

StreetSmart[™] **series**
Models 17X and 35X

StreetSmart Sign Installation Manual

August 26, 2010

Dynamic outdoor advertising solutions

Part Number 1179600101 rev.C

ADAPTIVE
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Introduction

Purpose

This manual explains how to mount and electrically connect an AlphaEclipse StreetSmart sign and is intended for sign installers.

Revision history

Revision	Date	Notes
1179600101	August 10, 2005	First release.
1179600101	December 9, 2005	Added information for larger signs, new labeling and new logos.
rev. B	February 19, 2008	Major updates throughout the manual including a new format. Added Ooh!Media related connectivity options, sign specifications, and diagrams for mechanical, wiring, and connectivity options. Also added specific warranty and sign ventilation requirements.
rev. C	July 31, 2008	Updated ventilation and clearance requirements, including enhanced illustrations. Revised installation instructions for wiring multiple sign sections.

Safety information

Equipment symbols



Chassis ground



Mains power (1 = ON, 0 = OFF)

Warnings, cautions, and notices

Warnings, cautions, and notices are posted in appropriate locations throughout this manual.

Equipment protection

Preventing 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, “*Preventing Electrostatic Discharge (ESD) Damage*,” available on our Web site at <http://www.adaptivedisplays.com>.

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.

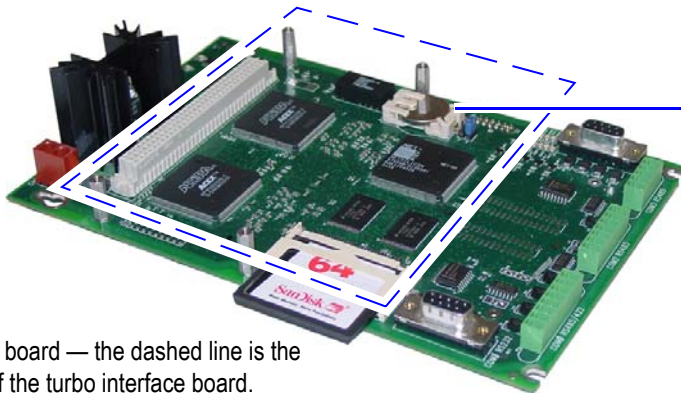
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with installation guidelines, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Battery backup

In the event of power loss, backup batteries in an AlphaEclipse sign provide power in order to save messages and time settings.

A lithium backup battery is located on the top of a sign’s controller board under the turbo interface board (see below). The backup battery should only be replaced by a qualified Adaptive technician.

WARNING! Danger of explosion if battery is incorrectly replaced.



Lithium 3.0V, 200mm backup battery (Panasonic BR2032) located under the turbo interface board

Controller board — the dashed line is the location of the turbo interface board.

Figure 1. Battery locations on the controller board

Equipment description

Sign models

There are two models of AlphaEclipse StreetSmart signs:

- 17X — 17mm LED pitch sign available in either red or amber colors.
- 35X — 35mm LED pitch sign available in either red or amber colors.

Modular construction

AlphaEclipse StreetSmart signs are built using modular construction. That is, a sign may be built from smaller sections or modules as shown below. To review the technical specifications for the various sign configurations, see “Sign configuration specifications” on page 55.

Sign Section Type	AlphaEclipse StreetSmart 17X Sign Sections (Pitch = 17.5mm / LED colors = Red or Amber)	AlphaEclipse StreetSmart 35X Sign Sections (Pitch = 35mm / LED colors = Red or Amber)
1		
2		
3		
4		

Figure 2. Sign modules

Opening a sign

WARNING! Hazardous voltage. Contact with high voltage may cause death or serious injury. The power switches on the circuit breaker DO NOT turn off power to all lines in a sign. Remove power at the source.

Notice: Open sign doors slowly to prevent damage to internal components.

While opening a cube door on an AlphaEclipse StreetSmart sign is a straightforward procedure, locating where a cube door starts and ends can be a challenge. This is because an AlphaEclipse StreetSmart can be made up of a number of different-sized cubes (see “Modular construction” on page 7).

1. Remove power from the sign at the source.
2. Locate the cube door you want to open.

Locating a cube door

→ Look at the back of a sign

The most efficient way to locate the size of each cube door is to look at the back of a sign, as in the following example.

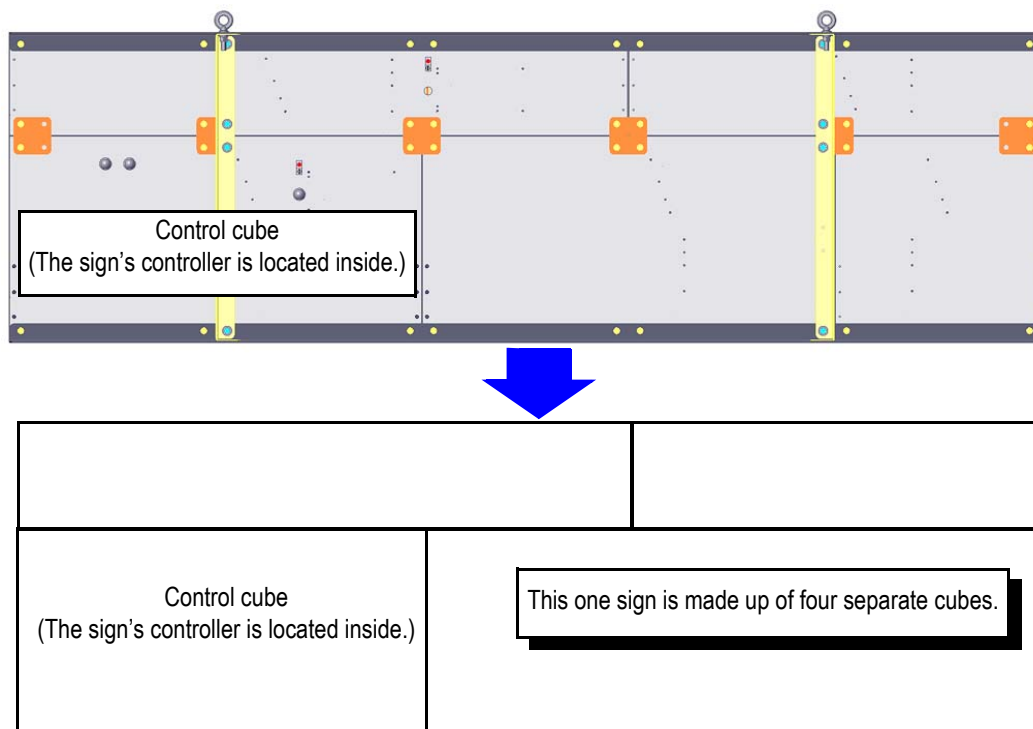


Figure 3. Rear view of the sign

→ Examine the sides of the sign

If it is not possible to look at the back of a sign, then examine each side of the sign for clues to where each cube starts and ends.

Note: Though not as good as looking at the back of a sign, examining all the sides does help narrow down the search.

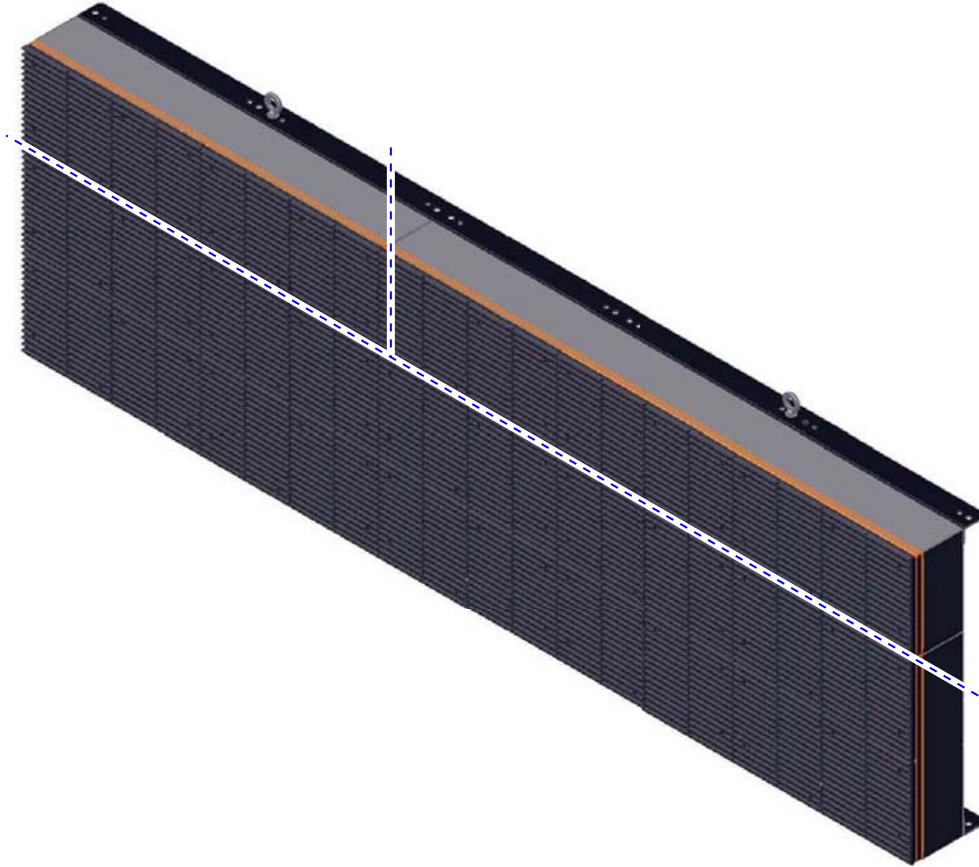

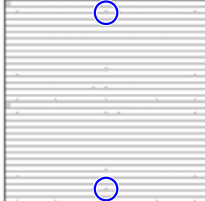




Figure 4. Identifying cube doors from the sides of a sign

➔ **Locate the screws holding the door in place**

1. Use the table below to locate the door locks.

Door size	StreetSmart 17X and 35X
2 x 2	
2 x 1	
1 x 2	
1 x 3	

2. Use a 5/32-inch hex tool to open the door locks:

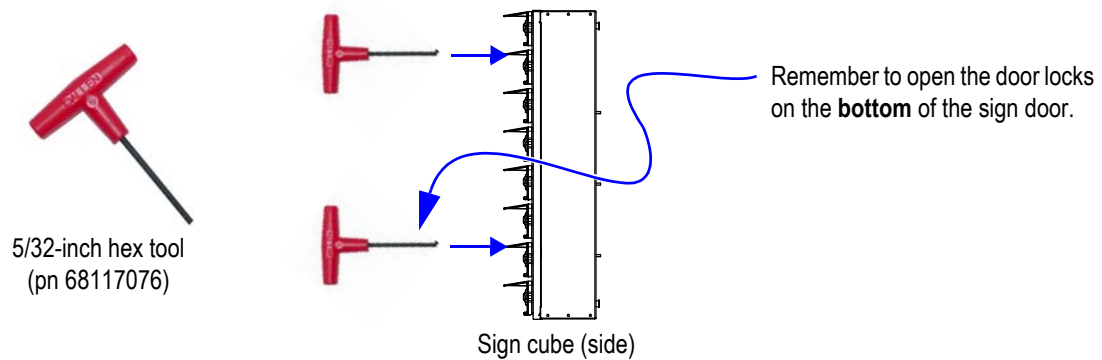


Figure 5. Opening the door locks

3. Carefully open the sign door:

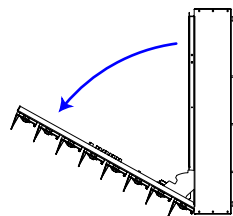


Figure 6. Opening the sign door

Front view

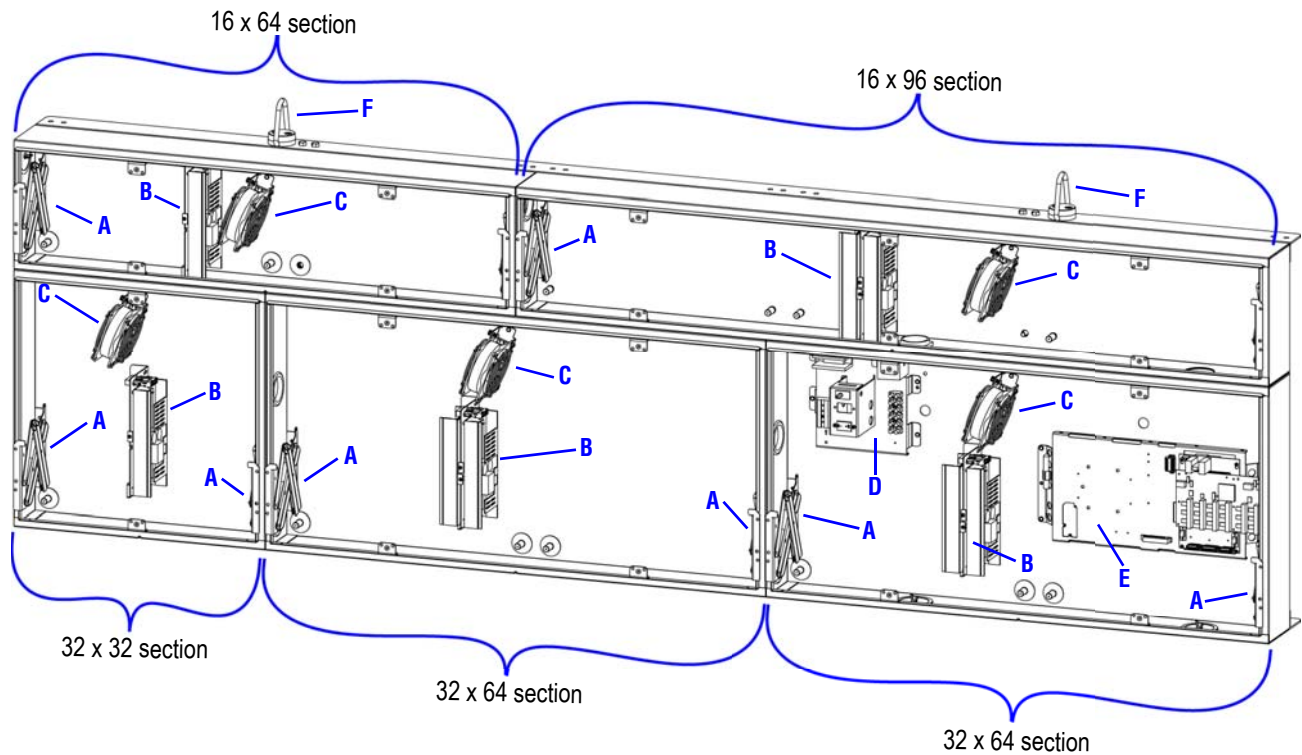


Figure 7. StreetSmart 17X 48x160 sign, other sign sizes are similar

Item	Name	Description
A	SIGN DOOR HINGE	Hinge for door.
B	POWER SUPPLY	Provide DC power to sign components: <ul style="list-style-type: none"> For AlphaEclipse StreetSmart 17X signs, SP225-5.0 power supplies provide 5.25VDC. For AlphaEclipse StreetSmart 35X signs, SP225-7.5 power supplies provide 8.2VDC.
C	FAN	<ul style="list-style-type: none"> 120V, 110 CFM (pn 46008045) 240V, 110 CFM (pn 46008029B)
D	POWER PLATE	Incoming AC power connects to breakers and is passed through the rest of the sign. A Fan Test switch momentarily connects power to all the fans.
E	CONTROLLER PLATE	Contains the controller board. The controller will contain <i>one</i> of the following connectivity options (for more information, see "Installing the sign's connectivity" on page 42): <p>AlphaNet options:</p> <ul style="list-style-type: none"> telephone modem (includes a telephone line surge arrestor) wireless transceiver fiber optic modem RS232 direct connection RS485 direct connection
F	LIFTING HOOKS	Used to lift the individual sign sections into place. These hooks should not be used to mount or hang the sign. Lifting hooks should be removed after the sign is mounted.

Inside door assembly

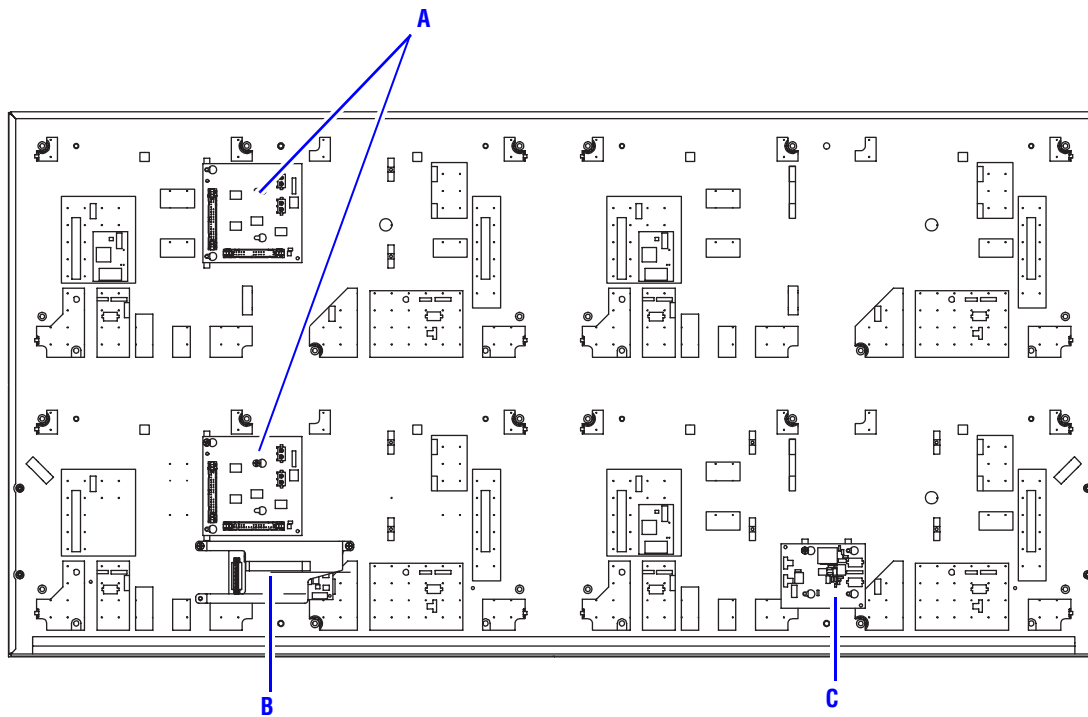


Figure 8. StreetSmart 17X and 35X, 2x2 building block. Other sign sizes are similar

Item	Name	Description
A	DIFFERENTIAL CONVERTER BOARDS	This board converts the data from the controller board to the display boards. There will be either one or two differential converter boards in a sign, depending on the sign's door size. <ul style="list-style-type: none"> • 2x2 and 2x1 sign doors — 2 differential converter boards • 1x2 and 1x3 sign doors — 1 differential converter board
B	LIGHT SENSOR BOARD	The light sensor board (pn 11759008SP) is used to dim the sign's LEDs.
C	BOOST REGULATOR (17X ONLY)	The boost regulator is only used on the AlphaEclipse Street Smart 17X signs. The boost regulator steps up the voltage for the controller board from 5 volts to 9 volts. There is only one boost regulator in a sign.

