AlphaXpress DMS Walk-in Sign Maintenance Manual

New Mexico P1509-5

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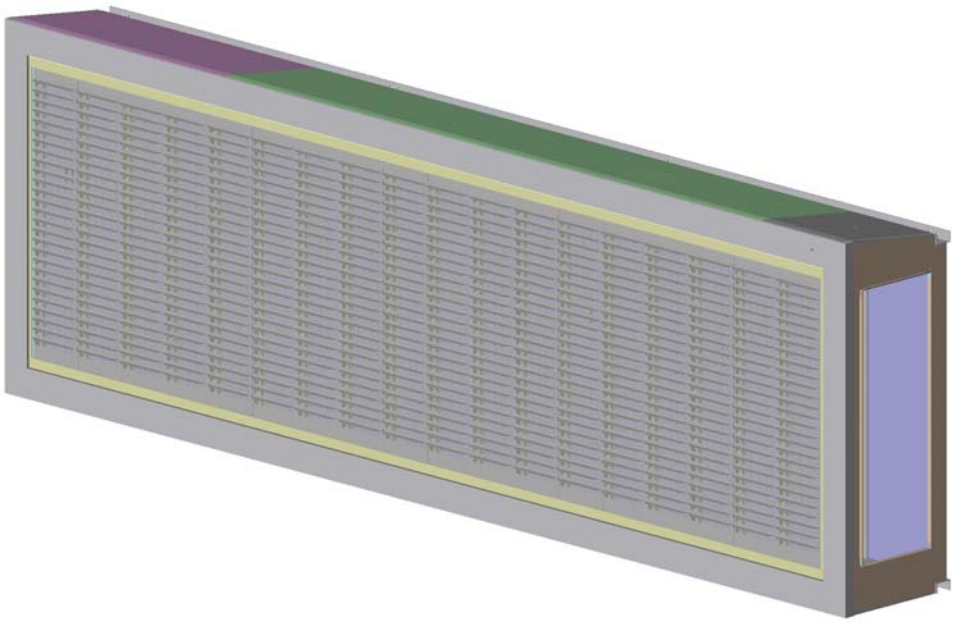

Manual part number: 1509610301A

Revision date: November 15, 2006

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Adaptive Micro Systems

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Contents

Introduction

Purpose

This manual is intended as a guide for maintenance and repairs considered field serviceable.

This field service manual supplies technical information for service and technical personnel so that they can maintain the equipment at the assembly but not the component level.

Revision history

Table 1: Revision history

Revision	Date	Notes
1509610301A	November 1, 2006	First release.

Related documentation

Technical documentation can be found at Adaptive's web site (http://www.adaptivedisplays.com):

Table 2: Related documentation

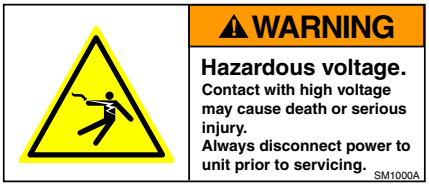
Part #	Manual title	Description
TechMemo #05-0005	Preventing Electrostatic Discharge (ESD) Damage	Describes the precautions to take to protect electronic components from ESD damage.
1509650201	P1509-5 27x108 Wiring diagram	Sign wiring diagram.

Safety information

Equipment symbols

Chassis ground

Warnings and cautions



Other warnings and cautions are posted in appropriate location throughout this manual.

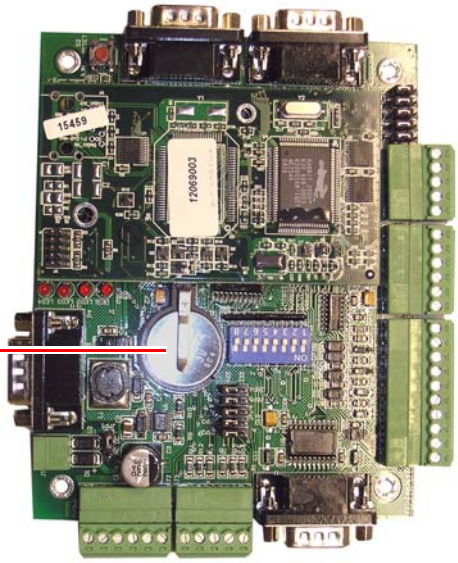
Battery backup

In the event of a power loss, two lithium batteries and one power supply panel provide power to the sign's controller boards.

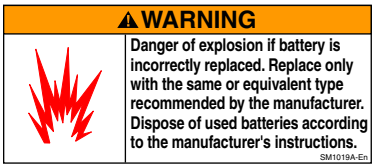
Note: The lithium batteries only provide enough power to backup the sign's controllers memory during a power loss, not the sign's LED displays.

3V lithium backup batteries

One 3V lithium battery is located on each of the sign's controller boards



3V lithium battery (Panasonic CR2032 or equivalent).



Installation

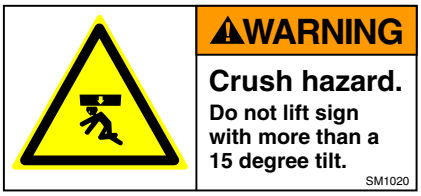
Fan and light switch location

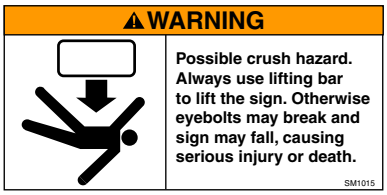
Two, 12-hour timer switches that control sign lighting and fans are located at the sign entrance.

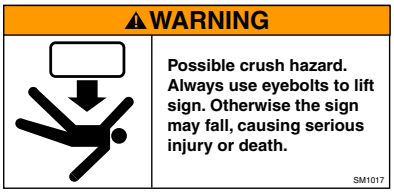
Figure 1: Lighting and fan timer switches

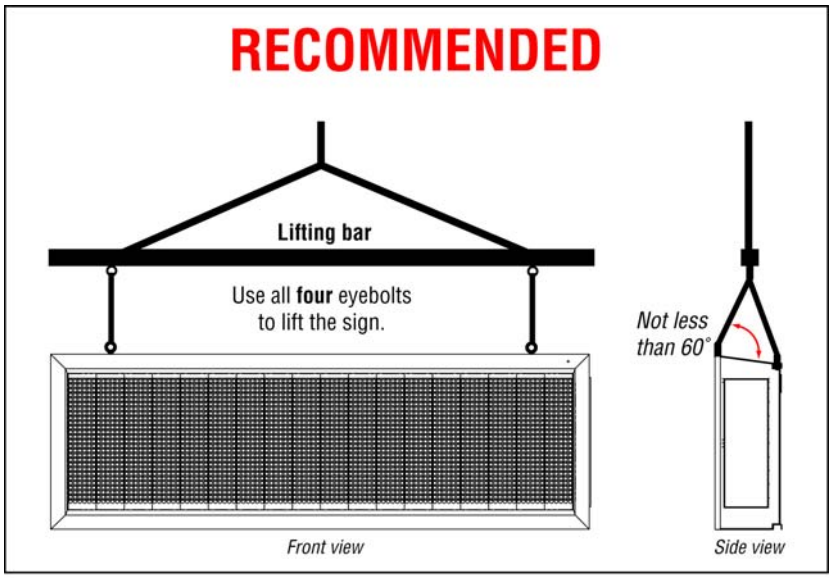
Mechanical installation

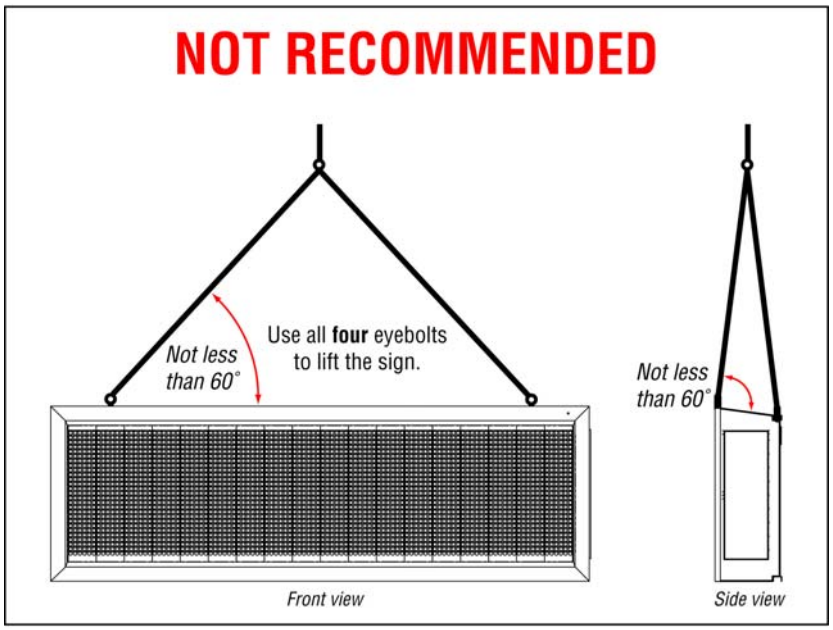
Lifting the sign











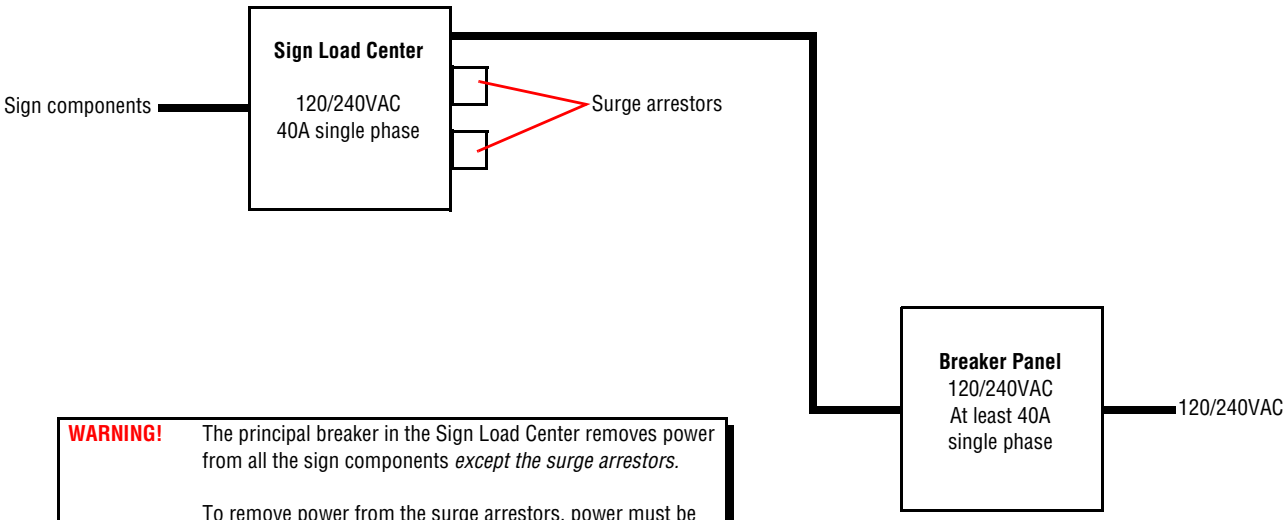
Mounting the sign

Use all five girder brackets on the back of the sign to attach the unit to a support structure.

Girder brackets — use *all five brackets* to mount the sign.

- Attach the sign to the support structure using *all eight bolts* on each of the five brackets.
- Tighten each bolt to 45 foot-pounds.
- The front of the sign can be tilted up or down by 3°.

Electrical installation

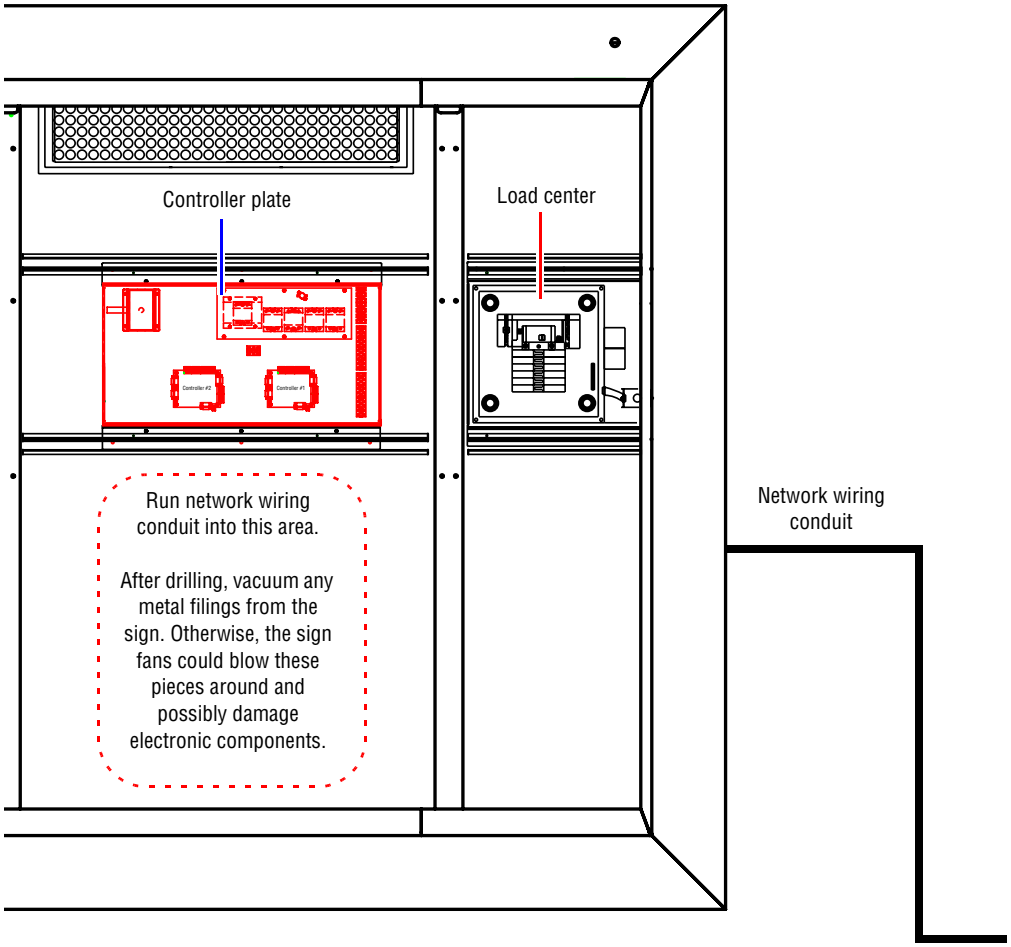


WARNING! The principal breaker in the Sign Load Center removes power from all the sign components *except the surge arrestors.*

To remove power from the surge arrestors, power must be switched off at the customer provided Breaker Panel.

