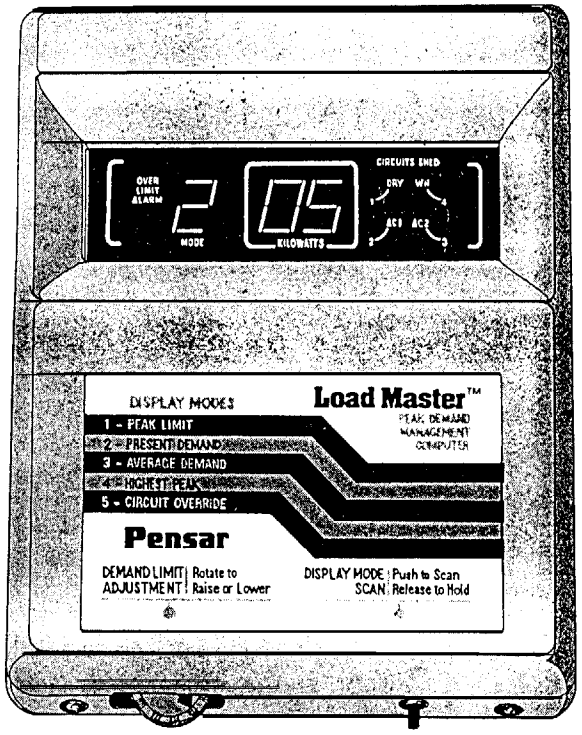
Pensar

Load Master™ II B



Owners Manual

ORIGINAL PURCHASER: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

DATE INSTALLED: _____

SERIAL NUMBER: _____

MODEL NUMBER: _____

SOLD BY

MANUFACTURED BY:

ElectroSem, LLC
2600 South Hardy Drive
Tempe, AZ 85282
602-955-6566

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INTRODUCTION

Congratulations on your purchase of a Pensar energy management system. The name Pensar represents quality and superior technical achievements. Please take the time to carefully read this manual before attempting to make any changes in operation. Keep it handy for future reference.

The LOAD MASTER IIB is an advanced microcomputer load control system that can help substantially save on your utility bills. It does so by monitoring your total electric consumption and controlling high energy usage appliances in order to limit your "peak demand".

DEMAND is the amount of power needed to operate all the appliances you have on at one time. PEAK DEMAND is the highest demand for electricity, averaged over a given period of time (15, 30 or 60 minutes), that you require during a billing month. Your LOAD MASTER IIB has been programmed to coincide with the averaging period used by your utility.

When the LOAD MASTER IIB senses that your kilowatt demand limit may be exceeded, it automatically "sheds" (turns off) selected electrical devices, one at a time, in an order (priority) that you have preselected. As the demand lessens, each device is restored at the earliest possible moment, usually within six to ten minutes.

High peak demand is a concern to utilities because they must always have enough energy available to service all of their customers at any given time. The higher the total peak demand, the more costly it is to the utility, and ultimately to you the consumer. In order to encourage customers to lower their peak demand, many utilities have created demand rates which reward you with lower energy bills.

With the help of a PENSAR energy management system, thousands of utility customers have been able to reduce their peak demand and take full advantage of the savings potential of these demand rates. Your wise investment in a LOAD MASTER IIB makes it possible for you to enjoy these savings, starting today and for many years to come.

EQUIPMENT

Relay Enclosure

The relay enclosure contains the switching devices used to control the loads (circuits and appliances). It is located next to the circuit breaker panel. The relay enclosure contains no user adjustable parts and should be opened ONLY by a trained serviceman.

To Turn Off the LOAD MASTER IIB simply turn off the circuit breaker labeled "Load Controller" located inside the breaker panel.

Display Panel

An attractive display panel houses the microcomputer and places all the controls and information you need right at your fingertips.

The MODE display indicates which data is currently displayed in the KILOWATTS display area. The definition of each mode is given on the label. To change the current display mode use the switch labeled DISPLAY MODE SCAN. It is located at the bottom right of the display panel.

The thumb wheel labeled DEMAND LIMIT ADJUSTMENT is located at the bottom left of the display panel. Rotate it clockwise to raise the Peak Limit or counter clockwise to lower the limit.

