ALPHA Solar
with Smart Alec option

Installation
and
Operation Manual

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       ALPHA Solar
Indoor/Outdoor Display
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ADAPTIVE

NOTE: Due to continuing product innovation, specifications in this document are subject to change without notice.

Visit us at our Internet World Wide Web site:

http://www.ams-i.com or e-mail us at sales@ams-i.com.

Contents

Warranty

Adaptive Micro Systems, Inc. warrants to the original purchaser that the sign, keyboard and power supply will be free of defects in workmanship and materials for a period of one year from the date of purchase.

Adaptive Micro Systems, Inc. will without charge, repair or replace, at its option, defective product or component parts upon delivery to the factory service department accompanied by proof of the date of purchase in the form of a sales receipt.

This warranty does not apply in the event of any misuse or abuse of the product, acts of God (lightning strikes, wind/storm damage, etc.) or as a result of any unauthorized repairs or alterations. This warranty does not apply if the serial number is altered, defaced or removed from the sign. Incandescent lamps used in incandescent products are not covered by this warranty.

The purchase price of this product does not include, from Adaptive Micro Systems, Inc., any on-site support, service or maintenance.

Local ordinances prohibiting the use of flashing signs may exist in some locations. Compliance with local ordinances is the sole responsibility of the customer.

To obtain warranty coverage, this product must be registered. Please complete the enclosed warranty registration card and mail it to Adaptive Micro Systems, Inc.

How to obtain warranty service

1. Contact the dealer/distributor from whom the sign was purchased. If you do not know where the product was purchased, contact Adaptive Micro Systems Customer Service at 414-357-2020.
2. If the dealer/distributor cannot service the product, obtain a Return Merchandise Authorization (RMA) number through that company. An RMA number is required to obtain warranty service.
3. Fill out the Return Merchandise Authorization (RMA) Form on the following page. To obtain warranty service, this form including the RMA number must accompany the product.
4. Follow return instructions on the RMA form to return to Adaptive Micro Systems, Inc.

Return Merchandise Authorization (RMA) form

RMA Number:_____

Date of Purchase: _____

Company Name: _____

Contact Person: _____

Address: _____

_____

Phone Number: _____

Description of Problem: _____

_____

_____

_____

_____

Return Instructions:

Step 1:   Obtain an RMA number from your dealer/distributor.

Step 2:   Fill out this form and include proof of purchase receipt if product is under warranty.

Step 3:   Pack this form and the sign in the original carton (or a suitable replacement). Please write the RMA number on the outside of the package. Any damage to the product during shipment is the responsibility of the freight company or the owner of the sign.

Step 4:   Ship the package, **postage/shipping prepaid** to:

Adaptive Micro Systems, Inc.
Attn: RMA No. _____
7840 North 86th Street
Milwaukee, WI 53224

PLEASE WRITE THE RMA NUMBER ON THE LABEL OF THE SHIPPING BOX - THANK YOU.
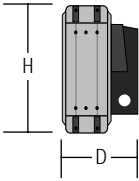
Description

The ALPHA sign is intended for either indoor or outdoor use.

Figure 1: ALPHA indoor/outdoor display
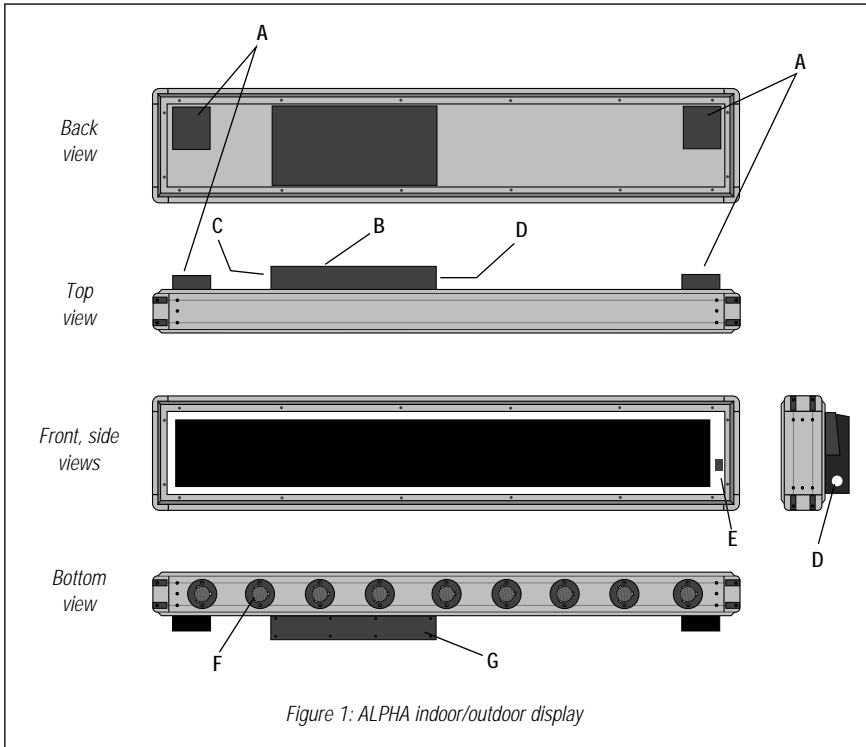
Item	Name	Description
A	Cooling fan duct	Vents air circulated by a sign's fan.
B	Power supply cover	Power supply connections are accessed by removing this panel. See "Installation" on page 8.
C	Power Conduit opening	Electrical wiring to the power supply is run through this opening. See "Power supply wiring" on page 15.
D	Signal Conduit opening	Wiring used to connect the sign to a network is run through this opening. See "Signal wiring" on page 14.
E	Infrared (IR) receiver and photocell window	Point the Remote Control keyboard (part number 1072-1111) at this window and use it to type in messages and program the sign's operation. The photocell senses brightness and is used for dimming the sign. See "Connecting a sign to a personal computer" on page 7.
F	Air filters	Draw in air for the sign's fans. Must be cleaned periodically — see "Appendix A: Periodic maintenance" on page 16.
G	Power supply access cover	See "Electrical connection" on page 12.

