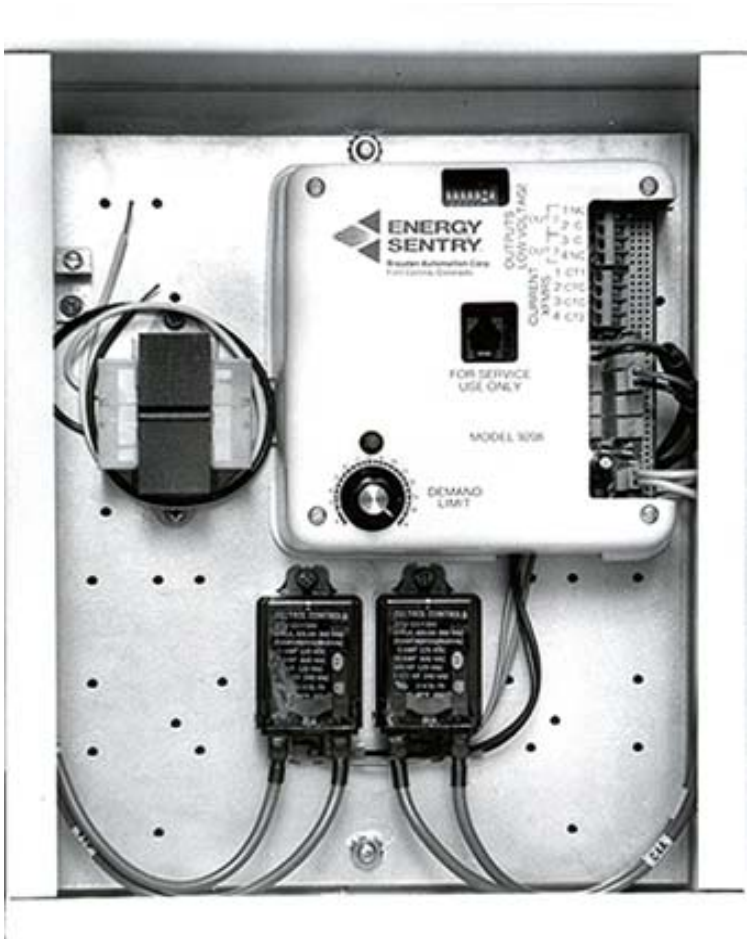
ENERGY SENTRY®

Computerized Energy Management



Model 9208
Load Management System
Owner's/Installation Manual

BRAYDEN AUTOMATION

Helping you to use energy more efficiently

Model 9208
Load Management System
Owner's/Installation Manual

P/N 09208-94100B REV 6/1/2003

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Notice to Users

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Relocate the Energy Sentry with respect to the receiver.
3. Move the Energy Sentry away from the receiver.
4. Plug the Energy Sentry into a different outlet so that Energy Sentry and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock No. 0004-0000-00345-4.

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Section 1. Operating Instructions

Introduction and Overview of Demand Control

Congratulations on your decision to purchase an ENERGY SENTRY® 9208 Load Management System. As the owner of an all-electric home metered under the Demand Billing rate, you fall into a special group of consumers who can lower their monthly electric bills by reducing energy demand peaks. ENERGY SENTRY's load management system enables you to reduce these peaks while maintaining efficient use of energy. Your decision to purchase a 9208 represents a sound and intelligent investment which will repay you over the years to come in reduced electric bills. The 9208 is one of the finest, most user-friendly load management systems on the market today.

The Demand Billing Rate

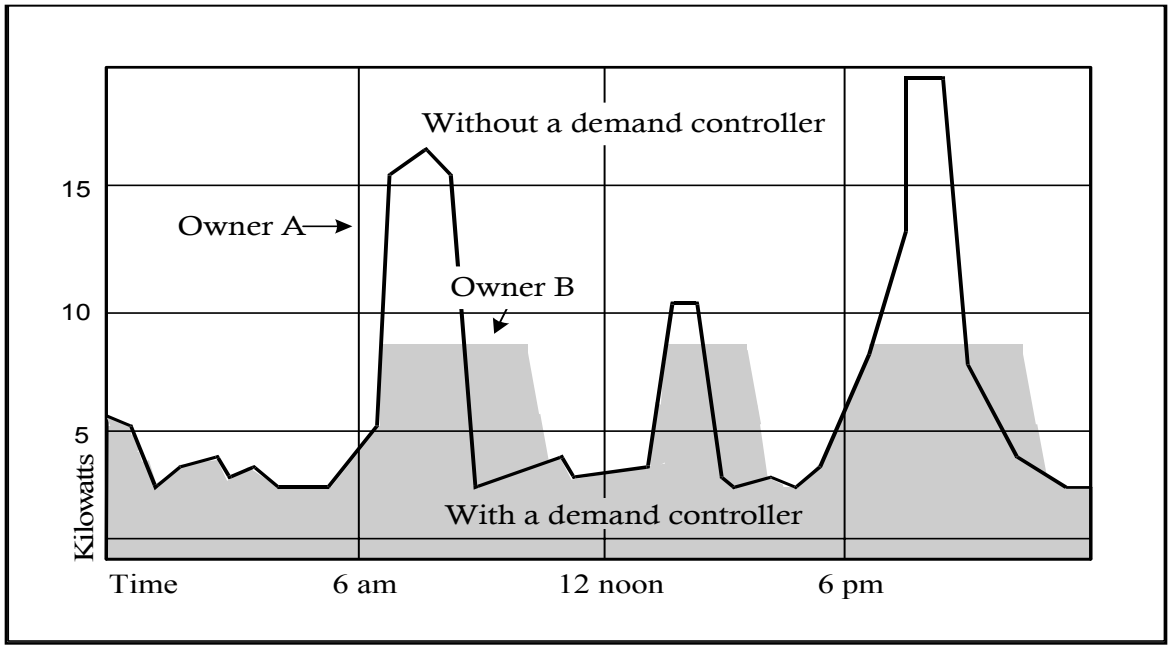
Not all electricity costs the same. The reason for this is the billing structure which your utility makes available to you. The most common are the Energy and Declining Block rates.

Under the Energy rate you are billed for total energy use per month (total KWH use) regardless of how you use this energy. Owner A in Figure 1 illustrates a typical daily energy use pattern. Notice the demand peaks in the morning and evening. Under the Energy rate, these peaks do not affect Owner A's bill since he pays for the total KWH use only.

Utility companies are concerned about these demand peaks since they increase the costs of supplying electricity to their customers. As a result, they have devised the Demand Billing rate which is a preferred rate to reward customers who control their peak usage of electricity. Billing under the Demand rate works like this: Suppose you are heating or cooling your home, washing dishes, drying clothes and cooking the family dinner all at the same time. Chances are your home is at peak energy usage or drawing electricity from the electric company at a maximum rate. This peak energy usage is illustrated by Owner A in Figure 1. Under the Demand rate you pay for both total energy use (in KWH like the Energy rate) and for your highest average peak energy usage during the billing period (highest average KW demand).

When compared to the Energy rate, the Demand rate offers a much lower charge for total KWH use. But, since there is also a Demand charge for the highest average peak energy usage during the billing period, the savings could be offset if this demand peak is high. Now let's look at Owner B in Figure 1. In this case, Owner B is billed under the Demand rate but he has controlled his peak demand and has correspondingly reduced his Demand charge. The result will be a lower electric bill for using the same amount of electricity as Owner A. The key to his savings is in controlling his peak energy usage by leveling his energy demand.

Figure 1. Owner A and B Graph



Different Meters

To benefit from your ENERGY SENTRY® 9208 system you must have a demand meter and be billed on a demand billing electric rate from your utility. Utilities use different demand meters; therefore you will need to check with your local utility to make sure you have a demand meter. Obtain a free booklet or rate sheet from your power company describing your electric rate and how to read your electric meter. We recommend that you read your metered demand on the day prior to when the meter is read by the power company, to verify that your setting matches the meter's reading.

The Demand meter registers not only the total energy consumed, just like the standard watt hour meter, but also has separate dials, a pointer or register which records and indicates the highest average peak energy usage or demand peak. This peak is recorded over a 15, 30, or 60 minute demand interval (depending on the utility). Once this demand peak is registered on the meter, a corresponding Demand charge results even if this peak occurred only once during the billing period.