Sign to central network connection

Inside sign view



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Equipment description

General description

- Serviceability: Walk in.
- Weight: 5000 pounds (No to exceed, approximately).
- Display technology: LED
- Display size: 27 rows x 108 columns (see Figure 2).
- LED matrix: 9 pixels high x 6 pixels wide.
- Character height: 18 inches, nominal (see Figure 2).
- Character width: 9 inches, nominal (see Figure 2).

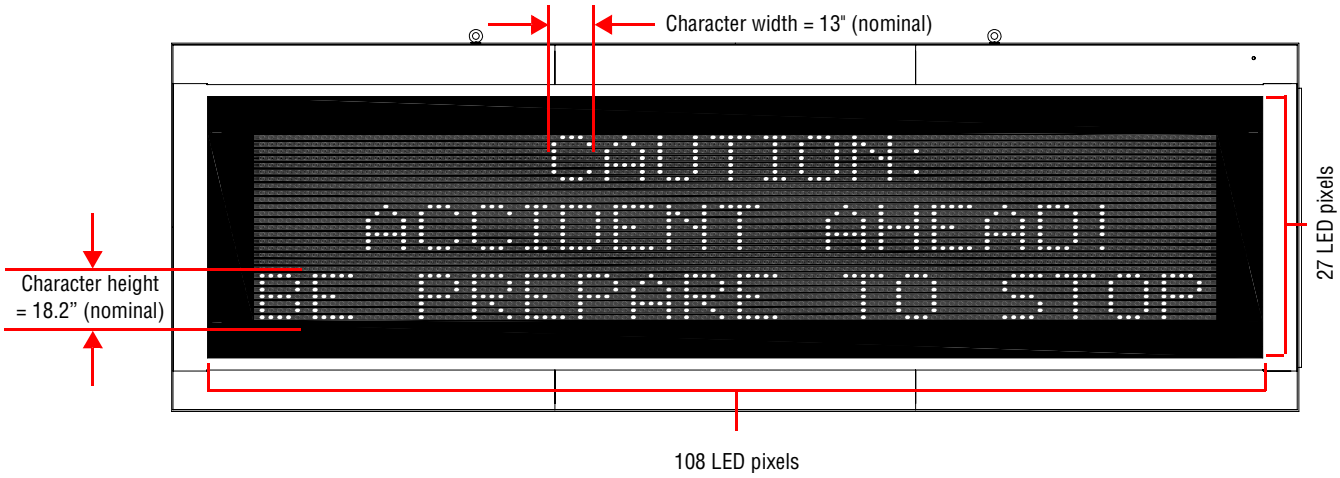


Figure 2: Display size

- Pitch (distance between each LED pixel): 2.6 inches:

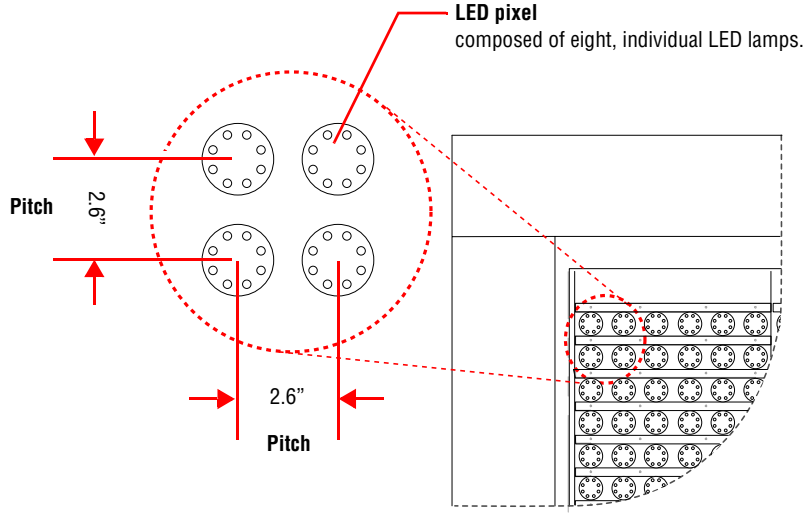
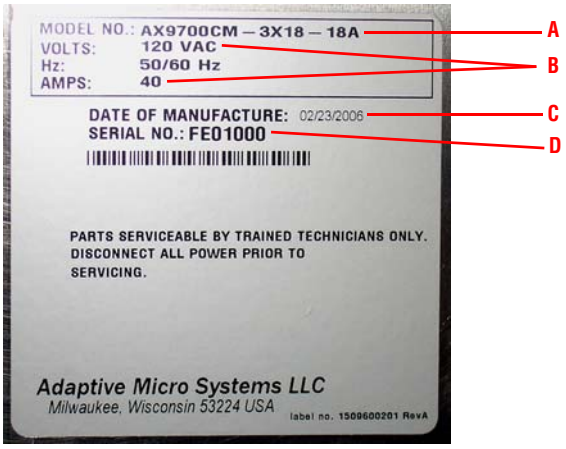


Figure 3: LED pitch

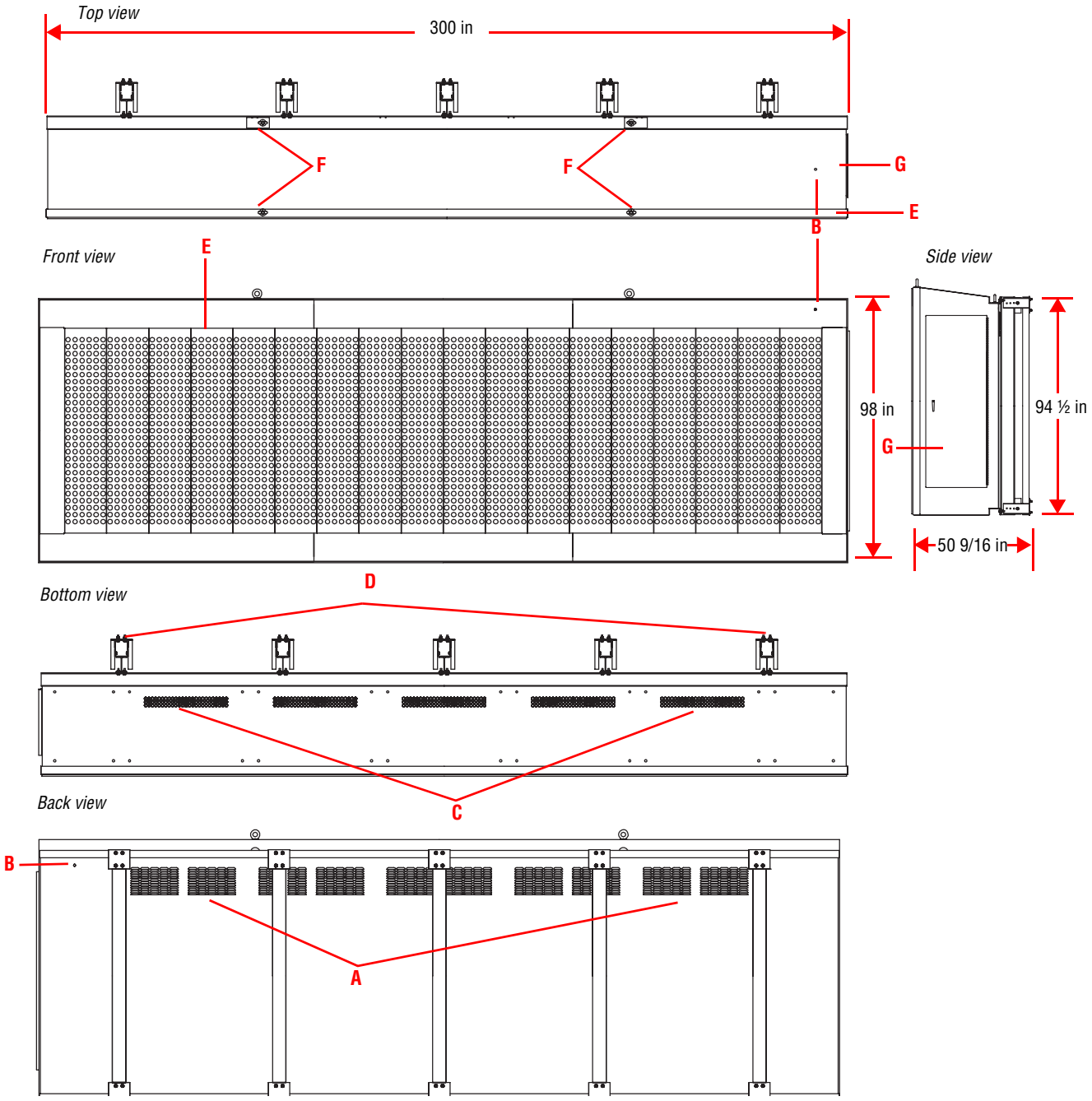
Equipment identification

An equipment label is located inside the sign near the door, above the load center panel.



Item	Name	Description
A	Model number	AX9700FM–27X108–18A Character height (18 inches) Character color (“A” = amber) Display size “FM” = Full Matrix AlphaXpress 9700 sign
B	Electrical information	Input voltage, frequency, and amperage.
C	Date of manufacture	Month, date, and year the sign was made.
D	Serial number	Consecutive, unique identification number.

Outside views

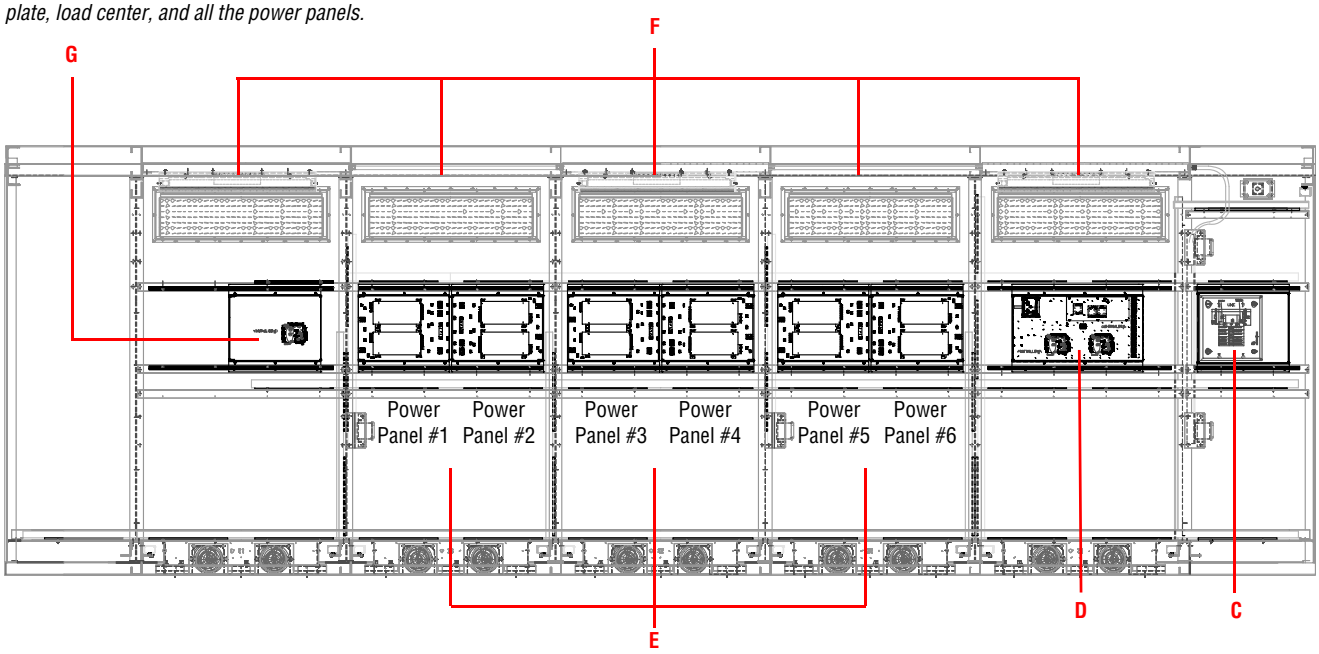


Item	Name	Description
A	Exhaust vents	Fans located on the sign floor *push* air out of the sign and through these vents.
B	Light sensor	Used for dimming the sign LEDs. There are 3 light sensors used in the sign.
C	Floor vents	Fans located on the floor *pull* air through the floor vents.
D	Mounting beams	Six beams used to mount the sign on a structure and to angle the sign face ±3°.
E	LEDs	Used to display messages.
F	Lifting eyebolts	Used to lift the sign into place for mounting. **All four eyebolts must be used to lift this sign** (see "Mechanical installation" on page 8).
G	Access door	Allows walk-in entry to the inside of the sign. NOTE: To keep the door open, use the locking arm inside the sign.