Technical specifications

AMS part number	LED rows x columns	LED color	Input VAC (±10%)	Input AMPS	Number of fans (36CFM)	Case dimensions (L x H x D)	Weight
416-96R120	96 x 16	Red	120	2.5	2	49.72 x 12.47 x 7.40 (in) 126.29 x 31.67 x 18.80 (cm)	57 lbs 25.9 kg
416-96A120	96 x 16	Amber	120	2.5	2	49.72 x 12.47 x 7.40 (in) 126.29 x 31.67 x 18.80 (cm)	57 lbs 25.9 kg
416-96R230	96 x 16	Red	230	1.2	2	49.72 x 12.47 x 7.40 (in) 126.29 x 31.67 x 18.80 (cm)	57 lbs 25.9 kg
416-96A230	96 x 16	Amber	230	1.2	2	49.72 x 12.47 x 7.40 (in) 126.29 x 31.67 x 18.80 (cm)	57 lbs 25.9 kg
416-128R120	128 x 16	Red	120	2.8	3	64.12 x 12.47 x 7.40 (in) 162.86 x 31.67 x 18.80 (cm)	66 lbs 29.9 kg
416-128A120	128 x 16	Amber	120	2.8	3	64.12 x 12.47 x 7.40 (in) 162.86 x 31.67 x 18.80 (cm)	66 lbs 29.9 kg
416-128R230	128 x 16	Red	230	1.4	3	64.12 x 12.47 x 7.40 (in) 162.86 x 31.67 x 18.80 (cm)	66 lbs 29.9 kg
416-128A230	128 x 16	Amber	230	1.4	3	64.12 x 12.47 x 7.40 (in) 162.86 x 31.67 x 18.80 (cm)	66 lbs 29.9 kg
416-160R120	160 x 16	Red	120	3.1	3	78.52 x 12.47 x 7.40 (in) 199.44 x 31.67 x 18.80 (cm)	76 lbs 34.5 kg
416-160A120	160 x 16	Amber	120	3.1	3	78.52 x 12.47 x 7.40 (in) 199.44 x 31.67 x 18.80 (cm)	76 lbs 34.5 kg
416-160R230	160 x 16	Red	230	1.5	3	78.52 x 12.47 x 7.40 (in) 199.44 x 31.67 x 18.80 (cm)	76 lbs 34.5 kg
416-160A230	160 x 16	Amber	230	1.5	3	78.52 x 12.47 x 7.40 (in) 199.44 x 31.67 x 18.80 (cm)	76 lbs 34.5 kg
416-192R120	192 x 16	Red	120	3.3	3	92.92 x 12.47 x 7.40 (in) 236.02 x 31.67 x 18.80 (cm)	85 lbs 38.6 kg
416-192A120	192 x 16	Amber	120	3.3	3	92.92 x 12.47 x 7.40 (in) 236.02 x 31.67 x 18.80 (cm)	85 lbs 38.6 kg
416-192R230	192 x 16	Red	230	1.6	3	92.92 x 12.47 x 7.40 (in) 236.02 x 31.67 x 18.80 (cm)	85 lbs 38.6 kg
416-192A230	192 x 16	Amber	230	1.6	3	92.92 x 12.47 x 7.40 (in) 236.02 x 31.67 x 18.80 (cm)	85 lbs 38.6 kg

NOTES: 120 VAC transformer output = 400 W (57 A @ 7 VAC)
230 VAC transformer output = 400 W (57 A @ 7 VAC)
Sign cases are extruded aluminum frame with cast aluminum corners.
Back is sheet aluminum and front is a polycarbonate lens. Units are designed to be used outdoors and all power and signal connections must be hardwired.
Operating temperature range: -20°C to +55°C.

EMI compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications made to the sign that have not been expressly approved by Adaptive Micro Systems, Inc. could void your authority to operate the sign.
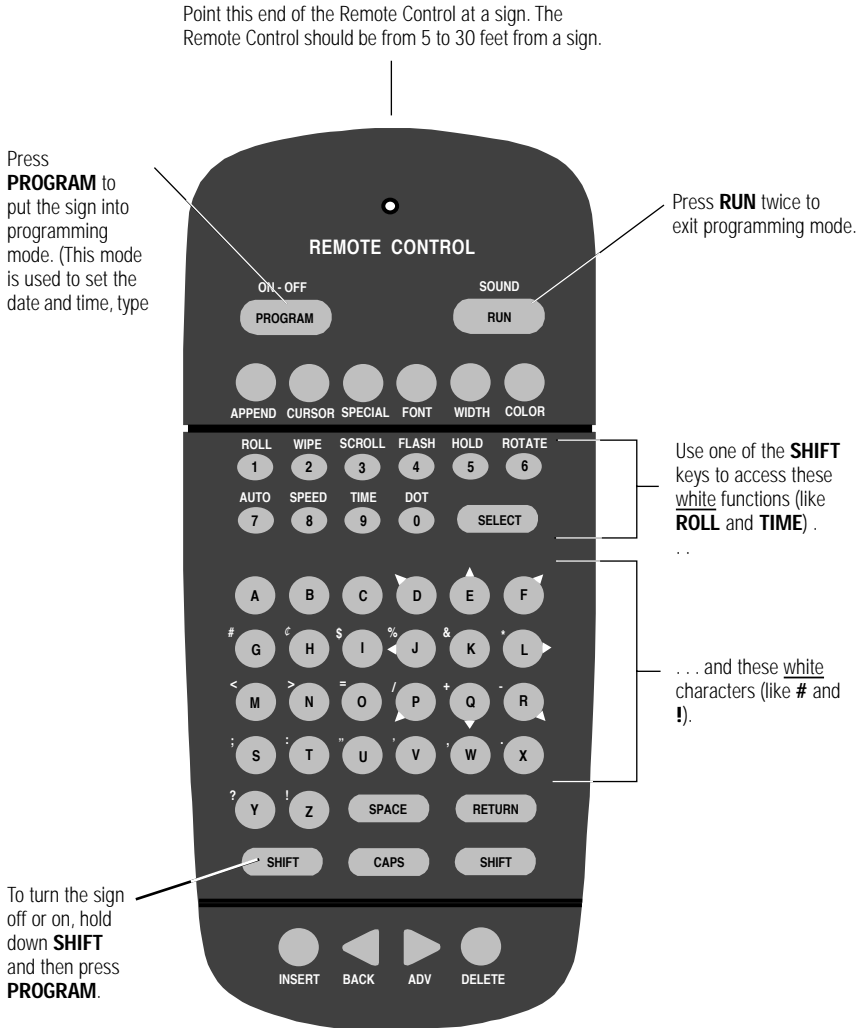
Remote Control keyboard description (optional)