Where ENERGY SENTRY® 9208 Technology Comes In

If it was humanly possible to go through your home continuously and manually turn off heating or cooling circuits and major appliances to level out peak demand whenever necessary, you wouldn't need a load management system to take advantage of the Demand rate offered by your utility company. But remember, one slip in any one demand interval and your utility bill would reflect a high Demand charge.

The 9208 takes over this difficult, continuous burden for you. The 9208 is one of the most sophisticated products available for controlling peak demand. When properly used, it can result in average monthly savings of up to 35% and as much as 50% during heavy use months. The sole purpose of the 9208 is to efficiently allocate electricity usage to electrical loads so that demand peaks are kept below the level you set.

How the 9208 Works

The 9208 contains a small microprocessor-based computer which turns certain circuits off to keep peak demand below a limit that you preset. Not all circuits need to be controlled by the 9208. Circuits controlled usually include the air conditioning, all heating zones, the dryer, the water heater, or any other load with some thermal inertia.

In a typical all-electric home, the morning routine may involve turning up some thermostats, operating the range, water heater and other appliances. Normally, operations of these loads causes a morning peak (such as that illustrated by Owner A in Figure 1) which registers on the Demand meter.

Now, let's put the 9208 to work. There are several optional load control strategies available. A typical strategy could involve the 9208 recognizing higher priority loads, such as the dryer, and cutting back on the heating or cooling loads in one or more rooms while this load is on. When the dryer turns off, the power it had been using is channeled back to the room heating or cooling, thus maintaining comfort but reducing peak demand. The end result is that while you have still used the amount of energy normally called upon by your lifestyle or process, this usage has been leveled out to reduce the peak demand. This is illustrated by Owner B in Figure 1.

How the 9208 Saves

Now that we've examined how the 9208 enables you to use the energy you are accustomed to but spreads this usage out by turning off noncritical loads for short periods of time, let's look at how this saves you money. Remember the utility company

Table 1. Customer Bill Comparison

	Case I Uncontrolled All-Electric Home Energy Rate	Case II Uncontrolled All-Electric Home–Demand Billing Rate	Case III Energy Sentry® Controlled All-Electric Home–Demand Billing Rate
Energy Use per Month	3000 KWh	3000 KWh	3000 KWh
Peak Demand During Month	N/A	19 KW	8 KW
Electric Bill	$370.37	$333.57	$216.31
Savings Over Energy Rate	———	$36.80 (9.9%)	$154.06 (41.6%)
Savings Over Uncontrolled Demand Rate	———	———	$117.26 (35.1%)

helps you save by offering the Demand rate which is a lower rate per unit of total power consumed (KWH). You can save money under this rate if you control your peak energy usage so as to keep the corresponding Demand charge low.

The following hypothetical example illustrates how ENERGY SENTRY's 9208 helps you save. Three cases are presented for a single residence. **In all three cases the total energy consumption is the same.** The differences are in the utility rate structure and whether or not an ENERGY SENTRY® 9208 is installed.

CASE I is an all-electric home billed under the Energy rate. This differs from the Demand charge since there is a higher charge for total energy used. Most homes not under the Demand rate are billed under the Energy rate. Reference to Table 1 shows a monthly energy use of 3000 KWh. Although rates vary from utility to utility, the electric bill based on actual utility rates for this energy usage level would be $370.37 with 3000 KWh being a typical usage for a high use month.*

CASE II is the same all-electric home with the same energy usage, but billed under the Demand rate. In this case, peak energy usage plays an important part in determining the total bill. Although energy use peaks will vary from month-to-month, a typical value for a high-use month might be 19 KW. Based on a total usage of 3000 KWh, the electric bill based on actual utility rates would be $333.57.** Compared to CASE I, use of the Demand rate results in a slightly lower monthly bill for the same energy usage. The reason is the Demand charge for the high demand peak offsets the savings on energy costs.

CASE III again uses the same all-electric home billed under the Demand rate. The energy usage is 3000 KWh which is the same as in Case I and Case II. The difference is that a ENERGY SENTRY® 9208 is now installed and peak demand is reduced to a maximum of 8 KW. Based on this peak demand and energy consumption, the electric bill is reduced to $216.31.** This means a savings of 41.6% over the Energy rate in Case I and a savings of 35.1% over the uncontrolled Demand rate in Case II. For your home, installing an ENERGY SENTRY® 9208 could result in a savings of up to 50% of your monthly utility bill during the heavy use months with an average annual savings of up to 35%. The added bonus is that you don't have to reduce your overall consumption to save. Rather, just let your ENERGY SENTRY® 9208 level out your usage.

Note that depending on the application of the 9208 in a residence, the savings are based on the utility rates in effect and by how low the Demand Limit is set. Contact the utility company for the actual rate schedules that apply.

*Based on Arizona Public Service Summer Schedule E-12 Energy rate, effective April 1, 1988. Does not include fuel cost adjustment and taxes.

**Based on Arizona Public Service Summer Schedule EC-1 Demand rate, effective April 1, 1988. Calculation based on KW Demand Rate. Does not include maximum KWh adjustment, fuel cost adjustment and taxes.

Superior Features of the 9208

Eight Separate Control Points

High peak demand occurs when electrical loads are used simultaneously. The 9208 can control up to sixteen individual electrical loads on eight separate control points. The appliances which are controlled can be turned off for brief periods with little or no interruption to your lifestyle. These loads usually consist of heating or cooling circuits, dryer and hot water heater. On the average these loads are responsible for 60% to 80% of your electrical demand. With eight separate control points, the 9208 provides maximum utilization of energy. That's because the loads which are turned on and off are smaller permitting a more regular and even demand level.

Microprocessor for Maximum Accuracy and Reliability

Use of a microprocessor allows the 9208 to precisely measure KW power demand and accurately compute the average KW demand. In addition, by using a microprocessor, the 9208 can adapt to any user lifestyle or load requirement by allowing virtually unlimited flexibility in choosing load control strategies and minimum on/off times.

EEPROM Non-Volatile Memory for Maximum Flexibility

ENERGY SENTRY'S EEPROM memory "remembers" all custom system settings you have set even when power is lost to your unit. In this way utility power interruptions do not affect the settings in your 9208.

Choice of Load Control Strategies

The choice of load control strategies, made possible by the use of a microprocessor, offers unlimited flexibility as to how loads may be controlled. This means the 9208 can be adapted to almost any application, requirement or lifestyle.

Minimum On/Off Times to Protect Heat Pump and Air Conditioning Loads

All eight control points of the 9208 can be programmed with minimum on and off times, each variable up to 15 minutes. This feature allows the 9208 to be used with heat pump and air conditioning motor loads by providing compressor timing protection.

System Description

Your ENERGY SENTRY® 9208 Load Management System consists of two basic components. These include the Control Unit and the Current Transformers. The Systems Diagram in Figure 1 page 12 of the installation section of this manual shows how these components are connected to control loads at the load center. One circuit and controlled load is shown.

Your 9208 controls only those loads to which it is connected. Typically, only deferrable loads such as electric heaters, heat pumps, air conditioners, water heaters, and clothes dryer heating element are controlled. These loads will vary depending on application and should be listed in the space provided at the end of this manual. If you are in doubt as to what loads are controlled, you should ask the electrician who installed your 9208.

The basic function of your 9208 in controlling these loads is to keep the total electrical demand below a peak value which is set according to your desired level of comfort and minimum load requirements. Each of the components which make up the 9208 has a separate and unique function in accomplishing this task as described below:

Control/Relay Unit

The Control/Relay Unit consists of logic control unit and up to eight power switching relays. The system is mounted next to the main circuit breaker panel. A rotary knob with a scale is provided to set the demand limit and allows for increasing or decreasing the demand level to balance savings with comfort.

Current Transformers

Two current transformers, usually mounted inside the load center serve to monitor total electrical load. They tell the computer in the logic control unit how much electricity you are using for all loads, not just those controlled by the 9208. By monitoring the total load, controlled loads may be turned on and off to keep total demand below the limit you set.

System Operation

Your 9208 has been designed for ease of operation and to provide efficient energy use. Please carefully read the following instructions concerning unit operation as they will enable you to maximize efficient energy use and minimize your electric bill.

Your ENERGY SENTRY® Load Management System is controlling approximately 60% to 80% of the total electrical load in your home. Except for the stove, the uncontrolled loads are relatively small and do not create much of a demand.

If your demand limit is set below 6 KW, the total of your uncontrolled loads may exceed the limit setting.