Rear view

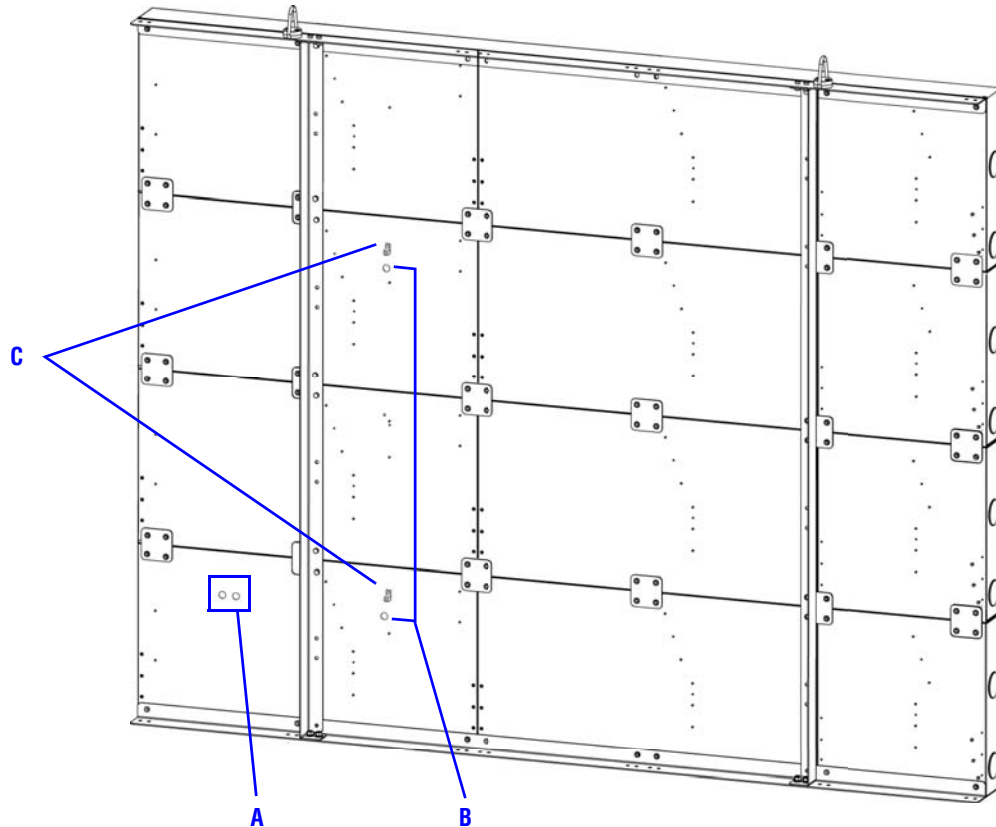


Figure 9. StreetSmart 35X 64x80 sign, other sign sizes are similar

Item	Name	Description
A	COMMUNICATION ENTRY HOLES*	<p>Adaptive recommends using one communication entry hole for the sign's connectivity option and the other entry hole for networking signs together and/or connecting an optional temperature probe.</p> <p>When installing conduit for connecting the AlphaNet communication options to the sign, the connection must be waterproof.</p> <p>Note: Because fiber optic cable is not adversely affected by power cables, if there's adequate room, fiber optic cable can be run in the same conduit as the power wires. However, RS485 wire <i>cannot</i> be run in the power conduit because RS485 wire is adversely affected by power cabling.</p>
B	POWER CONDUIT HOLES*	<p>The location of the power conduit holes varies with the size of the sign. For location information for the various sign sizes, see "Primary power and data entry locations" on page 56 and "Secondary power entry locations (35X signs only)" on page 57.</p> <ul style="list-style-type: none"> AC power is connected here. Conduit connected here should be waterproof. <p>Note: 35X signs larger than 56 rows x 32 columns require two power inputs.</p>
C	GROUND LUG	For attaching an earth-ground rod to the sign.

* Communication entry holes and power conduit holes accept a 1/2" standard EMT fitting. The actual diameter opening is 7/8".

Equipment identification

Sign label

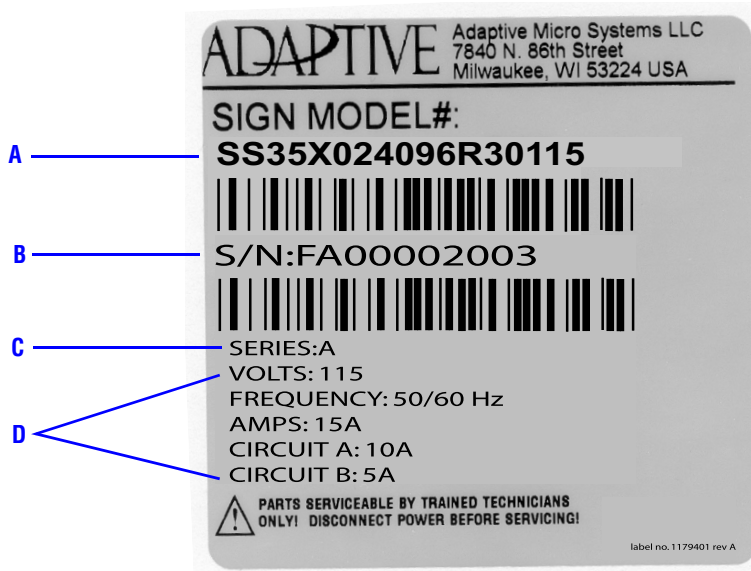


Figure 10. This label is located on the back of and inside of the control cube

Item	Name	Description
A	SIGN MODEL NUMBER	<p>SS 35X 024X096 R 30 115</p> <ul style="list-style-type: none"> Sign input voltage LED viewing angle LED lamp color: <ul style="list-style-type: none"> • R = Red • A = Amber • RGB = Full color Number of rows and columns in pixels AlphaEclipse StreetSmart model: <ul style="list-style-type: none"> • 17X = 17.5mm pitch • 35X = 35mm pitch AlphaEclipse StreetSmart sign
B	SERIAL NUMBER	Consecutive, unique identification number for the sign.
C	SERIES LETTER	Revision level of sign.
D	ELECTRICAL INFORMATION	Input voltage, frequency, and total amperage of the sign: <ul style="list-style-type: none"> • “AMPS” = total sign amperage. • “CIRCUIT A”, “CIRCUIT B”, and so on = a sign that needs multiple, separate circuits and the required amperage for each circuit.

Section compliance label

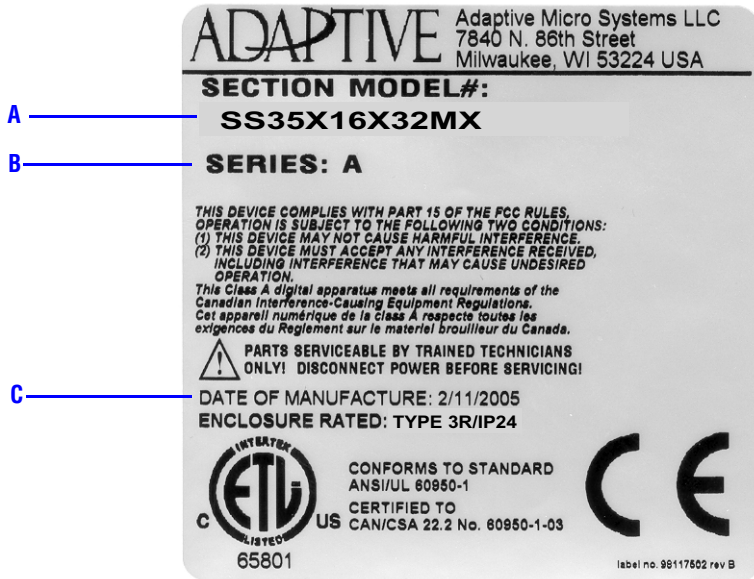


Figure 11. Section compliance labels are located on the back of each sign section

Item	Name	Description
A	SECTION MODEL NUMBER	<p>SS 35X 16X32 MX</p> <ul style="list-style-type: none"> Section configuration: <ul style="list-style-type: none"> • MX = Main section • SX = Secondary section • MS = Main secondary • MP = Main power Number of rows and columns in pixels for only this section. AlphaEclipse StreetSmart model: <ul style="list-style-type: none"> • 17X = 17.5mm pitch • 35X = 35mm pitch AlphaEclipse StreetSmart sign
B	SERIES LETTER	Revision level of sign.
C	DATE OF MANUFACTURE	Month, day, and year the sign was made.

Section identifier label

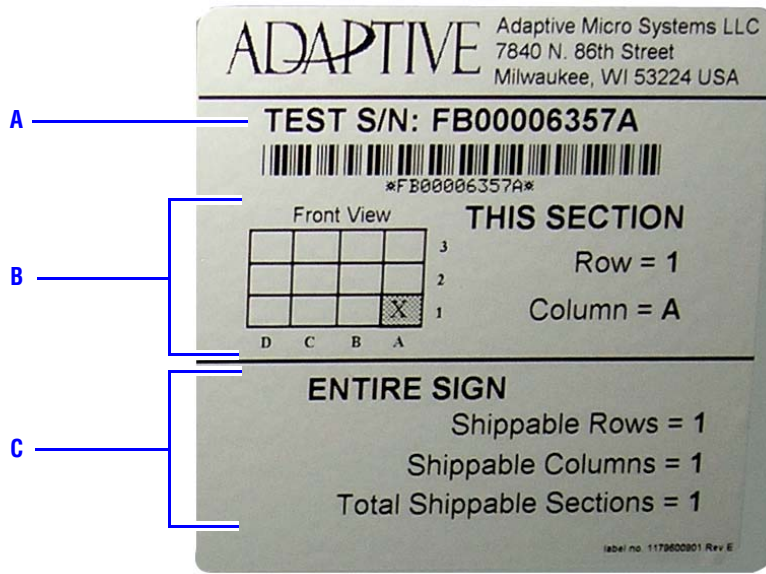


Figure 12. Section identifier labels are located on the back of each section

Item	Name	Description
A	SERIAL NUMBER	Consecutive, unique identification number for the sign.
B	SECTION LOCATION	Location of this section in relation to the entire sign:
C	SIGN SIZE	Sign size in sections.

Temperature protection

Sign shutdown

- When the temperature of the sign's controller board is equal to or greater than 203°F (95°C), the message "OT" will appear in the upper left of the sign's display area. All other LEDs will remain off.
- When the temperature of the sign's controller board is less than 194°F (90°C), then the sign will resume normal operation.

Fans

When the temperature inside a sign exceeds 100°F (38°C), the fans will start. When the temperature falls below 80°F (27°C), the fans will stop.

Temperature logging

The sign keeps track of its internal temperature and this log can be read using AlphaNET Diagnostic software.

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Mechanical installation

Overview

The AlphaEclipse StreetSmart signs uses a modular design allowing for several different sign sizes and configurations.

The sign must be installed onto a super-structure designed to withstand live loads and comply with all national and local codes. Live loads include loading from wind and seismic events. Because every sign installation is unique, there is no single procedure for mounting AlphaEclipse StreetSmart signs.

WARNING! Sign sections must be supported (affixed to a super-structure able to withstand live loads and comply with all national and local codes) prior to opening the doors, otherwise the sign may tip causing serious injury.

Notice: Sign parts could sustain damage if the doors are opened and the sign is not fully off the ground. Failure to comply voids the warranty.

Structures defined

Sub-structure: The formed steel angle on the back of each sign section (top and bottom). Supplied with the sign.

Super-structure: Customer or installer supplied structure to which the sign sections are mounted. Super-structures must be approved by a qualified structural engineer.

ID sign: Company name and/or logo sign supplied by the customer or installer. ID signs used in conjunction with Adaptive signs must not interfere with Adaptive's ventilation, electrical, and mounting requirements.

Super-structure design

The design of a sign's support structure depends on a number of factors: mounting methods, building codes, foundation, sign size, sign weight, sign height, wind loading, and seismic loading.

All installations, super-structure designs, and connections must be approved by a qualified structural engineer. Call Adaptive Micro Systems at 1-800-558-7022 for contact information for structural engineering consultants.

Sign mounting guidelines and requirements

Notice: Do not use sign's ground-lugs for grounding installation equipment such as welding equipment or the warranty will be void.

Only the sign's sub-structure may be welded. Welding any other part of the sign will void the warranty.

The method used to mount signs varies greatly from location to location. The installer must ensure the installation complies with all national and local codes.

A qualified structural engineer must review the structure and attachment points to the super-structure. The back of the sign uses a 2"x 3" x 0.13" formed steel angle. These angles assist in mounting the sign.

Sign installers must comply with the following Adaptive requirements or the sign warranty will be void:

- Any ID sign, fascia trim, or structure used above the sign **must** either have flashing or extend past the face of the sign.
- **DO NOT** allow water to pool / gather underneath or on top of the sign.
- **DO NOT** allow water from an above ID sign, fascia trim, flashing, or any other structure to drip directly onto the sign's door seams.
- **DO NOT** seal the sign in way that restricts hot air from escaping the inside of the sign.
- Comply with all sign ventilation and clearance requirements. Refer to "Ventilation requirements" on page 21 for details.

Sign painting or wrapping

Notice: Painting or vinyl wrapping the top and/or the back of the sign will void the warranty.

The sides and bottom of the sign may be painted or vinyl wrapped without affecting the product warranty. When painting the sign, follow the paint manufacturer's instructions for surface preparation of mill finish aluminum.

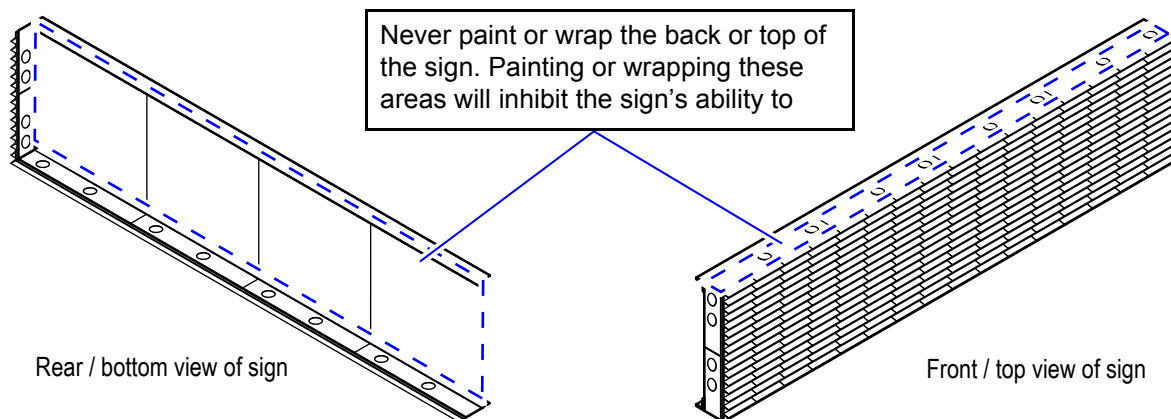


Figure 13. Painting or wrapping the sign.

Ventilation requirements

Notice: Inadequate ventilation will ultimately result in component failure that may not be covered under warranty.

Signs require obstruction-free space for adequate air ventilation between solid mounting surfaces and the top, bottom, and sides of the sign. This is required for all wall, monument, and pole mounted signs. Refer to “Wall mounting” on page 22, “Monument Mounting” on page 23, or “Pole mounting” on page 25 for more details.

Always take into consideration other neighboring heat sources such as backlit signs, lighting sources, etc. and add additional ventilation when needed.

Note: Shading the back of the sign will enhance thermal performance.

Adaptive Explains

How does the sign cool itself?

Although the sign cases are completely enclosed with no forced air ventilation, the sign does rely on natural convection to cool. The top and back of the sign case uses these surfaces as heat sinks to cool the inside cabinet temperatures. An internal mixing fan helps cooling by mixing the air inside bringing it all to a more uniform temperature or isothermal.

The sign is enclosed to keep out contaminants which adversely affects the sign from corrosion and dirt build-up. The dirt build-up or corrosion deters the sign’s ability to cool.

What is natural convection?

Natural convection is a type of heat transportation. In natural convection, air surrounding a heat source receives heat, becomes less dense and rises. The surrounding, cooler air then moves to replace it. This cooler air is then heated and the process continues, forming a convection current.

For every installation provide adequate ventilation or the sign warranty may be void:

- **DO NOT** mount air ducts (vents) directly to the sign or sign’s sub–structure.
- **DO NOT** modify the sign or sign’s sub–structure for ventilation purposes (see Figure 19 on page 27). The super–structure design **MUST** incorporate adequate ventilation.
- Provide 7–square inches of ventilation for every 1–square foot of sign. For signs under 7–feet in height use 3.5–square inches for every 1–square foot of sign. Ventilation is defined as obstruction–free space.
- Ventilation air ducts **MUST** be installed evenly spaced around the perimeter of the sign (top, bottom, and sides). Evenly spaced air ducts help maintain a consistent air flow around the sign.
- Air duct size **MUST** be a minimum of 7–square inches (equivalent to a 3–inch round air duct).
- If the sides of the sign are covered (enclosed), install a minimum of two air ducts in each side covering.
- Provide a minimum clearance of 1–inch above and below the sign.
- Provide a minimum clearance of 6–inches behind the sign.

Wall mounting

Signs require obstruction-free space for adequate air ventilation between solid mounting surfaces and the top, bottom, and sides of the sign.

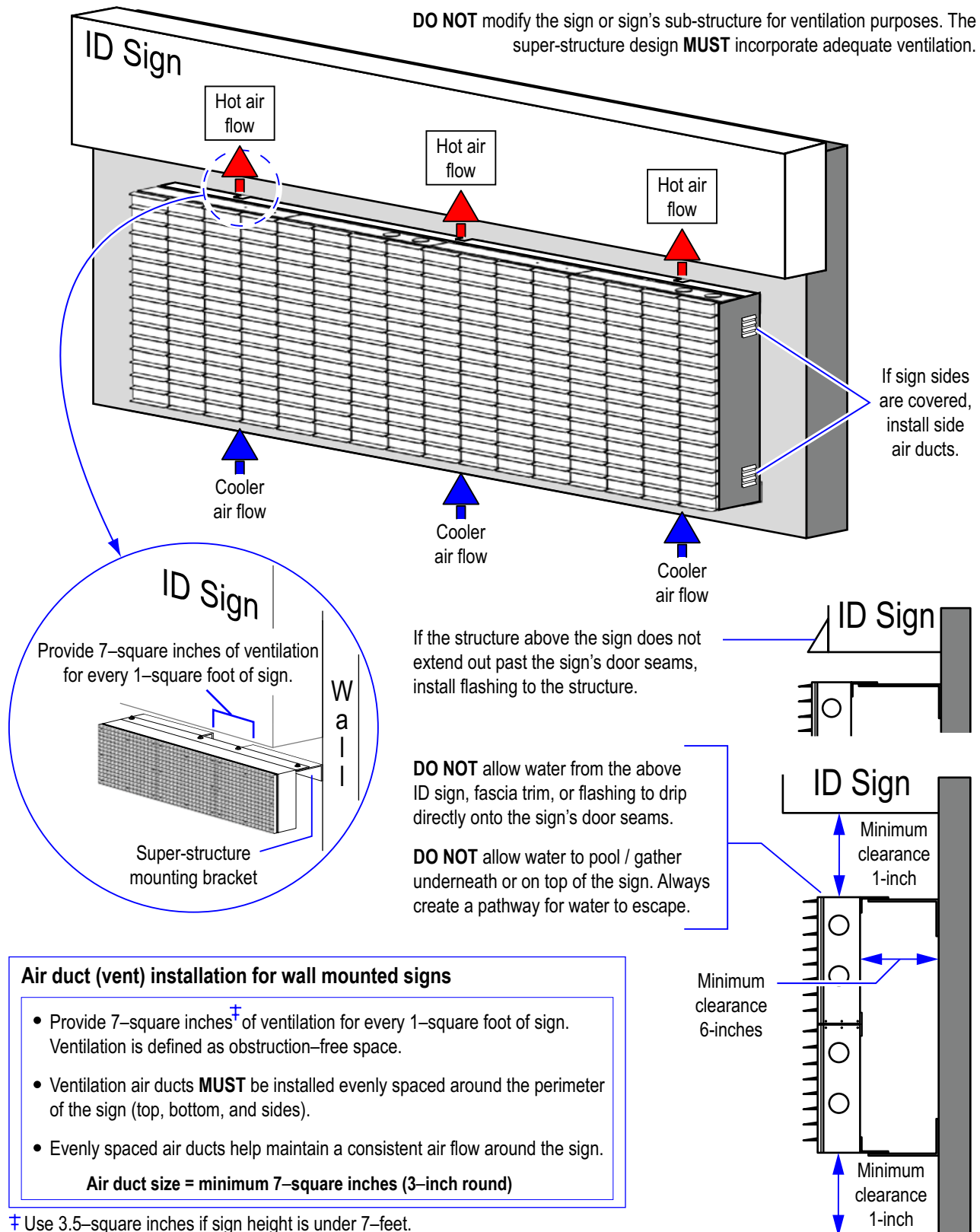


Figure 14. Ventilation requirements around a wall mounted sign

Monument Mounting

If there is an obstruction on the outside of the sign (as in a monument-style installation), care must be taken to assure the sign is able to cool. Air ducts **must** be used in the monument to allow air to flow behind the sign. When monument mounting a StreetSmart sign, use air ducts to help hot air escape. For back to back sign configurations refer to “Ventilation diagram for back-to-back sign configurations” on page 60 for details.

Note: Adaptive recommends the installation of fans to force hot air out of the air ducts.