Point this end of the Remote Control at a sign. The
Remote Control should be from 5 to 30 feet from a sign.

Press
PROGRAM to
put the sign into
programming
mode. (This mode
is used to set the
date and time, type

Press **RUN** twice to
exit programming mode.

REMOTE CONTROL

ON - OFF

SOUND

PROGRAM

RUN

APPEND   CURSOR SPECIAL   FONT   WIDTH   COLOR

ROLL   WIPE   SCROLL   FLASH   HOLD   ROTATE
1   2   3   4   5   6

AUTO   SPEED   TIME   DOT
7   8   9   0   SELECT

Use one of the **SHIFT**
keys to access these
white functions (like
ROLL and **TIME**) .
. .

A   B   C   D   E   F

¢ $ %   &   '
G   H   I   J   K   L

<   >   =   /   +   -
M   N   O   P   Q   R

. . . and these white
characters (like **#** and
!).

;   :   "   '   '
S   T   U   V   W   X

?   !
Y   Z   SPACE   RETURN

' SHIFT   CAPS   SHIFT

To turn the sign
off or on, hold
down **SHIFT**
and then press
PROGRAM.

INSERT   BACK   ADV   DELETE

Figure 2: Infrared (IR) Remote Control keyboard.

Basic sign operation

Turning a sign on and off

When power is applied to the sign, it starts up automatically, and removing power turns the sign off.

However, there is also another way:

*Holding down **SHIFT** and then pressing **PROGRAM** turns a sign's <u>display</u> off and on. (However, this method does not turn a sign's <u>power</u> off or on.)*

NOTE: Messages that you have programmed into the sign will *not* be lost when you turn a sign off. Messages will be retained for up to <u>30 days</u> if the sign is not powered.

Setting a sign's serial address

The serial address is a number that you can assign to a sign. Typically, this feature would be used for a sign that is connected to other signs on a network. Giving a unique serial address to a sign allows you to send messages to that *particular* sign.

See the document **Network Configurations** (part number 9708-8046) for more detailed information on networking signs.

NOTE: The serial address can also be set by using DIP switches inside the sign. See "Appendix B: Using DIP switches to set the serial address" on page 17.

Step	When you do this...	You see this...
1	Press **PROGRAM**.	SET SERIAL ADDRESS
2	Press **ADV**.	SERIAL ADDRESS = 000
3	Type a number, like *010*. NOTE: A serial address is actually a number from 0 to 255. NOTE: When a sign leaves the factory, its serial address is set to 000.	SERIAL ADDRESS = 010
4	Press **RUN** twice to set the new serial address and return the sign to normal operation.	

Connecting a sign to a personal computer

Though messages can be programmed into an ALPHA sign using the hand-held Remote Control, a more convenient method of sending messages is to connect the sign to either a single PC or a network of signs.