Figure 2. Control/Relay Unit

When this happens, the ENERGY SENTRY® system will give an audible warning (if the alarm is set to "on") that the limit is about to be exceeded. This means that you have a minute or two to turn off some of the uncontrolled loads to keep the meter from registering a higher KW than the control setting.

Important: Only your uncontrolled loads or controlled loads which are currently timing out a minimum-on time can initiate the over-limit alarm.

Setting The Demand Limit

There are no fixed demand settings that will be suitable for everyone. The level of energy (demand) that is required to satisfy comfort, economy, and convenience will vary widely with the uniqueness of each house and its occupants.

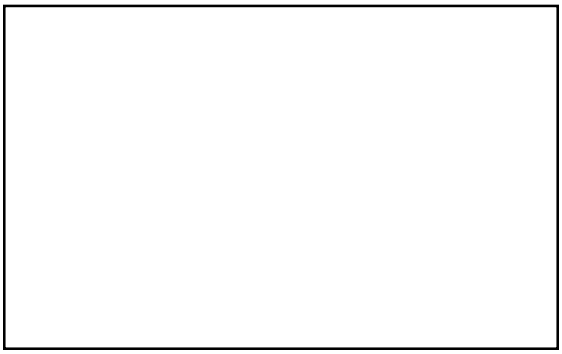
In arriving at the best demand setting for you, we recommend that you start with the lowest KW that you think you will need during the present billing period. The 9208 has a demand limit setting range of 2 to 15 KW in .5 KW increments. Each increment on the logic board's cover consists of a shaded, dark area which represents the area in which that demand limit setting can be attained. For best results, set the white pointer line of the knob to the center of the dark shaded area of the scale, as shown in Figure 3. If you need more energy to maintain comfort, just increase the KW level by .5 KW. If, after a few hours, this is not enough, increase it by .5 KW again until you are comfortable.

It is important to remember that once the meter reading increases, it will not come down until it is reset to zero each month by the meter reader. So it will not benefit you to lower your demand setting below what is already registered on the meter.

The KW values in Table 2 are given as a guideline to assist you in setting your demand limit:

At a comfortable inside temperature, the KW demand level will be directly proportional to the heat loss or gain of your home. Homes that have high power consumption (KWH) will generally require higher demand settings than those homes with low power consumption.

Figure 3. Demand Limit Set Point Dial



Hints for Maximum Savings

When the demand setting is to be decreased (for example, from 10 KW in February to 8 KW in March), the setting should be decreased **BEFORE** your utility meter is read. You can check past bills to determine this date or call the utility company directly.

Table 2. Typical KW Values by Month*

Month	Summer (A/C)Area	Winter (Heating) Area
January	4–6 KW	7–10 KW
February	4–6	7–10
March	5–7	6–9
April	5–8	5–7
May	6–10	5–6
June	6–10	5–6
July	6–10	5–6
August	6–10	5–6
September	6–8	5–7
October	5–7	6–8
November	4–6	7–9
December	4–6	7–10

Settings will vary with lifestyle, home construction and climate.
*Typical settings for heat pumps will be 10–40% higher.

When the demand setting is to be increased (for example, from 6 KW in September to 7 KW in October), the setting should be increased **AFTER** your utility meter is read.

You can help greatly in increasing the effectiveness of your 9208 system and increase your savings by trying to avoid turning on two or more major appliances at the same time whenever possible. This will assist the system not only in controlling demand but will increase the comfort level of your home; (e.g.: Dry clothes at times when the range is not in use).

Load Shedding Sequence

When your total power consumption starts to exceed the demand setting, the system sheds the first load. If necessary, additional loads will be shed to keep the average demand below the demand setting. Loads are shed according to the priority strategy selected: either the fixed priority strategy, the rotating strategy, or a combination. See Part 13 of the Installation section of this manual for an explanation on how to select the load control strategy.

The load shedding priority selected is based on the type of heating and cooling equipment and the design of your house. If desired, the priorities may be easily changed by your dealer or electrician. Typical priorities for a house with baseboard heating are shown in Chart A on page 9. Priorities for a home with heat pump/air conditioning are shown in Chart B.

Control of Clothes Dryer

The clothes dryer is usually one of the last circuits the 9208 load system sheds. When the dryer is shed, the dryer motor continues to tumble clothes. Only the heating element is cut off during this brief period. This means that when you are at 5 or 6 KW and cooking a large meal, the dryer will be shed when the oven element (4.5 KW) is on. When the oven element is off, the dryer element is restored. This may result in your clothes being slightly damp at the end of the drying period and may require longer drying times.

Note: If the dryer cannot be restarted (or stops) each time it is shed, it is not properly wired to the system. Have your electrician change it. It will only take a few minutes at the breaker panel.

Caution: If you purchase a new dryer or if you move into a home with a load management system already installed, your dryer may not work properly. Since dryers are not all wired the same, the dryer wires in the circuit breaker panel may have to be reversed.

Chart A. Baseboard Heated Home

Load Control Strategy: Combination Fixed/Rotate

Priority	Shed Sequence	Load	Demand
1 (Highest)	Last	Dryer (Heating Element Only)	5.5 KW
2	Second	Water Heater	4.5 KW
3 (Lowest)*	First*	Living Room Heat	3.5 KW
3 (Lowest)*	First*	Basement Heat	4.0 KW
3 (Lowest)*	First*	Entry Heat	1.5 KW
3 (Lowest)*	First*	Bedroom Heat	2.0 KW
3 (Lowest)*	First*	Bedroom Heat	2.0 KW
3 (Lowest)*	First*	Family Room Heat	3.0 KW

* NOTE: Shedding sequence of rotating loads begins with the load which has been restored the longest. When all #3 priority loads are all shed, the #2 priority load is shed next. #1 priority load is shed last, if necessary.

Chart B. Heat Pump/Air Conditioner Home

Load Control Strategy: Fixed Priority

Priority	Shed Sequence	Load	Demand
1 (Highest)	Last	Dryer (Heating Element Only)	5.5 KW
2	Seventh	Compressor #1	3.0-7.0 KW
3	Sixth	Compressor #2	3.0-7.0 KW
4	Fifth	Water Heater	4.5 KW
5	Fourth	Strip Heat #1 Elec. Furnace	5.0 KW
6	Third	Strip Heat #2 Elec. Furnace	5.0 KW
7	Second	Strip Heat #3 Elec. Furnace	5.0 KW
8 (Lowest)	First	Strip Heat Elec. Furnace	45.0 KW

NOTE: (1) Compressor is not shed when outside temperature is below 30°F (when outside thermostat is installed).

(2) Compressor cannot be restarted for at least five minutes after it is shed. This delay feature is for compressor protection.

Shed Test (Systems Test)

To verify that your system is measuring the demand and shedding loads, make the following test:

1. Set the demand limit to 2 KW (or the minimum demand).
2. Turn on oven and all top elements of your stove.
3. All controlled loads will shed (turn off) ie: A/C will turn off; (maximum time will be 10 minutes).
4. Turn OFF all stove elements and oven.
5. Raise the demand limit to your demand setting.
6. All loads will restore according to the control strategy and when minimum off times have elapsed. A/C will turn on; (maximum time will be 15 minutes).

System is OK

Changing Load Control Strategies

When your 9208 was installed, the strategy most appropriate to your existing load requirements was selected. If your load requirements have since changed, or if you would like to change your load control strategy, refer to Part 13 of the Installation section of this manual.

Service of Heating/ Air Conditioning, Water Heater and Clothes Dryer

When technicians service any electrical equipment that is controlled by the 9208, they should be advised that you have a load management system. They should also be warned not to disconnect the system wiring or leave its power supply (circuit breaker) off. Otherwise they may unknowingly disable your system which could result in a very high electric bill.

The ENERGY SENTRY® 9208 system simply acts as another switch on the water heater, dryer, or heating/cooling equipment. It cannot cause damage or premature failure of the equipment it is connected to when it is installed and set correctly. Nor can it cause a higher electric bill than you would have had without a system.

When the power to the 9208 system is Off at the breaker panel, power will be available to all controlled loads as long as the power to the system is "off" (contacts close when power is "off"). Without power the 9208 system cannot control your demand. This is why the power must be restored to the system after a service call.

Using the Energy Sentry with a Utility Control System

The 9208 may be connected to a utility's load control system to allow for use only when the reduction is needed by the utility, or be used in a time-of-use mode by activating the system with an external switch. If your utility is using one of these two operational modes with your system, you may be able to experience greater savings and enhanced comfort. Check with your utility for more information on whether the 9208 is being used in either of these modes.