The CIRCUITS SHED indicator lights indicate at a glance which electrical devices have been shed. When the light is on, that particular load has been turned off. If the light is not illuminated the appliance or circuit has power available. It may or may not be operating, however, depending on its own switch or thermostat.

USER CONTROLS

The "**USER CONTROLS**" are provided to allow access to all the controls necessary to effectively operate the LOAD MASTER IIB.

Mode #1 Peak Limit:

This mode displays the highest point the LOAD MASTER IIB will allow your demand to rise. The limit is adjustable in one kilowatt increments to fit you individual needs.

It may take some trail and error to determine the setting that best suits your needs, and maximizes your savings. Since there are several variables affecting your choice of demand limit, such as location, climate, home size and life style. It is recommended that you consult your local dealer or installer for advice on adjusting your peak limit.

How To Change Peak Limit Setting:

1. If not already in mode 1, press mode switch until "1" is displayed in the mode window.

NOTE: Simply moving the thumb wheel labeled "DEMAND LIMIT ADJUSTMENT" will also cause selection of display mode 1. This can be useful to indicate inadvertent change of limit by normally leaving the display in another mode.

2. Raise or lower setting using the thumb wheel labeled "DEMAND LIMIT ADJUSTMENT".

3. Your displayed selection is valid. You may press the mode switch to change display mode as desired.

Mode #2 Present Demand:

The rate at which you are currently using power is displayed. When loads are turned on and off, the display will change within seconds to show the change in your rate of power consumption.

NOTE: Because the LOAD MASTER IIB is an averaging controller, you will, at times, see the present demand go above the peak limit. However, the average value displayed in this mode, over the entire averaging period, will be less than or equal to the peak limit.

Mode #3 Average Demand:

The power consumption of the past averaging period is displayed. Knowing how much energy was used during the last period can be valuable in determining if there is enough energy available to run additional appliances.

Mode #4 Highest Peak:

The highest peak (highest average demand) is retained in memory for your convenience. The amount shown will approximate the kilowatt demand that you'll be billed by the power company. To keep this reading current, erase once a month just after your meter has been read. **CAUTION:** Leaving the display in mode 4 for over 5 seconds will erase your highest peak.

How To Erase Highest Peak:

1. If not already in mode 4, press mode switch until "4" is displayed in the mode window.

2. Leave the display on this mode for approximately six seconds.

Mode #5 Circuit Override:

This mode allows you to temporarily change the priority of a load for a period of 60 minutes. This will prove quite helpful if you need to use an appliance (such as an air conditioner) which is currently being shed.

When a load is selected for override it is given the highest priority. After the period of override, the load will automatically revert back to its original priority.

How To Override Normal Operation of a Circuit:

1. If not already in mode 5, press mode switch until "5" is displayed in the mode window.

2. Select the circuit you wish to override by continuing to press the mode switch until its number appears in the data window.

3. After approximately six seconds display mode 2 is set to signal acceptance of the override.

NOTE: The circuit override WILL NOT allow a load to operate when the last period average exceeds the demand limit. If this should occur, the load in override will be the first allowed to operate once the average is again below the demand limit.

How To Cancel Override a Circuit:

To cancel an override perform the same steps as above for overriding a circuit but select "0" as the circuit.

ALARM

When the LOAD MASTER has shed all loads and the demand is exceeding the set point, the alarm is sounded. The alarm is usually activated by an uncontrolled load such as an oven or range. When the alarm sounds, turn off any uncontrolled appliances for a few minutes.

NOTE: If your alarm sounds frequently your Peak Limit may be set too low.

INSTALLATION DIP SWITCHS

Four dip switchs are located on the left circuit board of your display panel and are accessible after removing the plastic case secured by four screws. Once properly set (by your installer), these switchs will not normally be changed. If you decide to change these settings, exercise caution.

CAUTION: Static electricity can cause immediate failure or reduce the life expectancy of solid state components. Always ground yourself to the metal chassis (and earth ground if available) **before** handling electronic equipment.