The diagram below shows how to connect an ALPHA sign to a single PC. For further connection options, see the document **Network Configurations** (part number 9708-8046).
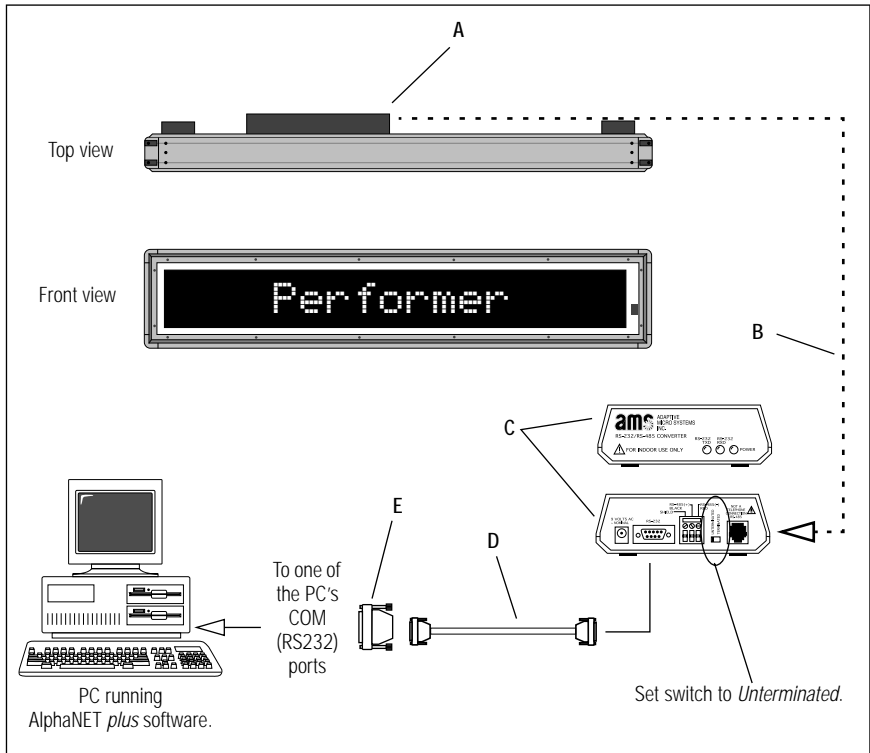
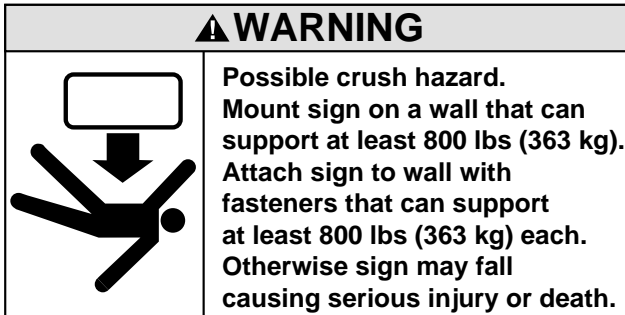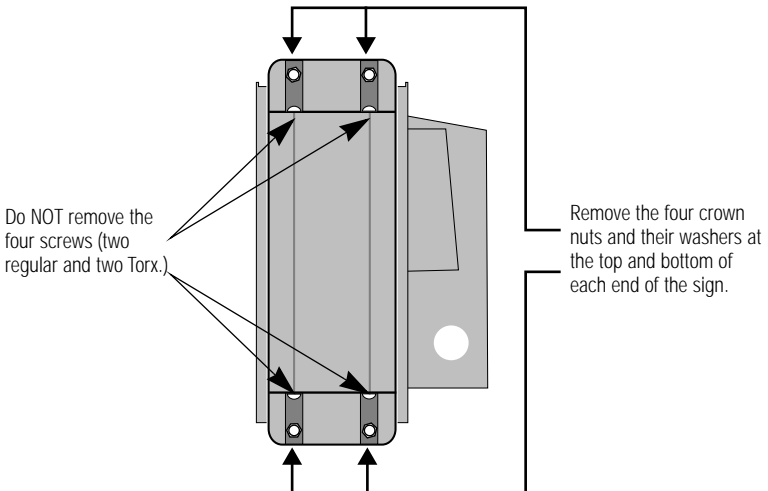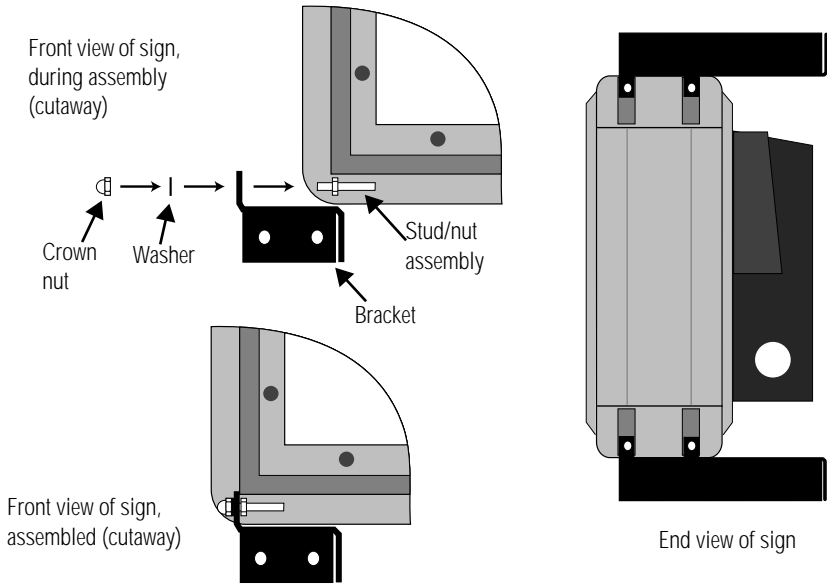| Item	Part #	Description
A	—	One end of the RS485 cable connects here. See "Signal wiring" on page 14.
B	1088-8000	RS485 cable, connects sign to the RS485 connector block on the Converter Box III.
C	1088-1111	Converter Box III
D	1088-8634	10 foot, 9 pin-to-9 pin, type "A9" RS232 cable
E	—	serial port DB25-to-DB9 adapter (may be required by your computer)

Installation

Mounting instructions

If possible, do not mount an ALPHA Solar in direct sunlight. Messages will be best seen when an ALPHA Solar is mounted in a shaded location.

⚠ WARNING

**Possible crush hazard.
Mount sign on a wall that can
support at least 800 lbs (363 kg).
Attach sign to wall with
fasteners that can support
at least 800 lbs (363 kg) each.
Otherwise sign may fall
causing serious injury or death.**

---

1. Using a 1/4" socket wrench, remove the four crown nuts and washers from the upper and lower corners on each end of the sign. Keep these crown nuts and washers for attaching the mounting brackets. Do not attempt to remove the stud/nut assembly from which the crown nuts and washers were removed.

Do NOT remove the four screws (two regular and two Torx.)

Remove the four crown nuts and their washers at the top and bottom of each end of the sign.