If You Need Service

Your ENERGY SENTRY® Model 9208 has been carefully assembled and tested at the factory. Only components having a high degree of reliability and long life have been used in its manufacture. In the event a failure does occur, your 9208 has been designed so household appliances and loads will continue to function. The only difference is that there will be no demand control, and high demand peaks can occur. If a malfunction should occur, you may turn off the 9208 at the breaker labeled "9208" or "Load management system," located in the load center (breaker panel). You may control your demand manually, if desired, to avoid unnecessary demand peaks as follows:

1. Heat or cool only those rooms which are occupied by keeping the thermostat set on only while you are in each room.
2. When cooking meals, all heating or cooling zones should be turned off.
3. Avoid using appliances simultaneously. For example, do not use the dryer and the range at the same time.
4. You may monitor your highest demand peak on the utility meter to determine the effectiveness of manual control.
5. Since there are no user serviceable parts or components in the 9208, refer all service to the installing electrician, authorized ENERGY SENTRY® dealer or distributor, or the factory, as described in the warranty.

Appendix A

Glossary

The following terms are used throughout this manual. They are defined here so as to assist you in understanding their meaning and use.

Declining Block Rate - A method of charging for electric service used by electric utilities based on total energy consumed (KWh) and cost per KWh. The cost per KWh is usually reduced as total KWh use increases.

Demand Billing Rate - A method of charging for electric service used by electric utilities based on the total energy consumed (KWh) and the demand peak (KW).

Demand Meter - A utility meter which measures both total energy consumed in KWh and the highest average demand peak in KW.

Demand Peak - The highest average KW demand over the billing period. Averages may be determined over 15, 30, or 60 minute intervals depending upon the utility.

Energy Rate - A method of charging for electric service used by utilities where the cost of electricity is based only on KWh consumption multiplied by a fixed cost per KWh. Cost per KWh remains the same regardless of the number of KWh's used. Also called "Flat" rate.

Kilowatt (KW) - 1,000 watts. The basic measurement of power.

Kilowatt Hour (KWh) - The basic measurement of electric energy consumption as metered by the electric load steadily for one hour. (If you were to turn on ten 100 watt lights for one hour, you would have consumed one kilowatt hour of electrical energy.

Watt - A measure of electrical power or rate of doing work. It is analogous to horsepower where one horsepower is equivalent to approximately 746 watts.

Section II - 9208 Installation Instructions

This manual contains instructions for installation, check- out, and programming the Energy Sentry 9208 Load Management System. **In order to ensure proper installation and warranty coverage, please read this manual thoroughly before actually proceeding with the work.**

Note: All wiring must be installed in accordance with national and local electrical codes.

Important: If the 9208 is to be connected to a heat pump compressor or air conditioning compressor, make sure that you complete section 13 "System Programming."

2.0 Tools And Materials Required

2.1 Tools Required:

- Standard flat blade screwdriver
- Small 1/8" wide flat blade type screwdriver
- Amp-Clamp Current Sensor (if available)
- Digital Volt Meter (required for troubleshooting only)

2.2 Material Required (not provided):

- Four 1/4" x 1" lag bolts and/or appropriate hardware for mounting System Unit.
- 15 Amp single pole circuit breaker for load system 120VAC Power Supply.
- Sufficient length of #14 AWG hookup wire to connect 120 volt power and ground from load center to System Unit.
- Sufficient conduit, #10 AWG or #12 AWG wire (depending on load size), and associated hardware to connect load center to System Unit (if required)

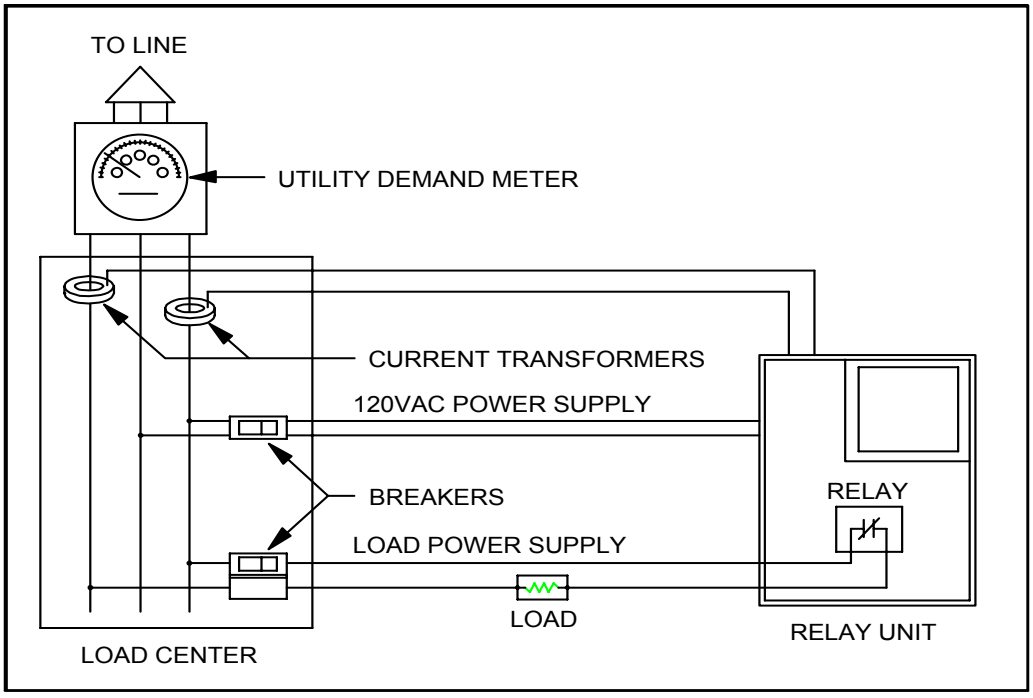
3.0 Pre-Installation System Check List

3.1 Parts Check

Package should contain all parts listed.

P/N	Quan.	Description
	2	Current Transformers:
8420-3028 (or)		200 AMP Current Transformer (or)
8420-3029		400 AMP Current Transformer

Figure 1. 9208 System Diagram



P/N	Quan.	Description
	1	9208 Control Unit– 1 of 3 types:
09208A-XXFIXXX		SM Surf. Mnt NEMA 118"x12"x4"
09208A-XXCRXXX		RT Raintight NEMA 3R 16"x12"x4"
09208A-XXCHXXX		RT Raintight NEMA 3R 12"x10"x4" with lift-off hinged cover
("X" indicates not applicable to this section)		
3620-7002	1	Warranty Registration Card
09208-94100A	1	9208 Owner's/ Installation Manual (this document)

Note: Notify your Energy Sentry dealer if any parts are missing.

Caution: Ensure the 15 amp circuit breaker is off before connecting supply line.

3.2 System Overview

The Energy Sentry 9208 system consists of two general pieces. They are the Control Unit and the Current Transformers. Figure 1 shows the general system configuration. The Control unit mounts next to the breaker panel. The Current Transformers mount in the breaker panel around the main feeder cables.

4.0 Locating And Mounting the Control Unit

4.1 General Control Unit Types

4.1.1 Surface Mount Relay Unit (P/N 09208A-XXFIXX)"SM"

This relay unit is equipped with a 12" x 12" x 4" NEMA 1 screw cover box with a cover of the same size. It should be surface mounted on a finished wall or recessed in an unfinished stud wall such that future finishing will leave the unit flush mounted. Four screw holes (for 1/4" screws) are provided in each corner of the rear of the unit. Screws, lag bolts, or nails could be used to mount unit to adjacent studs.

4.1.2 Raintight Control Unit(P/N 09208A-XXCHXXX or 09208A-XXXCRXXX) "RT"

This relay unit is provided with a 12" x 10" x 4" (with up to 6 power relays) NEMA 3R Raintight enclosure. Four holes for mounting are provided. This unit is surface mounted with four 1/4" lag bolts or other appropriate hardware. This unit is also available in a 16 x 12 x4 Nema 3R Screw Cover Enclosure.

4.2 General Mounting Procedure

4.2.1

Remove the Relay Plate Assembly from the Unit Enclosure by removing the lower 1/4-20 Hex Nut and loosening the upper 1/4-20 Hex Nut enough so as to slide the relay plate out of the enclosure.

4.2.2

Mount enclosure in an upright vertical position near the breaker panel but no higher than 6 feet above the ground using four 1/4" lag bolts and appropriate mounting hardware.