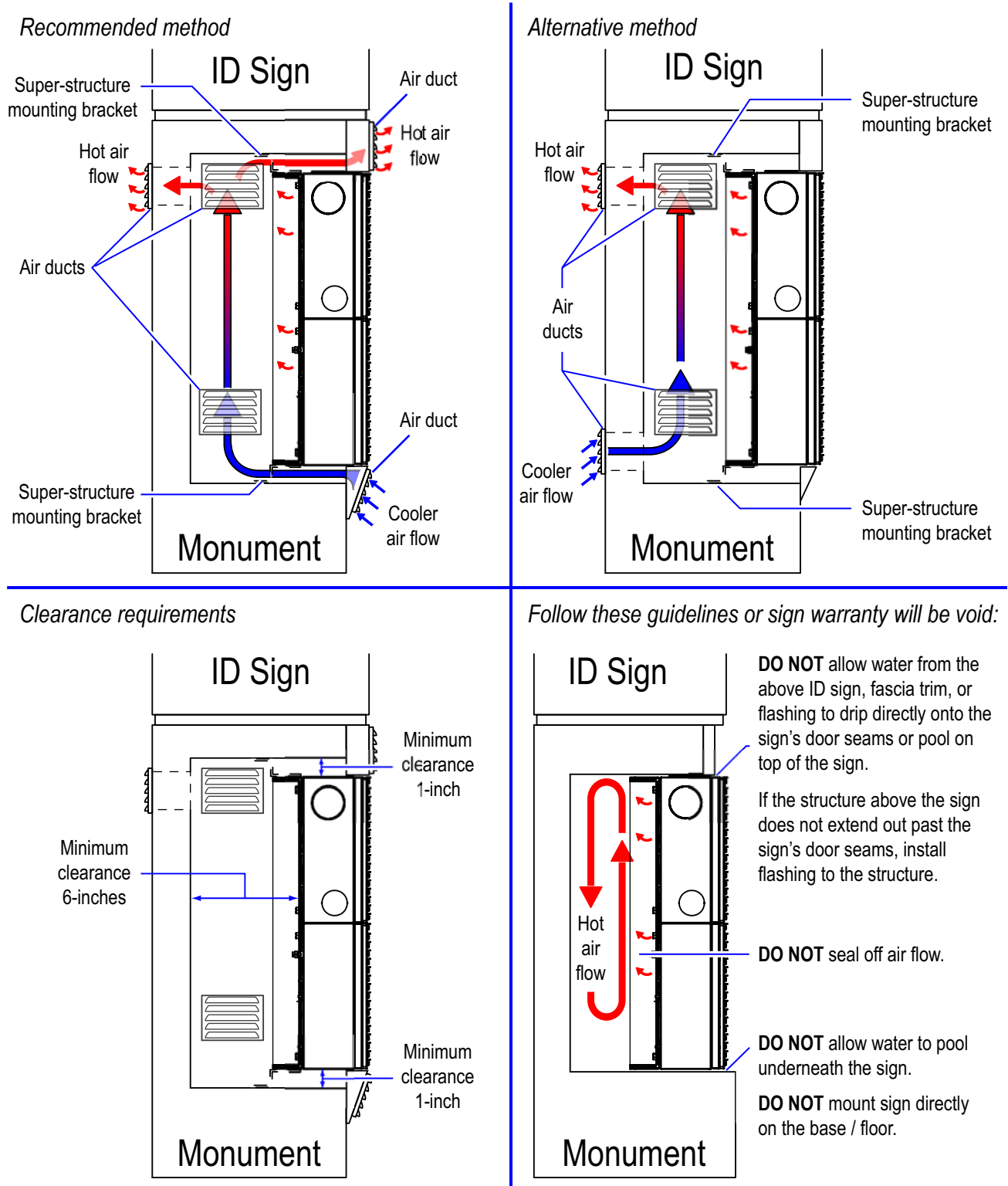


Figure 15. Use air ducts when monument mounting.

Pole mounting

Signs require obstruction-free space for adequate air ventilation between solid mounting surfaces and the top, bottom, and sides of the sign.

Air duct (vent) installation for pole mounted signs

- Provide 7-square inches[‡] of ventilation for every 1-square foot of sign. Ventilation is defined as obstruction-free space.
- Ventilation air ducts **MUST** be installed evenly spaced around the perimeter of the sign (top, bottom, and sides).
- Evenly spaced air ducts help maintain a consistent air flow around the sign.

Air duct size = minimum 7-square inches (3-inch round)

[‡] Use 3.5-square inches if sign height is under 7-feet.

DO NOT wrap or paint sign top (super-structure must allow hot air to escape).

DO NOT allow water to pool / gather underneath or on top of the sign. Always create a pathway for water to escape.

DO NOT modify the sign or sign's sub-structure for ventilation purposes.

If the structure above the sign does not extend out past the sign's door seams, install flashing to the structure.

Provide a minimum clearance of 1-inch above and below the sign and 6-inches behind the sign.

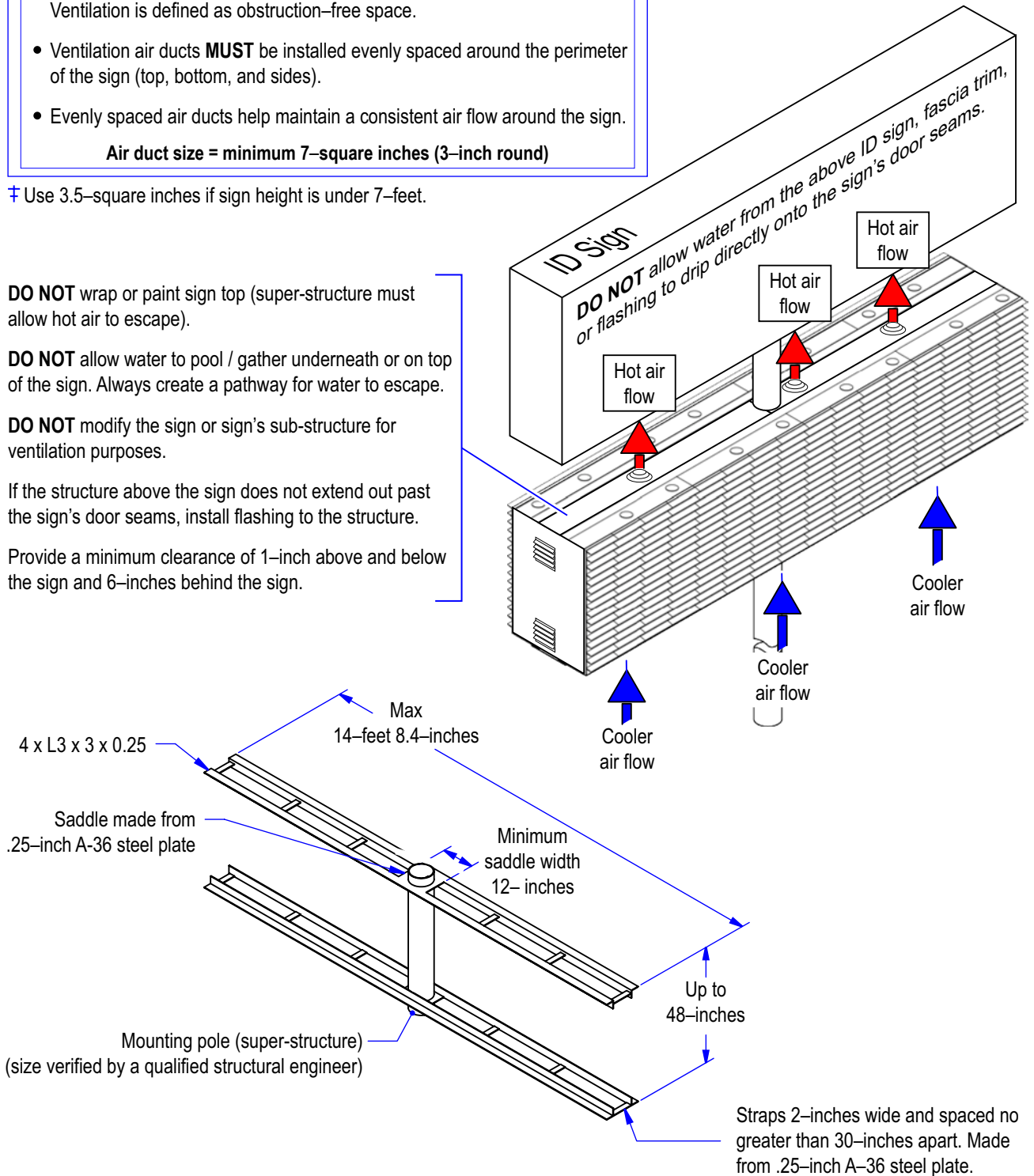


Figure 17. Pole mounting a StreetSmart sign.

Lifting the sign

WARNING! Crush hazard. Improperly assembling or lifting a sign can create a crush hazard.

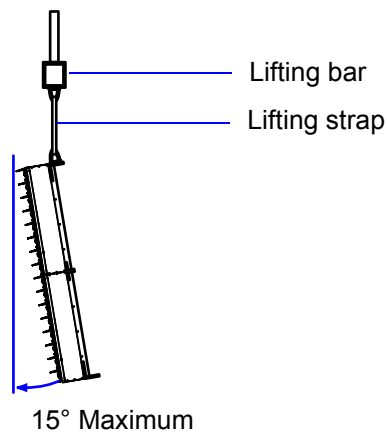
Do NOT use eyebolts to lift an assembled sign. They are designed only to lift a sign section from its shipping crate.

Lift the sign evenly and level, with no more than a 15 degree tilt.

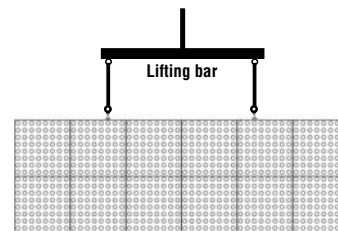
Use a lifting bar adjusted to the width of the lifting hardware on the sign to raise the shippable section. After mounting the sign sections, remove the lifting hardware or corrosion to the sign may occur. **Failure to follow these instructions will void the warranty.**

1. Lift the sign section up to the super-structure.
2. Position the sign section on the super-structure.

15° Maximum lifting tilt



PREFERREED METHOD



ALTERNATE METHOD

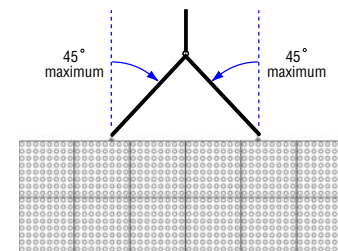


Figure 18. Sign section lifting methods

Mounting the sign to the super-structure

The methods used to mount a sign to a super-structure vary greatly. It is the installer's responsibility to ensure that the installation complies with all national and local codes.

Notice: Drill holes as needed in the sign's sub-structure for fasteners. Only drill holes into the sign when field upgrade instructions or Adaptive's Technical Service Department explicitly states to do so. Drilling holes in the sign under any other circumstance will void the sign's warranty.

When drilling holes or welding the sign's sub-structure, follow these guidelines or the warranty will be void:

- **DO NOT** drill additional conduit holes through the controller plate in the control case.
- **DO NOT** drill additional conduit holes along the bottom of the case, because water may pool there.
- **DO NOT** use the sign's ground-lugs for grounding installation equipment such as welding equipment.
- **DO NOT** weld any part of the sign except for the sign's sub-structure.

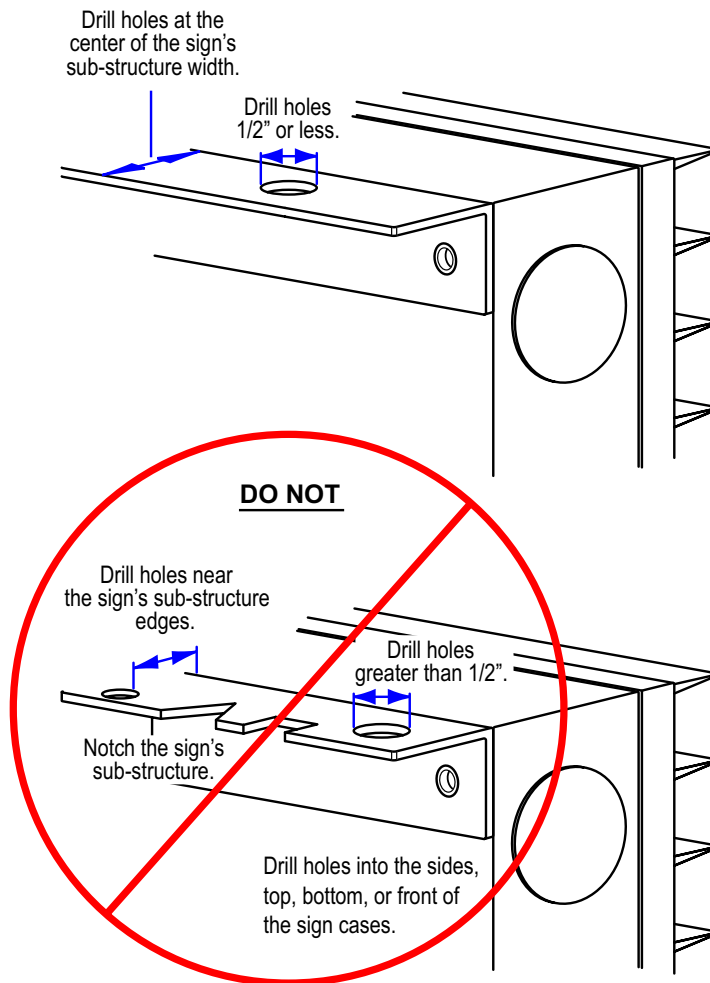


Figure 19. Drilling guidelines

Notice: Dissimilar metals must be isolated to avoid galvanic corrosion.

Any area on the sign's frame from which paint is removed during mounting, must be recoated with paint that is UL recognized to standard UL-1332, category DTOV2. Failure to repaint the area will result in accelerated corrosion of the sign's structure. Adaptive Micro Systems is not responsible for any failure in the sign's structure because of accelerated corrosion. Failure to comply will void the sign's warranty.

Mounting signs with multiple sections

Large AlphaEclipse StreetSmart signs are shipped from the factory in multiple sections. Mount sign sections to the super-structure starting with the bottom right section, section 1. Refer to the identifier label (See “Section identifier label” on page 16 for label information) on each section to determine the proper location. Large signs with multiple sections are mounted horizontally first, and vertically second. For signs with more than one vertical section, use the supplied bolts to vertically connect the sections.

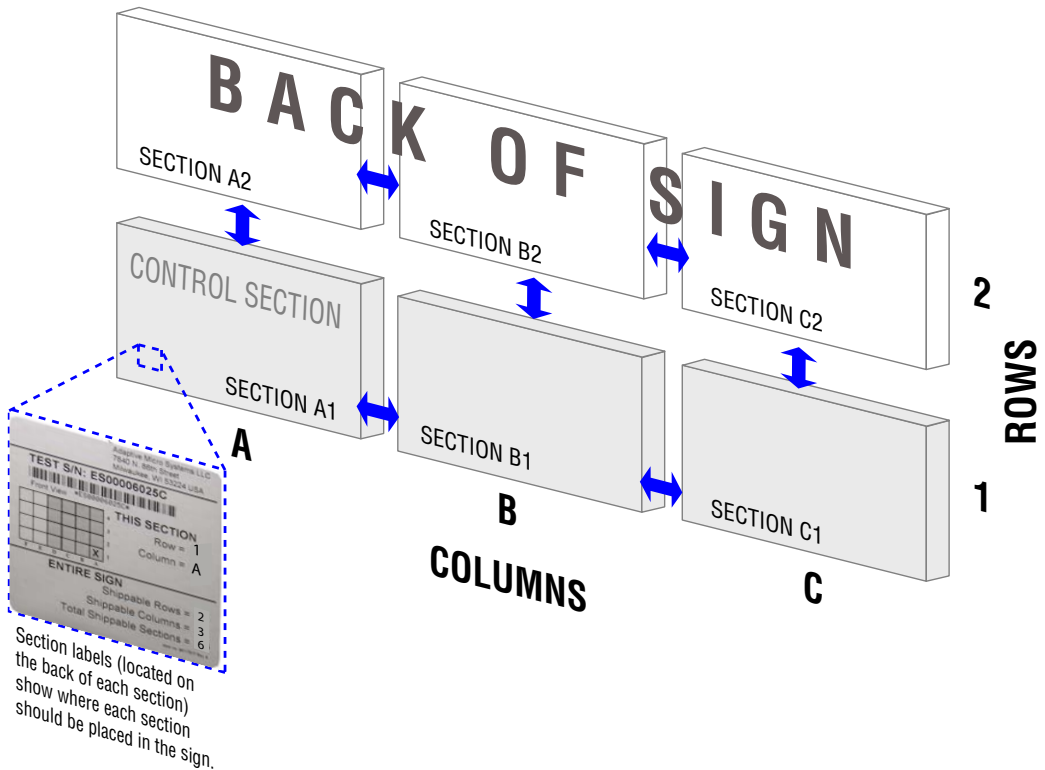
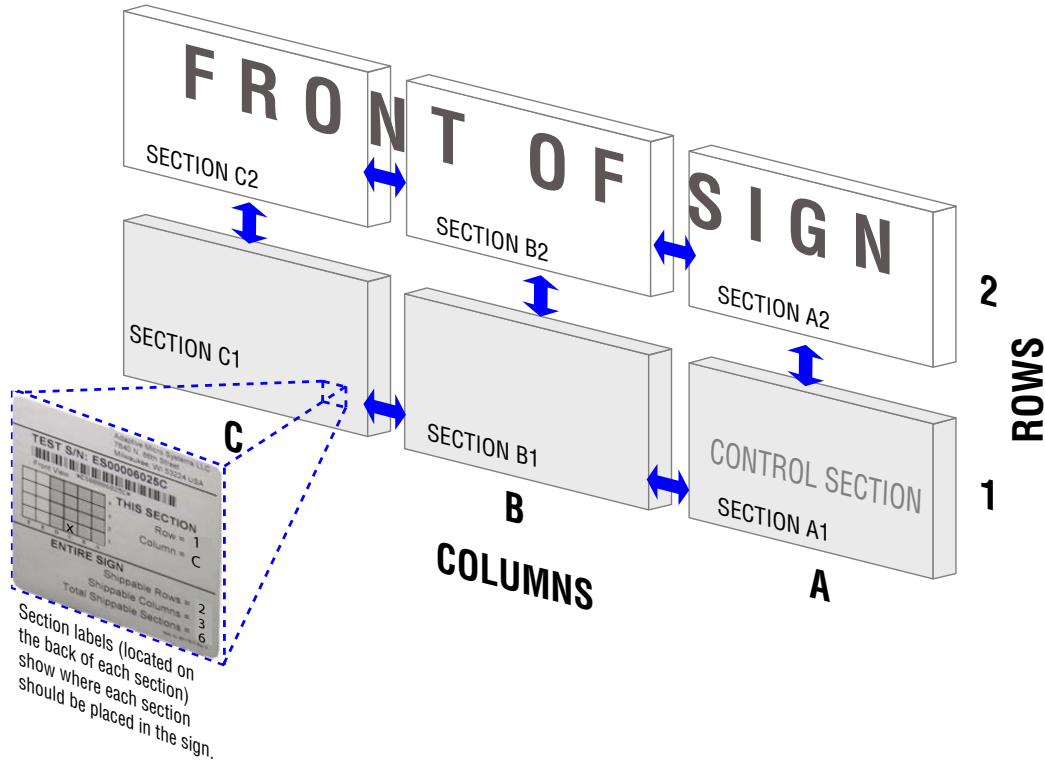


Figure 20. Multiple section sign assembly

Wiring signs with multiple sections

Notice: Failure to install any of the vertical or horizontal grommets between sign sections can allow water entry into the sign and will void the warranty.

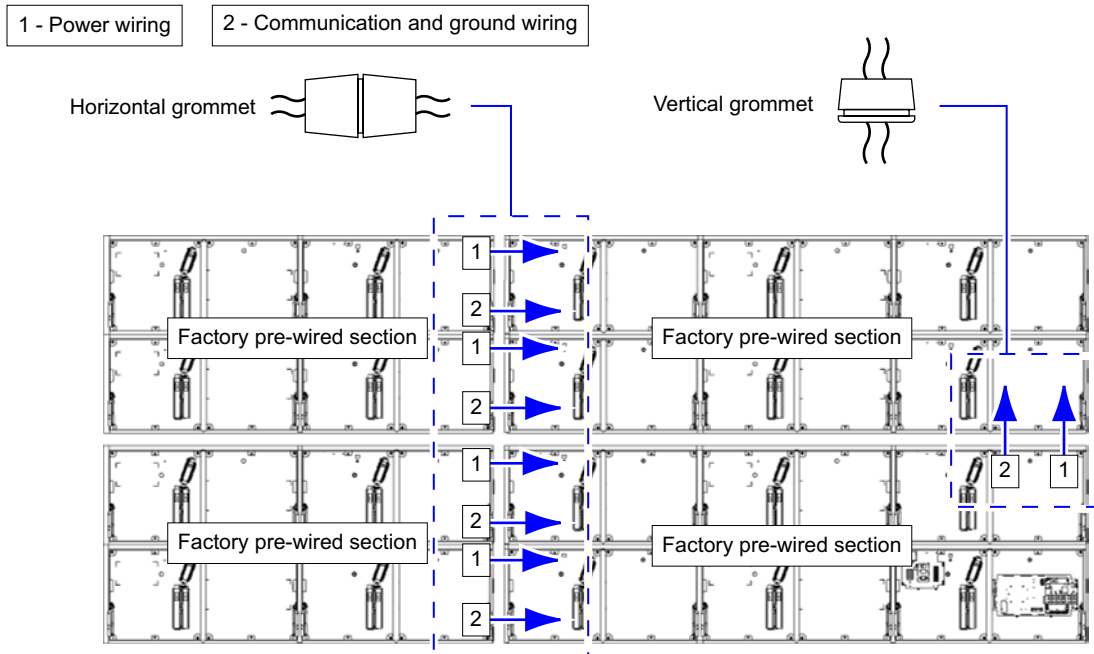


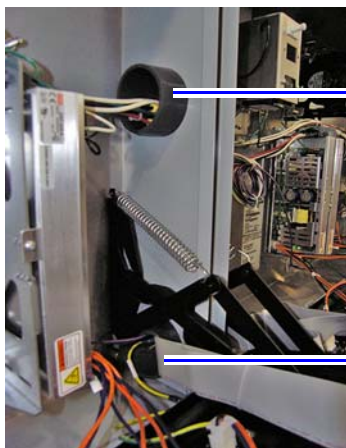
Figure 21. Multiple sign section wiring.