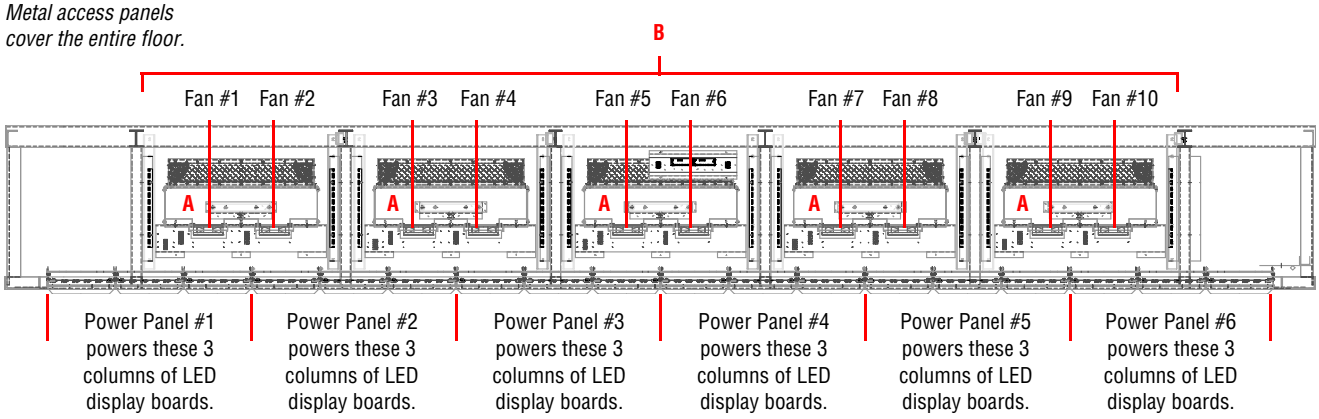
Inside views

General inside view

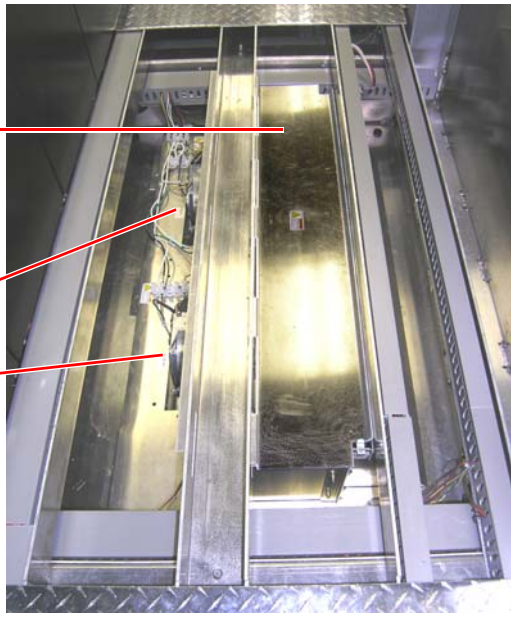
Inside front view
Protective panels cover the controller plate, load center, and all the power panels.

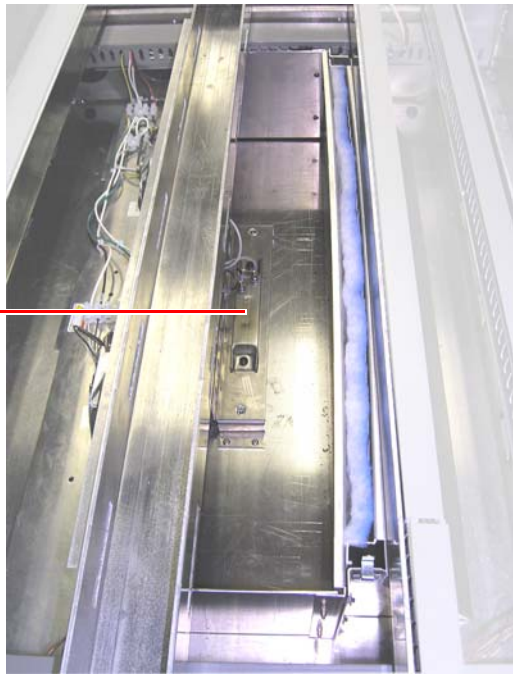


Inside bottom view
Metal access panels cover the entire floor.



Item	Name	Description
A	Heater	Used to reduce humidity inside the sign. Heaters are enclosed inside a metal case suspended above the sign floor.

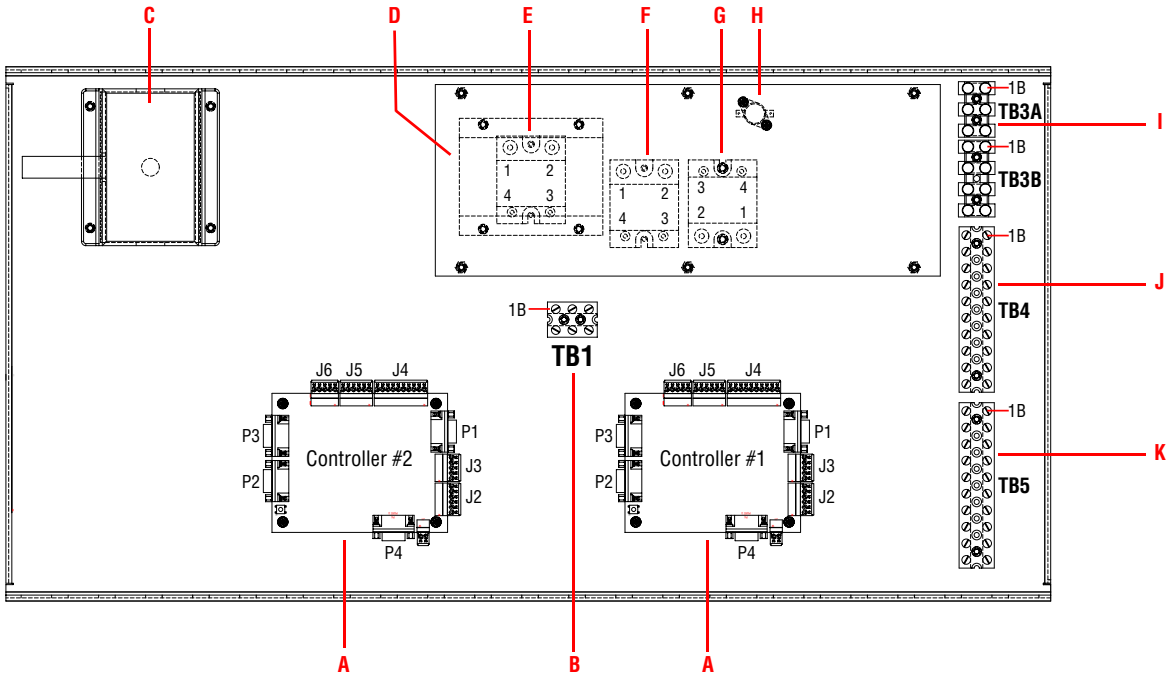
<table>
<tr><td>B</td><td>Fan housing</td><td>A total of 10 fans are located underneath the sign's metal flooring. The fans blow air out of the sign through vents in the bottom of the sign:
 

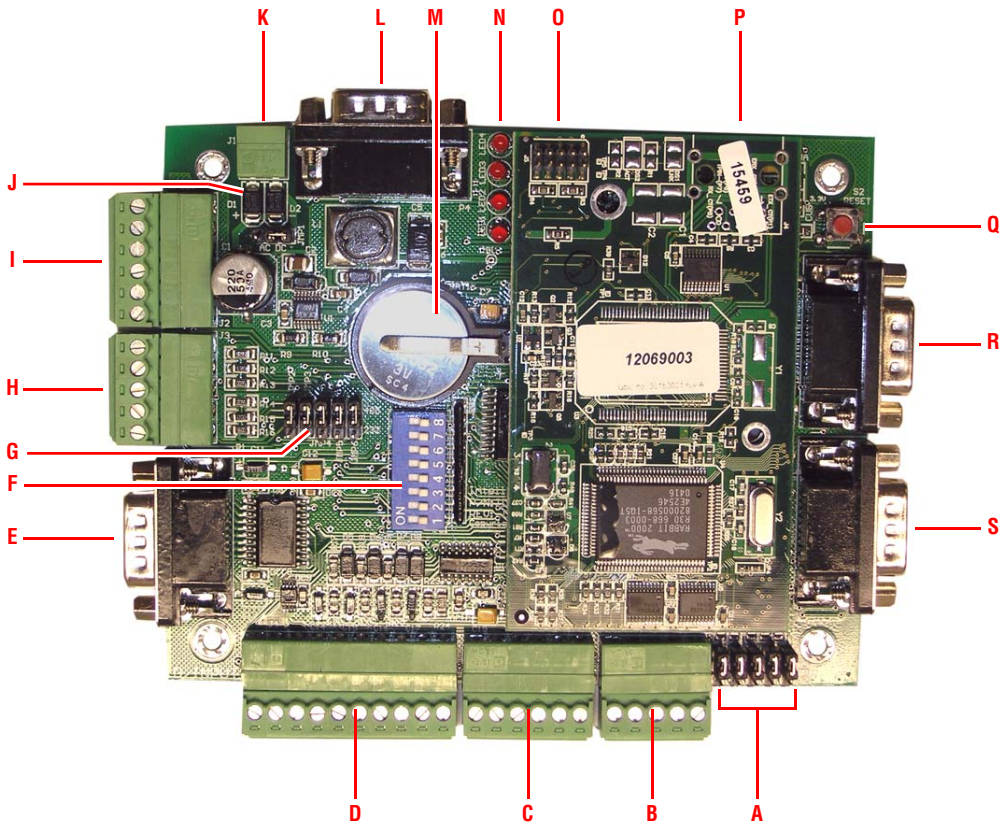
 
</td></tr>
<tr><td>C</td><td>Load center</td><td>See “Load center panel” on page 23.</td></tr>
<tr><td>D</td><td>Controller plate</td><td>See “Controllers” on page 18.</td></tr>
<tr><td>E</td><td>Power panels</td><td>See “Sign power panels” on page 22.</td></tr>
<tr><td>F</td><td>Air vent filter</td><td>Clean and replace as needed.</td></tr>
<tr><td>G</td><td>Controller #3</td><td>Used to communicate to the Central\Traffic Operations Center.</td></tr>
</table>

Controllers

Sign controllers #1 and #2



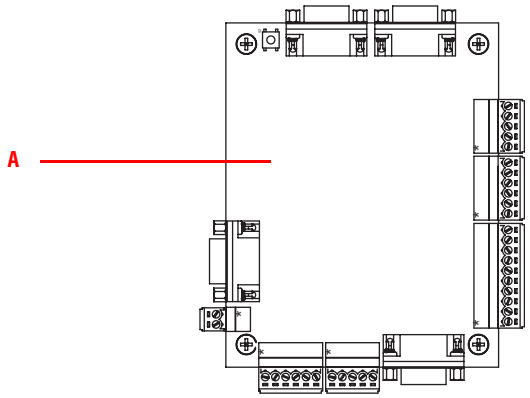
Item	Name	Part #	Description
A	Controller #1 Controller #2	12069003	These two boards control sign operation in conjunction with the ground controller (Controller #3) which is connected to an NTCIP network.
B	Terminal block #1	43201044	Distributes power to the relays and humidity sensor.
C	Humidity sensor	1507100601	Measures internal relative humidity within 3% accuracy.
D	Plastic cover	1509000501	Protection against hazardous voltages from the relays underneath the cover.
E	Relay #1	48000009	Normally open. When closed, this relay activates the heaters.
F	Relay #2	48000007	Normally open. When closed, this relay activates the fans.
G	Relay #3	48008203	Normally open. When closed, this relay is activated and indicates the status of power to the fans.
H	Thermostat	30670005	Normally open. Closes when temperature > 120°F and activates the fans. Opens when temperature < 90°F.
I	Terminal block #3	43201036 (3A) 43201047 (3B)	Distributes through relays and thermostats to heaters, beacons, and fans.
J	Terminal block #4	43201054	Provide wiring for status signals such as power fail signals for power supplies, fan monitoring, door switch, and DC power for the controller assembly.
K	Terminal block #5	43201054	



Item	PCB label	Name	Description
A	JP7 to JP11	Comm Port selection Jumpers for J6 and P2	Set to RS485 with termination.
B	J6	RS485 Port 1	
C	J5 A/INPUT	Analog inputs	
D	J4 D/INPUT	Digital inputs	
E	P1	RS232 port	
F	S1	DIP switches	
G	JMP2 to JMP6		Set to RS485 without termination for Controller #2 and Controller #3. Set to RS232 or RS485, depending on the use of the J3/P1 port by customer.
H	J3	RS422 port	
I	J2	Digital outputs	
J	JMP1		Set to DC.
K	J1	Power connector	Set to DC.
L	P4	RS232 port	Not used.
M	BAT1	Battery backup	3V lithium battery (Panasonic CR2032 or equivalent).

N	LED1 to LED4	Diagnostic LEDs	• LED1: ❑ Controller #1 = Heartbeat. ❑ Controller #2 = Heartbeat. ❑ Controller #3 (Ground Controller) = Heartbeat. • LED2: ❑ Controller #1 = Communications from Controller #3 on J3. ❑ Controller #2 = Communications from Controller #3 on J3. ❑ Controller #3 (Ground Controller) = Communications from Central/Local port P1 and P3. • LED3: ❑ Controller #1 = Not used. ❑ Controller #2 = Not used. ❑ Controller #3 (Ground Controller) = Flashes when transmitting to sign controllers 1 and 2. • LED4: ❑ Controller #1 = Flashes when transmitting out of J6 LED display board. ❑ Controller #2 = Flashes when transmitting out of J6 light sensor. ❑ Controller #3 (Ground Controller) = Flashes when receiving communication from sign controllers 1 and 2.
O	J5	Programming port	Used to program the controller with a rabbit programming cable.
P	J4	Ethernet port	Installed only on controller #3
Q	S2 RESET	Controller reset switch	Used to do a soft reset on the controller.
R	P3		Only used on controller #3
S	P2		Not used.