2. Assemble the mounting brackets, an internal tooth lock washer and a crown nut onto the stud/nut assembly at the upper and lower corners of each end of the sign. The drawing below illustrates the lower left corner of the sign.
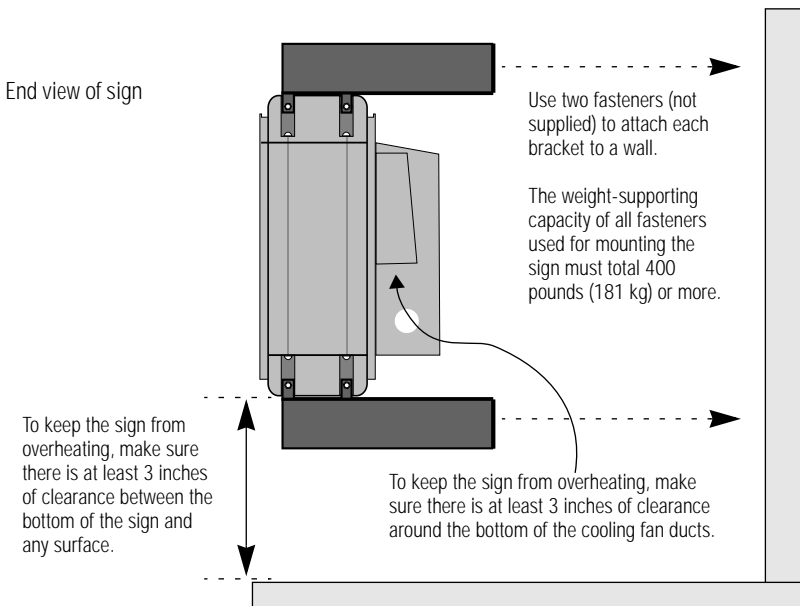
Front view of sign, during assembly (cutaway)

Crown nut

Washer

Stud/nut assembly

Bracket

Front view of sign, assembled (cutaway)

End view of sign

3. Use the dimensions A, B, C, and D in the table below for predrilling holes in the supporting wall.)

Mounting dimensions			
Dimension	ALPHA Solar size (LED rows x columns)		
	96 x 16	128 x 16	160 x 16	192 x 16
A	42.5″ (108 cm)	56.9″ (144.5 cm)	71.3″ (181 cm)	85.7" (217.7 cm)
B	43.75″ (111.1 cm)	58.2″ (147.8 cm)	72.6″ (184.4 cm)	87" (221 cm)
C	46" (116.8 cm)	60.4" (153.4 cm)	74.75" (190 cm)	89.2" (226.6 cm)
D	14" (all sizes) (35.6 cm)		
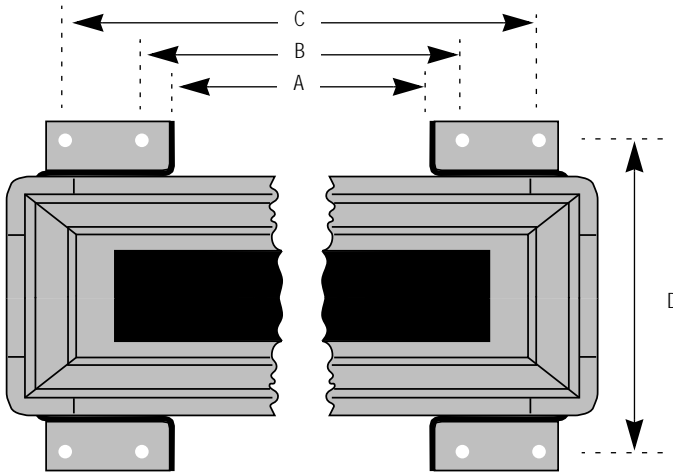
4. Mount the sign to a wall capable of supporting at least 400 pounds (181 kg.)

   NOTE: Wall mounting fasteners are not supplied.

⚠ WARNING

**Possible crush hazard.
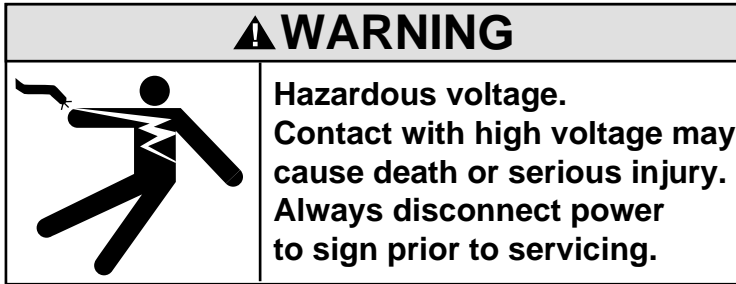Mount sign on a wall that can
support at least 800 lbs (363 kg).
Attach sign to wall with
fasteners that can support
at least 800 lbs (363 kg) each.
Otherwise sign may fall
causing serious injury or death.**

End view of sign

Use two fasteners (not supplied) to attach each bracket to a wall.

The weight-supporting capacity of all fasteners used for mounting the sign must total 400 pounds (181 kg) or more.

To keep the sign from overheating, make sure there is at least 3 inches of clearance between the bottom of the sign and any surface.

To keep the sign from overheating, make sure there is at least 3 inches of clearance around the bottom of the cooling fan ducts.

5. Proceed with the electrical connection of the sign. (See "Electrical connection" on page 12.)

Electrical connection

The following procedure should only be attempted by a qualified electrician.

⚠ **WARNING**
Hazardous voltage. **Contact with high voltage may cause death or serious injury.** **Always disconnect power to sign prior to servicing.**

1. Mount the sign as described in "Mounting instructions" on page 8.

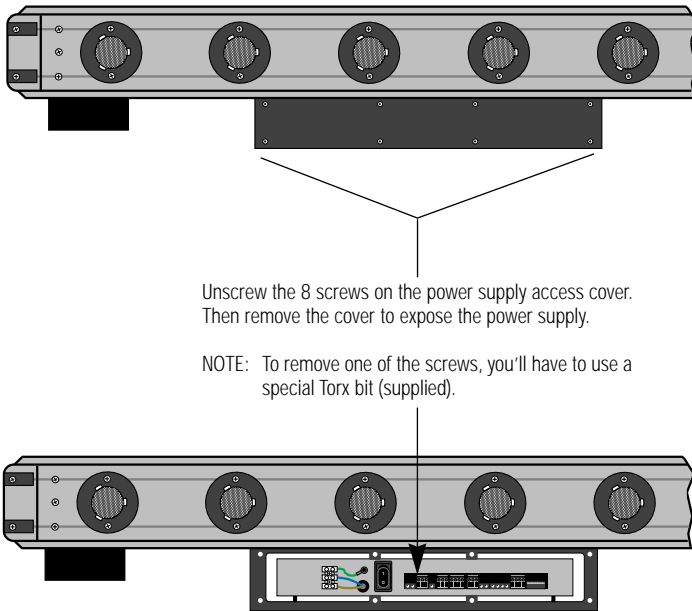2. Unscrew the 8 screws on the power supply access cover. Then remove the cover:

Unscrew the 8 screws on the power supply access cover. Then remove the cover to expose the power supply.