Wire horizontal sign sections starting from the right cube of the left–most sign section into the left cube of the sign section on the right. Wire vertical sign sections starting from the top right cube of the bottom–most sign section up into the bottom right cube of the sign section above. Horizontal and vertical wiring procedures are the same.

Note: 35X signs larger than 56 rows x 32 columns require two power inputs. See “Running power to the sign” on page 34 for details.

➔ To wire signs with multiple sections

1. Open the sign sections.
2. Remove the stickers covering the wire pathway openings between shippable sign sections.
3. Remove tie wraps.
4. Insert grommets and route cables through the appropriate opening.

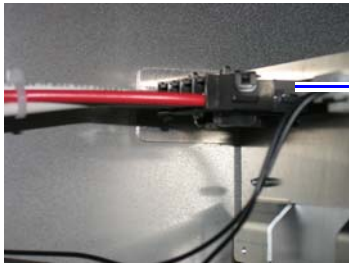


Install grommet and route the power cable connector through the grommet.

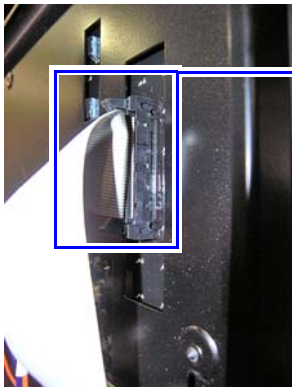
Install grommet and route communication(s) and ground wire through the grommet.

Figure 22. Grommets installed in sign section pathway openings.

5. Connect cable ends to the designated component.



Power cable and power supply connection.



Plug the ribbon cable into the open connector.

- If applicable, connect the longer ribbon cable to the top-most driver board connector.
- Align the tab on the connector with the slot opening on the plug.
- Secure the cable connection with the two tabs on the side of the connector.



Ground wire connection between sign sections.

Figure 23. Cable connection between shippable sign sections.

6. Repeat steps 1-6 between all shippable sections.

Electrical installation

WARNING! Hazardous voltage. Contact with high voltage may cause death or serious injury. The power switches on the circuit breaker **DO NOT** turn off power to all lines in a sign. Remove power at the source.

Notice: The following electrical installation requirements must be followed or the sign warranty will be voided.

Electrical installation must only be attempted by a qualified electrician. Electrical connection must comply with all applicable national and local codes.

Requirements for electrical installation

The electrical installation of signs varies greatly. The following bullet points are requirements. **It is the installer's responsibility to ensure that the installation complies with all national and local codes.**

- All power wiring **must** be from circuit breaker-protected lines.
- **DO NOT** connect the sign to a GFI-protected circuit.
- A two-pole disconnect device **must** be installed in the building wiring for each branch circuit supplying the sign.
- The sign **must** be properly grounded according to the applicable national and local electrical codes (for example, NEC Article 250 and 600, and IEEE 1100-1999).
- All electrical conduit connections **must** be watertight.
- Use minimum 80° C copper wire only.
- Torque terminals to a minimum of 7 in/lbs and a maximum of 10 in/lbs.
- **DO NOT** drill additional conduit holes.
- **DO NOT** route power and communication wires out of the cube door and around the side of the sign; the wires will be damaged when the door is closed.
- Separate conduits **must** be used for signal wires (for example, RS232, RS485) and for power wires. However, fiber optic wire may be run in the same conduit with power wires.

Power requirements

Adequate power **must** be run to the sign in accordance with the “Technical Specifications” on page 49 and “Sign configuration specifications” on page 55 for power requirements.

- The sign is configured for **one of two power configurations only**; 115VAC single-phase or 230VAC single-phase power. The sign is **NOT** configured to run off a 208 3-phase power source.
- The sign **must** be run on it's own dedicated circuit to ensure proper operation. This is particularly important when the sign is installed in a structure containing ballasts for fluorescent lamps. They **must** have their own circuit. Not complying with this requirement can lead to intermittent sign operation or malfunction.
 - **Do NOT** run power to the sign and the ballasts off the same circuit.
 - When ballasts are used in the same vicinity of the Adaptive sign, it is recommended that they be of the electronic low harmonic type to further reduce the risk of any interference with the sign.
 - Wire gauge and breakers **must** be sized or verified in accordance with Adaptive's input power specifications, the National Electric Code, and applicable local codes. **Under-sizing the wire gauge or breaker size can lead to intermittent sign operation or malfunction.**
 - Some sign sizes require more than one circuit (power entry) according to Adaptive's “Technical Specifications” on page 49.

Adaptive Explains

Is it necessary to run *two* conduits to a sign?

It is not always necessary. Two conduits are only necessary when communication wire, like RS485 wire, is run to a sign from a computer or from another sign. In these cases, one conduit would contain the sign's power wires and the other conduit the communication wires.

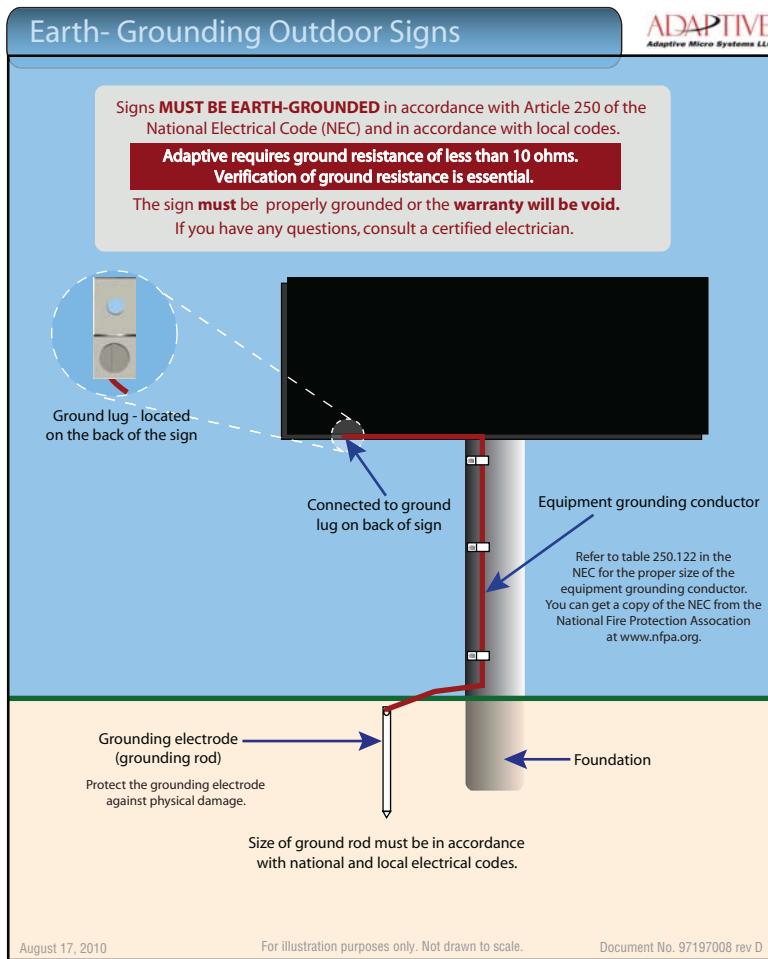
If power and communication wires are put in the same conduit, communication wires will pick up electrical interference from the power wires. For example, when a live power cord is placed next to a stereo speaker wire, the interference from this cord may cause the speaker to hum. In the case of a sign, this same effect could disrupt messages sent to the display.

However, fiber optic cable and power wires can share the same conduit because fiber optic cable is immune to electrical interference.

Earth-grounding StreetSmart signs

Properly grounding each sign is necessary because it is an essential means of preventing shock, shock hazards, and potential fire hazards.

WARNING! Failure to properly ground the sign could result in elevated voltage from lightning entering the sign seeking a path to earth. The high voltage can result in electric shock, fires, and the destruction of the sign from lightning.



The following requirements *must be followed or the warranty will be void:*

- Signs **must** be grounded in accordance with Article 250 of the National Electrical Code and in accordance with applicable local codes.
- **Do NOT** terminate the ground on metal poles or buildings. The metal will corrode resulting in deteriorated grounding properties. Additionally, metal poles or buildings are often mounted on material that does not provide an effective ground.

Adaptive requires the following:

- Use copper-clad ground rods as the grounding electrode. They provide effective grounding for an indefinite period of time.
- Depending on the local soil conditions and codes, more than one ground rod may need to be installed.
- Since moisture becomes more stable at greater distances below the earth's surface, when possible, install the ground rod so that eight feet extend below the frost line to lessen the deviation in the system's resistance.
- Verify the grounding electrode conductor is securely attached at both ends.

Figure 24. Earth-grounding illustration

Lightning strike protection

A sign bonded to an earth ground has a means of dissipating the high voltage and current from a nearby lightning strike. The resistance of the grounding electrode **must** be as low as possible. However, damage can still occur to a sign's electronic equipment from lightning voltage transients.

Though some surge protection is incorporated into a sign, to protect a sign from high-voltage lightning transients, **surge protectors need to be installed in accordance with NEC Articles 280 and 285** and local codes.

Running power to the sign

➔ To run power to the sign

1. Run power to the sign using weathertight conduit.

Note: 35X signs larger than 56 rows x 32 columns require two power inputs. For the locations of the primary and secondary power entry conduit holes, see “Primary power and data entry locations” on page 56 and “Secondary power entry locations (35X signs only)” on page 57.

2. Connect each power circuit to the appropriate wireway power terminal on the power plate.

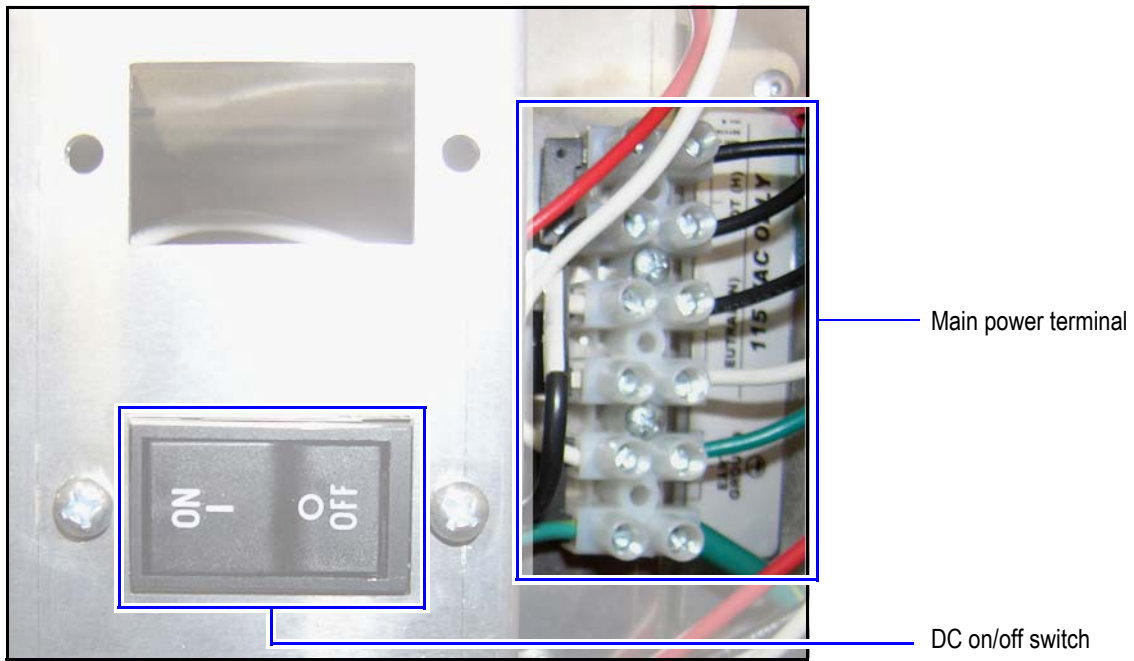
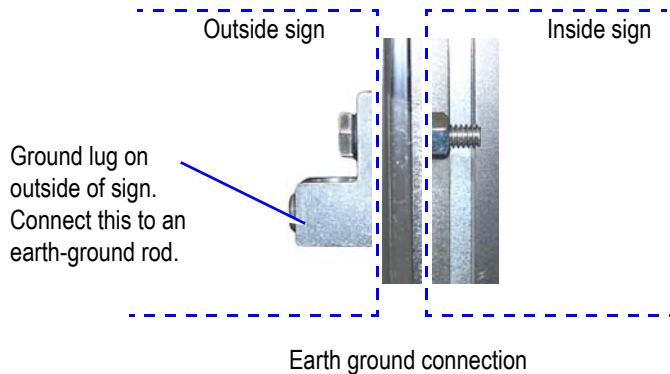


Figure 25. Wiring on the power plate

3. Connect a minimum of one grounding lug to an earth-ground rod.



Tip: Ground lugs are located near each power entry hole on the back of the controller case and if applicable the secondary power case on 35X signs larger than 56R x 32C.

Figure 26. Ground lug

4. Place the DC on/off switch in the on position.
5. Close the sign doors.
6. Repeat steps 1 through 5 for secondary power input.

Temperature probe (optional)

When properly installed, the temperature probe will send a signal to the sign's controller board that indicates the accurate ambient temperature near the sign. The temperature probe with the standard cable (pn 71220401) can be mounted within 25 feet of the sign. This distance can be extended by changing the length and gauge of the cable. Contact Technical Support for more information.

Temperature probe mounting requirements and guidelines

Requirements for temperature probe mounting

Notice: Do **NOT** mount the temperature probe along the top of the sign, on the sign, near sprinklers, or water fountains.

Failure to follow the temperature probe mounting requirements may cause intermittent or inaccurate operation and will not be covered by the warranty.

- Vents on temperature probe **must** point downward. See Figure 27 on page 36 for proper orientation.
- Do **NOT** run the temperature probe cable in the same conduit as the sign's power wires.
- The conduit connection to the sign **must** be watertight.
- Do **NOT** mount temperature probe directly to the sign; however it is okay to mount to the sign's sub-structure.

Guidelines for temperature probe mounting

Choose a mounting location that meets the following criteria, otherwise the temperature probe will record a false temperature reading:

- Mount the temperature probe on or near the sign's super-structure. Mount below the bottom of the sign, avoiding the intake of hot air emitting from the sign. Refer to "How does the sign cool itself?" on page 21 for details.
- Air movement is not restricted by nearby walls or other obstructions.
- Mounting background is light-colored and not dark-colored.
- Above vegetation and not above asphalt or blacktop.
- On the north side of a building to provide protection from the sun.
- Shield the probe from the effect of the direct sun, reflected heat, or any nearby sources of heat, such as chimneys, lamps, vents, or HVAC ducts.
- At least six feet off the ground, and at least one foot below the eave of a protected overhang so convection currents (rising hot air flow) are not trapped around the temperature probe. Also, make sure convection currents are not blocked by mounting plates.
- Only one temperature probe is required in a network of signs but it **must** be connected to the Master sign.

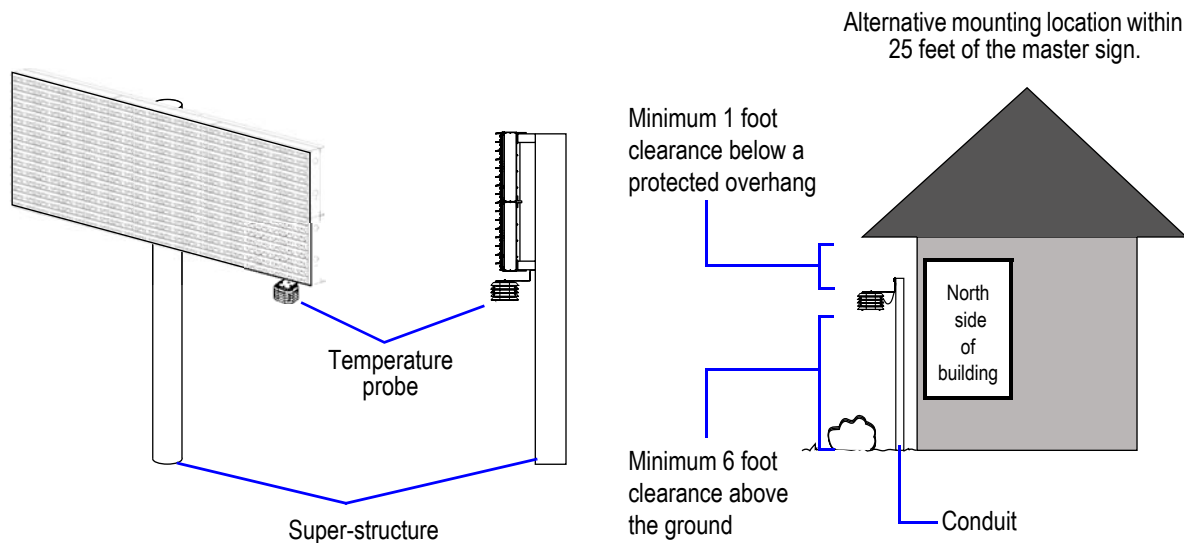


Figure 27. Provide temperature probe mounting locations.

➔ To install the temperature probe

WARNING! Hazardous voltage! Contact with high voltage may cause death or serious injury. Always disconnect main power to unit prior to servicing.

1. The temperature probe **must** be mounted with the vents pointing downward using the mounting holes OR the conduit holes on the bracket.

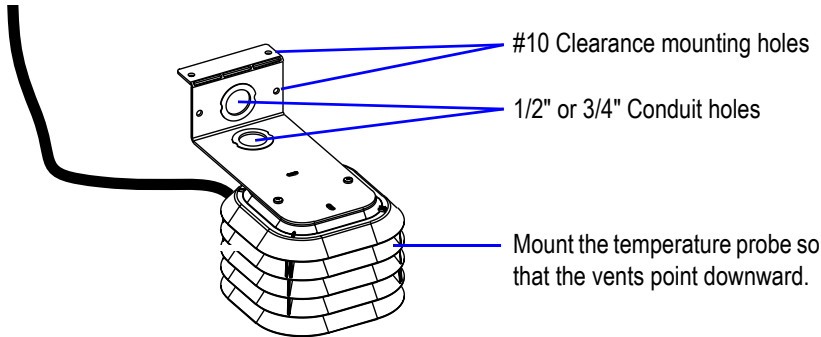


Figure 28. Temperature probe

2. Run the temperature probe cable through watertight conduit to the control cube. **The conduit connection to the sign must be watertight.**

Notice: To prevent interference, do **NOT** run the temperature probe cable in the same conduit as the sign's power wires. For more information, see "Is it necessary to run two conduits to a sign?" on page 32.