Ground controller (Controller #3)



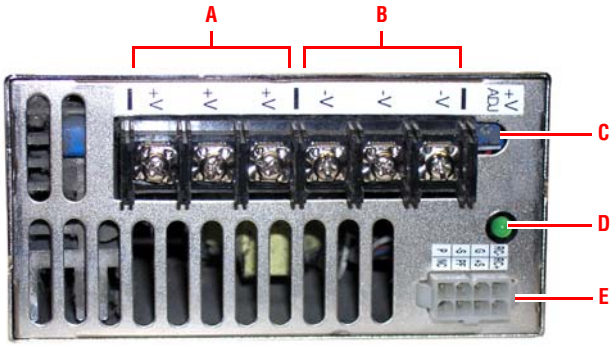
Item	Name	Part #	Description
A	Ground controller	15029101	This controller (#3) is connected to an NTCIP network and works in conjunction with the two sign controller boards to control sign operation.

Sign power panels

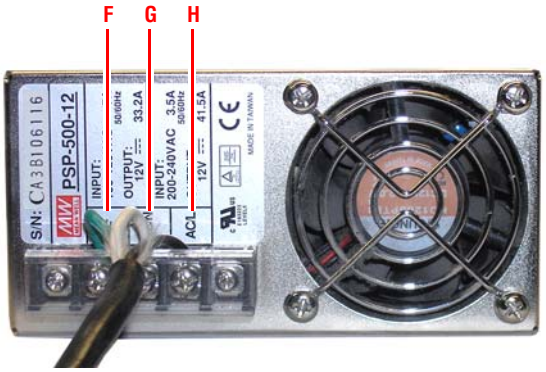
There are six power panels in the sign (see “General inside view” on page 16). Each panel contains two, Meanwell PSP-500-12 12VDC output power supplies.

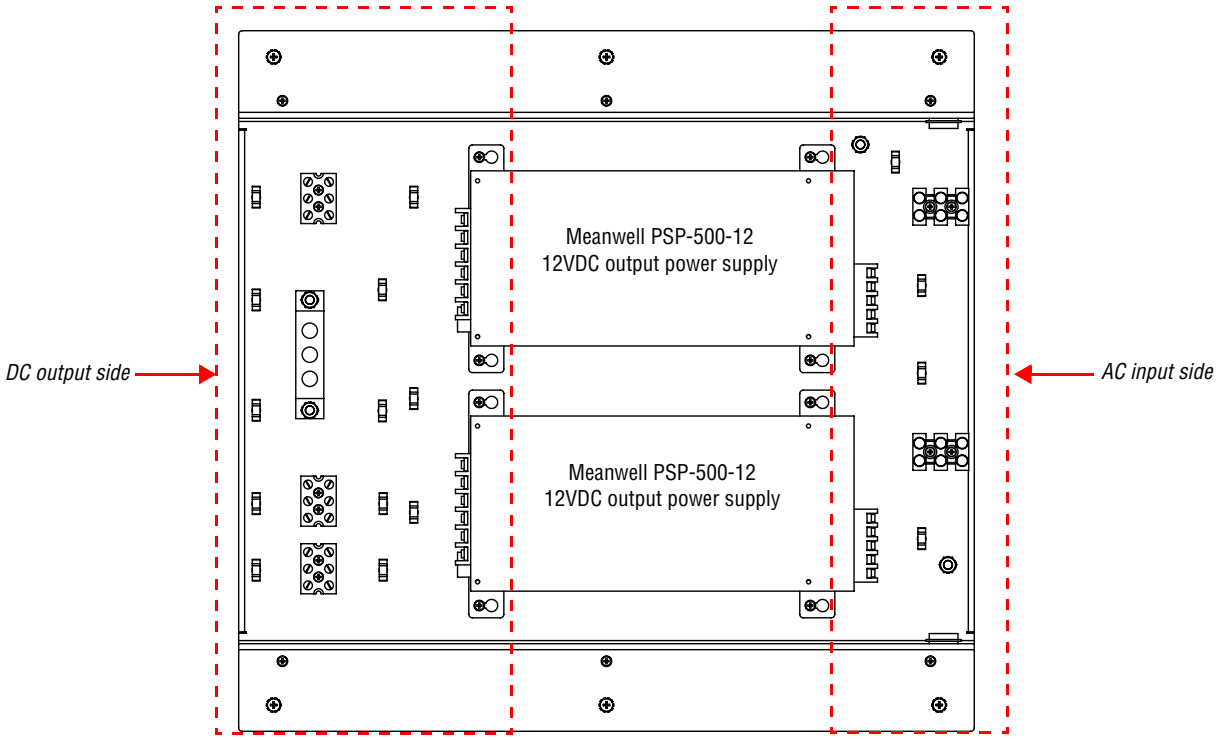
Note: Both power supplies may not turn on at the same time if there is not enough display load.

Power supply DC output (front view)



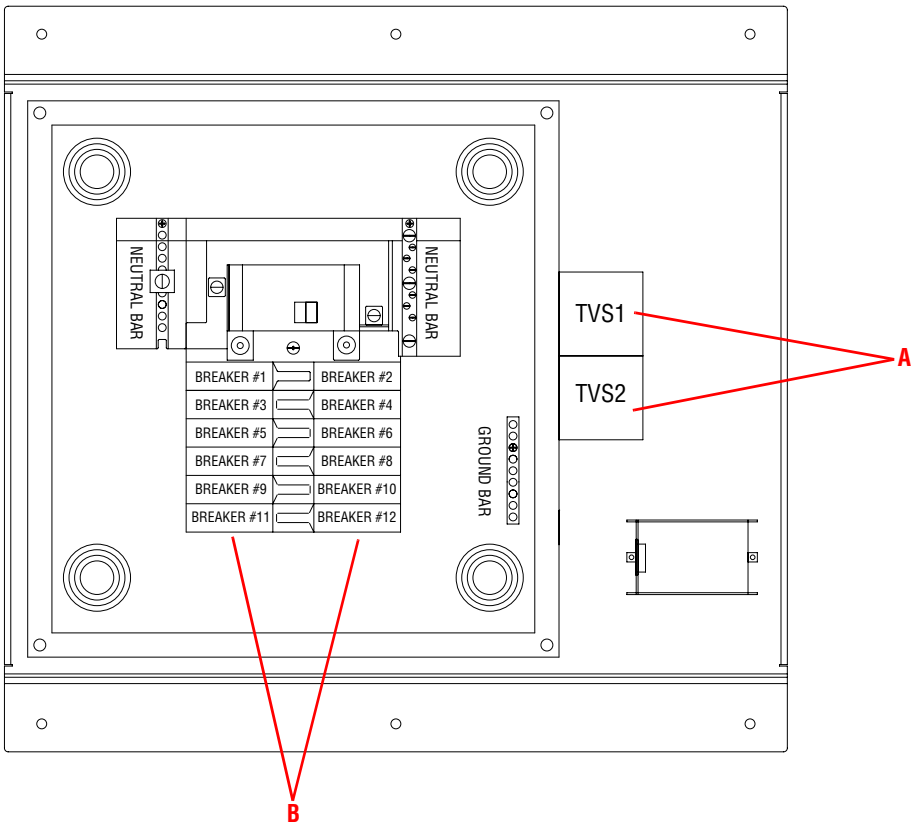
Power supply AC input (back view)





Item	Power supply label	Name	Description
A	V+	12VDC +	DC output
B	V-	12VDC -	
C	—	DC output voltage adjust	Adjustment range. Output should be set to 12VDC.
D	—	Input power indicator	Green = AC voltage supplied to power supply.
E	—	Signal connector	Used for power sharing function, remote sense, and power good signal.
F	⏚	AC in ground	AC input (90-264VAC, 47-63Hz)
G	AC/N	AC in neutral	
H	AC/L	AC in neutral	

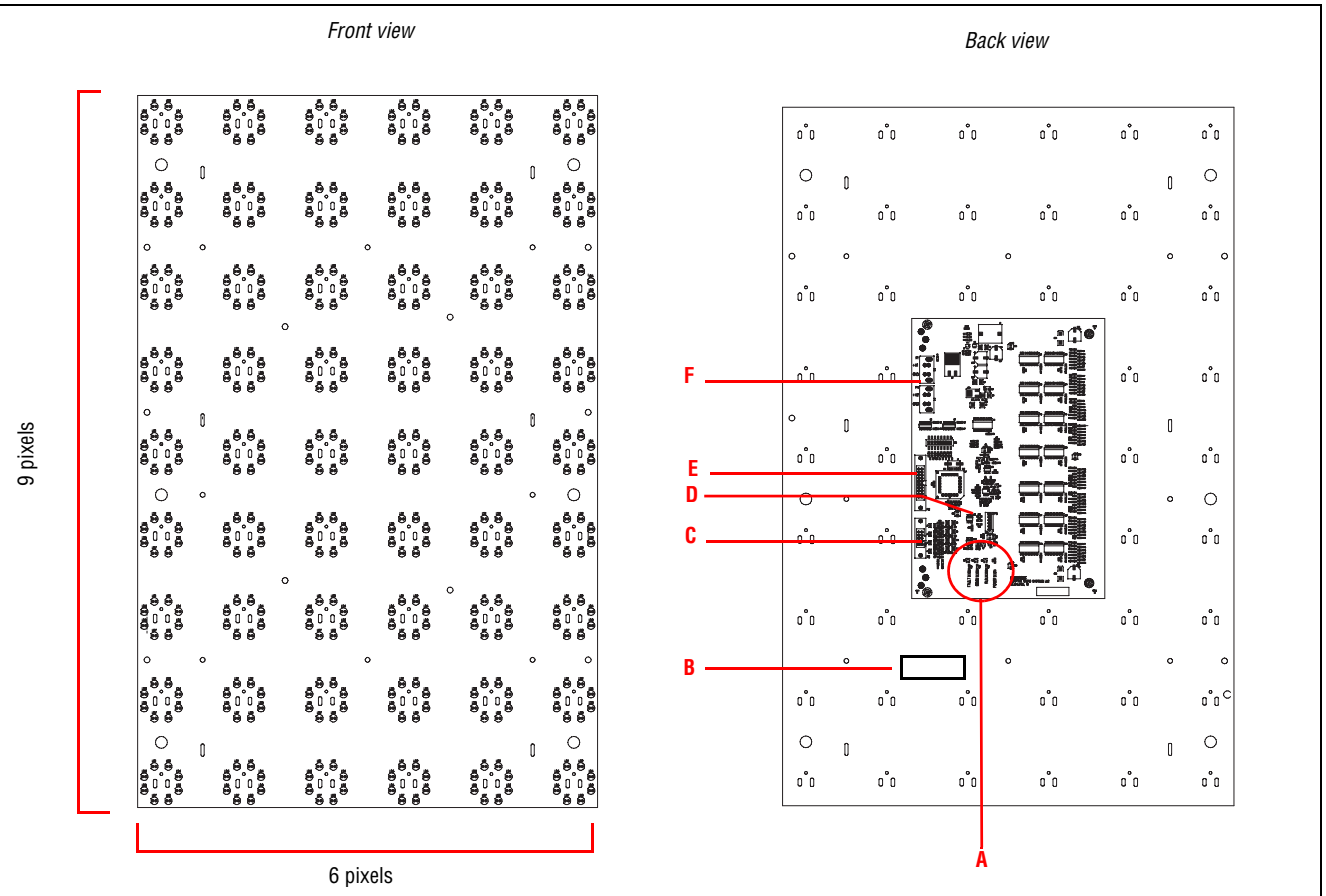
Load center panel



Item	Name		Part #	Description
A	Surge arrestors		30350019	Citel M18-120 surge arrestor.
B	Sign circuit breakers	Breaker #1	48100005	PS1, 3, 5
		Breaker #2	48100005	PS2, 4, 6
		Breaker #3	48100005	PS7, 9, 11
		Breaker #4	48100005	PS8, 10, 12
		Breaker #5	48100005	Lights
		Breaker #6	48100005	Fans
		Breaker #7	48100006	Outlets
		Breaker #8	48100006	Heaters
		Breaker #9	—	Not Used
		Breakers #10 and #12	48100020	Breakers #10 and #12 are connected to a dual-pole 40A breaker. This is the main/ principal breaker for the sign.
		Breaker #11	—	Not Used

LED driver board

There are 54 LED driver boards in a sign. Each board is 6 x 9 pixels, and each pixel is composed of eight LED lamps.



Item	PCB label	Name	Description
A	LD1	POWER	On = 12V supplied to LED driver board.
	LD2	FAULT	On = one or more faulty LED lamps on the LED driver board (if in normal operating mode).
	LD3	COMM	• On = There is NO communication from sign controller. • Off = There is communication from the sign controller.
	LD4	RUN	Flashing = LED driver board processor operating.
B		BIN label	Information on the intensity and wavelength of the LED lamps.
C	P3	Data	Connects to Controller #1 via a ribbon cable.
D	P5		Programming port for the LED driver board processor.
E	P2	Address plug	Addressing is preset from the factory via the wire assembly (p/n 1509100701). See the wiring diagram listed in “Related documentation” on page 5.
F	P1	+V1	Supplies power to the LED driver board.

