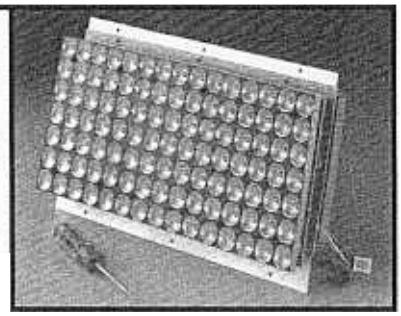
ALPHA *INCANDESCENT LAMP MODULES*

INSTALLATION AND MAINTENANCE INSTRUCTIONS



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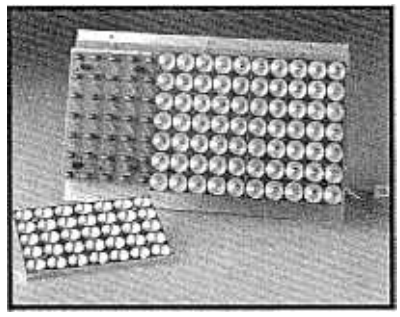
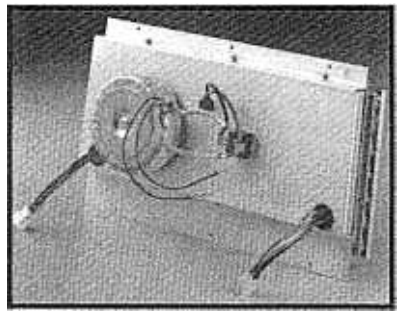