NOTE: To remove one of the screws, you'll have to use a special Torx bit (supplied).

Figure 3: ALPHA sign (bottom view) — Power supply access cover removal

3. After removing the power supply access cover, press the **0** on the sign's internal power switch:

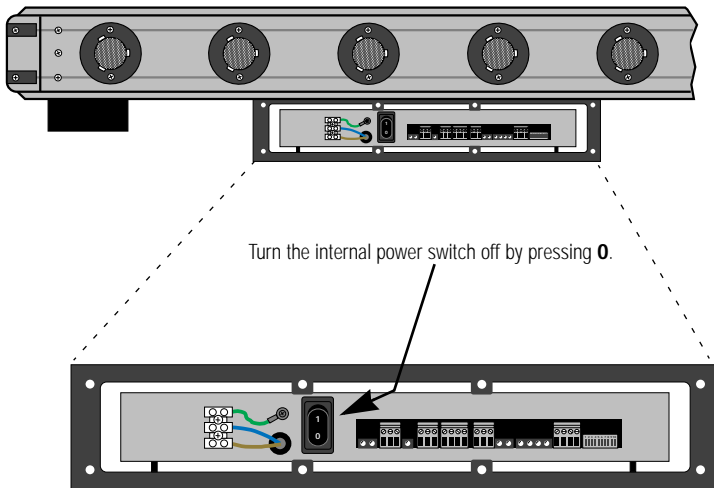Turn the internal power switch off by pressing **0**.

Figure 4: ALPHA sign (bottom view) — Power supply internal switch

4. Per local electrical codes, run the appropriate electrical wiring from a power source through the Power Conduit:

   NOTE: Separate conduits must be run to the sign for power and for signal connections.

   NOTE: If the sign is mounted *outdoors*, then all electrical connections (like the conduit) ***must be watertight***.
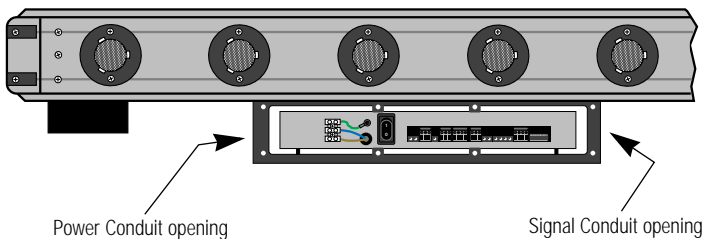

Power Conduit opening   Signal Conduit opening

Figure 5: ALPHA sign (bottom view) — Power and Signal Conduit locations

Signal wiring

5. In order to connect the sign so messages can be sent to it by a computer, run RS485 signal wire (pn 1088-8000) through the Signal Conduit:
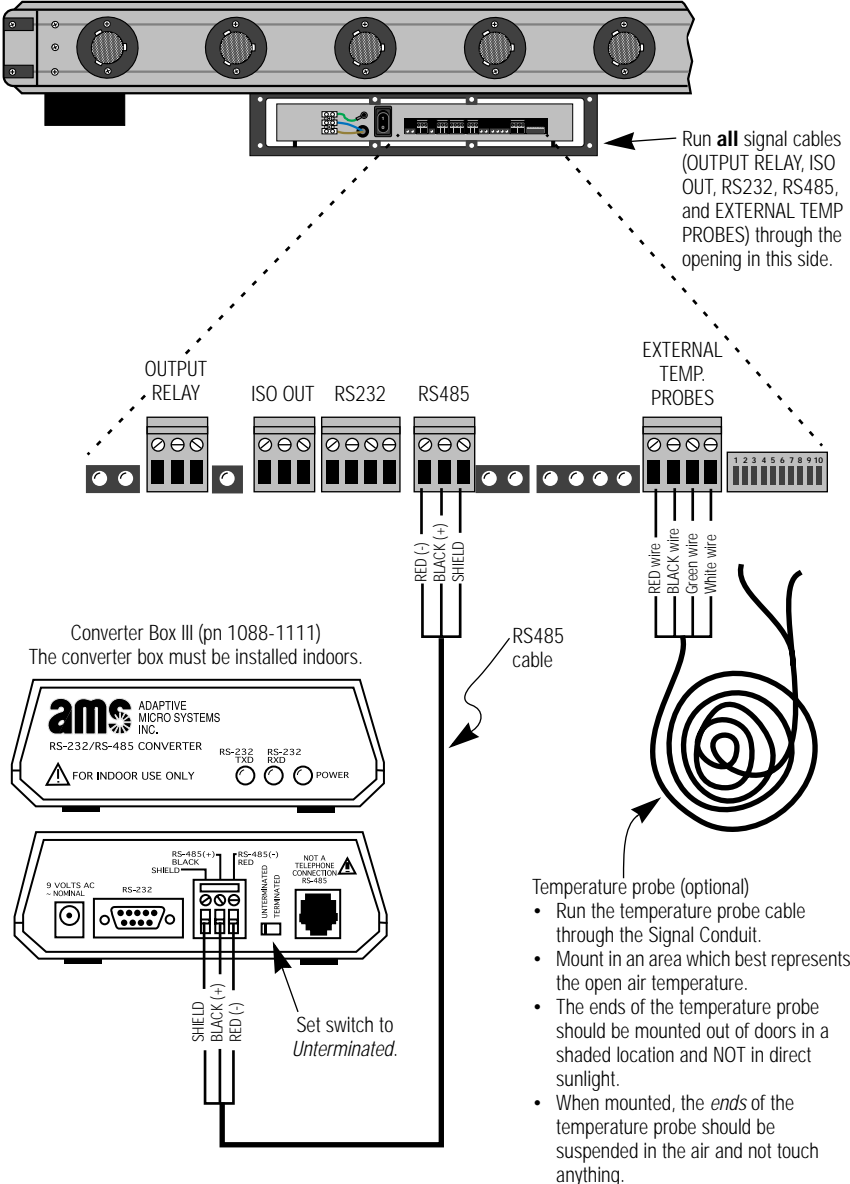