Maintenance

Air filter cleaning

The exhaust vent and fan air filters should be checked every six months. To clean an air filter, do the following:

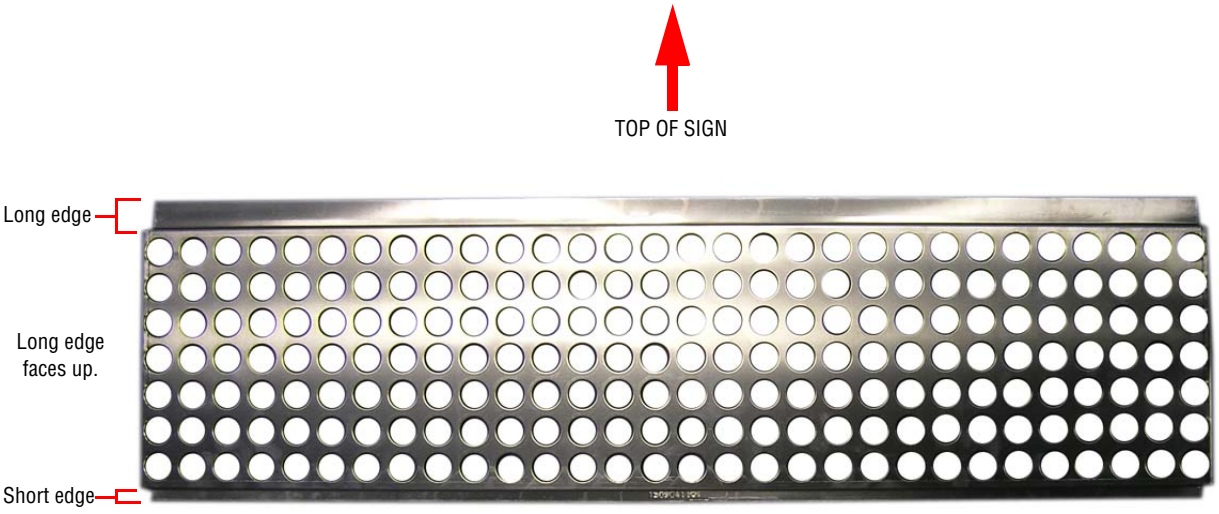
Air vent filter cleaning

1. Locate the air vents (see “General inside view” on page 16.)
2. Remove the air vent cover.

3. Pull out the air vent filter.

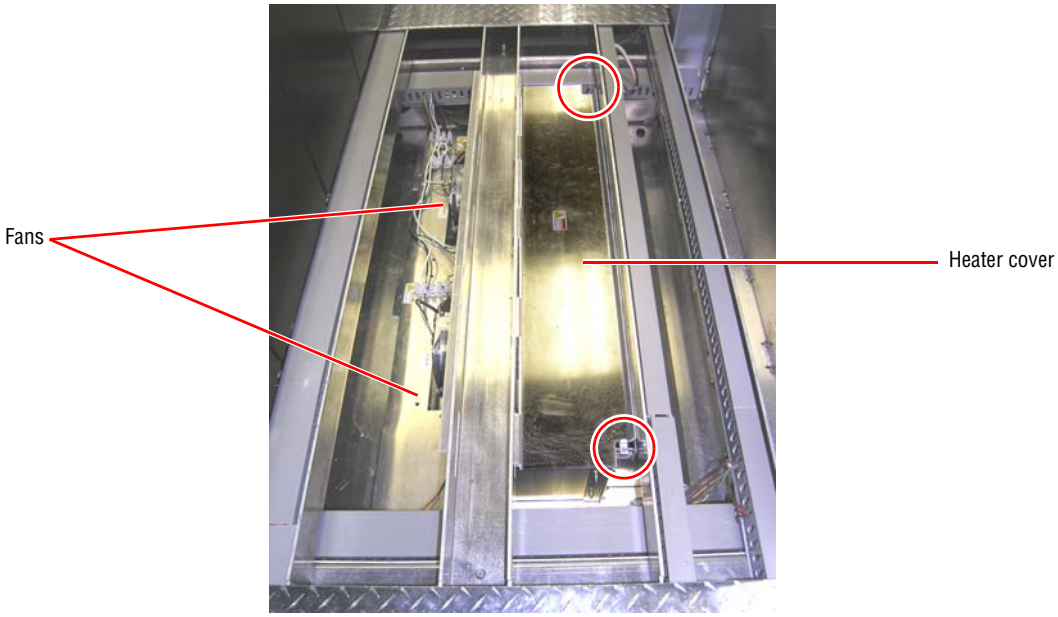
4. If the air vent filter needs cleaning, wash it using warm water and dish cleaning liquid. Rinse the filter in clean water. Then dry the filter with a clean cloth.
5. Return the clean air vent filter to the sign.

6. Reattach the air filter cover.

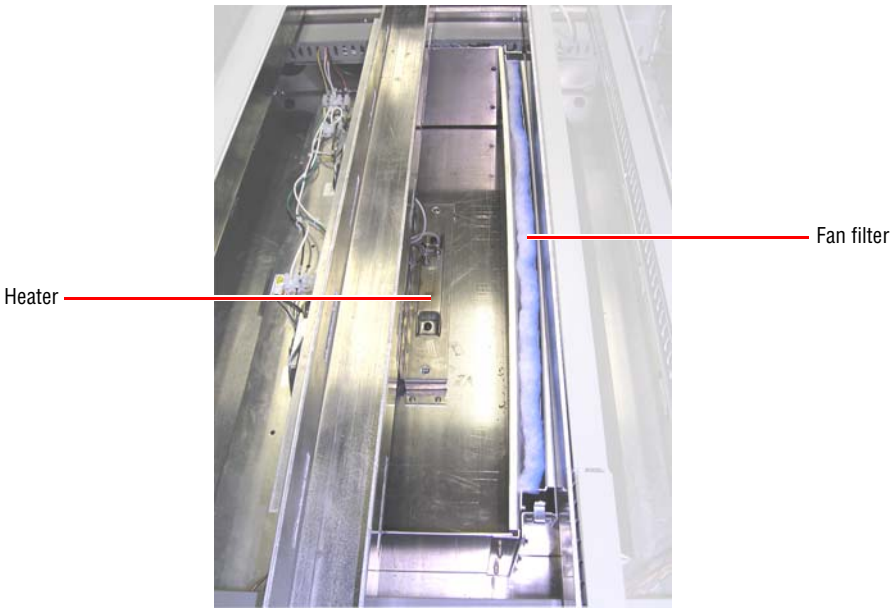


Fan filter cleaning

1. Locate the fan housing (see “General inside view” on page 16).
2. Lift the metal access floor panel from over the fan and heater housing. Detach the two latches (circled below) holding the heater cover to the sign.



3. Remove the heater cover.



4. Remove the fan filter.
5. If the fan filter needs cleaning, wash it using warm water and dish cleaning liquid. Rinse the filter in clean water. Then dry the filter with a clean cloth.
6. Replace the fan filter.
7. Reattach the fan cover.
8. Place the metal access cover back over the heater and fan housing.

Physical Inspection

Exterior inspection

- Check for any physical damage to the exterior of the sign.
- Check for loose nuts, bolts, hinges, doors, etc. on the sign.
- Check for corrosion, especially on the mounting hardware.
- Check the electronics for foreign debris and general cleanliness.
- Check the interior of the sign for foreign debris and general cleanliness.
- Check the exterior of the sign for general cleanliness.
- Check the LEDs of the sign for general cleanliness and visibility.

Interior inspection

- Check each surge protector on the load side of the sign (see “General inside view” on page 16). Make sure the LED on each device is lit.

If the LED indicator on a surge protector is off, the surge protector must be replaced.

LED indicators

- Check for any obvious physical damage to the interior.
- Check for loose nuts, bolts, hinges, doors, etc.
- Check the electronics for foreign debris and general cleanliness.
- Make sure the sign’s drain holes are not plugged.

Note: Verify the 100A breaker is turned on in the breaker panel.

Troubleshooting

This chapter contains the LED Variable Message Sign (VMS) Troubleshooting and a general explanation of how each problem can be isolated through a step by step direction.

Introduction

Due to the complexity of the electronic equipment, it is impossible to describe every possible malfunction that could occur. The intent of this section is to follow a path from the beginning to the end of each system so that a general understanding of the operating system is established. When the sign is not functioning properly, these procedures should help you access the electronics and isolate the defective component(s) in the sign. The defective components may then be removed and replaced with a known good component. The topics discussed and most common problems that you might experience are listed below.

If none of the procedures suggested in this chapter produce a satisfactory solution, you may contact the Adaptive Micro Systems Service Department at 414-357-2020 during normal business hours.

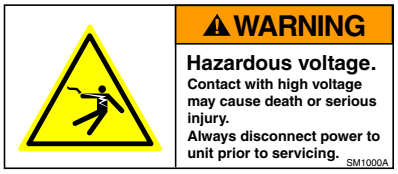
Tools required for troubleshooting and repair

In all cases of troubleshooting and repair, some tools are required to perform these tasks. The following is a list of common test equipment and tools required to test, remove and replace a defective PCB and/or piece of hardware:

- DMM (Digital multimeter)
- 1/8" slotted screwdriver
- 3/16" slotted screwdriver
- #2 Phillips screwdriver
- #3 Phillips screwdriver
- 3/16" nutdriver
- 1/4" nutdriver
- 3/8" nutdriver
- 7/16" nutdriver
- 6" or 8" slip joint pliers
- Needle nose pliers
- Wire strippers (multi-gauge)

Access to the electronics and operating system is required to perform the procedures listed herein. Make sure that you have all codes, keys, combinations, and special entry tools.

Common problems



Problem: Inoperative AC power

Possible cause	Recommended solutions	Notes
1. Cable connection not properly secured or came off 2. Faulty power supply 3. Circuit breaker tripped 4. Corroded terminals 5. Blown lighting arrestor	• Check all cables to make sure they are properly connected and making positive contact. • Verify AC power is flowing to the panel providing power to the sign controllers. • Verify AC power is flowing to the ground controller. • In the load center, verify AC is applied to the power supply boxes across the breakers. • If a problem is found during testing, repair or replace the faulty component.	In the power supply panels, verify AC power is supplied to all the power supplies, across input terminals. Referring to the wiring diagram listed in "Related documentation" on page 5 for the power supply panel view, measure across TB1 and TB2 to verify AC voltage is present.

Problem: Inoperative DC power

Possible cause	Recommended solutions	Notes
1. Cable connection not properly secured or came off 2. Faulty power supply 3. Faulty printed circuit board 4. Corroded terminals	• Check the DC power side of the sign. • In the power supply panels, verify 12VDC power is present at the +V (orange) and -V (violet), terminals TB3 and TB4. • Verify the LED driver board is receiving power. Check the LED indicator LD1 (labeled POWER). If it is lit, then the board is receiving power. Also check the power connector for 12VDC (V+ is orange and V- is violet). • On the light sensor/temperature sensor board LS0-2, check for +12VDC (pin 11) and GND (pin 9) on the boards. • If a problem is found during testing, repair or replace the faulty component.	

Problem: Nonfunctional brightness control, nonfunctional sign

Possible cause	Recommended solutions	Notes
All three photocell sensors in the sign are not functioning.	• Check all connections to and from the photocell sensor board to make sure they are secure. • Check for 12VDC power at the photocell. • Check the sign software to make sure the sign is not in a “blank” mode. • Check the address switch on the photocell. • Check the configuration jumpers on the controller board. • Verify the light sensors are addressed properly. Verify the COM LED indicator is flashing on each light sensor. ❑ Use Intelligent Control to make sure the sign is in Photocell mode. ❑ Front light sensor verification: — Cover the back and top light sensors. — Using Intelligent Control, check the Status screen to see if a photocell reading is present. If above 2 out of 15, cover the front photocell. The value should decrease to 1. If all is as described, go to top light sensor verification. — If the value is less than 2 out of 15, shine a floodlight on photocell to saturate the light sensor. The value should change within 30 seconds. If status of the light value increases, continue to top light sensor verification. If status does not increase, then replace the light sensor board. ❑ Top light sensor verification: — Cover the front and back light sensors. — Using Intelligent Control, check the Status screen to see if a photocell reading is present. If above 2 out of 15, cover the top photocell. The value should decrease to 1. If all is as described, go to back light sensor verification. — If the value is below 2 out of 15, shine a floodlight on photocell to saturate the light sensor. The value should change within 30 seconds. If status of the light value increases, continue to back light sensor verification. If status does not increase, then replace the light sensor board. ❑ Back light sensor verification: — Cover the top and back light sensors. — Using Intelligent Control, check the Status screen to see if a photocell reading is present. If above 2 out of 15, cover the back photocell. The value should decrease to 1. If all is as described, all light sensors are working properly. — If the value is below 2 out of 15, shine a floodlight on photocell to saturate the light sensor. The value should change within 30 seconds. If status of the light value increases, then all light sensors are working. If value doe not increase, then replace the pcb assembly. — Remove and replace the board.	If at least one photocell is functioning properly, the sign will dim according to ambient light levels.

Problem: Nonfunctional single LED(s), functional sign

Possible cause	Recommended solutions	Notes
Faulty LED	Remove and replace the LED driver board containing the faulty LED(s).	

Problem: Nonfunctional single pixel(s), functional sign

Possible cause	Recommended solutions	Notes
Faulty pixel	• In Intelligent Control, run the Pixel Test to locate where the faulty pixel is located. • Remove and replace the LED driver board containing the faulty pixel(s).	

Problem: Nonfunctional pixels on entire display board(s), functional sign

Possible cause	Recommended solutions	Notes
Faulty pixel	• In Intelligent Control, run the Pixel Test to locate where the faulty pixel(s) is/are located. • Verify that the DC power supplies are not faulty and test for presence of voltage. • If the test indicates a faulty set of power supplies, remove and replace the power supply supplying power to the display boards. If the voltage at the LED driver board is less than 10.5VDC, this may show pixel failures for the pixel diagnostics. • If power supplies are OK, remove and replace the LED driver board containing the faulty pixel(s).	