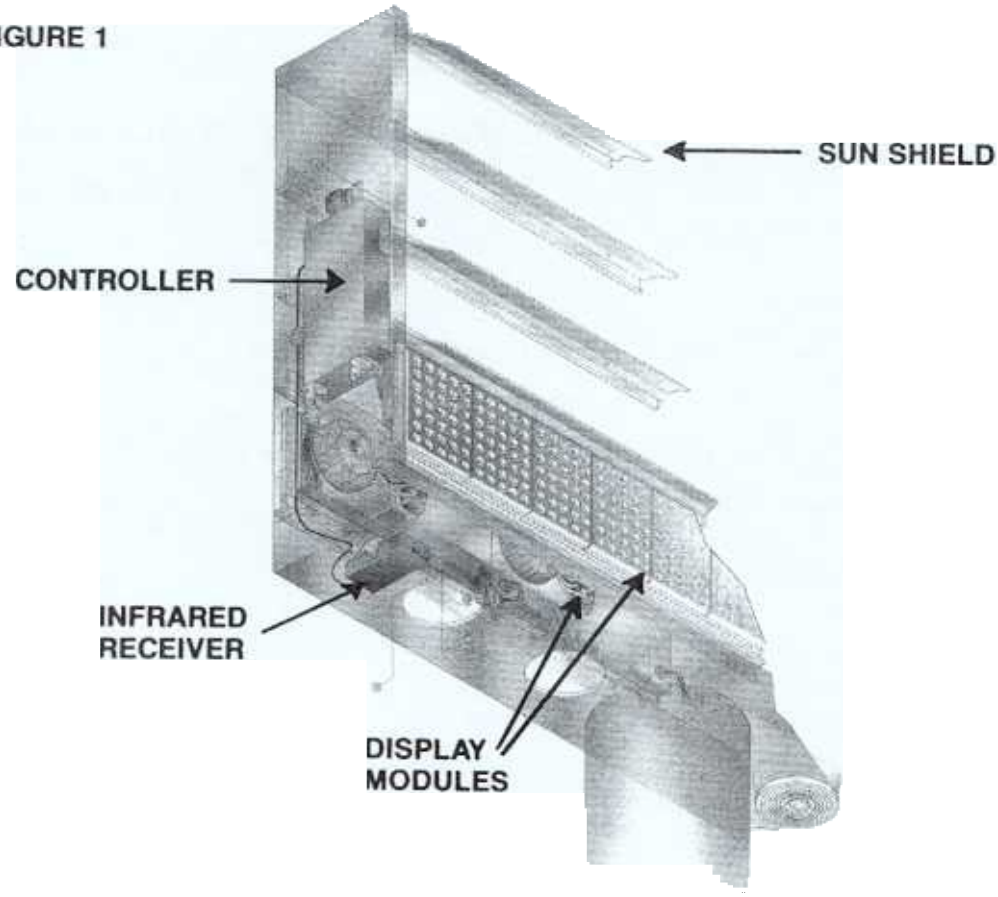


SECTION 1
Case and Mounting Recommendations

The actual case design is to be determined by the installer. However, as a general guideline, refer to drawing numbers 10499002-5,10499002-6 and figure 1. For our examples, we used angle iron to construct a framework for the mounting of the modules and attached a sheet metal skin to this frame. The spacing between lines will be determined by your particular application. For our example, we based the spacing off a standard industry application and common angle stock material.

Electronic components of this unit consist of three basic types of modules: the lamp module, the controller module and the infrared receiver. (The mounting footprints of these components can be found on drawing numbers 10930111-1, 10490001-1 and 10713211-1.) Once again, the number of lamp modules is determined by application but only one controller module and one infrared receiver is required per unit.

FIGURE 1



The infrared receiver should be mounted to the outside bottom of the case under the approximate location of the controller module. On a single sided sign, the controller module should be mounted in the lower right hand section of the sign (as looking from the face of the sign) either to the side or back of the case. The reason for this is that the controller module always connects to the lower right hand lamp module. The location of the lamp modules depend on your application, however, for end to end placement the distance from the beginning of one lamp module to the next is 13.5".

NOTE: When mounting these components to the frame of the sign, make sure that star washers or similar type locking washers are used in order to ensure adequate grounding of each component to the frame.

SECTION 2
Electrical Connections

Please refer to drawing #10490000-1 for a wiring connection example of a 3 line by 4 lamp module sign. Each lamp module has 4 connections to make. Two of the connections use simple plug-in connectors. One connector mates with a connector from the previous lamp module and the other connector mates with a connector to the next lamp module in the line. Note that all of the lamp modules, even though they may be in different physical lines, are actually connected in a single row. A line interconnect cable is used to connect one row to the next. The other two connections of the lamp modules go to the AC line voltage. (The power filter is optional, but recommended.)

The controller module requires four to five connections. Two of the connections go to the AC line voltage. The other two to three connections are again simple plug-in connectors. One connector mates with a connector from the infrared receiver and the other one or two connectors mate with the lamp modules. (Only one connector is used for a single sided sign. For a double sided sign, a line interconnect cable is needed to extend to the first module of the other side of the sign. The controller module always connects to the lower right hand lamp module when looking at the front of the sign.)

The infrared receiver only has the one plug-in connection to the controller.

All AC wiring should be done in accordance with your area's local electrical code. Refer to the "Lamp Module Specifications" document to aid you in determining the electrical service required for your particular application. Avoid running AC wiring along with the line interconnnect cables if possible.

CAUTION: Make sure that the driver modules, controller and fans are all grounded to the frame of the sign and that the sign itself is properly grounded.

SECTION 3
Controller Module

Before the controller module is installed into the sign, it must be configured for that particular sign's size by a switch setting inside of the controller assembly. Once set, this switch does not have to be changed unless the sign size would change. To get at the switch, the cover of the controller must be removed by taking out the 4 Phillips head screws. See figure 2. The 8 position dip switch should now be readily accessible.

There are 3 rules to determining the possible size combinations:

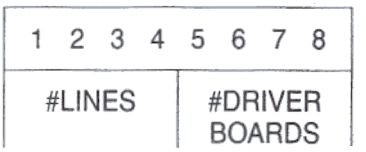
1) The minimum number of lines (or rows) is 2 and the maximum number is 15.
2) The minimum number of lamp modules per line is 4 and the maximum is 15.
3) The maximum number of lamp modules per side on the sign is 64. The following chart summarizes these maximum sizes.