3. Connect the temperature probe cable to the wireway terminal block as shown in Figure 29.

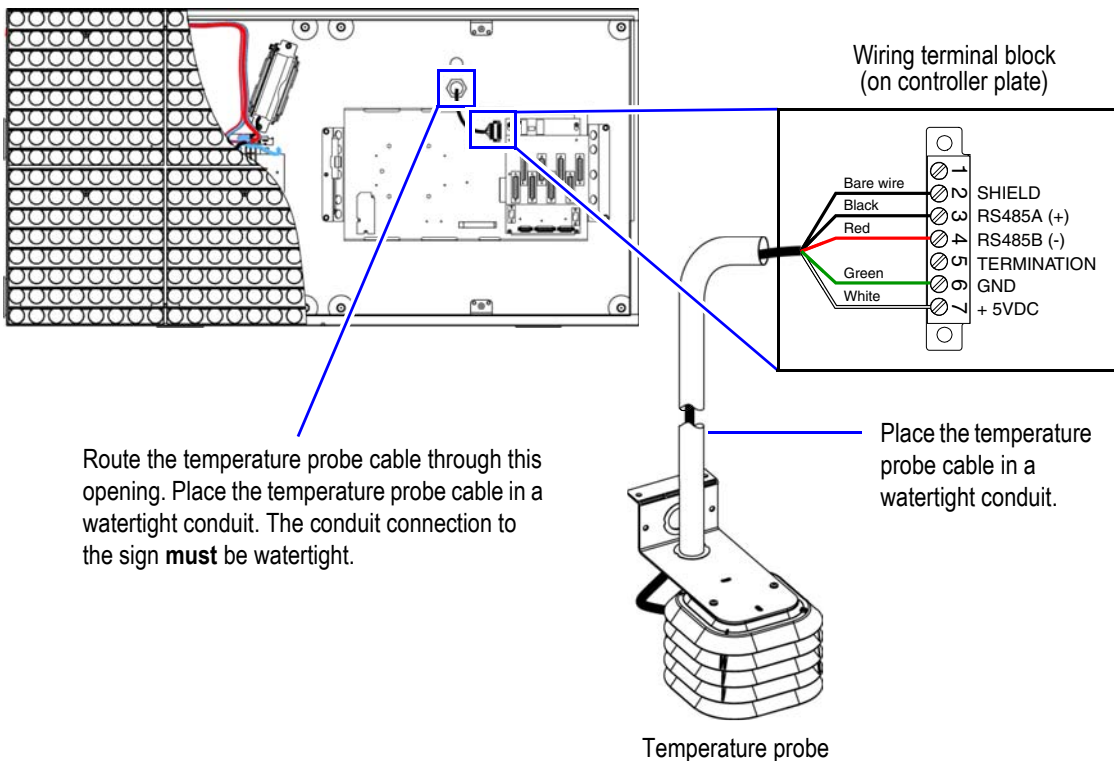


Figure 29. Temperature probe connection details

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Networking signs

Master/Secondary Master and Master/Slave sign connections

Two to four signs can be set up as either:

- **Master/Secondary Master (page 40)** — two to four signs that can display a different message. While the same message could be sent to all signs, the messages may not appear at exactly the same time.
- **Master/Slave signs (page 41)** — all these signs display the same message at the same time. In this setup, one sign is configured as the Master and all the others as Slave signs.

Note: When two or more signs are connected together, they must be properly terminated. See “RS485 Termination” on page 45.

Adaptive Explains

Does it matter if signs are set up as Master/Secondary Master or Master/Slave?

The most important difference between Master/Secondary Master and Master/Slave signs is that Master/Slave signs all display the same message at the exact same time. Signs configured as Master/Secondary Master allow you to display a different message on each of the signs.

How are signs set up to be Master/Secondary Master or Master/Slave?

Signs are configured at the factory.

How can I tell if a sign is a Master, a Secondary Master, or a Slave?

- Turn the sign off and then on again. The word “Master”, “Sec-Master” or “Slave” will appear in the sign’s startup messages.
- Use AlphaNET Diagnostics software to read this information from a sign.
- Read the label on the back of the sign that indicates how the sign is configured.

Master/Secondary Master sign wiring

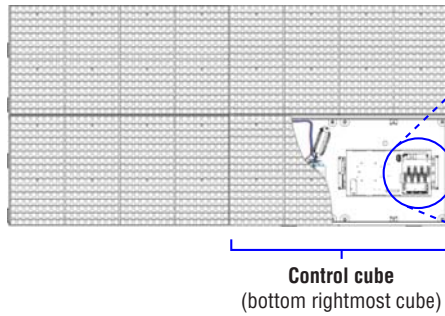
If your signs have the following labels, you have a Master/Secondary Master sign configuration.



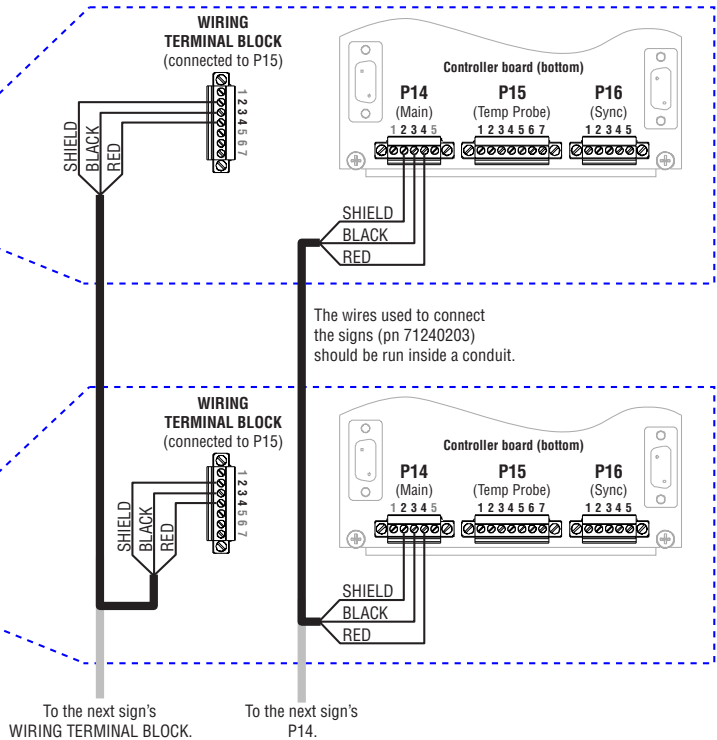
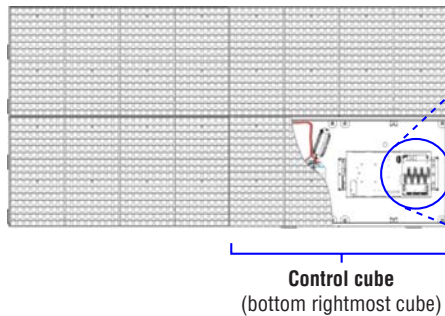
Figure 30. Master/Secondary Master labels

Wire the signs as shown in Figure 31:

MASTER SIGN - SERIAL ADDRESS 1



SECONDARY MASTER SIGN - SERIAL ADDRESS 2



PINOUTS	
P14 COM0 RS485/422:	P16 COM3 RS485:
1 = NC	1 = NC
2 = SHIELD	2 = SHIELD
3 = RS485A (+)	3 = RS485A (+)
4 = RS485B (-)	4 = RS485B (-)
5 = TERMINATION	5 = TERMINATION
P15 COM2 RS485:	WIRING TERMINALBLOCK:
1 = NC	1 = NC
2 = SHIELD	2 = SHIELD
3 = RS485A (+)	3 = RS485A (+)
4 = RS485B (-)	4 = RS485B (-)
5 = TERMINATION	5 = TERMINATION
6 = GND	6 = GND
7 = +5VDC	7 = +5VDC

Figure 31. Master//Secondary Master wiring diagram

Master/Slave sign wiring

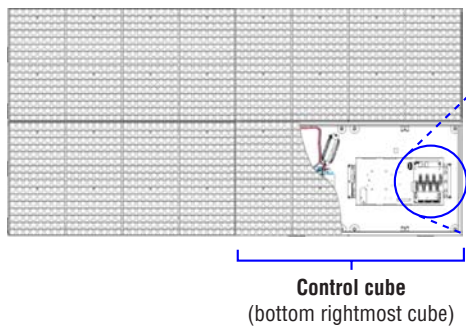
If your signs have the following labels, you have a Master/Slave sign configuration.



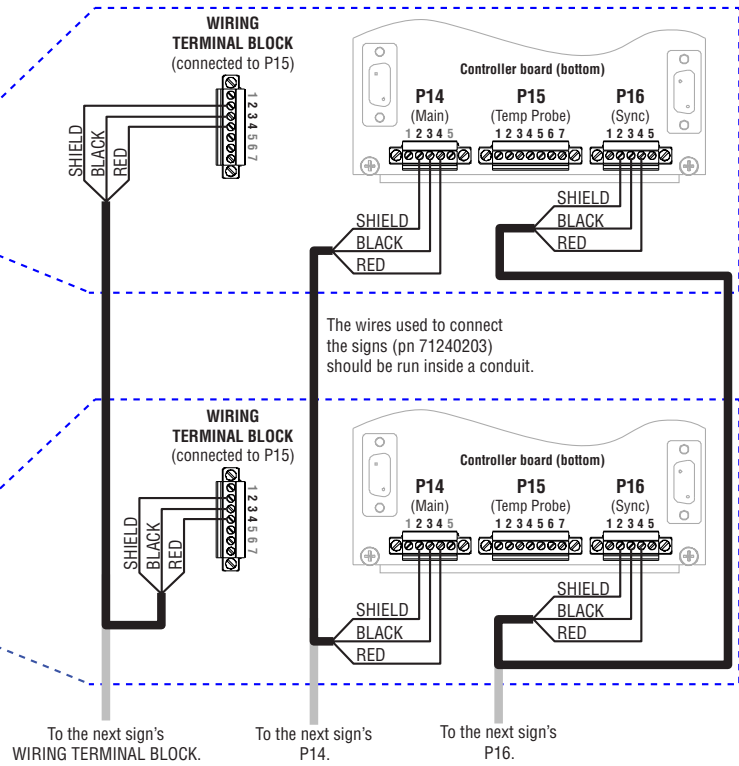
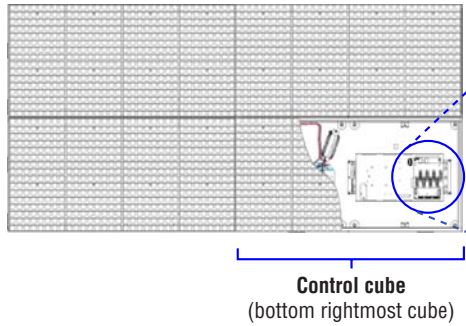
Figure 32. Master/Slave labels

Wire the signs as shown in Figure 33.

MASTER SIGN - SERIAL ADDRESS 1



SLAVE SIGN - SERIAL ADDRESS 2



PINOUTS	
P14 COM0 RS485/422:	P16 COM3 RS485:
1 = NC	1 = NC
2 = SHIELD	2 = SHIELD
3 = RS485A (+)	3 = RS485A (+)
4 = RS485B (-)	4 = RS485B (-)
5 = TERMINATION	5 = TERMINATION
P15 COM2 RS485:	WIRING TERMINALBLOCK:
1 = NC	1 = NC
2 = SHIELD	2 = SHIELD
3 = RS485A (+)	3 = RS485A (+)
4 = RS485B (-)	4 = RS485B (-)
5 = TERMINATION	5 = TERMINATION
6 = GND	6 = GND
7 = +5VDC	7 = +5VDC

Figure 33. Master/Slave wiring diagram

Installing the sign's connectivity





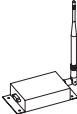
Connectivity options

In order to display messages, a sign must be connected to a computer that is running AlphaNET software. This computer is referred to as the messaging computer.

There are a number of ways to connect the messaging computer to a sign. Refer to the following tables for information about your connection option.

Note: Messaging computer is not supplied by Adaptive Micro Systems.

Connectivity options for AlphaNet

Options	Description	Page
 <p>Modem kit</p>	By placing a modem inside a sign (factory installed) and attaching another transmitting modem to the messaging computer, messages are sent to a sign through ordinary phone lines.	43
 <p>Converter Box III</p>	Using RS485 wire (pn 71240203) routed through a weather tight conduit, a sign can be wired to a computer up to 4000 feet away from the sign. Do not use ordinary wire, phone wire or CAT 5 wire in place of Adaptive's RS485 outdoor wire.	43
 <p>Direct RS232 connection</p>	A short (50 foot) connection typically used for sign troubleshooting or field testing.	44
 <p>Fiber optic</p>	Using a fiber optic mini-modem inside a sign (factory installed) and another fiber optic mini-modem connected to the messaging computer, a sign can be connected to a computer that could be up to 2 miles away from the sign. Fiber optic cable is immune to electrical interference so the cable can be placed in the same conduit as the power wires.	44
 <p>Wireless transceiver</p>	One wireless transceiver is placed inside the sign and another transceiver is connected to the messaging computer. Wireless transceivers can connect to a sign up to several miles away. (Actual distance can vary greatly depending on the local environment, obstructions, electrical interference, etc.)	44

AlphaNet connectivity option overview

The steps in this section explain how to install the various AlphaNet connectivity options. For more detailed diagrams of the connectivity options, see “AlphaNet connectivity diagrams” on page 61.

IMPORTANT! Regardless of how the sign will be connected to the messaging computer, the messaging computer must have AlphaNet software installed on the messaging computer. Refer to “How to install AlphaNET 3.0 software (pn 97088099)” for details.



Modem connection

For more detailed diagrams of this connectivity option, see “120V Modem connection diagram” on page 62 and “230V Modem connection diagram” on page 63.

Note: Transmitting modem (pn 10889301) is not supplied with the option but can be purchased from Adaptive.

⇒ **To connect your sign using a Modem:**

1. Use the RS232 cable supplied with the transmitting modem to connect the modem to the messaging computer.
2. Use the RJ11 phone cord to connect the modem to the telephone service.

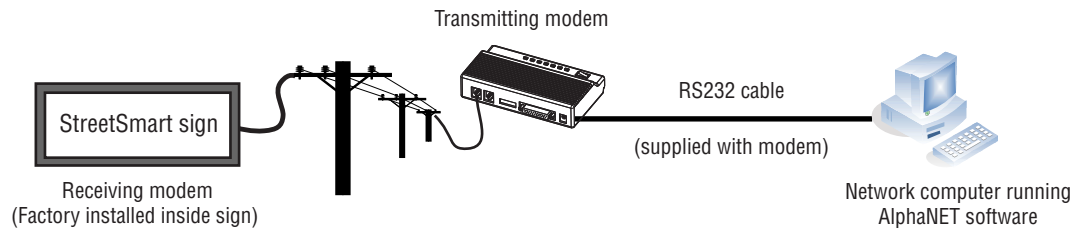


Figure 34. Modem connection overview



Converter box III connection

For a more detailed diagram of this connectivity option, see “Converter Box III connection diagram” on page 64.

⇒ **To connect your sign using a Converter Box:**

1. Connect the Converter Box to the Master Unit with outdoor RS485 wiring.
2. Connect the Converter Box to the messaging computer with RS232 serial cable.
3. Place the converter box next to the computer.

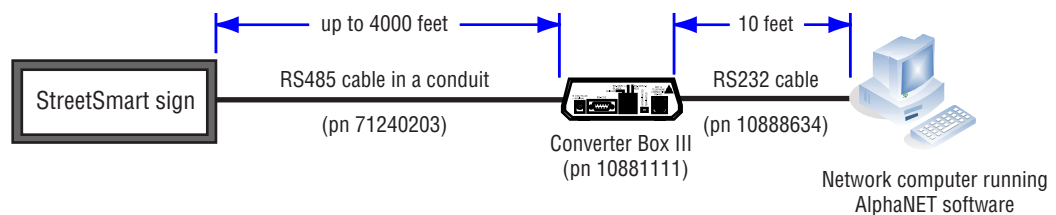


Figure 35. Converter box III connection overview



RS232 direct connection

This connection is mainly used for troubleshooting the sign or field testing the sign while on-site.

⇒ **To connect your sign using a RS232 cable:**

1. Open the control cube and connect the RS232 cable to the Master Unit.
2. Connect the messaging computer to the same RS232 serial cable.

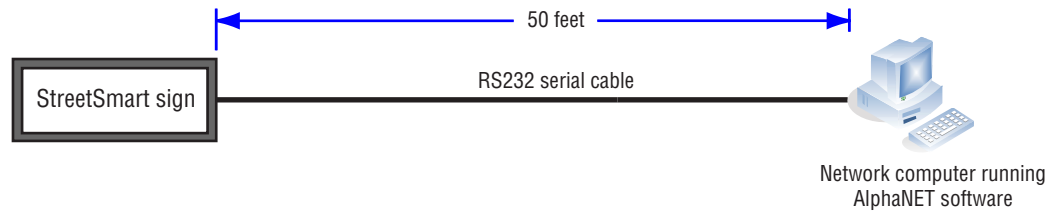


Figure 36. RS232 direct connection overview



Fiber optic connection

For a more detailed diagram of this connectivity option, see “Fiber Optic connection diagram” on page 65.

⇒ **To connect your sign using Fiber Optic:**

1. Use the DB9-to-DB9 cable to connect the messaging fiber optic modem to the computer.
2. Run fiber optic cables from the fiber optic modem in the sign to the fiber optic modem connected to the messaging computer.

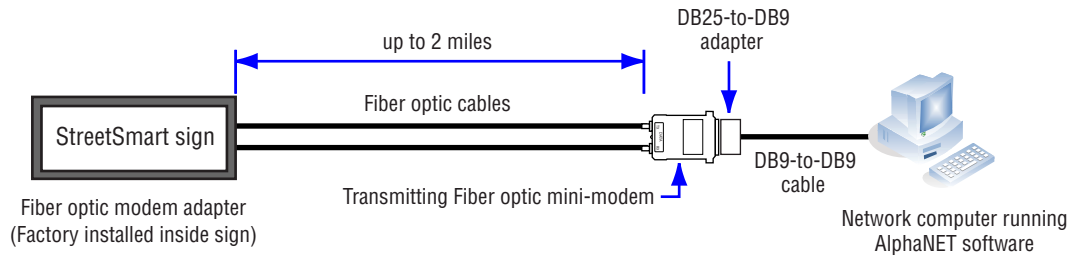


Figure 37. Fiber optic connection overview



Wireless transceiver connection

For a more detailed diagram of this connectivity option, see “Wireless transceiver connection diagram” on page 66.

To connect your sign using a Wireless Transceiver (MaxStream Xtend 900 MHz), use the RS232 cable to connect the transmitting transceiver to the messaging computer.

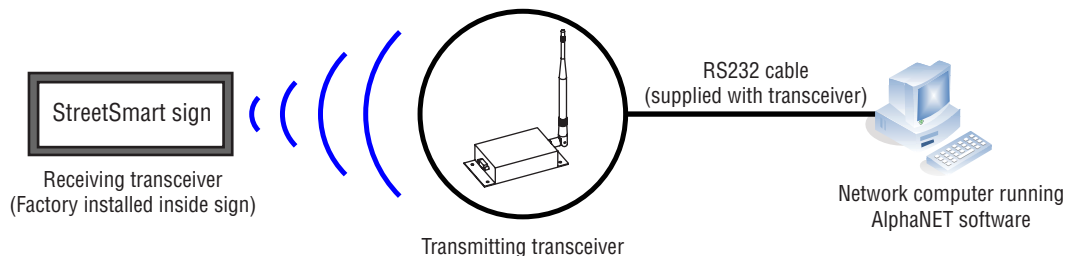


Figure 38. Wireless transceiver connection overview

RS485 Termination

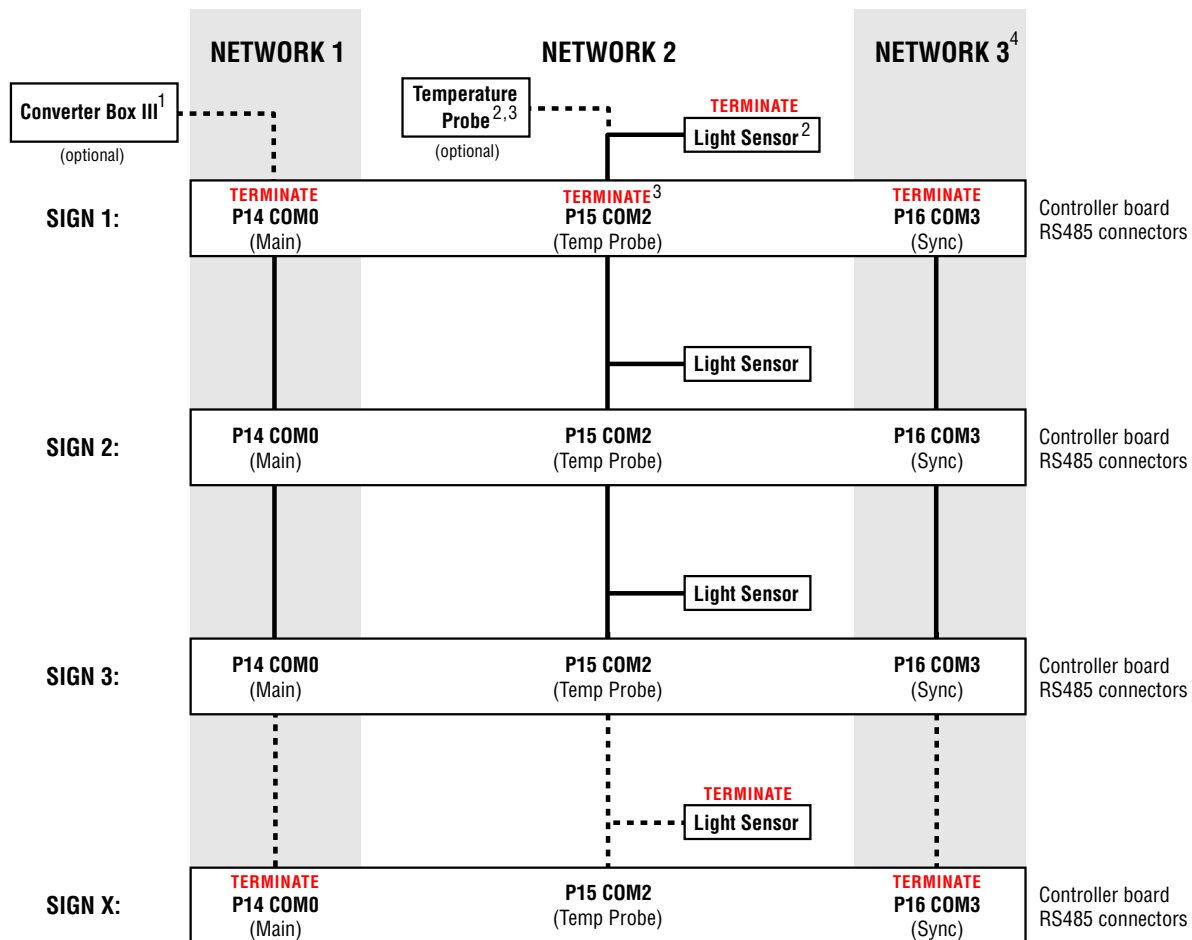
What is RS485 termination?