Run **all** signal cables (OUTPUT RELAY, ISO OUT, RS232, RS485, and EXTERNAL TEMP PROBES) through the opening in this side.

OUTPUT RELAY ISO OUT RS232 RS485

EXTERNAL TEMP. PROBES

RED (-)
BLACK (+)
SHIELD

RED wire
BLACK wire
Green wire
White wire

Converter Box III (pn 1088-1111)
The converter box must be installed indoors.

RS485 cable

ams ADAPTIVE MICRO SYSTEMS INC.
RS-232/RS-485 CONVERTER
RS-232 TXD   RS-232 RXD   POWER
⚠ FOR INDOOR USE ONLY

RS-485(+) BLACK
SHIELD
RS-485(-) RED
NOT A TELEPHONE CONNECTION RS-485 ⚠
9 VOLTS AC ~ NOMINAL
RS-232
UNTERMINATED
TERMINATED

SHIELD
BLACK (+)
RED (-)

Set switch to *Unterminated.*

Temperature probe (optional)
• Run the temperature probe cable through the Signal Conduit.
• Mount in an area which best represents the open air temperature.
• The ends of the temperature probe should be mounted out of doors in a shaded location and NOT in direct sunlight.
• When mounted, the *ends* of the temperature probe should be suspended in the air and not touch anything.

Figure 6: ALPHA sign (bottom view) — RS485 and temperature probe connections

Power supply wiring

6. Connect the wires from the Power Conduit to the appropriate wires power supply wires:

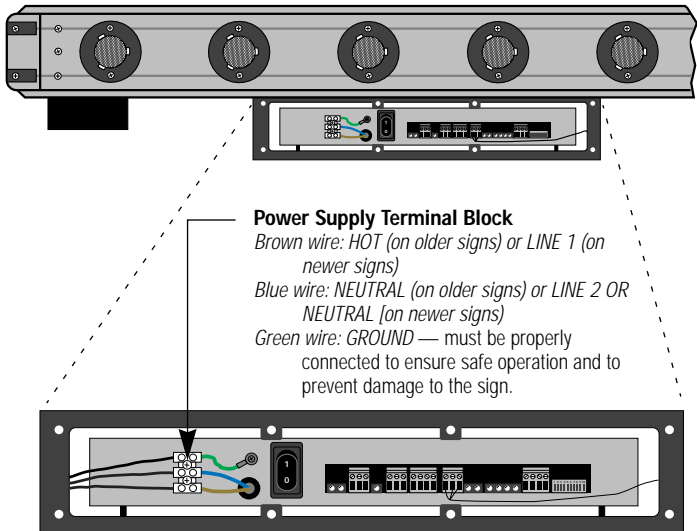   Do NOT connect the other ends of the wires in the Power Conduit to a power source yet!

Power Supply Terminal Block
Brown wire: HOT (on older signs) or LINE 1 (on newer signs)
Blue wire: NEUTRAL (on older signs) or LINE 2 OR NEUTRAL [on newer signs]
Green wire: GROUND — must be properly connected to ensure safe operation and to prevent damage to the sign.

Figure 7: ALPHA sign (bottom view) — Power supply connection

7. If you need to assign a serial address to this sign, see "Appendix B: Using DIP switches to set the serial address" on page 17.

8. Press the **I** on the internal power switch:

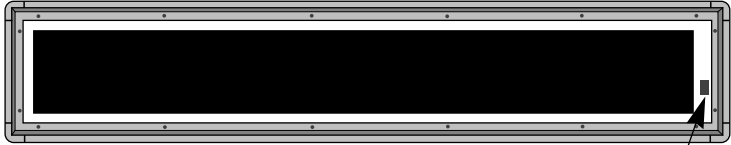Press **I** on the internal power switch.
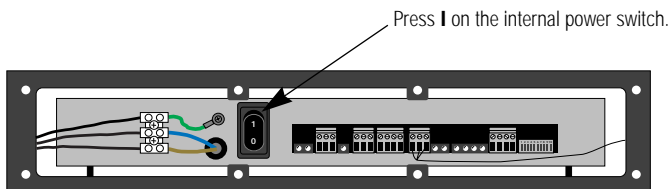
9. Using the eight screws you previously removed, replace the power supply access cover.

10. Connect the wires from the Power Conduit to a *switched, fused power source*.

11. The sign is now ready for use.

Appendix A:
Periodic maintenance

Perform this maintenance as needed:

• Clean the front lens of the sign:

Keep this area especially clean. A photocell which is used to adjust the sign's brightness level is located here.

• Clean the sign's air filters at least every 6 months and more frequently in dusty environments:

If the air filters (located on the bottom of the sign) become clogged, the sign may become overheated and shut down.

