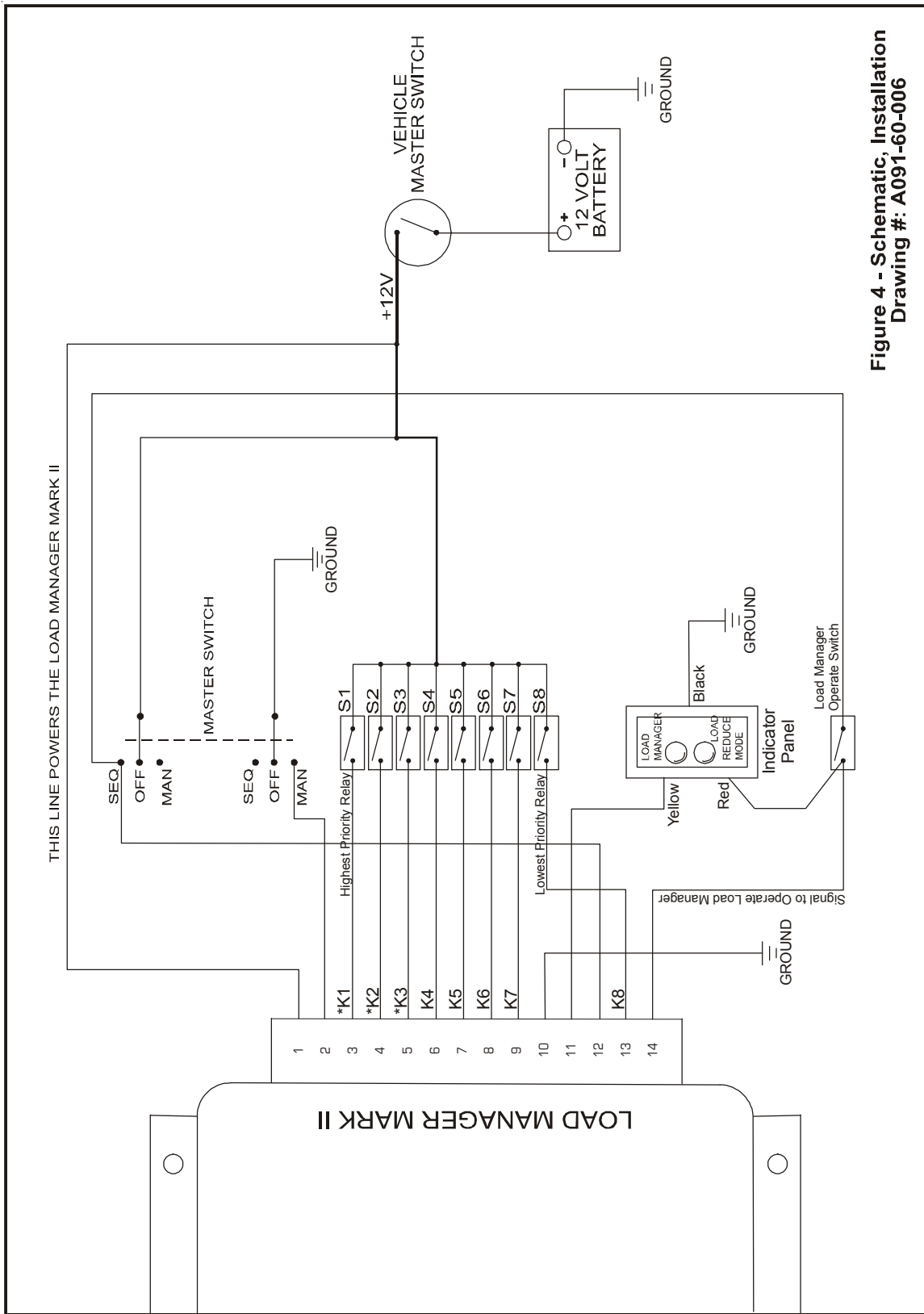
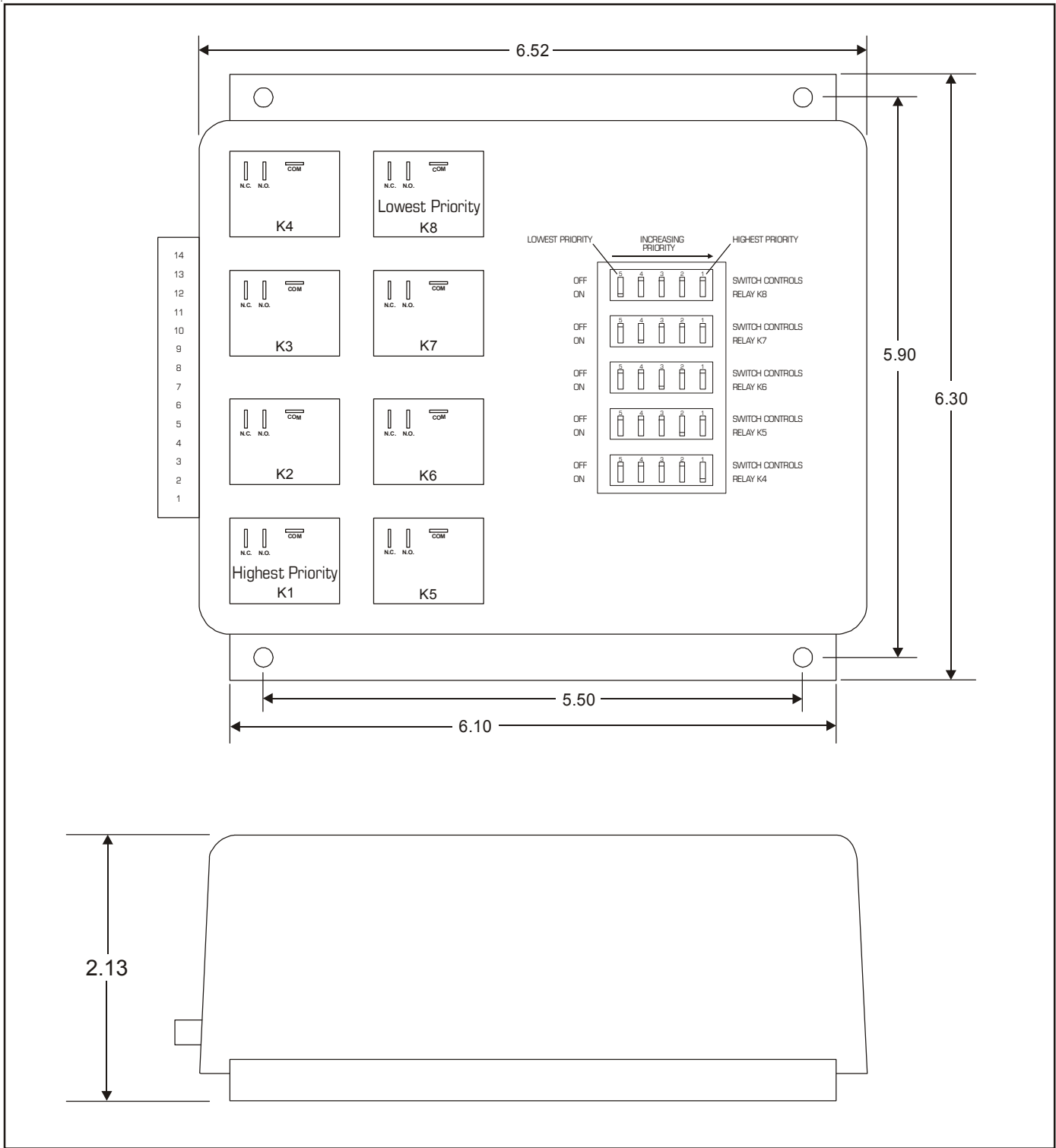


Figure 4 - Schematic, Installation
Drawing #: A091-60-006

*Note: Relays K1, K2, and K3 will sequence "ON" and "OFF", but will not shed loads.



**Figure 5, Outline Drawing, Load Manager Mark II
Drawing #: B091-60-008**

INSTALLATION RECORD & WARRANTY

Date Installed _____

Installed By _____

Vehicle Identification _____

Vehicle Owner _____

WARRANTY

All products of Kussmal Electronics Company Inc. are warranted to be free of defects of material or workmanship. Liability is limited to repairing or replacing at our factory, without charge, any material or defects which become apparent in normal use within 3 years from the date the equipment was shipped. Equipment is to be returned, shipping charges prepaid and will be returned, after repair, shipping charges paid.

Kussmal Electronics Company, Inc. shall have no liability for damages of any kind to associated equipment arising from the installation and /or use of the Kussmal Electronics Company, Inc. products. The purchaser, by the acceptance of the equipment, assumes all liability for any damages which may result from its installation, use or misuse, by the purchaser, his or its employees or others.