Maximum sign configurations are

#Lines by #Lamp modules per line	#Characters per line
2 by 15	37
3 by 15	37
4 by 15	37
5 by 12	30
6 by 10	25
7 by 9	22
8 by 8	20
9 by 7	17
10 by 6	15
11 by 5	12
12 by 5	12
13 by 4	10
14 by 4	10
15 by 4	10

The 8 position switch is organized as follows:

SW



ON = 1

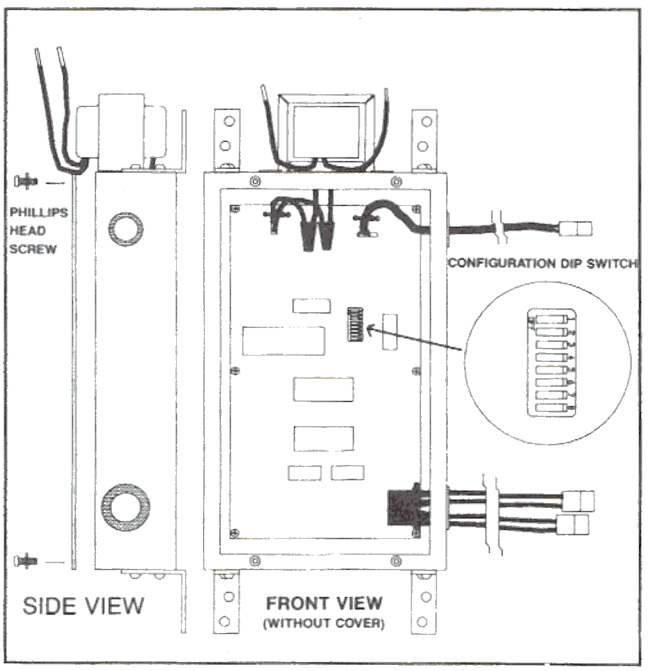
OFF = 0

The first four switch positions indicate the number of lines (per side) on the sign. The second four switches indicate the number of lamp modules per line (again on one side only). The controller module does not care whether the sign has one or two sides. The switches are easily set by toggling the white lever either on or off (a small screw driver works quite well for this). Use the table below to help determine the proper switch setting. Assume a "1" is the on position and a "0" is the off position.

NUMBER OF LINES	SWITCH 1	2	3	4	NUMBER OF LAMP MODULES	SWITCH 5	6	7	8
2	0	0	1	0	2	N/A			
3	0	0	1	1	3	N/A			
4	0	1	0	0	4	0	1	0	0
5	0	1	0	1	5	0	1	0	1
6	0	1	1	0	6	0	1	1	0
7	0	1	1	1	7	0	1	1	1
8	1	0	0	0	8	1	0	0	0
9	1	0	0	1	9	1	0	0	1
10	1	0	1	0	10	1	0	1	0
11	1	0	1	1	11	1	0	1	1
12	1	1	0	0	12	1	1	0	0
13	1	1	0	1	13	1	1	0	1
14	1	1	1	0	14	1	1	1	0
15	1	1	1	1	15	1	1	1	1

Once setting the switches to the correct configuration, reassemble the controller module by replacing the cover and four screws. The controller module is now configured to your size sign. Refer to figure 3 for an example.

FIGURE 2:



CONTROLLER MODULE (CONFIGURATION SWITCH ACCESS)

FIGURE 3:

SAMPLE CONFIGURATION

SECTION 4
Infrared Receiver Positioning

The infrared receiver is equipped with an adjustable mounting bracket which enables the installer to change the angle that the receiver is to the sign. Set the angle of the receiver to match up with the approximate location of the person programming the sign (approximately 25 feet).

SECTION 5
Shading

Although each lamp has its own parabolic reflector to maximize its light output, some type of shading of the lamp modules is recommended for optimized viewing in direct sunlight. In our example, we used a sheet metal shade over each line of the sign approximately 6″ in length. Please notice that the shade has a slight angle to it (about 7 degrees) to increase its effectiveness at lower sun levels.

In addition to shading, a black screen material is recommended over the face of the lamp modules in order to optimize the contrast of the display in direct sunlight. It also helps to keep the lamp modules free of bugs and other objects. We used ordinary window screen in front of each line of the display.