Caution: NEMA 3R Outdoor enclosures should be mounted where they receive the least possible amount of direct sunlight. Flush Mount and Surface Mount enclosures (NEMA 1) must be mounted indoors only.

4.2.3

Connect the Control Unit Enclosure to the load center with metal conduit from the appropriate knockout(s), if required. A 1-1/4" conduit must be installed to accommodate the eight load wires, size #10-#12 AWG, four #18 AWG current transformer wires three #14 AWG wires for 120 VAC power to unit.

5.0 Wiring the 120 VAC Power Supply to the Control Unit

5.1

Install a single pole 120 volt 15 AMP circuit breaker in the breaker panel and mark it "ENERGY SENTRY Load Management System."

Caution: Ensure the 15 amp circuit breaker is off before connecting supply line.

5.2

Run a 120 volt supply line (#14 AWG copper, 600 volt ground line) from the separate 120 volt, 15 AMP single-pole breaker just installed in the load center into the control unit through the conduit.

5.3

Strip supply leads back 1/2". Attach the "hot" wire (from breaker) to the black wire of the power transformer. Attach the neutral wire to the white wire of the power transformer.

5.4

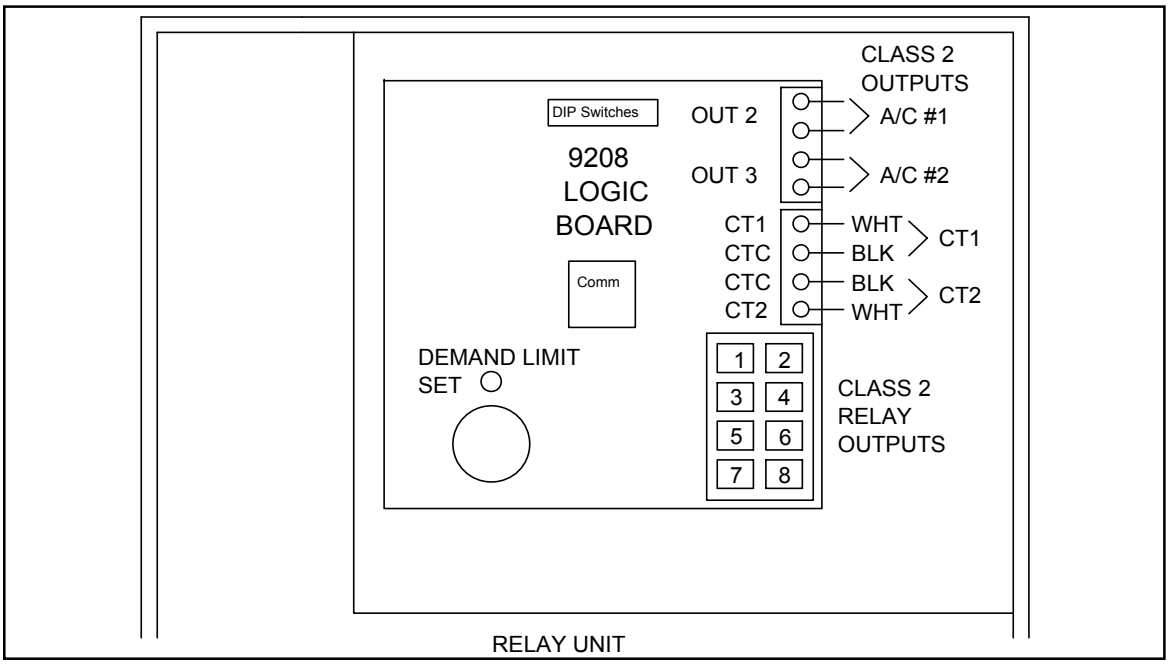
Connect the ground line to the ground lug on the relay plate and tighten snugly.

5.5

This completes wiring of the 120 VAC power to the 9208.

Caution: Leave breaker off until installation is complete.

Figure 2. Low Voltage Class 2 Connections



6.0 Installing and Wiring Current Transformers

Warning: Current transformers which are not connected to the unit may generate hazardous voltages and currents. Short CT leads together during installation and leave shorted if power is restored before CTs are connected to unit. Once CTs are properly connected to unit, they should no longer be shorted together.

Caution: Installation of current transformers may need to be coordinated with the local electric company.

Note: Some electrical codes require that current transformers be mounted in a separate enclosure.

6.1

Disconnect main power to the load center panel by removing the meter or by a main disconnect switch. **Do not install current transformers on a "live" service.**

6.2

When power is off, install current transformers around main feeder cables between the meter and the main breaker as shown in the wiring diagram on Control Unit or Figure 1.

Current transformers must be installed in the same direction.

Note: Ensure both current transformers are mounted in the same direction, that is, with the wires emerging from the same side–either both up or both down.

6.3

Run current transformer leads into Control Unit. Cut the black/white twisted pair of each to a sufficient length to connect to J2, the 4 position terminal strip on the right hand side of the 9208 System Board Assembly. Leave about 8-12" extra. **Do not run leads next to high voltage (Class I) wiring, if possible.**

6.4

Strip each conductor back 1/4" and connect black & white wires to 4 position terminal strip as follows:

Table 1. Current Transformer Connections To Control Unit Terminal

Terminal #	Name	Wire Color
1 (top)	CT1	White-from CT1
2	CTC	Black-from CT1
3	CTC	Black-from CT2
4 (bottom)	CT2	White-from CT2

6.5

Route current transformer wires around the right side of the System Board Assembly.

6.6

For flush mount unit, route current transformer wires through a separate knockout. Secure with a metal cable clamp at the knockout to provide strain relief.

6.7

This completes installation and wiring of the current transformers.

7.0 Making Up a Load Schedule And Load Assignments

Note: The 9208 Unit is shipped from the factory ready to operate with a Fixed Priority Load Control Strategy with no preset Minimum On/Off times. Before system programming may be done, all components of the 9208 must first be installed and verified as operating properly as set forth in Section 12 of the installation section of this manual. Instructions for enabling and disabling minimum On/Off times are provided in Section 13.

Caution: Ensure all circuits to be controlled are turned off at the appropriate breaker in the load center before proceeding.

Warning: When controlling heat pump and air conditioning compressor loads, a minimum off time of at least five minutes must be programmed. Minimum off times are available standard only on circuits 2 and 3. (Some manufacturer's may require longer minimum off times for compressor protection. Check with manufacturer.) Therefore, compressors must be connected to circuits 2 and 3. In other words, if you have one compressor, it must be connected to Circuit #2; if you have two compressors, they must be on Circuits #2 and #3. When installation is completed, minimum on and off times can be enabled as set forth in Section 13.

7.0.1

Prepare a load schedule identifying which loads will be connected to which circuits. **The following are examples only. Your application may be different and require a variation of these examples. Contact your ENERGY SENTRY® representative or the factory for applications assistance.**

7.0.2

The 9208 is equipped with two low voltage signal or "Pilot" relays on Circuits 2 and 3 of the system board assembly. These are designed for switching up to 3 AMP, 24 volt AC thermostat loops with the normally closed contact. Therefore, if no air conditioning or heat pumps are to be controlled, do not connect anything to control points #2 and #3 (terminals OUT 1 & 2), the 4-position barrier strip on the upper right of the System Board Assembly. Remember to appropriately enable or disable control points #2 and #3 as required. See System Programming in Section 13.

7.1 Electric Baseboard or Radiant Ceiling Heat Homes:

Example only. It is recommended that for best results with these types of heating systems, the loads be connected as follows:

Example 1. (No Air Conditioner)

Circuit #:	Relay Type	Pole	Load:
1	Power	A	Dryer
2	Pilot Power	- A B	n/c Hot Water Heater *Heat
3	Pilot Power	- A B	n/c Heat *Heat
4	Power	A B	Heat *Heat
5	Power	A B	Heat *Heat
6	Power	A B	Heat *Heat
7	Power	A B	Heat *Heat
8	Power	A B	Spa/Hot Tub or Heat *Heat

*For better control, do not use the second pole of each relay unless necessary.

7.2 For Homes With Heat Pumps without Compressor Connected

Example only. In some heating climates, it may be preferable not to connect the heat pump compressor to the load management system. Check with your local utility and/or heating contractor to determine whether your compressor should be controlled. If you decide to control your compressor, please refer to Example 3, Section 7.3. In any case, the backup electric forced air furnace heat strips should be controlled. Electric furnaces usually have from two to five stages of heat which is controlled by what most manufacturers call a "sequencer." The sequencer usually uses a fixed priority scheme to turn on and off these heat strips as required. Heat strips should be controlled individually with remote relays on the 240 VAC line (See Section 11).