Dip Switch #1:

» Four load system:
  - on (left): circuit #3 has no connection (always restored).
  - off (right): all circuits assumed connected.

» Six load system:
  - on (left): circuit #2 has no connection (always restored).
  - off (right): all circuits assumed connected.

Dip Switch #2:

» Four load system:
  - on (left): enables priority selection with switch #4.
  - off (right): (fixed priority) Circuit 1 has highest, then 2, 3, and finally circuit 4 has lowest priority.

» Six load system:
  - on (left): (rotate) Circuits 1 through 4 have equal priority. Circuit 5 has lower priority followed by 6 with lowest.
  - off (right): (fixed priority) Circuit 1 has highest, then 2, 3, 4, 5, and finally circuit 6 has lowest priority.

Dip Switch #3:

  - on (left): Range of demand limit adjustment thumb wheel is 0 to 15 kilowatts.
  - off (right): Range of the demand limit adjustment thumb wheel is 0 to 31 kilowatts.

Dip Switch #4:

» Four load system (active only if switch #2 on):
  - on (left): Circuits 1 through 3 have equal priority. Circuit 4 has lower priority.
  - off (right): (rotate) Circuits 1 through 4 have equal priority.

» Six load system:
  - on (left): Circuit 5 must be restored 15 minutes before circuit 6 may be restored. Circuit 6 is always shed before circuit 5.
  - off (right): Circuits 5 & 6 controlled normally.

HOW TO LIVE WITH YOUR LOAD CONTROLLER

The load controller is designed to HELP you save money but not to cause inconvenience. Raise your limit in small increments as you need more energy. If you want to reduce your limit, do so two to three days before your next billing cycle begins to reap the benefits in your next bill.

If you voluntarily spread out your usage, you may not even know the LOAD MASTER is keeping your demand in check. In summer, avoid using major appliances such as the range/oven during the hottest time of the day. In winter avoid major appliance use during times when your heater is required most. Use your microwave and barbecue to help shift your cooking loads. Dry cloths in the morning or later in the evening. Running pool equipment at night may cost a little chlorine but may drop your demand by 1.5 kilowatts per pump.

SERVICING

If one of the appliances controlled by the LOAD MASTER IIB is not functioning properly first check to see that the CIRCUITS SHED lights indicate a restored status (light off).

If the load light is lit, you may decide to increase your demand limit or override the load. See "How to Set Your Peak Limit" and "How to Override Normal Operation of a Circuit". Your major controlled loads require between 5 and 7 kilowatts each to run uninterrupted.

Otherwise, you may locate the source of a problem by turning off the LOAD MASTER IIB at the circuit breaker panel. All circuits connected will be restored to normal operation. **CAUTION:** Watch your demand.

If the Problem Persists: The appliance involved might be malfunctioning and the appropriate serviceman should be notified.

If the Problem Ends: Call your installation organization for service.

TECHNICAL SPECIFICATIONS

Display Panel

Dimensions 4.75"w x 6.0"h x 1.3"d.
Mounting: Surface (vertical)
Color and material: Ivory, molded plastic
Power Requirements: Class II, 12 VAC, 3 watts, 60 Hz.

Relay Enclosure

Dimensions: 10"w x 12"h x 4.0"d.
Enclosure type: NEMA 3R Raintight, screw cover
Operating Temperature: -50° F to +170° F.
Power Requirements: 117 VAC, 15 watts, 60 Hz.
Components:
RELAYS: Electromechanical type. 12 VDC coils
Up to six relays in any combination.
A. 5 amp pilot-duty SPST
B. 25 amp 1 HP DPST-NC
C. 35 amp 1½ HP SPST-NC-DB
Transformer: Class 2, 12 VAC, 60 Hz. 30 VA

Current Transformers

Two ring type with 24" 600 volt leads
Standard type: 200 amp/8 volt class 2
Dimensions: 1.8" OD x .75" ID x 1.0" width
400 and 600 amp ratings also available

Interconnect Cable

(between Relay Enclosure and Display Panel) 11 conductor, 18 AWG, 65 feet maximum (supplied by others)