SECTION 6
Overheating

The controller module is equipped with a temperature sensing device to help prevent the sign from overheating. If the controller becomes too hot, the message displayed will automatically be turned off to allow the sign to cool off. When the sign has sufficiently cooled down, the message will automatically re-start. To indicate that the sign is cooling down and not malfunctioning, two flashing dots will be displayed on the upper left line. One in the upper left corner and one in the lower left corner.

NOTE: The sensing device is only an aid in overheat prevention. The sign MUST be equipped with cooling devices. See Cooling (Section 7).

In the event that the controller module shuts itself off repeatedly and indicates an overheat condition, the following steps should be taken:

1. Make sure that all fan intakes are clear of any obstructions.
2. Make sure that the face of the sign is not obstructed. Remember, the sign face is the exhaust for the hot air.
3. Make sure that all the fans in the system are functioning. If so, the number of fans may not be sufficient and more may have to be added.
4. If the problem still persists, consult your Alpha dealer.

SECTION 7
Cooling

It is the responsibility of the installer to provide adequate cooling for the sign. The basic concept behind the method of cooling is quite simple. The fans or blowers are to be positioned so that they draw air from the outside of the case and form a positive pressure inside of the case. The only points of exit for this air should be through the face of the display. The venting in the aluminum mounting plates of the lamp modules allows for this type of air flow, provided the pressure is great enough. Note that in our examples, the fans are placed in the bottom of the case in order to assist the natural air flow that moves upward. In additon, this placement also provides maximum protection against rain, snow or other foreign materials from entering the fan intake. It is extremely important that this basic concept of airflow be followed in order to ensure adequate ventilation of the sign.

Here are general guidelines to to keep in mind when designing your case with respect to airflow:

- Use several smaller fans rather than one large fan. Several smaller fans will distribute airflow more evenly and probably be more cost effective than one or two larger fans.

- Keep the airflow path as unobstructed as possible. This has a very important impact on cooling efficiency. Try to keep the amount of open space in the back of the case as deep as the width of the fans.

- Try to ensure that the only point of exit for the air is through the lamp modules. "Seal" off the case as much as is reasonable. Don't leave large openings around the ends of the lamp modules which would allow air to exit.

- If using a type of fan guard, or screen over the fan intakes (which is recommended), avoid utilizing too fine of a material. The finer the material, the more restricted air intake will be (also, the easier it will clog up with debris).

The number and size of fans will vary for every application. The important thing to remember is that the fans bring air in from the outside of the case, form a positive pressure inside of the case and that the air exhaust is through the displays only. The cooler the sign runs, the longer the electronic components will last and the longer the bulb life. A fairly safe figure to base your fan needs on is approximately 20 CFM per lamp module. For example, in our three line by four sign, 2 fans rated at 110 CFM each were sufficient for our cooling needs.

SECTION 8
Maintenance

Lamp Replacement

A simple lamp test can be run on the lamp modules helping you to easily locate burned out bulbs. Refer to the operators manual for running this test. Once located, lamp replacement can begin. First, remove the screen material which was placed over the face of the display by the installer.

Note: Power should be turned off to the unit before proceeding.

Next, remove the 7 x 5 aluminum reflector over the bulb(s) to be replaced. There are 3 aluminum reflectors on each lamp module and each is held on by four plastic locking standoffs. To release the locking mechanism, push in the tip of standoff with your thumb or forefinger and pull up slightly on that corner. Repeat this procedure on the other three corners and then remove the entire reflector. The lamps are now readily accessible. Grip the lamp that you wish to replace between your thumb and forefinger and pull it straight out of its socket. To replace, simply insert a new lamp into the socket and push until it is firmly seated. DO NOT twist lamps while in socket at any time, just push in or pull out.

Lamp life will vary in every application. Line voltage, types of messages run, and sign location can all have an inpact on life. You are going to have to replace random lamps that burn out. However, after a period of time, you may notice a silvering of most of the lamps. This is an indication that lamps will begin to burn out more frequently. At this time you may wish to replace all of the lamps on the display in order to avoid frequent lamp replacement.

Fan Intake

Periodically, make sure that the fan intake is free of any obstructions or debris. In addition, the screen material over the lamp modules should be checked for damage and wear. Any blockage of these two areas will directly impact cooling efficiency and sign operation.

Notes

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