When signs are networked together, it is necessary to terminate each end of the network. This is necessary to make sure that the signs communicate with each other.

If signs are not correctly terminated, messages may not display properly.

When is RS485 termination used?

Three RS485 networks are used to communicate with and between AlphaEclipse StreetSmart signs. Each network must be terminated. As a general rule, the first and last sign should be terminated:



NOTES:

As a general rule, the first and last sign should be terminated in an RS485 network.

¹ If a Converter Box III is connected to P14 in Sign 1 and 2 or more signs are networked together, then (1) remove termination from P14 in Sign 1 and (2) set switch on back of Converter Box III to terminated.

² If a Temperature Probe is connected to a sign network of 2 or more signs, then remove termination from the Light Sensor in Sign 1.

³ If a Temperature Probe is connected to just a single sign, then remove termination from P15 in Sign 1.

⁴ NETWORK 3 (RS485 sync) is only used when signs are set up as Master/Slave (1 Master sign plus 1 or more Slave signs).

Figure 39.RS485 network termination.

Adding RS485 termination

WARNING! Hazardous voltage. Contact with high voltage may cause death or serious injury. The power switches on the circuit breaker DO NOT turn off power to all lines in a sign. Remove power at the source.

➔ **To add RS485 termination**

1. Remove power from the sign at the source.
2. Locate the sign’s control cube see “Front view” on page 11.
3. Open the control cube see “Opening a sign” on page 8.
4. Attach a wire jumper to the appropriate connector on the Controller board.
 - Controller board P14 COM0, P15 COM2, P16 COM3

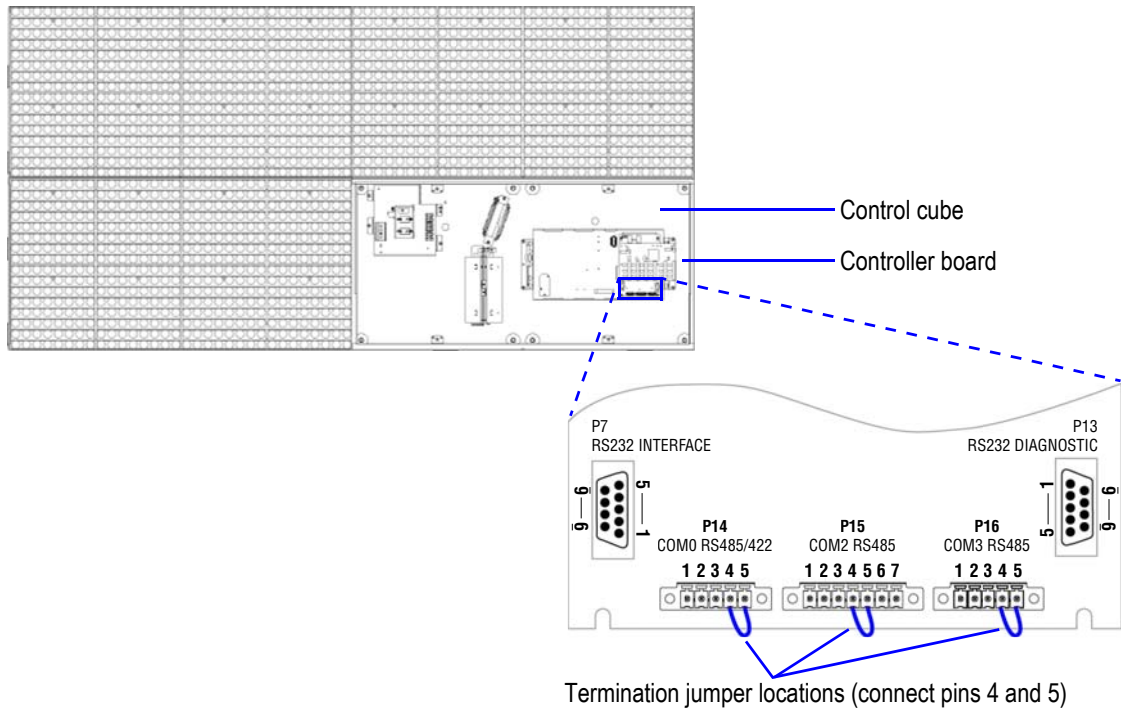


Figure 40: Termination jumper locations on controller board

- P1 (on Light Sensor board which is located on control cube door)

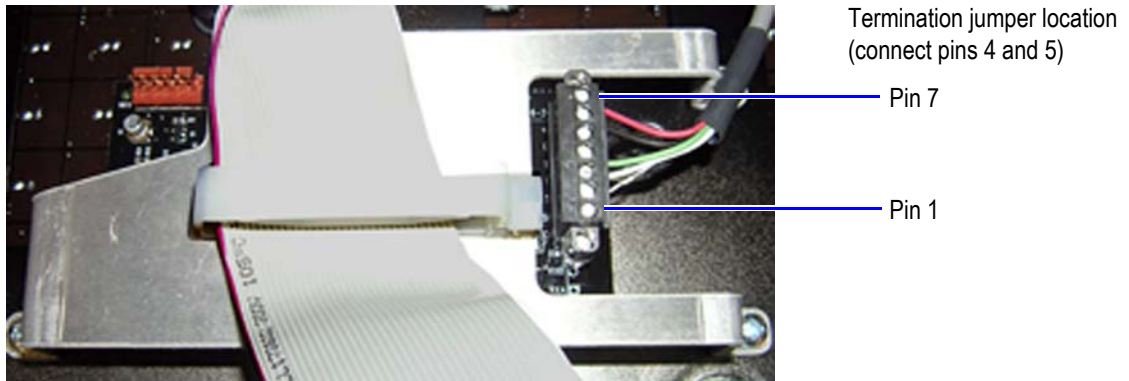


Figure 41: Light sensor jumper locations

5. Close and secure the control cube.
6. Apply power to the sign at the source.

Removing RS485 termination

WARNING! Hazardous voltage. Contact with high voltage may cause death or serious injury. The power switches on the circuit breaker DO NOT turn off power to all lines in a sign. Remove power at the source.

➔ **To remove:**

1. Remove power from the sign at the source.
2. Locate the sign's controller cube see "Front view" on page 11.
3. Open the control cube see "Opening a sign" on page 8.
4. Remove the wire jumper from the appropriate connector. See Figure 40, "Termination jumper locations on controller board," and Figure 41, "Light sensor jumper locations," on page 46 for details.
5. Close and secure the control cube.
6. Apply power to the sign at the source.

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Appendix A

Technical Specifications

The most current specifications are maintained on Adaptive's website (www.adaptivedisplays.com).

WARNING! Hazardous voltage. Contact with high voltage may cause death or serious injury. The power switches on the circuit breaker DO NOT turn off power to all lines in a sign. Remove power at the source.

Notice: The following electrical installation requirements must be followed or the sign warranty will be voided.

Electrical installation must only be attempted by a qualified electrician. Electrical connection must comply with all applicable national and local codes.

Requirements for electrical installation

The electrical installation of signs varies greatly. The following bullet points are requirements. **It is the installer's responsibility to ensure that the installation complies with all national and local codes.**

- All power wiring **must** be from circuit breaker-protected lines.
- **DO NOT** connect the sign to a GFI-protected circuit.
- A two-pole disconnect device **must** be installed in the building wiring for each branch circuit supplying the sign.
- The sign **must** be properly grounded according to the applicable national and local electrical codes (for example, NEC Article 250 and 600, and IEEE 1100-1999).
- All electrical conduit connections **must** be watertight.
- Use minimum 80° C copper wire only.
- Torque terminals to a minimum of 7 in/lbs and a maximum of 10 in/lbs.
- **DO NOT** drill additional conduit holes.
- **DO NOT** route power and communication wires out of the cube door and around the side of the sign; the wires will be damaged when the door is closed.
- Separate conduits **must** be used for signal wires (for example, RS232, RS485) and for power wires. However, fiber optic wire may be run in the same conduit with power wires.

Power requirements

- The sign is configured for **one of two power configurations only**; 115VAC single-phase or 230VAC single-phase power. The sign is **NOT** configured to run off a 208 3-phase power source.
- The sign **must** be run on it's own dedicated circuit to ensure proper operation.
- Wire gauge and breakers **must** be sized or verified in accordance with Adaptive's input power specifications, the National Electric Code, and applicable local codes. **Under-sizing the wire gauge or breaker size can lead to intermittent sign operation or malfunction.**
- Some sign sizes require more than one circuit (power entry) according to Adaptive's Technical Specifications.

AlphaEclipse StreetSmart 17X sign specifications

Note: 17X case depth = 9.875 inches from the front of the display to the back of the steel mounting angle.

Rows	Cols	Height (Ft and In)	Width (Ft and In)	Weight (pounds)	Number of Power Entries	115VAC			230VAC		
						Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)	Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)
16	64	11"	3'-8"	54	1	1.85	1.85	-	0.93	0.93	-
16	96	11"	5'-6"	69	1	2.76	2.76	-	1.38	1.38	-
16	128	11"	7'-4"	93	1	3.69	3.69	-	1.84	1.84	-
16	160	11"	9'-2"	109	1	4.61	4.61	-	2.30	2.30	-
16	192	11"	11'-0"	125	1	5.53	5.53	-	2.76	2.76	-
16	224	11"	12'-10"	148	1	6.31	6.31	-	3.16	3.16	-
16	256	11"	14'-8"	179	1	7.07	7.07	-	3.54	3.54	-
32	64	1'-10"	3'-8"	62	1	3.37	3.37	-	1.69	1.69	-
32	96	1'-10"	5'-6"	92	1	5.53	5.53	-	2.76	2.76	-
32	128	1'-10"	7'-4"	111	1	7.37	7.37	-	3.69	3.69	-
32	160	1'-10"	9'-2"	140	1	9.22	9.22	-	4.61	4.61	-
32	192	1'-10"	11'-0"	159	1	11.06	11.06	-	5.53	5.53	-
32	224	1'-10"	12'-10"	188	1	11.96	11.96	-	5.98	5.98	-
32	256	1'-10"	14'-8"	222	1	13.48	13.48	-	6.74	6.74	-
48	64	2'-9"	3'-8"	100	1	5.22	5.22	-	2.61	2.61	-
48	96	2'-9"	5'-6"	138	1	8.29	8.29	-	4.15	4.15	-
48	128	2'-9"	7'-4"	173	1	11.06	11.06	-	5.53	5.53	-
48	160	2'-9"	9'-2"	211	1	13.82	13.82	-	6.91	6.91	-
48	192	2'-9"	11'-0"	238	1	16.59	16.59	-	8.29	8.29	-
48	224	2'-9"	12'-10"	284	1	18.27	18.27	-	9.14	9.14	-
48	256	2'-9"	14'-8"	339	1	20.55	20.55	-	10.28	10.28	-
64	64	3'-8"	3'-8"	113	1	6.74	6.74	-	3.37	3.37	-
64	96	3'-8"	5'-6"	164	1	11.06	11.06	-	5.53	5.53	-
64	128	3'-8"	7'-4"	194	1	14.75	14.75	-	7.37	7.37	-
64	160	3'-8"	9'-2"	246	1	17.18	17.18	-	8.59	8.59	-
64	192	3'-8"	11'-0"	276	1	20.22	20.22	-	10.11	10.11	-
64	224	3'-8"	12'-10"	328	1	23.92	23.92	-	11.96	11.96	-
64	256	3'-8"	14'-8"	389	1	N/A	N/A	-	14.98	14.98	-
80	64	4'-7"	3'-8"	142	1	8.59	8.59	-	4.30	4.30	-
80	96	4'-7"	5'-6"	202	1	13.82	13.82	-	6.91	6.91	-
80	128	4'-7"	7'-4"	249	1	18.43	18.43	-	9.22	9.22	-
80	160	4'-7"	9'-2"	309	1	21.64	21.64	-	10.82	10.82	-
80	192	4'-7"	11'-0"	347	1	25.44	25.44	-	12.72	12.72	-
80	224	4'-7"	12'-10"	415	1	N/A	N/A	-	15.12	15.12	-
80	256	4'-7"	14'-8"	489	1	N/A	N/A	-	17.02	17.02	-
96	64	5'-6"	3'-8"	155	1	10.11	10.11	-	5.06	5.06	-
96	96	5'-6"	5'-6"	228	1	15.66	15.66	-	7.83	7.83	-
96	128	5'-6"	7'-4"	270	1	20.22	20.22	-	10.11	10.11	-
96	160	5'-6"	9'-2"	343	1	25.77	25.77	-	12.89	12.89	-
96	192	5'-6"	11'-0"	385	1	N/A	N/A	-	15.17	15.17	-
96	224	5'-6"	12'-10"	459	1	N/A	N/A	-	17.94	17.94	-
96	256	5'-6"	14'-8"	539	1	N/A	N/A	-	20.22	20.22	-

AlphaEclipse StreetSmart 35X sign specifications

Note: 35X case depth = 10.135 inches from the front of the display to the back of the steel mounting angle.

Rows	Cols	Height (Ft and In)	Width (Ft and In)	Weight (pounds)	Number of Power Entries	115VAC			230VAC		
						Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)	Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)
8	32	11"	3'-8"	54	1	1.12	1.12	-	0.56	0.56	-
8	48	11"	5'-6"	69	1	1.52	1.52	-	0.76	0.76	-
8	64	11"	7'-4"	93	1	2.24	2.24	-	1.12	1.12	-
8	80	11"	9'-2"	109	1	2.64	2.64	-	1.32	1.32	-
8	96	11"	11'-0"	125	1	3.04	3.04	-	1.52	1.52	-
8	112	11"	12'-10"	148	1	3.76	3.76	-	1.88	1.88	-
8	128	11"	14'-8"	179	1	4.16	4.16	-	2.08	2.08	-
8	144	11"	16'-6"	195	1	4.56	4.56	-	2.28	2.28	-
8	160	11"	18'-4"	218	1	5.28	5.28	-	2.64	2.64	-
8	176	11"	20'-2"	245	1	N/A	N/A	-	2.84	2.84	-
8	192	11"	22'-0"	261	1	N/A	N/A	-	3.04	3.04	-
8	208	11"	23'-10"	286	1	N/A	N/A	-	3.40	3.40	-
8	224	11"	25'-8"	318	1	N/A	N/A	-	3.60	3.60	-
8	240	11"	27'-6"	335	1	N/A	N/A	-	3.80	3.80	-
8	256	11"	29'-4"	375	1	N/A	N/A	-	4.16	4.16	-
16	32	1'-10"	3'-8"	62	1	1.92	1.92	-	0.96	0.96	-
16	48	1'-10"	5'-6"	92	1	3.04	3.04	-	1.52	1.52	-
16	64	1'-10"	7'-4"	111	1	3.84	3.84	-	1.92	1.92	-
16	80	1'-10"	9'-2"	140	1	4.96	4.96	-	2.48	2.48	-
16	96	1'-10"	11'-0"	159	1	5.76	5.76	-	2.88	2.88	-
16	112	1'-10"	12'-10"	188	1	6.88	6.88	-	3.44	3.44	-
16	128	1'-10"	14'-8"	222	1	7.68	7.68	-	3.84	3.84	-
16	144	1'-10"	16'-6"	251	1	8.80	8.80	-	4.40	4.40	-
16	160	1'-10"	18'-4"	269	1	9.60	9.60	-	4.80	4.80	-
16	176	1'-10"	20'-2"	321	1	N/A	N/A	-	5.36	5.36	-
16	192	1'-10"	22'-0"	341	1	N/A	N/A	-	5.76	5.76	-
16	208	1'-10"	23'-10"	373	1	N/A	N/A	-	6.32	6.32	-
16	224	1'-10"	25'-8"	409	1	N/A	N/A	-	6.72	6.72	-
16	240	1'-10"	27'-6"	440	1	N/A	N/A	-	7.28	7.28	-
16	256	1'-10"	29'-4"	476	1	N/A	N/A	-	7.68	7.68	-
24	32	2'-9"	3'-8"	100	1	3.04	3.04	-	1.52	1.52	-
24	48	2'-9"	5'-6"	138	1	4.56	4.56	-	2.28	2.28	-
24	64	2'-9"	7'-4"	173	1	6.08	6.08	-	3.04	3.04	-
24	80	2'-9"	9'-2"	211	1	7.60	7.60	-	3.80	3.80	-
24	96	2'-9"	11'-0"	238	1	8.80	8.80	-	4.40	4.40	-
24	112	2'-9"	12'-10"	284	1	10.64	10.64	-	5.32	5.32	-
24	128	2'-9"	14'-8"	339	1	11.84	11.84	-	5.92	5.92	-
24	144	2'-9"	16'-6"	377	1	13.36	13.36	-	6.68	6.68	-
24	160	2'-9"	18'-4"	411	1	14.88	14.88	-	7.44	7.44	-
24	176	2'-9"	20'-2"	482	1	N/A	N/A	-	8.20	8.20	-
24	192	2'-9"	22'-0"	512	1	N/A	N/A	-	8.80	8.80	-
24	208	2'-9"	23'-10"	561	1	N/A	N/A	-	9.72	9.72	-
24	224	2'-9"	25'-8"	619	1	N/A	N/A	-	10.32	10.32	-
24	240	2'-9"	27'-6"	660	1	N/A	N/A	-	11.08	11.08	-
24	256	2'-9"	29'-4"	726	1	N/A	N/A	-	11.84	11.84	-
32	32	3'-8"	3'-8"	113	1	3.84	3.84	-	1.92	1.92	-
32	48	3'-8"	5'-6"	164	1	6.08	6.08	-	3.04	3.04	-
32	64	3'-8"	7'-4"	194	1	7.68	7.68	-	3.84	3.84	-
32	80	3'-8"	9'-2"	246	1	9.92	9.92	-	4.96	4.96	-