The following general load schedule is typical for this application:

Example 2.

Circuit #:	Relay Type	Pole	Load:
1	Power	A B	Dryer *n/c
2	Pilot Power	– A B	n/c Heat #1 (1A) *n/c
3	Pilot Power	– A B	n/c Hot Water Heater *n/c
4	Power	A B	Heat #2 (1B) *n/c
5	Power	A B	Heat #3 (2A) *n/c
6	Power	A B	Heat #4 (2B) *n/c
7	Power	A B	Heat #5 (3A) *n/c
8	Power	A B	Spa/Hot Tub *n/c

*For better control, do not use the second pole of each relay unless necessary.

This schedule may be altered as necessary to suit the needs of the particular home and user. Relay poles not used (N/C) may be used if necessary. **This Is An Example Only.** For applications assistance, contact your dealer, representative or Brayden Automation Corp.

7.3 For Homes With Heat Pumps With Compressor Connected

Example Only. When assigning loads for homes with heat pumps or air conditioners with the compressor connected, compressors must be connected to Circuits 2 and 3 as discussed above. Below are examples 3 and 4.

This schedule may be altered to suit your application.

Circuits with compressors must have minimum off and minimum on times enabled. See Section 13 for System Programming Procedure.

Examples 3 and 4.

Circuit #	Relay Type	Example 3 Load Schedule A	Example 4 Load Schedule B
1	Power	Dryer	Dryer
2	Pilot	Compressor A/C#1	Compressor A/C #1
3	Pilot	Blank N/C	Compressor A/C #2
4A 4B	Power Power	Water Heater *n/c	Water Heater *n/c
5A 5B	Power Power	Aux. Heat #1 *n/c	Aux. Heat #1 *n/c
6A 6B	Power Power	Aux. Heat #2 *n/c	Aux. Heat #2 *n/c
7A 7B	Power Power	Aux. Heat #3 *n/c	Aux. Heat #3 *n/c
8A 8B	Power Power	Aux. Heat #4 *n/c	Aux. Heat #4 *n/c

*For better control do not use second pole of each relay unless necessary.

7.4

Use the form below to make up the load schedule

Circuit	Load Name(s)
#1A	Power
#1B	Power
#2	Low Voltage (3 A Max.)
#2A/B	Power (If Relay Installed)
#3	Low Voltage (3 A Max.)
#3A/B	Power (If Relay Installed)
#4A	Power
#4B	Power
#5A	Power
#5B	Power
#6A	Power
#6B	Power
#7A	Power
#7B	Power
#8A	Power
#8B	Power

8.0 Wiring Power Relays to Heat Circuits and Water Heater

8.1

Turn off all breakers for heat and water heater.

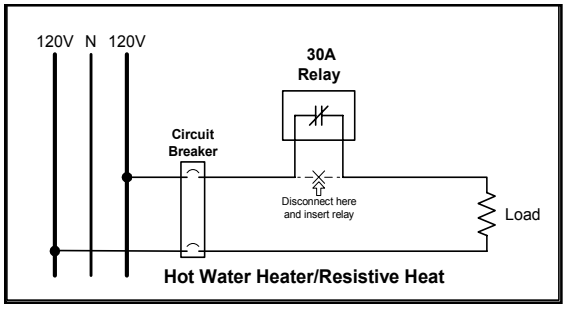
8.2

Heat circuits and the hot water heater are connected to the breaker panel as shown in Figure 3. Both wires are connected to a 240 VAC double pole breaker.

8.3

The relay is inserted in series with the load on one side of the load only as shown in Figure 3.

Figure 3. Typical Power Relay Load Interconnection



8.4

Remove either of the two wires from each load and wire nut this lead to a short length of #10 or #12 AWG (depending on load size) wire which runs into the Control unit. Wire-nut this length of wire to one lead of the relay's contact. With another short length of the appropriately sized wire, wire-nut it to the other end of the relay's contact. Connect the other end of this short length of wire back to the circuit breaker's terminal where the wire was originally removed as shown in Figure 4.

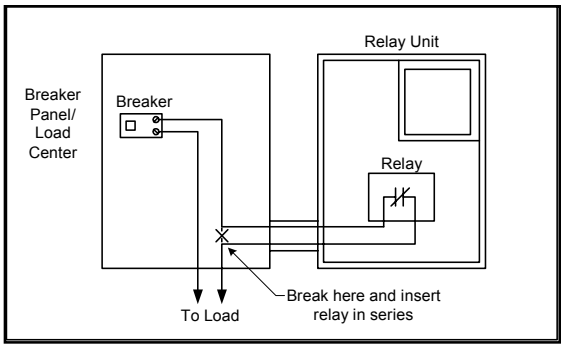
8.5

Repeat this procedure for the remainder of the heat circuits and hot water heater(s). Heat circuits are normally on 20 AMP circuit breakers and require #12 AWG wire. Hot water heaters are normally on a 30 AMP breaker and require #10 AWG wire. All 9208 relays are equipped with #10 AWG Red lead wire.

8.6

This completes wiring of power relays to heat circuits and to the hot water heater.

Figure 4. Power Relay Interconnection Schematic



9.0 Wiring The Power Relays to Dryer

9.1

Turn off the dryer breaker.

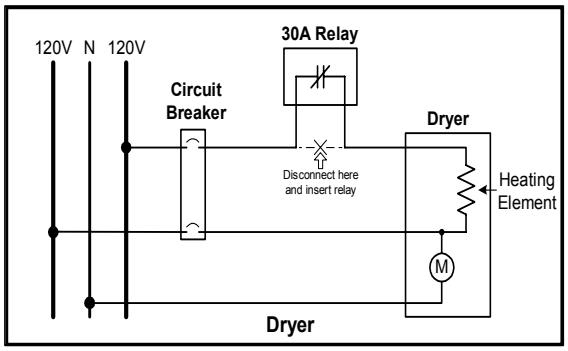
9.2

The dryer is connected to the breaker panel as shown in Figure 5. Both wires are connected to a 30 AMP, 240 VAC double pole breaker.

9.3

The relay is inserted in series on the heating element side of the load only as shown in Fig. 5. **The motor of the dryer is not connected.** Care must be taken to insure that the dryer is connected properly since improper connection **may** damage the dryer motor.

Figure 5. Typical Clothes Dryer Interconnection



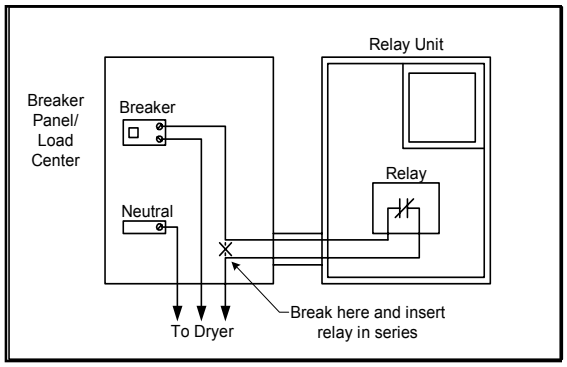
9.4

Remove one of the two wires from the dryer and wirenut, tape or suspend this wire such that it will not short to anything. Turn on dryer to see if the motor starts. If so, this is the correct wire to attach to the power relay. To verify this, turn off dryer, reattach this wire to the breaker and remove the other wire from the breaker. Start dryer again and this time the dryer's motor **should not** start. If the dryer motor starts with either wire disconnected, your dryer may require some internal wiring modifications before it can be connected to the load system. **Contact dryer manufacturer or consult dryer wiring diagram.**

9.5

Remove the proper wire from the breaker (with the proper wire removed, the dryer motor **should** start). Run two short lengths of #10 AWG wire between the breaker panel and the relay unit. Wire-nut the disconnected length of wire to one of the short lengths of wire in the breaker panel. Wire-nut the other end of this wire to one red lead of the relay's contact. From the relay's other red lead of the contact, wire-nut this to the other short length of wire that returns into the breaker panel. Connect the other end of the wire back to the dryer's circuit breaker as shown in Figure 6 below.

Figure 6. Dryer Interconnection Schematic



10.0 Wiring the Low Voltage Relays to Heat Pumps and Air Conditioners

10.1

Turn off all breakers which are going to be accepting connections.