To clean an air filter, remove the two screws on each filter cover. Remove the filter material and clean it in a mild detergent solution. Dry the filter material and return it to the sign.
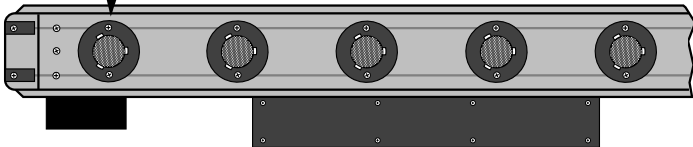
Appendix B:
# Using DIP switches to set the serial address

A sign's serial address can be set either by using the hand-held Remote Control or by changing the sign's *internal* DIP switches.

The DIP switch method should be used if you want to assign a permanent serial address to the sign. For example, if your sign is attached to a network of other signs, you may want to give your sign a unique address so that, if you wish, you could send messages to *only* your sign.

To change the serial address using DIP switches, do the following:

⚠ WARNING

**Hazardous voltage.
Contact with high voltage may
cause death or serious injury.
Always disconnect power
to sign prior to servicing.**

1. Turn off power to the sign.
2. Remove the sign's power supply access cover:
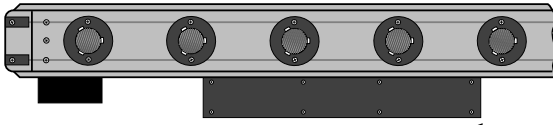
Unscrew the 8 screws on the power supply access cover.
Then remove the cover to expose the power supply.
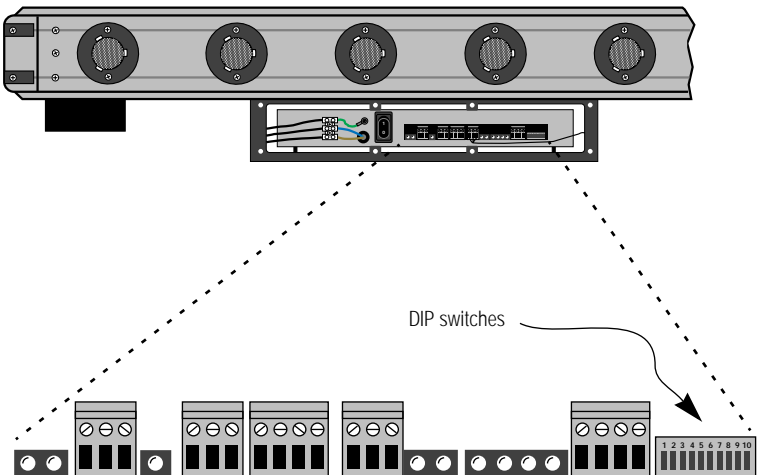
NOTE: To remove one of the screws, you'll have to use a
special Torx bit (supplied).

3.   After removing the power supply access cover, press the **0** on the sign's internal power switch:
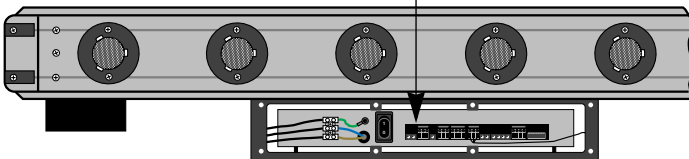
Turn the internal power switch off by pressing **0**.
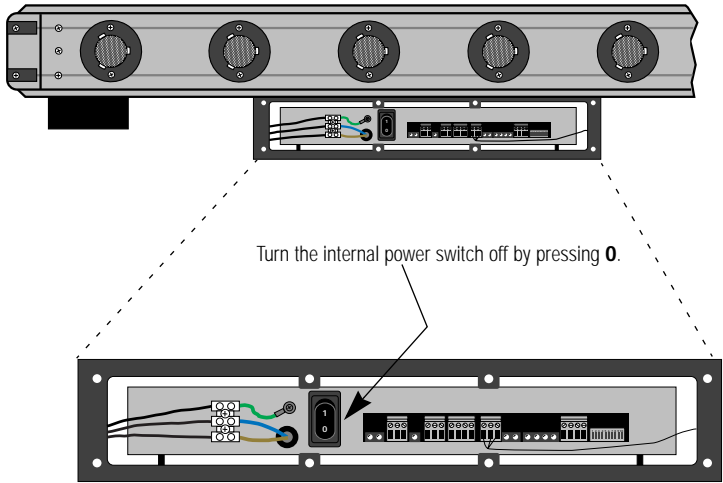
4.   Locate and then set the internal DIP switch using "Serial Address Table" on page 19:

DIP switches

1 2 3 4 5 6 7 8 9 10

5. Turn the internal power switch on by pressing **1**.
6. Replace the power supply access cover.

Serial Address Table

1 2 3 4 5 6 7 8 9 10

Serial address (decimal)	DIP switch settings									
	1	2	3	4	5	6	7	8	9	10
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF		
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF		
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF		
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF		
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF		
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF		
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF		
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF		
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF		
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF		
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF		
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF		
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF		
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	DON'T MOVE SWITCHES 9 AND 10!	
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF		
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF		
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF		
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF		
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF		
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF		
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF		
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF		
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF		
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF		
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF		
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF		

Appendix C: Troubleshooting

Problem	Possible cause(s) and solution(s)
Messages not being displayed on the sign.	• No power — make sure that the sign has power supplied to it. • No messages programmed — messages must be programmed into a sign using a personal computer that is attached to the sign. • Messages deleted — someone might have mistakenly deleted the messages that were programmed into the sign. In this case, all the messages will have to be re-entered. • Sign overheating — if two LEDs in the lower right of the sign's display are blinking, then the sign has overheated and shut itself down. Clean the sign's air filters (see "Appendix A: Periodic maintenance" on page 16).
Temperature displayed on the sign is not accurate	• Temperature probe not mounted properly — make sure (1) the temperature probe is mounted in an area which best represents the open air temperature; (2) the temperature probe is NOT in direct sunlight; and (3) the ends of the temperature probe are suspended in the air and not touching anything. • Temperature probe not connected properly — see "Signal wiring" on page 14.