Rows	Cols	Height (Ft and In)	Width (Ft and In)	Weight (pounds)	Number of Power Entries	115VAC			230VAC		
						Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)	Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)
32	96	3'-8"	11'-0"	276	1	11.52	11.52	-	5.76	5.76	-
32	112	3'-8"	12'-10"	328	1	13.76	13.76	-	6.88	6.88	-
32	128	3'-8"	14'-8"	389	1	15.36	15.36	-	7.68	7.68	-
32	144	3'-8"	16'-6"	441	1	17.60	17.60	-	8.80	8.80	-
32	160	3'-8"	18'-4"	471	1	19.20	19.20	-	9.60	9.60	-
32	176	3'-8"	20'-2"	566	1	N/A	N/A	-	10.72	10.72	-
32	192	3'-8"	22'-0"	600	1	N/A	N/A	-	11.52	11.52	-
32	208	3'-8"	23'-10"	656	1	N/A	N/A	-	12.64	12.64	-
32	224	3'-8"	25'-8"	721	1	N/A	N/A	-	13.44	13.44	-
32	240	3'-8"	27'-6"	777	1	N/A	N/A	-	14.56	14.56	-
32	256	3'-8"	29'-4"	843	1	N/A	N/A	-	15.36	15.36	-
40	32	4'-7"	3'-8"	142	1	4.96	4.96	-	2.48	2.48	-
40	48	4'-7"	5'-6"	202	1	7.60	7.60	-	3.80	3.80	-
40	64	4'-7"	7'-4"	249	1	9.92	9.92	-	4.96	4.96	-
40	80	4'-7"	9'-2"	309	1	12.56	12.56	-	6.28	6.28	-
40	96	4'-7"	11'-0"	347	1	14.56	14.56	-	7.28	7.28	-
40	112	4'-7"	12'-10"	415	1	17.52	17.52	-	8.76	8.76	-
40	128	4'-7"	14'-8"	489	1	19.52	19.52	-	9.76	9.76	-
40	144	4'-7"	16'-6"	549	1	22.16	22.16	-	11.08	11.08	-
40	160	4'-7"	18'-4"	596	1	24.48	24.48	-	12.24	12.24	-
40	176	4'-7"	20'-2"	711	1	N/A	N/A	-	13.56	13.56	-
40	192	4'-7"	22'-0"	754	1	N/A	N/A	-	14.56	14.56	-
40	208	4'-7"	23'-10"	827	1	N/A	N/A	-	16.04	16.04	-
40	224	4'-7"	25'-8"	906	1	N/A	N/A	-	17.04	17.04	-
40	240	4'-7"	27'-6"	971	1	N/A	N/A	-	18.36	18.36	-
40	256	4'-7"	29'-4"	1058	1	N/A	N/A	-	19.52	19.52	-
48	32	5'-6"	3'-8"	155	1	5.76	5.76	-	2.88	2.88	-
48	48	5'-6"	5'-6"	228	1	9.12	9.12	-	4.56	4.56	-
48	64	5'-6"	7'-4"	270	1	11.52	11.52	-	5.76	5.76	-
48	80	5'-6"	9'-2"	343	1	14.88	14.88	-	7.44	7.44	-
48	96	5'-6"	11'-0"	385	1	17.28	17.28	-	8.64	8.64	-
48	112	5'-6"	12'-10"	459	1	20.64	20.64	-	10.32	10.32	-
48	128	5'-6"	14'-8"	539	1	23.04	23.04	-	11.52	11.52	-
48	144	5'-6"	16'-6"	613	1	26.40	26.40	-	13.20	13.20	-
48	160	5'-6"	18'-4"	655	1	28.80	28.80	-	14.40	14.40	-
48	176	5'-6"	20'-2"	794	1	N/A	N/A	-	16.08	16.08	-
48	192	5'-6"	22'-0"	842	1	N/A	N/A	-	17.28	17.28	-
48	208	5'-6"	23'-10"	922	1	N/A	N/A	-	18.96	18.96	-
48	224	5'-6"	25'-8"	1008	1	N/A	N/A	-	20.16	20.16	-
48	240	5'-6"	27'-6"	1088	1	N/A	N/A	-	21.84	21.84	-
48	256	5'-6"	29'-4"	1175	1	N/A	N/A	-	23.04	23.04	-
56	32	6'-5"	3'-8"	198	2	6.85	5.76	1.12	3.44	2.88	0.56
56	48	6'-5"	5'-6"	287	2	10.64	9.12	1.52	5.32	4.56	0.76
56	64	6'-5"	7'-4"	352	2	13.76	11.52	2.24	6.88	5.76	1.12
56	80	6'-5"	9'-2"	441	2	17.52	14.88	2.64	8.76	7.44	1.32
56	96	6'-5"	11'-0"	498	2	20.32	17.28	3.04	10.16	8.64	1.52
56	112	6'-5"	12'-10"	595	2	24.40	20.64	3.76	12.20	10.32	1.88
56	128	6'-5"	14'-8"	695	2	27.20	23.04	4.16	13.60	11.52	2.08
56	144	6'-5"	16'-6"	784	2	30.96	26.40	4.56	15.48	13.20	2.28
56	160	6'-5"	18'-4"	850	2	34.08	28.80	5.28	17.04	14.40	2.64
56	176	6'-5"	20'-2"	939	2	N/A	N/A	N/A	18.92	16.08	2.84
56	192	6'-5"	22'-0"	996	2	N/A	N/A	N/A	20.32	17.28	3.04

Rows	Cols	Height (Ft and In)	Width (Ft and In)	Weight (pounds)	Number of Power Entries	115VAC			230VAC		
						Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)	Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)
56	208	6'-5"	23'-10"	1093	2	N/A	N/A	N/A	22.36	18.96	3.40
56	224	6'-5"	25'-8"	1193	2	N/A	N/A	N/A	23.76	20.16	3.60
56	240	6'-5"	27'-6"	1282	2	N/A	N/A	N/A	25.64	21.84	3.80
56	256	6'-5"	29'-4"	1390	2	N/A	N/A	N/A	27.20	23.04	4.16
64	32	7'-4"	3'-8"	212	2	7.68	5.76	1.92	3.84	2.88	0.96
64	48	7'-4"	5'-6"	316	2	12.16	9.12	3.04	6.08	4.56	1.52
64	64	7'-4"	7'-4"	377	2	15.36	11.52	3.84	7.68	5.76	1.92
64	80	7'-4"	9'-2"	481	2	19.84	14.88	4.96	9.92	7.44	2.48
64	96	7'-4"	11'-0"	542	2	23.04	17.28	5.76	11.52	8.64	2.88
64	112	7'-4"	12'-10"	646	2	27.52	20.64	6.88	13.76	10.32	3.44
64	128	7'-4"	14'-8"	754	2	30.72	23.04	7.68	15.36	11.52	3.84
64	144	7'-4"	16'-6"	857	2	35.20	26.40	8.80	17.60	13.20	4.40
64	160	7'-4"	18'-4"	919	2	38.40	28.80	9.60	19.20	14.40	4.80
64	176	7'-4"	20'-2"	1023	2	N/A	N/A	N/A	21.44	16.08	5.36
64	192	7'-4"	22'-0"	1084	2	N/A	N/A	N/A	23.04	17.28	5.76
64	208	7'-4"	23'-10"	1188	2	N/A	N/A	N/A	25.28	18.96	6.32
64	224	7'-4"	25'-8"	1296	2	N/A	N/A	N/A	26.88	20.16	6.72
64	240	7'-4"	27'-6"	1399	2	N/A	N/A	N/A	29.12	21.84	7.28
64	256	7'-4"	29'-4"	1507	2	N/A	N/A	N/A	30.72	23.04	7.68
72	48	8'-3"	5'-6"	393	2	13.68	9.12	4.56	6.84	4.56	2.28
72	80	8'-3"	9'-2"	600	2	22.48	14.88	7.60	11.24	7.44	3.80
72	96	8'-3"	11'-0"	677	2	26.08	17.28	8.80	13.04	8.64	4.40
72	112	8'-3"	12'-10"	806	2	31.28	20.64	10.64	15.64	10.32	5.32
72	128	8'-3"	14'-8"	950	2	34.88	23.04	11.84	17.44	11.52	5.92
72	144	8'-3"	16'-6"	1071	2	39.76	26.40	13.36	19.88	13.20	6.68
72	160	8'-3"	18'-4"	1156	2	43.68	28.80	14.88	21.84	14.40	7.44
72	176	8'-3"	20'-2"	1277	2	N/A	N/A	N/A	24.28	16.08	8.20
72	192	8'-3"	22'-0"	1354	2	N/A	N/A	N/A	26.08	17.28	8.80
72	208	8'-3"	23'-10"	1483	2	N/A	N/A	N/A	28.68	18.96	9.72
72	224	8'-3"	25'-8"	1627	2	N/A	N/A	N/A	30.48	20.16	10.32
72	240	8'-3"	27'-6"	1748	2	N/A	N/A	N/A	32.92	21.84	11.08
72	256	8'-3"	29'-4"	1900	2	N/A	N/A	N/A	34.88	23.04	11.84
80	32	9'-2"	3'-8"	287	2	9.60	5.76	3.84	4.80	2.88	1.92
80	48	9'-2"	5'-6"	422	2	15.20	9.12	6.08	7.60	4.56	3.04
80	64	9'-2"	7'-4"	504	2	19.20	11.52	7.68	9.60	5.76	3.84
80	80	9'-2"	9'-2"	639	2	24.80	14.88	9.92	12.40	7.44	4.96
80	96	9'-2"	11'-0"	721	2	28.80	17.28	11.52	14.40	8.64	5.76
80	112	9'-2"	12'-10"	856	2	34.40	20.64	13.76	17.20	10.32	6.88
80	128	9'-2"	14'-8"	1009	2	38.40	23.04	15.36	19.20	11.52	7.68
80	144	9'-2"	16'-6"	1144	2	44.00	26.40	17.60	22.00	13.20	8.80
80	160	9'-2"	18'-4"	1225	2	48.00	28.80	19.20	24.00	14.40	9.60
80	176	9'-2"	20'-2"	1361	2	N/A	N/A	N/A	26.80	16.08	10.72
80	192	9'-2"	22'-0"	1442	2	N/A	N/A	N/A	28.80	17.28	11.52
80	208	9'-2"	23'-10"	1577	2	N/A	N/A	N/A	31.60	18.96	12.64
80	224	9'-2"	25'-8"	1730	2	N/A	N/A	N/A	33.60	20.16	13.44
80	240	9'-2"	27'-6"	1865	2	N/A	N/A	N/A	36.40	21.84	14.56
80	256	9'-2"	29'-4"	2017	2	N/A	N/A	N/A	38.40	23.04	15.36
88	32	10'-1"	3'-8"	318	2	10.72	5.76	4.96	5.36	2.88	2.48
88	48	10'-1"	5'-6"	463	2	16.72	9.12	7.60	8.36	4.56	3.80
88	64	10'-1"	7'-4"	562	2	21.44	11.52	9.92	10.72	5.76	4.96
88	80	10'-1"	9'-2"	707	2	27.44	14.88	12.56	13.72	7.44	6.28
88	96	10'-1"	11'-0"	798	2	31.84	17.28	14.56	15.92	8.64	7.28

Rows	Cols	Height (Ft and In)	Width (Ft and In)	Weight (pounds)	Number of Power Entries	115VAC			230VAC		
						Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)	Total AC Current REQ (Amp)	Power Entry A (Amp)	Power Entry B (Amp)
88	112	10'-1"	12'-10"	951	2	38.16	20.64	17.52	19.08	10.32	8.76
88	128	10'-1"	14'-8"	1116	2	42.56	23.04	19.52	21.28	11.52	9.76
88	144	10'-1"	16'-6"	1261	2	48.56	26.40	22.16	24.28	13.20	11.08
88	160	10'-1"	18'-4"	1361	2	53.28	28.80	24.48	26.64	14.40	12.24
88	176	10'-1"	20'-2"	1505	2	N/A	N/A	N/A	29.64	16.08	13.56
88	192	10'-1"	22'-0"	1596	2	N/A	N/A	N/A	31.84	17.28	14.56
88	208	10'-1"	23'-10"	1749	2	N/A	N/A	N/A	35.00	18.96	16.04
88	224	10'-1"	25'-8"	1914	2	N/A	N/A	N/A	37.20	20.16	17.04
88	240	10'-1"	27'-6"	2059	2	N/A	N/A	N/A	40.20	21.84	18.36
88	256	10'-1"	29'-4"	2233	2	N/A	N/A	N/A	42.56	23.04	19.52
96	32	11'-0"	3'-8"	333	2	11.52	5.76	5.76	5.76	2.88	2.88
96	48	11'-0"	5'-6"	492	2	18.24	9.12	9.12	9.12	4.56	4.56
96	64	11'-0"	7'-4"	588	2	23.04	11.52	11.52	11.52	5.76	5.76
96	80	11'-0"	9'-2"	747	2	29.76	14.88	14.88	14.88	7.44	7.44
96	96	11'-0"	11'-0"	842	2	34.56	17.28	17.28	17.28	8.64	8.64
96	112	11'-0"	12'-10"	1001	2	41.28	20.64	20.64	20.64	10.32	10.32
96	128	11'-0"	14'-8"	1175	2	46.08	23.04	23.04	23.04	11.52	11.52
96	144	11'-0"	16'-6"	1334	2	52.80	26.40	26.40	26.40	13.20	13.20
96	160	11'-0"	18'-4"	1430	2	57.60	28.80	28.80	28.80	14.40	14.40
96	176	11'-0"	20'-2"	1589	2	N/A	N/A	N/A	32.16	16.08	16.08
96	192	11'-0"	22'-0"	1684	2	N/A	N/A	N/A	34.56	17.28	17.28
96	208	11'-0"	23'-10"	1843	2	N/A	N/A	N/A	37.92	18.96	18.96
96	224	11'-0"	25'-8"	2017	2	N/A	N/A	N/A	40.32	20.16	20.16
96	240	11'-0"	27'-6"	2176	2	N/A	N/A	N/A	43.68	21.84	21.84
96	256	11'-0"	29'-4"	2350	2	N/A	N/A	N/A	46.08	23.04	23.04

Sign configuration specifications

AlphaEclipse StreetSmart signs are built using modular construction. Signs are built from one or more of the four section types. See “Modular construction” on page 7 for more information about the different types of sign sections.

StreetSmart 17X sign configuration specifications (red or amber LEDs)

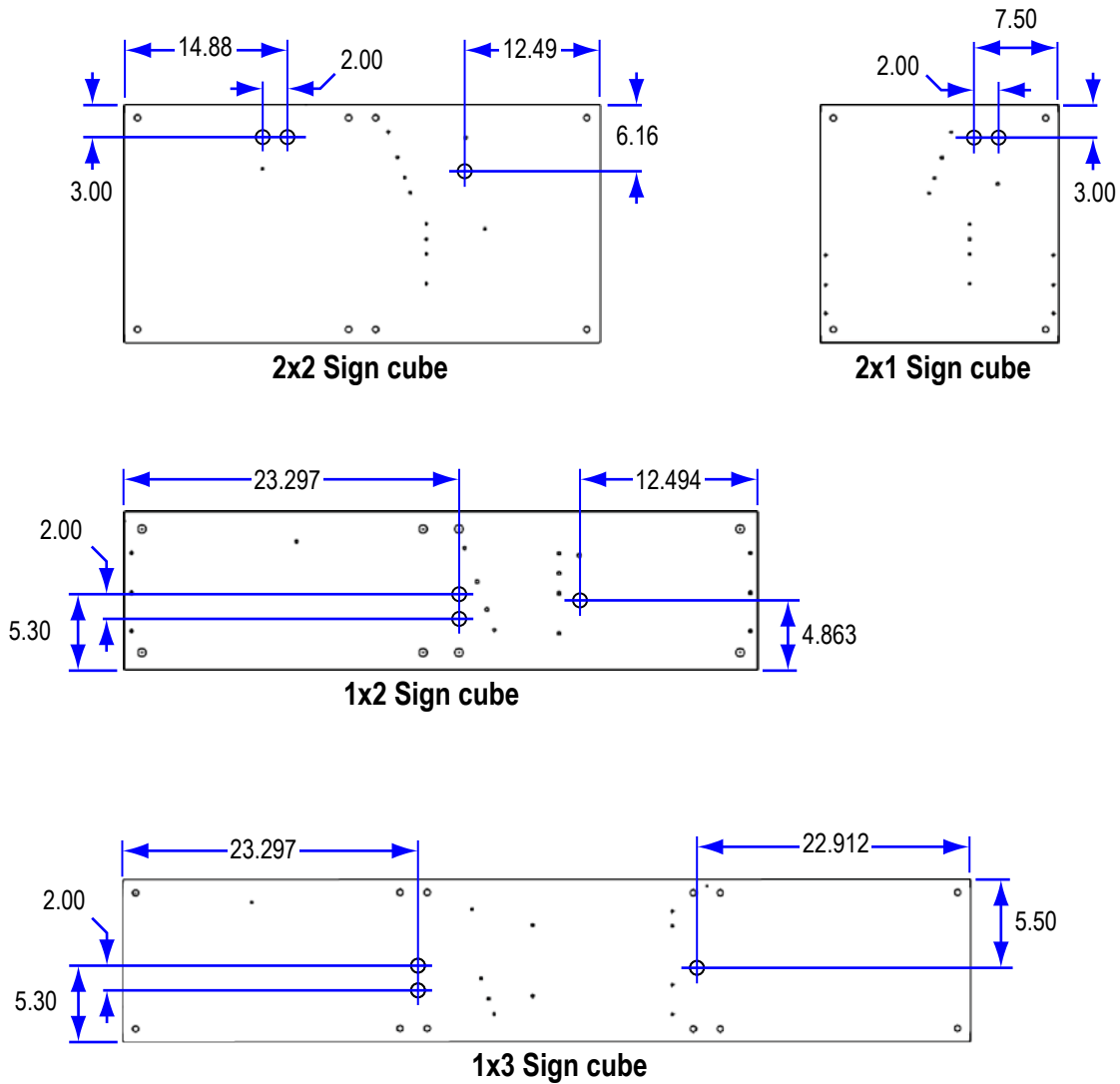
Description	Units	Sign section			
		32 x 64	32 x 32	16 x 64	16 X 96
LED pitch:	millimeters	17.5			
LED drivers:		4	2	2	3
Power supplies ¹ :		2	1	1	2
Internal fans:		1	1	1	1
Rated input voltage:	volts	115/230	115/230	115/230	115/230
Rated input frequency:	Hz	50/60	50/60	50/60	50/60
Rate input current @ 115V:	amps	3.37	1.85	1.85	2.61
Rate input current @ 230V:	amps	1.69	0.93	0.93	1.31
Width of enclosure:	inches	44	22	44	66
Height of enclosure:	inches	22	22	11	11
Depth of enclosure ² :	inches	6	6	6	6
Weight (approximate):	pounds	39	22	22	33
NOTES:					
¹ Meanwell USP225-5.0.					
² Does not include steel mounting angle.					

StreetSmart 35X sign configuration specifications (red or amber LEDs)

Description	Units	Sign section type			
		16 x 32	16 x 16	8 x 32	8 x 48
LED pitch:	millimeters	35			
LED drivers:		4	2	2	3
Power supplies ¹ :		1	1	1	1
Internal fans:		1	1	1	1
Rated input voltage:	volts	115/230	115/230	115/230	115/230
Rated input frequency:	Hz	50/60	50/60	50/60	50/60
Rate input current @ 115V:	amps	1.92	1.12	1.12	1.52
Rate input current @ 230V:	amps	0.96	0.56	0.56	0.76
Width of enclosure:	inches	44	22	44	66
Height of enclosure:	inches	22	22	11	11
Depth of enclosure ² :	inches	6	6	6	6
Weight (approximate):	pounds	39	22	22	33
NOTES:					
¹ Meanwell USP225-7.5.					
² Does not include steel mounting angle.					

Primary power and data entry locations

All views are from the back of the four different sized cubes.

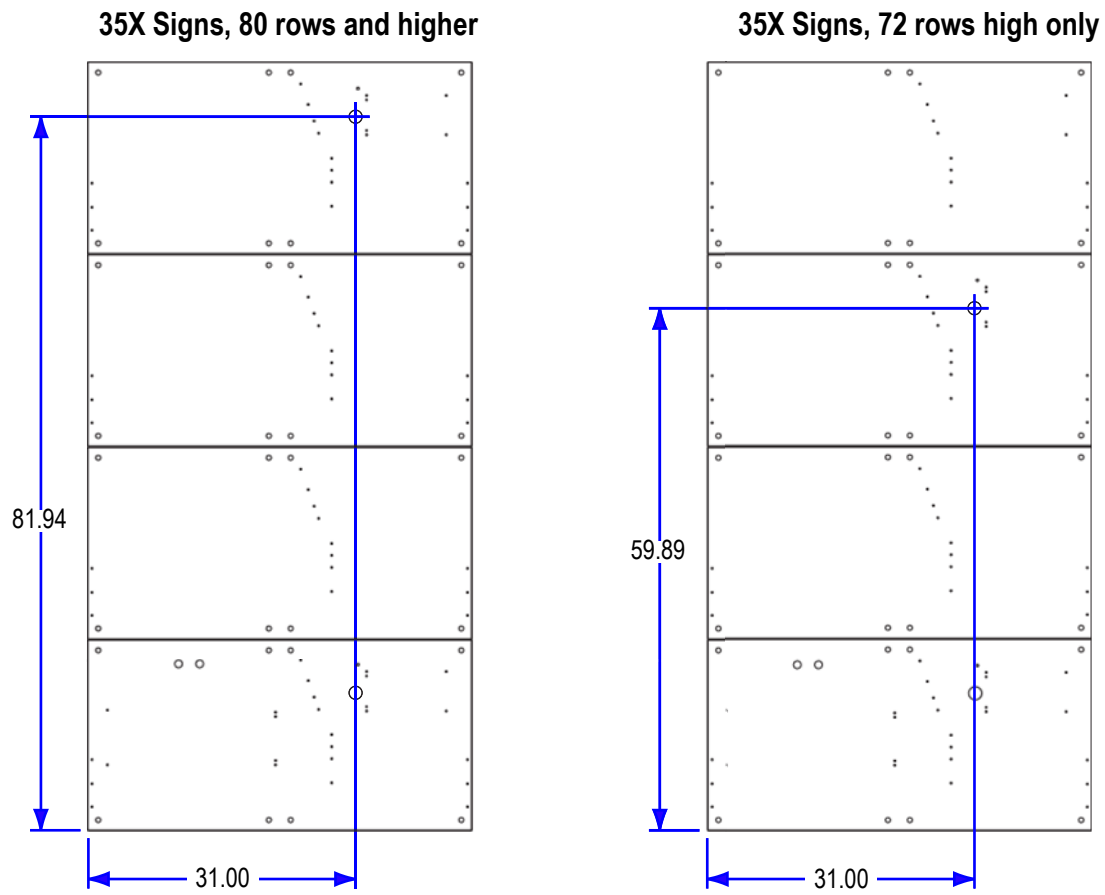


All dimensions are in inches.