Part replacement

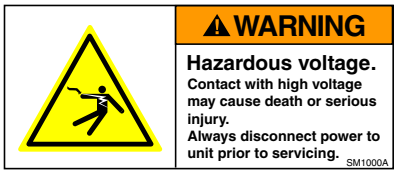
List of field-replaceable parts

Controlling electrostatic discharge (ESD)

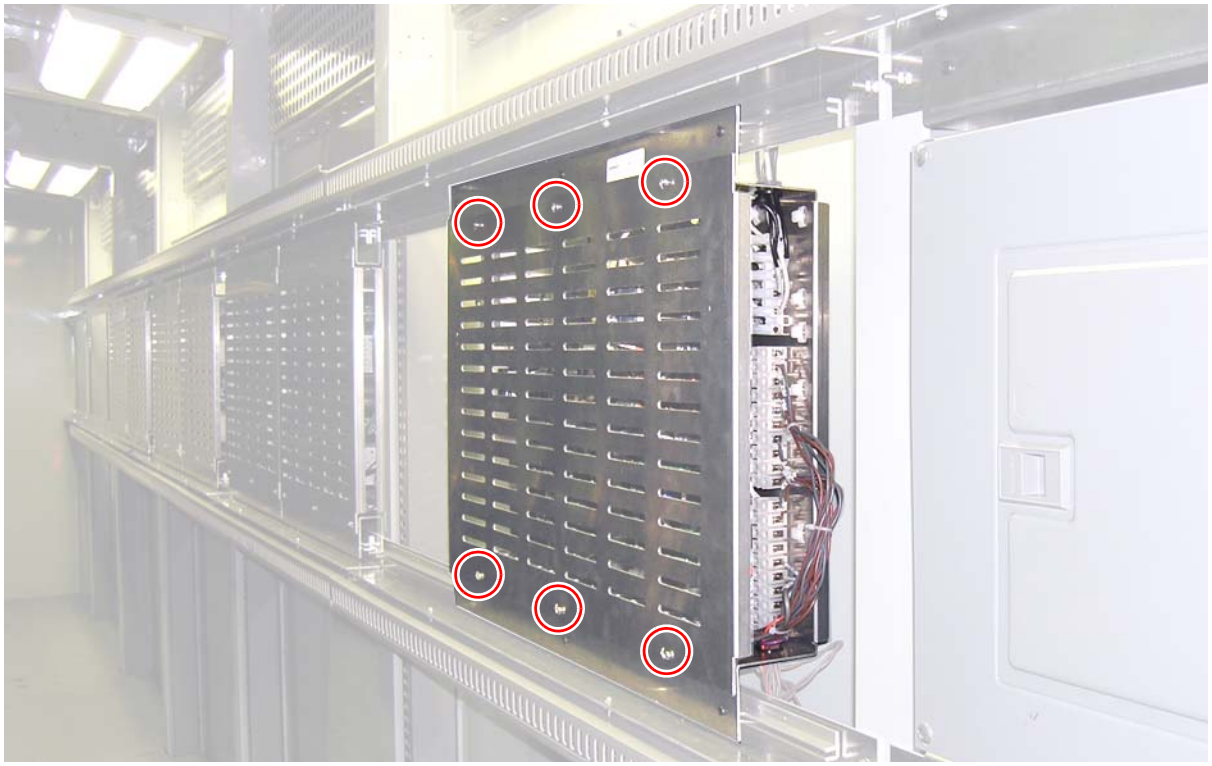
This equipment contains components that may be damaged by “static electricity”, or electrostatic discharge. To prevent this from happening, be sure to follow the guidelines in Adaptive Tech Memo 00-0005, *“Guidelines for Controlling Electrostatic Discharge Damage”*, available at Adaptive’s web site at http://www.adaptivedisplays.com.

Sign controller board replacement

1. Switch all sign breakers to the OFF position, except the breaker for the sign lights. See “Load center panel” on page 23.



2. Loosen, but do not remove, the screws (circled below) on the protective cover over the controller plate. Then remove the cover:



3. Locate the controller board (either Controller #1 or #2) to be replaced. See Figure 4 on page 35.

4. Set the DIP switches and jumpers on the *replacement* controller board so they match the DIP switch settings on the board to be replaced.

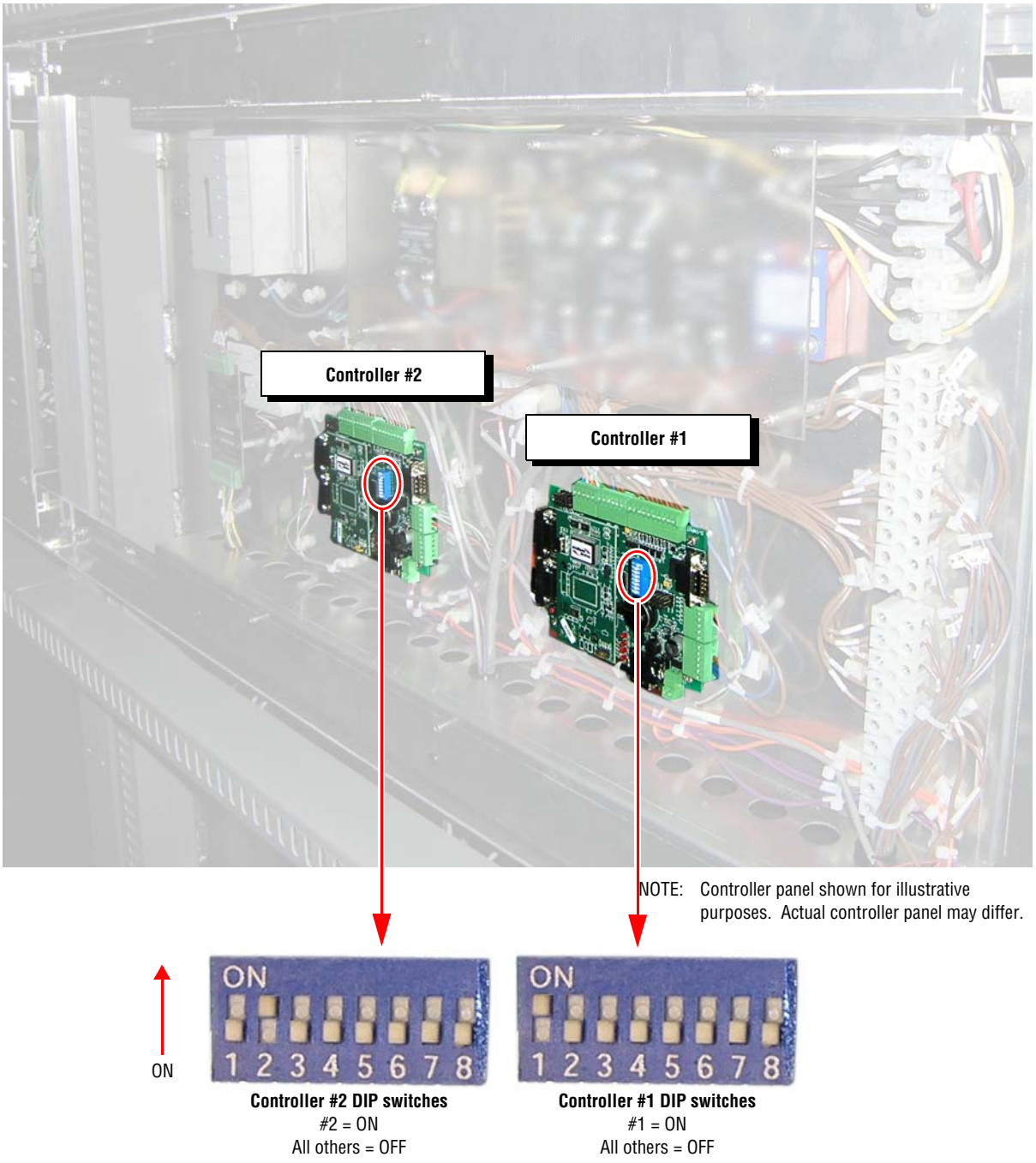
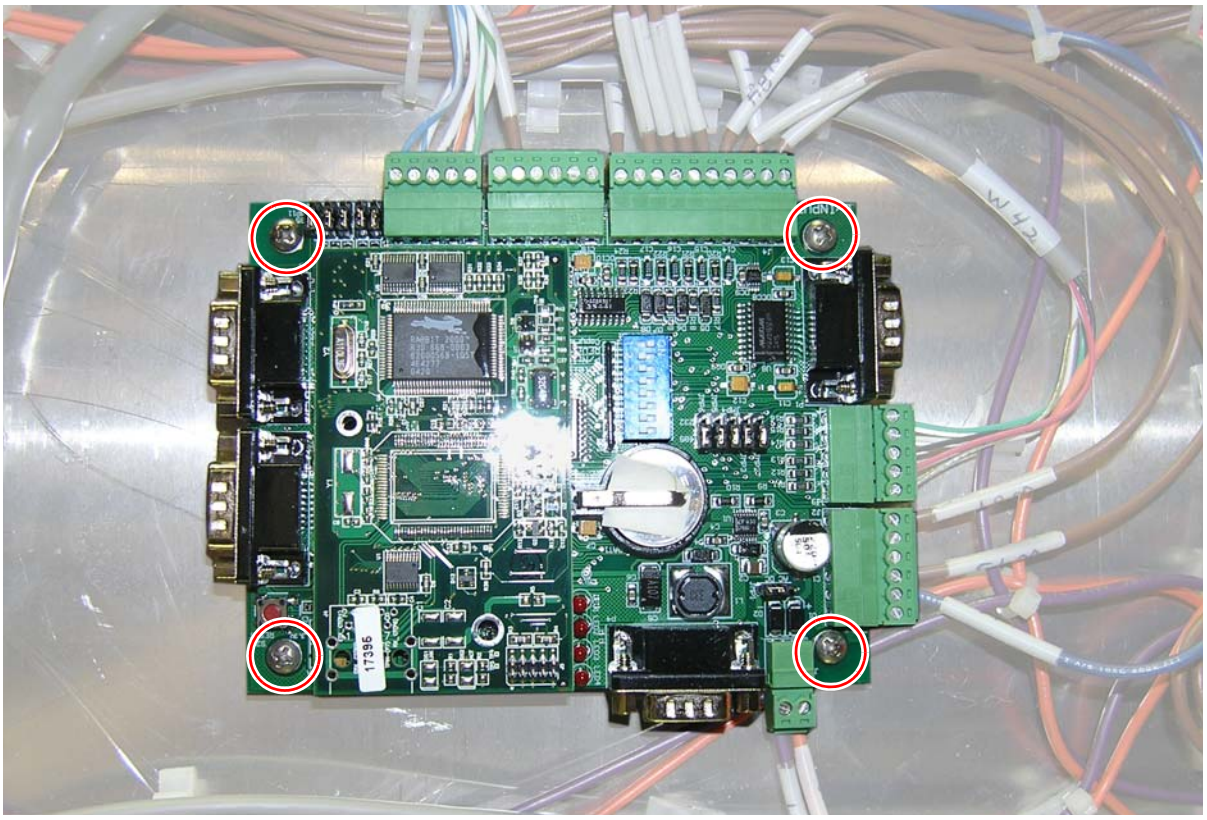


Figure 4: Sign controller boards.

5. Disconnect all cables from the controller board to be replaced.

6. Remove the four screws (circled below) that hold the controller board to the sign:

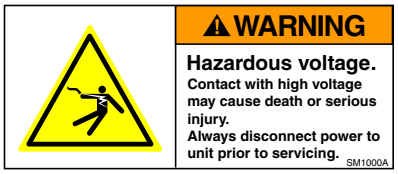


7. Fasten the new controller board to the sign. Then reconnect all the cables to the new board.
8. Reattach the protective cover over the controller plate.
9. Close the sign and apply power to the sign.

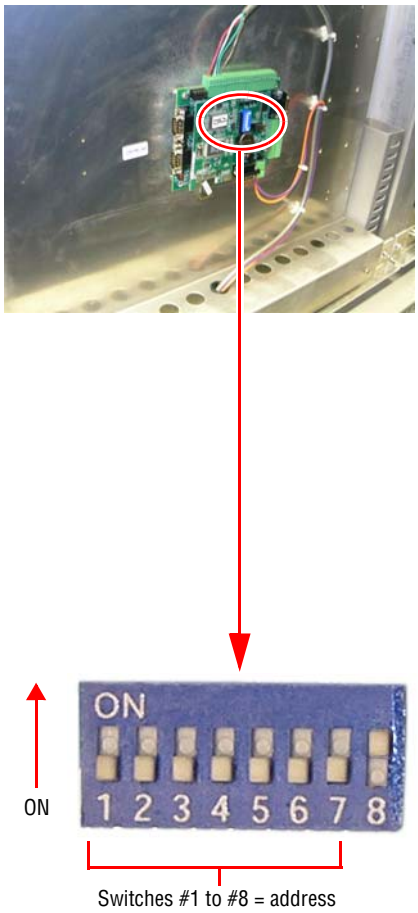
Ground controller (Controller #3) board replacement

Install the new controller board

1. Remove power from the ground controller panel.



2. Locate the controller board to be replaced.
3. Set the DIP switches and jumpers on the replacement board to match the DIP switches and jumpers on the board being replaced.



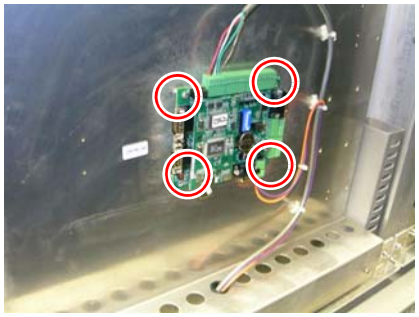
DIP switches
#1 through #8 = address

Dipswitch	Address
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

Figure 5: Ground controller panel.

4. Disconnect all the cables from the controller board to be replaced.

5. Remove the four screws (circled below) that hold the ground controller board to the panel. Remove the controller board from the sign.



6. Fasten the new ground controller board to the sign.
7. Reconnect all the cables to the new controller board.
8. Apply power to the ground controller plate.