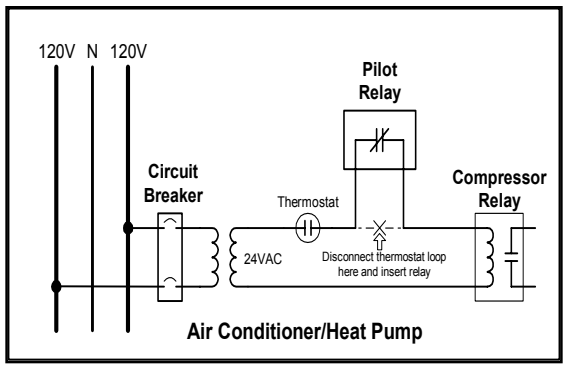
10.2

Connecting air conditioners and/or heat pump compressors to the 9208 is normally accomplished by inserting a 3 AMP low voltage relay in series with the low voltage 24 VAC thermostat control loop as shown in Figure 7 below. (Generalized Drawing). It is not recommended to control the entire heating system in this manner. Make sure that relays connected in the thermostat loop control the air conditioning only.

10.3

This completes wiring of low voltage relays to the heat pump or air conditioner thermostat loops.

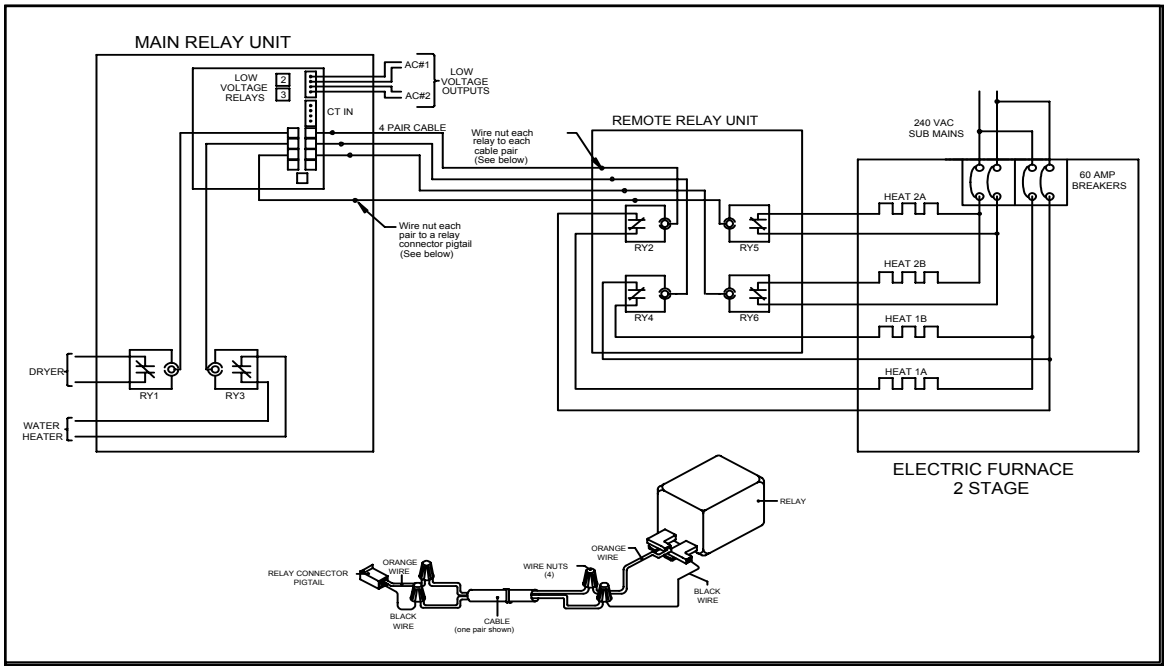
Figure 7. Typical Low Voltage Relay Interconnections



11.0 Connecting the Load Management System to an Electric Furnace

When connecting an electric furnace to the load management system, the simplest, most economical method is to install a remote relay box at the furnace. This relay box usually contains 3 to 6 relays for connection to each individual heat strip in the furnace. These relays are connected to the main relay unit by means of paired cable, normally one pair per relay. For example, for 4 remote relays, a #18 AWG eight conductor cable is required. Twisted pairs are recommended for this application for convenience. Relay connector pigtails (optional) should be used with the unit for connection at the main relay unit to the multi-conductor cable. At the remote relay unit, relay leads are wire-nutted to the multi-conductor as shown in Figure 8.

Figure 8. Electric Furnace Application



11.1

Determine the staging sequence of the electric furnace. For example, many furnaces have 3 stages of heat. Stage #1 consists of two 5 KW heating elements. Stage #2 many times also consists of two 5 KW heating elements. And finally, Stage #3 has one 5 KW heating element.

11.2

Wire the heating elements of Stage #1 to the first two available system relays. See Section 7.2 for an example. The heating elements, Heat 1A and Heat 1B are wired to relays #2 and #4. Heating elements #2A and 2B are wired to Relays #5 and #6. Heating element #3A is wired to relay #7, etc. The dryer would be wired to Relay #1 and the water heater to Relay #3.

11.3

Do the remaining relays similar to the first making sure that each relay is connected with a pair of wires. **Do not common any wires together.**

Note: This is an example only. Your application may be different. If you need application assistance call the factory.

12.0 System Checkout

12.1 Prior to Test:

12.1.1

Turn off all breakers in the load center.

12.1.2

Turn on Thermostats/switches for controlled loads.

12.2 Conduct Initial Operation Test

12.2.1

Ensure all breakers in the load center are off.

12.2.2

Turn on "Load management system" breaker.

12.2.3

All relays in the relay unit should open within one second. You will hear them click. The Green LED light will flash on and off at a rate of once per second indicating that all systems are operating properly. If unit fails to turn all relays **"off"** within one second, **turn power off immediately. Check wiring and connections to make sure that the unit is wired properly**. Try powering unit up again as before. If problems still arise, call your ENERGY SENTRY® Dealer or representative. If the 9208 is controlled by a utility control system, as described on page 10, the green LED will blink at a rate of 4 times per second when the 9208 load management system is in the off-peak (no control) mode.

12.2.4

Within eight seconds after power up, the first relay should close and one relay should close every 1 minute after that (unless load is held off by a minimum "off" time) until all relays are closed. If the 9208 is in the "off-peak" (as described above) all loads will restore within the first minute.

12.3 Conduct Power Off Test

12.3.1

All relays should be closed.

12.3.2

Set Demand Limit Setpoint Dial to 2 KW on the 9208 Control Board.

12.3.3

Turn on a large (> 5 KW) uncontrolled load such as the kitchen range. Leave all controlled loads off.

12.3.4

Within 5 to 10 minutes, all relays should turn off. When a 60 minute averaging time is selected, it may take several minutes to shed loads since the average KW demand is changing much more slowly.

12.3.5

Turn off uncontrolled load. Raise demand limit to 15 KW. Within a few minutes, the system will start to restore loads. About every 1 minute, the system should close or restore one relay. This verifies that the unit is measuring power properly.

12.3.6

Repeat Power Off test if any question exists that turning on the large (>5 KW) load with the demand limit set at 2 KW caused the system to shed loads; and that turning the uncontrolled loads off and turning the demand limit to 15 caused the relays to restore.

12.4 Conduct Power On Test

12.4.1

Ensure all breakers in the load center are off except for the 15 AMP "9208 Load System" breaker. Observe the disk of the KW hour meter to be sure that it is turning very slowly due only to the power consumed by the load system unit.

12.4.2

Set the demand limit to 15 KW.

12.4.3

This demand limit will allow all of the circuits to be turned on in about eight minutes-(one minute per circuit unless held off by a minimum off time). Listen for each relay to restore.

12.4.4

Turn on each controlled load circuit breaker, one at a time. The KW hour meter disk should speed up as each load is turned on. This verifies that all relays are actually closed and each circuit is providing power to the load. Alternately, this can be verified with an AMP-Clamp, if available.

Caution: Do not leave controlled loads on any longer than necessary as this may cause the electric meter to register a high demand peak.

Note: If minimum on and off times have been programmed into the unit, then loads controlled under these times will switch only when the appropriate time intervals have elapsed.