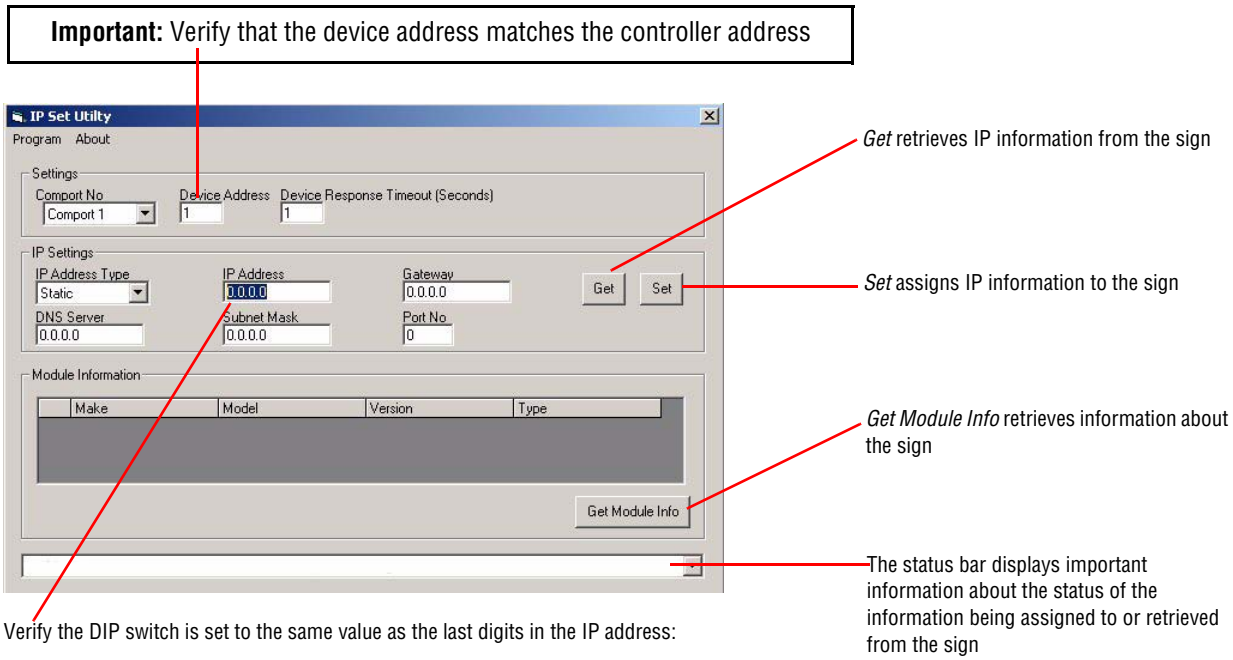
Set the IP address for new Controller #3 board

Note: To assign an IP address, the IP Set Utility program must be installed on the computer that will be communicating to the sign. Contact Adaptive Technical Services at (800) 558-7022 or (414) 357-2020 if you do not have this program.

1. Using a null modem cable, connect a laptop computer to the controller board at P3 (next to the Reset button).
2. Open IP Set Utility program — select **Start > Programs > IPSetUtility > IP Set Utility.**

3. Enter the appropriate information in the *IP Set Utility* window (See the following illustration.).

   Note: If the controller is operational, use *Get* to see if the sign's IP address can be retrieved.



Verify the DIP switch is set to the same value as the last digits in the IP address:

DIP switch positions	Equivalent decimal values
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128

For example, if the IP address is 10.1.20.20, then the DIP switch must be set with 3 and 5 **ON** and 1, 2, 4, 6, 7 and 8 **OFF.**

4. Click **Set** to set the IP address (each sign must have a unique IP address).

   Note: The DIP switches must be set to the same value as the last number of the IP address.

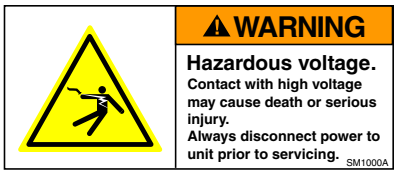
5. After the IP address is set, detach the computer from the controller board.

6. Reset the controller and verify operation of controller.

Power supply replacement

Sign power supplies

1. Turn all sign breakers to the OFF position, except the breaker for the sign lights. See “Load center panel” on page 23.



2. Loosen, but do not remove, the screws (circled below) on the protective cover over the power panel. Then remove the cover.

3. Remove all wires from the power supply to be replaced:

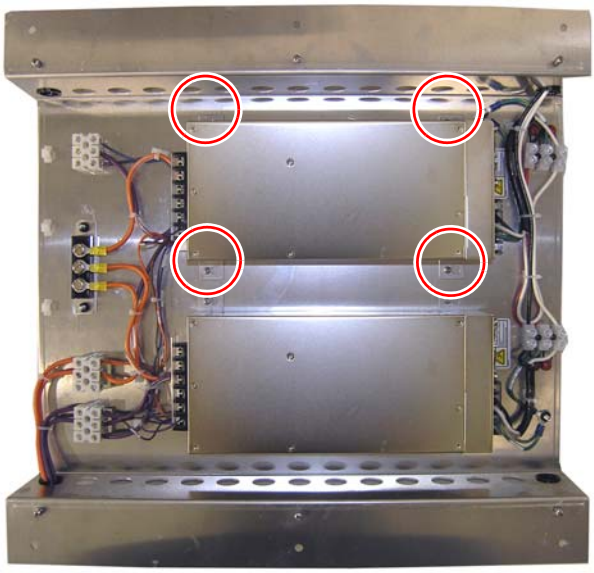
   DC connections:

   - ❑ V+ (orange-colored wire)
   - ❑ V- (violet-colored wire)
   - ❑ Signal harness

   AC connections:

   - ❑ Hot (black wire)
   - ❑ Neutral (white wire)
   - ❑ Ground (green wire)

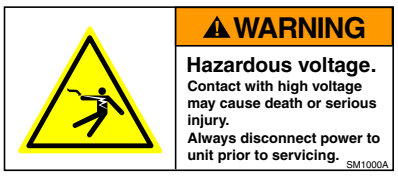
4. Loosen the four screws (circled below) that hold the power supply to the power panel. Then slide the power supply out.



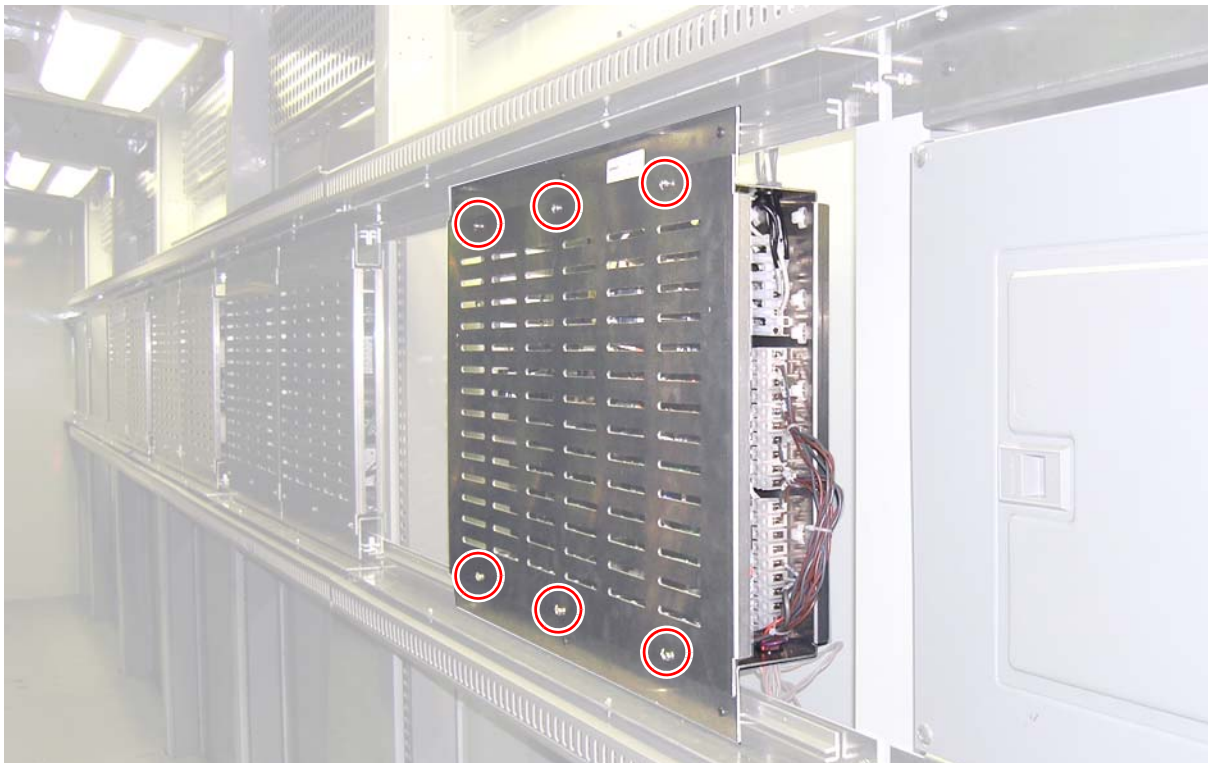
5. Fasten the new power supply to the power panel. Then reconnect all the wires to the new power supply.
6. Reattach the protective cover to the power panel.
7. Apply power to the sign and verify operation.

Relay replacement

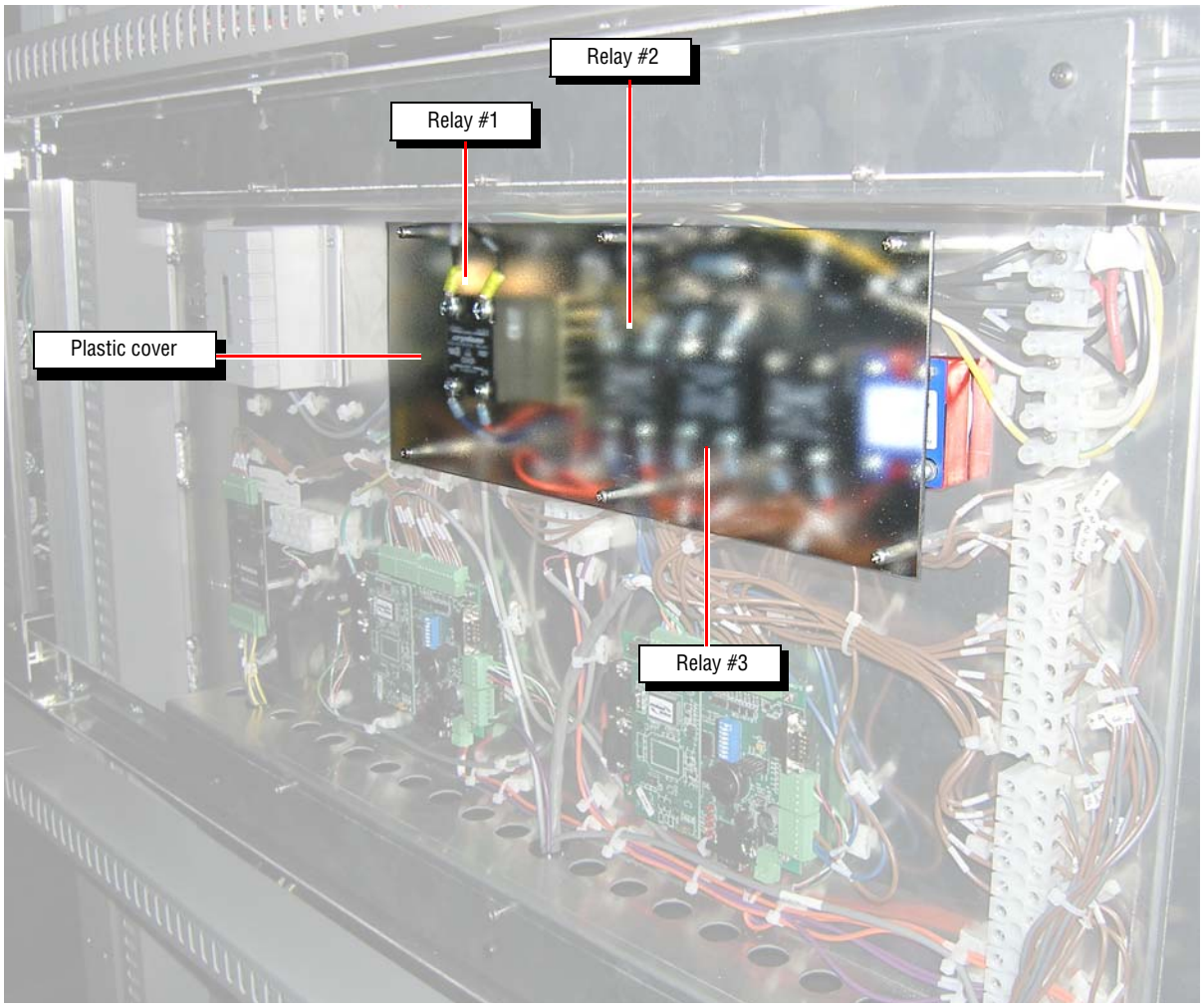
1. Switch all sign breakers to the OFF position, except the breaker for the sign lights. See “Load center panel” on page 23.



2. Loosen, but do not remove, the screws (circled below) on the protective cover over the controller plate. Then remove the cover.



3. Locate the relay (or the flasher) to be replaced.

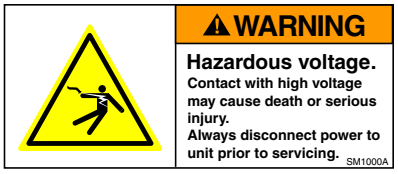


4. Before disconnecting the wires attached to the relay, mark the location of each wire so that the replacement relay can be connected properly.
5. Disconnect the wires.
6. Remove the screws holding the relay to the controller panel.
7. Attach the new relay to the controller panel.
8. Reconnect the wires to the new relay.
9. Reattach the plastic cover over the relays.
10. Reattach the protective cover over the controller plate.
11. Apply power to the sign.

LED driver board replacement

Note: To match the color and intensity of the sign's LEDs, you may need to determine the BIN letter of the LED driver board to be replaced (see "LED driver board" on page 24).