12.5

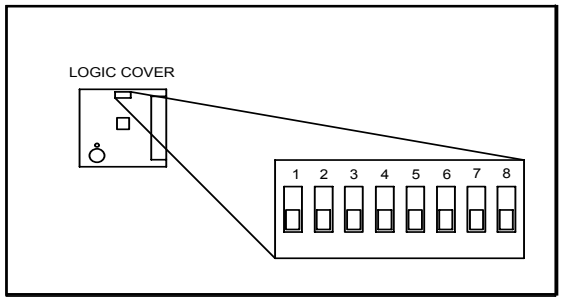
Restore household loads to the desired condition. The circuit breaker marked "9208 Load System" should be left on with desired demand limit of set on the rotary limit dial on the 9208 unit. See Section 13 for additional programming information.

13.0 System Programming

13.1

The system programming is done using the eight position Dip switch at the center of the top side of the control board assembly (Figure 9). They are described below:

Figure 9. Dip Switch Location



13.2 Switch Definitions

13.2.1

Switch #1 & #2: Selects the number of loads enabled. If control points (loads) are not used, the unused control points should be disabled to instruct the microprocessor to ignore these control points. This saves processing time and increases the home's load factor by not switching loads on and off which are not there. Select the switch combination on the chart below:

Switches 1 & 2 - determine the number of loads controlled.

S1	S2	Resulting Action
0(dn)	0(dn)	All loads Controlled
0(dn)	1(up)	Loads 1-7 controlled; Load #8 not controlled
1(up)	0(dn)	Loads 1-6 controlled; Loads #7 & 8 not controlled
1(up)	1(up)	Loads 1-5 controlled; Loads #6,7 & 8 not controlled

13.2.2

Switches 3,4,5 set the load control strategy. It can be set in either a fixed priority mode, a rotating mode, or a combination. The load control strategy determines the order in which the loads will be shed and restored. The table on page 21 indicates the switch positions for certain load control strategies.

Switches 3,4,5 - determine the load control strategy:

3	4	5	Resulting Action	Priority by Load # 1–2–3–4–5–6–7–8
0	0	0	All fixed priority	1–2–3–4–5–6–7–8
0	0	1	2 rotating loads	1–2–3–4–5–6–8–8
0	1	0	3 rotating loads	1–2–3–4–5–8–8–8
0	1	1	4 rotating loads	1–2–3–4–8–8–8–8
1	0	0	5 rotating loads	1–2–3–8–8–8–8–8
1	0	1	6 rotating loads	1–2–8–8–8–8–8–8
1	1	0	7 rotating loads	1–8–8–8–8–8–8–8
1	1	1	8 rotating loads	8–8–8–8–8–8–8–8

13.2.3

Switch 6 - Enables/disables the 8 minute minimum "on" time and 5 minute minimum "off" time on control points #2 and 3. With switch #6 in the Up position, the minimum On and Off times are enabled. With switch #6 in the Down position, the minimum On and OFF times are disabled and control points #2 and #3 will switch on and off without the time delays. Minimum On and Off times are required if compressor loads are connected to the system.

13.2.4

Switch 7 - Enables/disables the #3 control point. This assumes that the home has only one A/C and it is connected to control point #2. Control Point #3 is left blank, the water heater is connected to #4, and the dryer is connected to #1. With this switch in the Up position, control point #3 is Disabled and the contacts of the low voltage relay are held in the open position. In the Down position, control point #3 operates normally under the demand control algorithm.

13.2.5

Switch 8-Sets the demand averaging interval of the 9208. With the switch in the Down position the demand averaging interval is 15 minutes. With the switch in the Up position, the demand averaging interval is 60 minutes. This switch setting should match the averaging interval of the demand meter. If the 9208 is used with a 30 minute interval, set the switch in the Down position.

14.0 Wrap-Up

14.1

The 9208 Load Management System should now be "on" and all breakers for loads controlled by the 9208 should also be "on."

14.2

The 9208 should be set with the proper system settings.

14.3

Relays in Control Unit should be turning loads on and off as necessary.

14.4

Replace cover on the 9208 and on breaker panel and tighten screws.

14.5

Turn to the back page of the manual and record the following information in the spaces provided.

- Unit Serial Number
- Load Priority
- Load control strategy selected
- Household circuit or load assignments
- Minimum On/Off times for circuits #2 and # 3 if enabled, otherwise write 0.
- Date of Installation
- Name of Dealer or installing electrical contractor.
- Complete warranty card and drop in mail to Brayden Automation Corp.

Warranty card must be sent in for proper registration of unit. Warrantly not valid unless warranty card has been received and unit has been registered.

Note: The above information must be recorded in order to validate the warranty.

14.6

Leave the Owner's/Installation Manual in a convenient location for future reference. If installation is new construction, place manual in kitchen drawer with appliance manuals.

14.7

This concludes the installation of the 9208 Load Management System.

Required Warranty Information

Limited Three-Year Warranty

ENERGY SENTRY® Load Management Systems and their components are warranted by Brayden Automation Corporation against defects in materials and workmanship for three (3) years from the date of original installation, provided that the original date of installation is within one year from date of manufacture. This warranty is further conditioned upon the ENERGY SENTRY® system being properly installed and used for their ordinary and intended purposes. During the term of this warranty, Brayden Automation Corporation, through its authorized representative, will repair, or at its option, replace at no charge an ENERGY SENTRY® system or its components that proves to be defective, provided that you comply with the requirements set forth in this warranty.

Requirements and Conditions of Warranty

1) The limited warranties contained herein extend exclusively to the original purchaser of the ENERGY SENTRY® systems and members of purchaser's immediate household. If you sell your house after installation of the ENERGY SENTRY® system, this warranty is non-transferable to the new owner(s).
2) The system must be installed by a duly qualified and licensed electrical contractor or authorized dealer representative. Any removal and /or reinstallation must be done by a duly qualified and licensed electrical contractor or authorized dealer representative.
3) Repairs or replacement shall be undertaken by duly authorized service dealers or Brayden Automation Corporation. If you or any member of your family or any other unauthorized person manipulates, moves, alters, damages or attempts to repair or replace the ENERGY SENTRY® system, the warranty shall be void and of no effect.
4) Notification to Brayden Automation Corporation or its authorized dealer under this warranty must be received within one week after discovering any defect in materials or workmanship.
5) If the ENERGY SENTRY® system is removed and returned to the authorized service dealer or "Brayden Automation Corporation at 1807 E. Mulberry Ave., Fort Collins, Colorado, 80524" for repair or replacement under this warranty, all shipping and handling charges must be prepaid by you. Transit damage is not covered by the warranty and Brayden Automation Corporation suggests you insure shipments to the service dealer or to the factory. Remember to send proof of date of installation as well as the serial number of the unit which is located on the inside of the relay unit.
6) The warranty does not apply if the ENERGY SENTRY® system has been damaged by accident, alterations, abuse, misuse, improper installation, or act of God, or as a result of service or modifications by someone other than an authorized service representative.
7) In no event will Brayden Automation Corporation be liable for any lost profits, lost savings, incidental damages or other economic consequential damages, even if Brayden Automation Corporation has been advised of the possibility of such damages due to the proper or improper workings of the ENERGY SENTRY® system.
8) This warranty is for factory service only. Brayden Automation Corporation will not be responsible for any field service expense for a licensed electrician or authorized service representative to service the load management system during or after the warranty period is in effect.

This warranty is expressly made in lieu of any other warranties expressed or implied specifically including any warranty of merchantability or fitness for a particular purpose.

This warranty is further conditioned on the return and receipt of the warranty registration card.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Required Warranty Information

Installing electrician: Fill out applicable information on this page and items 5, 6, 7 and 8 on warranty card.

1. Strategy selected (check applicable strategy)

☐ Fixed ☐ Rotating ☐ Combination Fixed/Rotate

Control Circuit	Household Circuit Assignment/Description	Priority (if applicable)	Minimum "on/off" Time*
1	_____	_____	mins on____/off____
2	_____	_____	*mins on____/off____
3	_____	_____	*mins on____/off____
4	_____	_____	mins on____/off____
5	_____	_____	mins on____/off____
6	_____	_____	mins on____/off____
7	_____	_____	mins on____/off____
8	_____	_____	mins on____/off____

*Minimum "on/off" times on control circuits 2 and 3 are selectable – see section 13.0 of this installation manual or contact your dealer for more information.

Homeowner:

1. Record circuit assignments above inside the door of the Control Unit.
2. Fill out items 1 through 4 on warranty card and mail today!
3. Record items 5, 6, and 7 from warranty card below for your records.

Date of installation _____

Serial number _____

Installing electrical contractor _____ Phone _____

BRAYDEN AUTOMATION

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