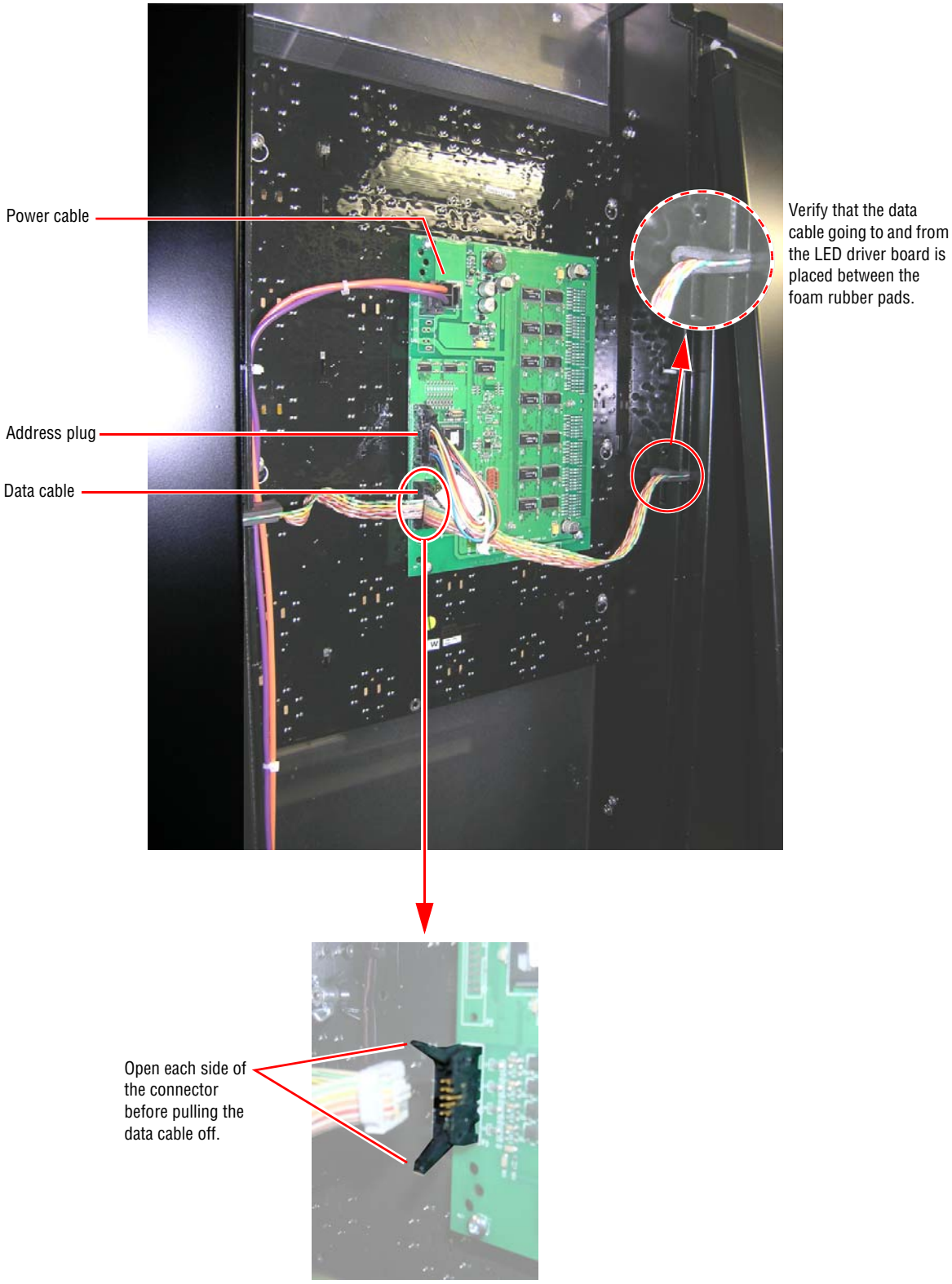
1. Switch all sign breakers to the OFF position, except the breaker for the sign lights. See "Load center panel" on page 23.



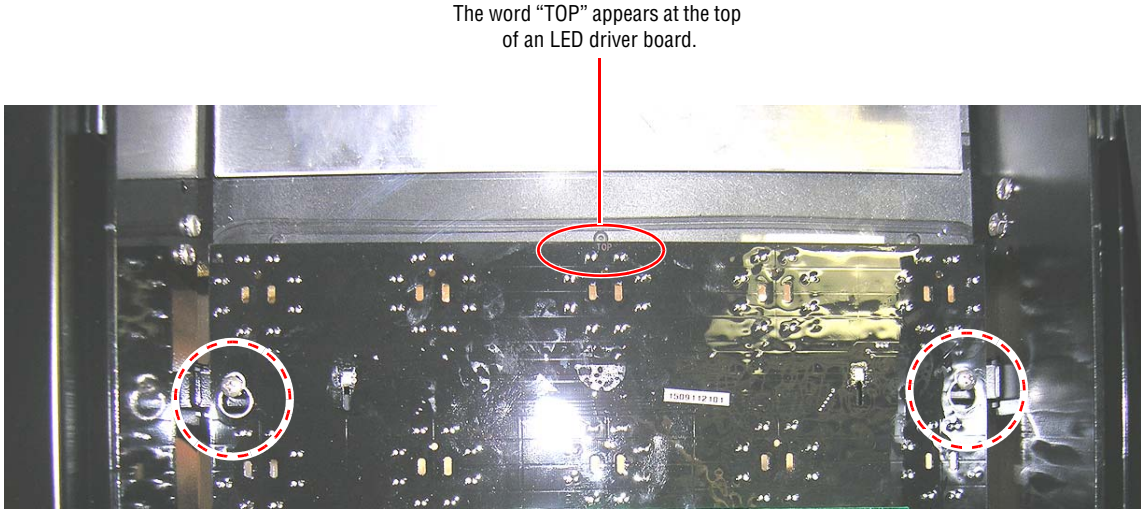
2. Locate the LED driver board to be replaced.
3. Remove the protective panel that covers the back of this LED driver board.

4. In the following order, remove the following from the back of the LED driver board:

- ❏ Power cable (P1)
- ❏ Address plug (P2)
- ❏ Communications cable (P3)



5. Loosen the six screws (two are circled below) that hold the LED driver board to the sign. Then remove the board.



6. Attach the new LED driver board to the LED panel.

   Note: The top of the LED driver board is marked with the word “TOP” on the front of the board.

7. Reconnect the cables (P1 and P3) to the LED driver board and connect the address plug (P2) that was removed from the old LED driver board into the new board.

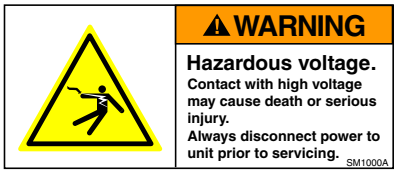
8. Reattach the protective panel that covers the back of this LED driver board.

9. Close the sign and apply power to the sign.

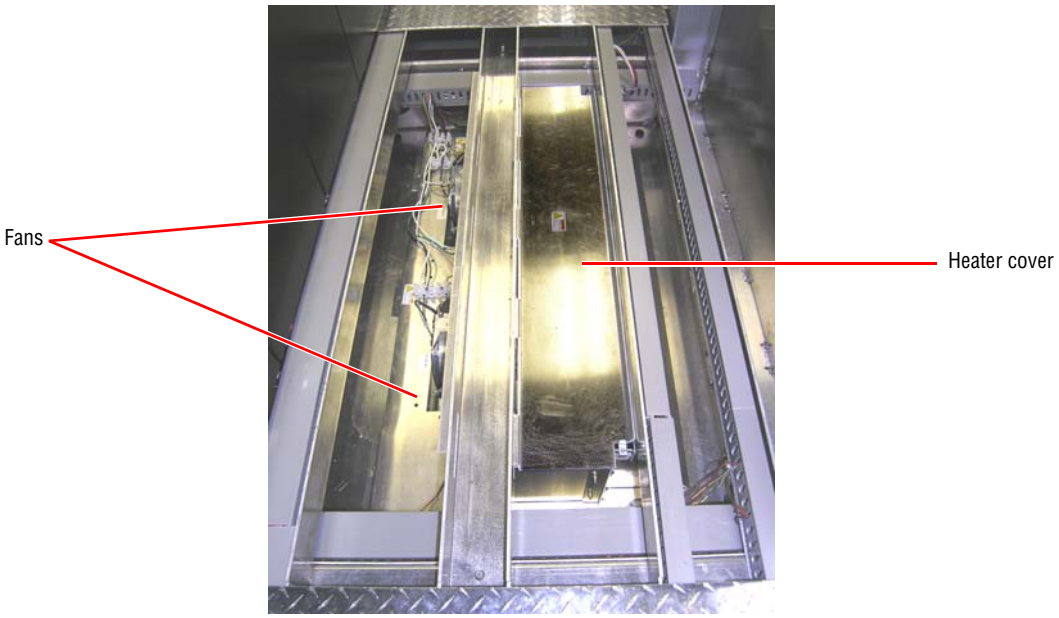
Fan replacement

Note: To replace the filter for a fan, see “Fan filter cleaning” on page 27.

1. Switch all sign breakers to the OFF position, except the breaker for the sign lights. See “Load center panel” on page 23.



2. Remove the metal access floor panel from over the fan that will be replaced:.



3. Remove the fan to be replaced from the fan assembly.

   Note: Before removing the wires attached to the fan, mark the location of each wire so that the replacement fan can be connected properly.

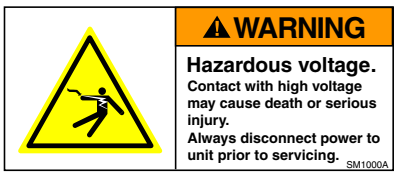
4. Attach the replacement fan by connecting the following wiring:

   - ❏ Black to Black
   - ❏ White to White
   - ❏ Red to Red
   - ❏ Blue to Blue
   - ❏ Yellow to Yellow

5. Place the metal access floor panel back.
6. Close the sign.
7. Apply power and test the fan.

Light sensor replacement

1. Switch all sign breakers to the OFF position, except the breaker for the sign lights. See “Load center panel” on page 23.



2. Locate the light sensor to be replaced.

   Note: Three light sensors are used in the sign. All three are located above the sign entrance door.

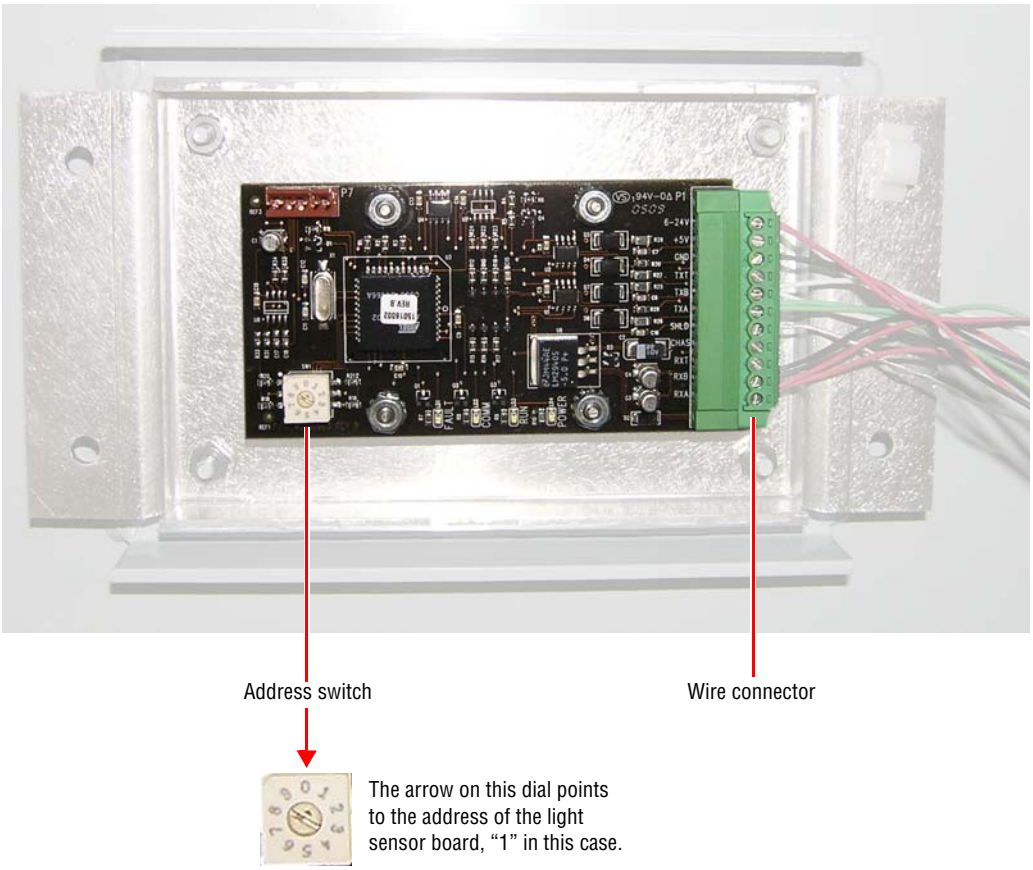
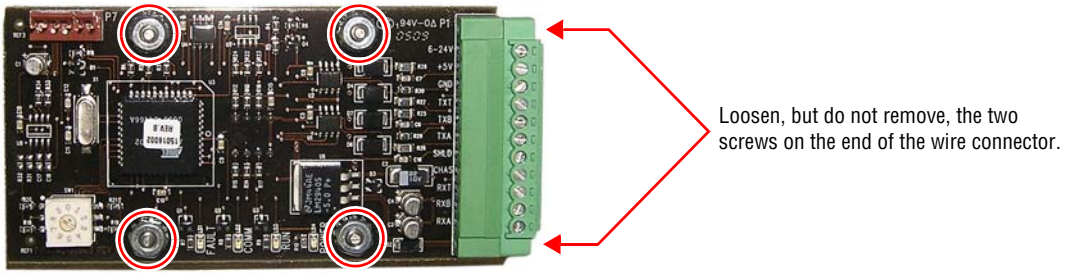


Figure 6: Light sensor

3. Set the address switch on the *replacement* light sensor board to the setting on the board that will be replaced:

   - ❏ Address 0 = light sensor on *front* of sign.
   - ❏ Address 1 = light sensor on *top* of sign.
   - ❏ Address 2 = light sensor on *back* of sign.

4. Use a small, flat blade screwdriver to remove the wire connector from the light sensor that is being replaced. Then remove the four nuts (circled below) that hold the board to the sign.



5. Attach the replacement light sensor to the sign.
6. Reapply power to sign.
7. Verify replacement light sensor is functioning properly.

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