Figure 42.Power and data entry holes for 17X and 35X signs

Secondary power entry locations (35X signs only)

Views are from the back of the sign sections.

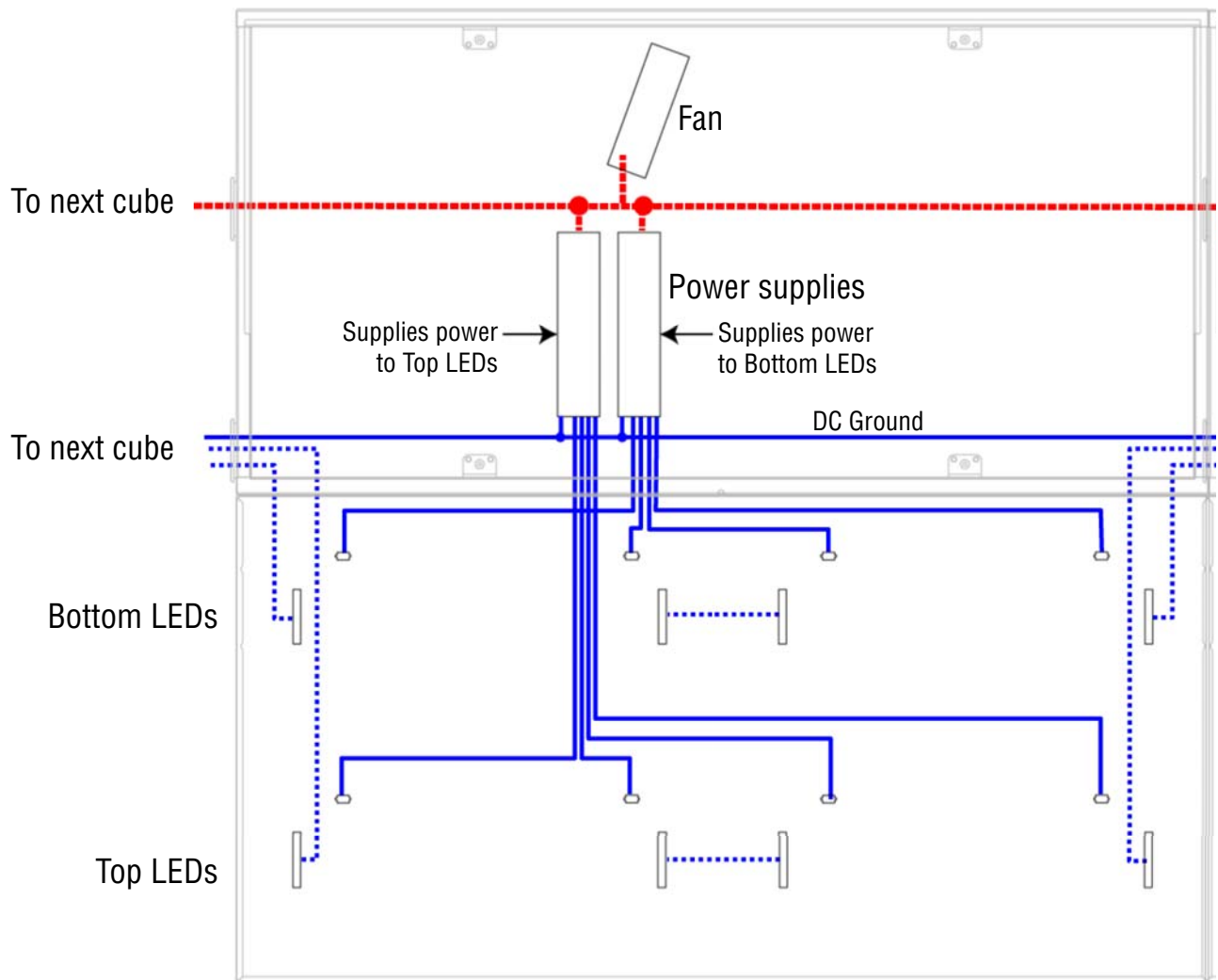


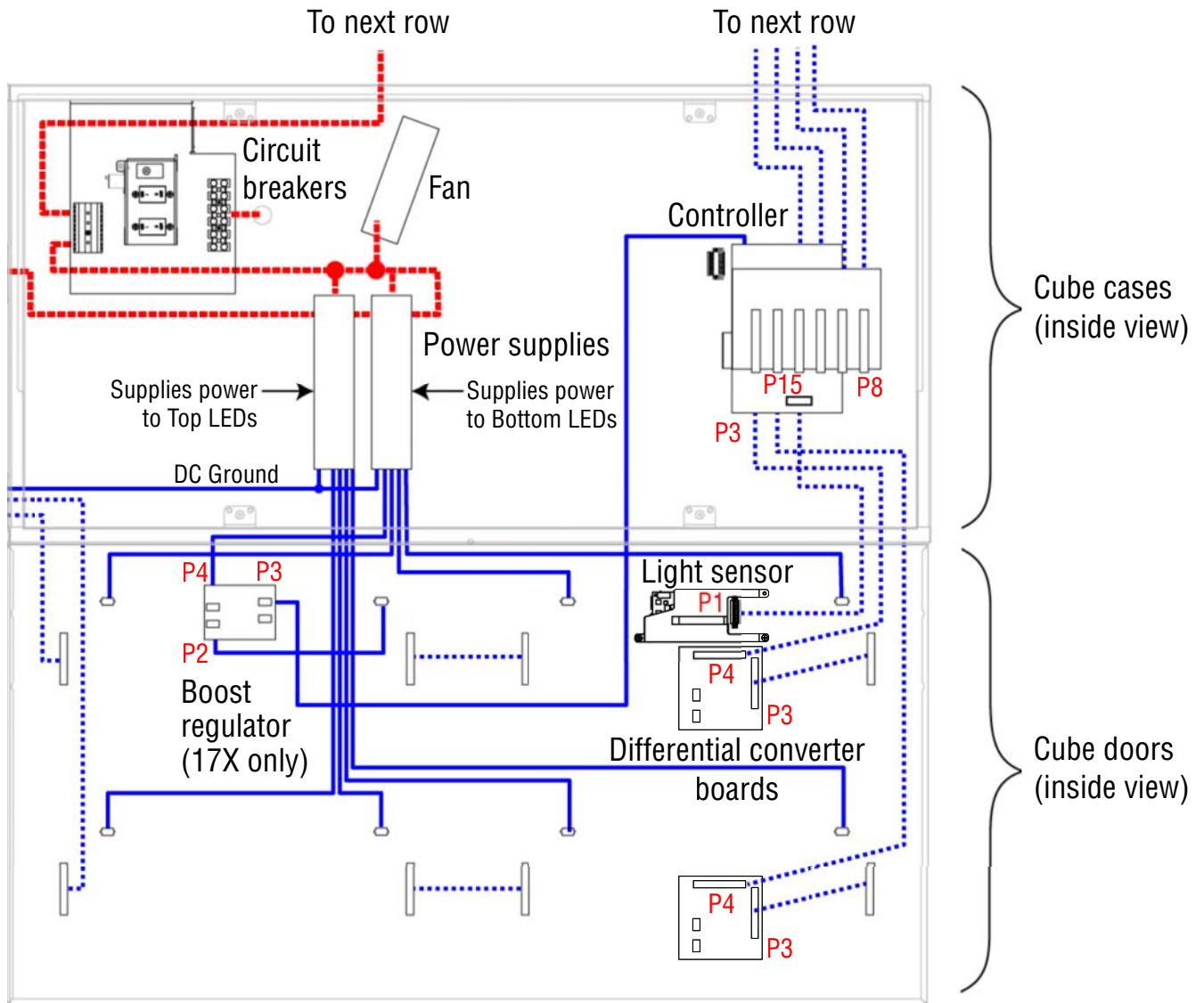
All dimensions are in inches.

Figure 43.Secondary power entry holes for 35X signs

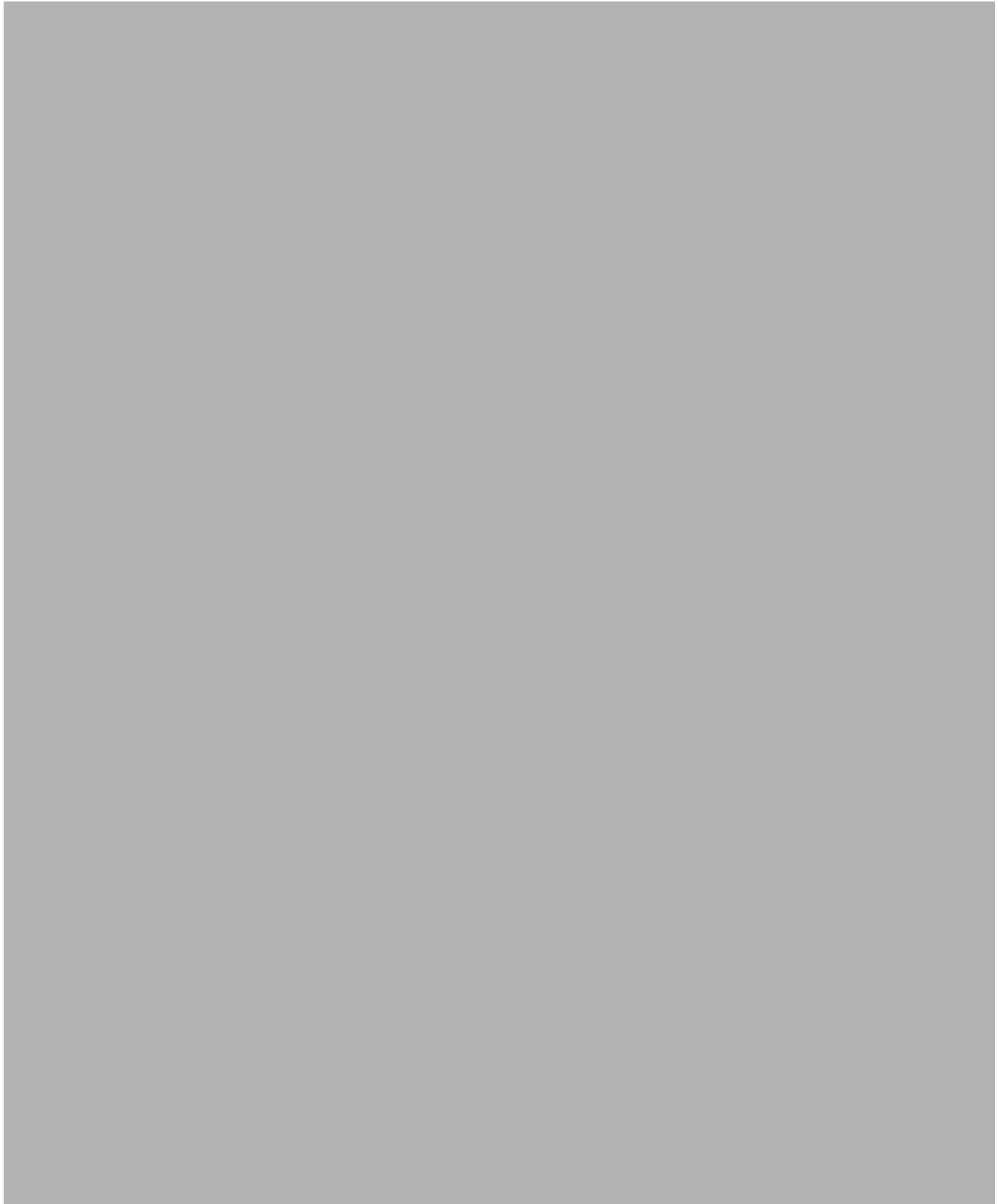
StreetSmart 17X and 35X wiring diagrams

- - - - - High voltage line (AC)
- — — — — Low voltage line (DC)
- · · · · Data line





Ventilation diagram for back-to-back sign configurations



Appendix B

AlphaNet connectivity diagrams

The diagrams on the following pages illustrate the set-up for the following AlphaNet connectivity options:

- “120V Modem connection diagram” on page 62.
- “230V Modem connection diagram” on page 63.
- “Converter Box III connection diagram” on page 64.
- “Fiber Optic connection diagram” on page 65.
- “Wireless transceiver connection diagram” on page 66.

120V Modem connection diagram

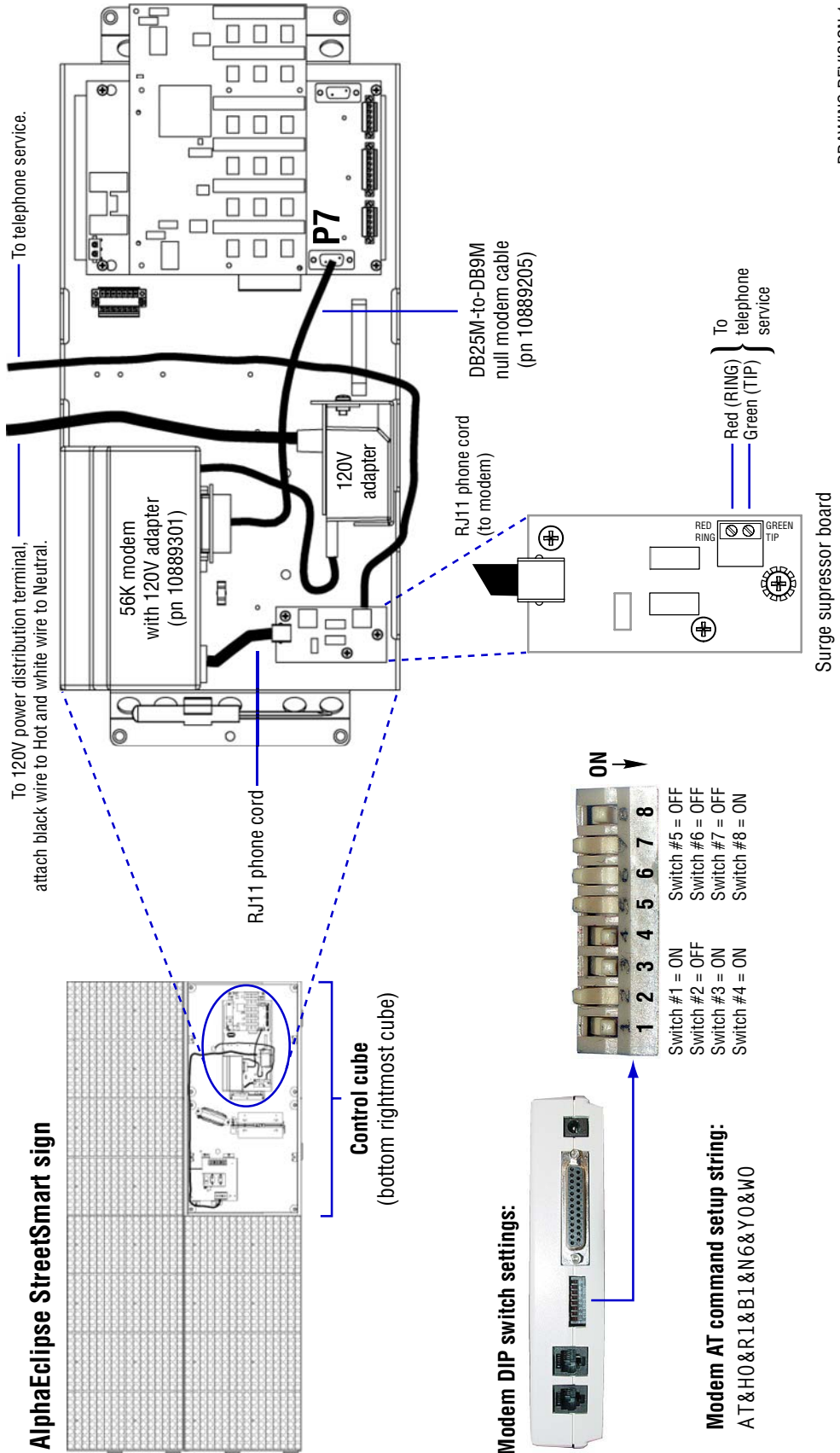
AlphaEclipse StreetSmart sign

In order to display messages on a sign, the messaging computer must be connected to the sign, such as with a pair of telephone modems (a Transmitting modem attached to the messaging computer and a Receiving modem attached to a sign).
 Modems can connect to a sign that is almost anywhere. However, a sign must have its own phone line.

Modem (120V) computer-to-sign connection



Overview

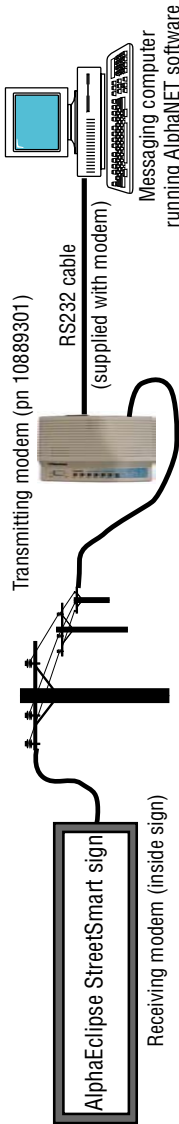


Wiring

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230V Modem connection diagram

Modem (230V) computer-to-sign connection



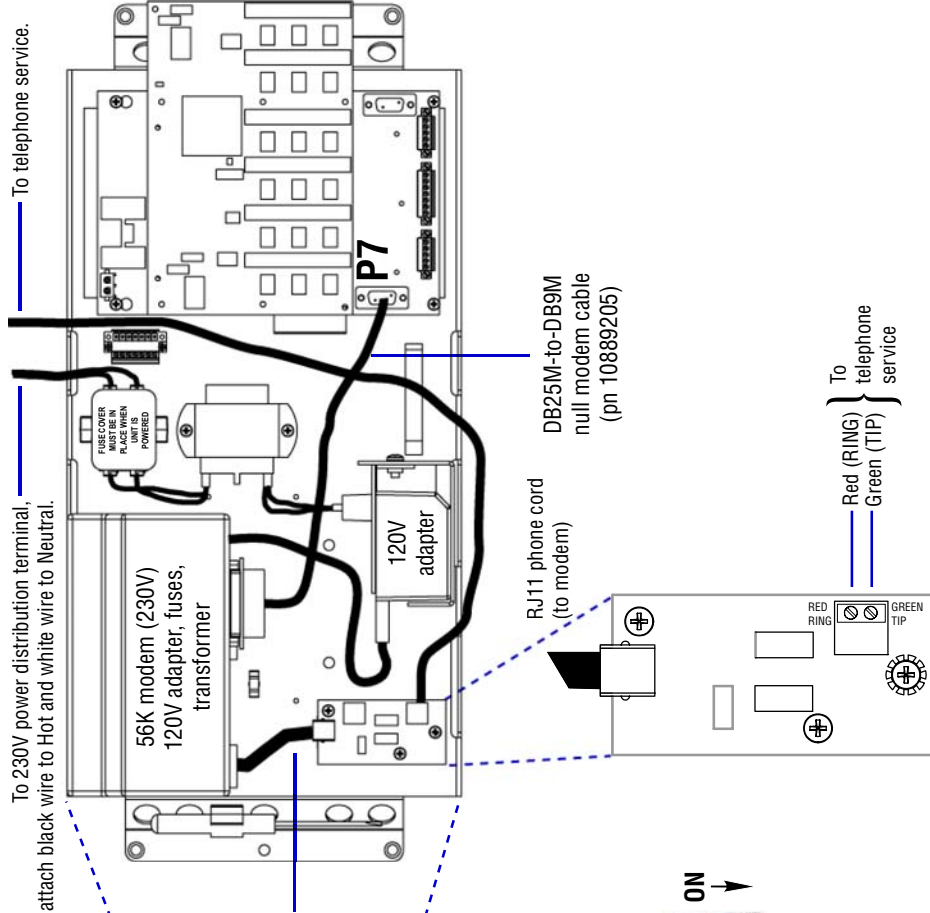
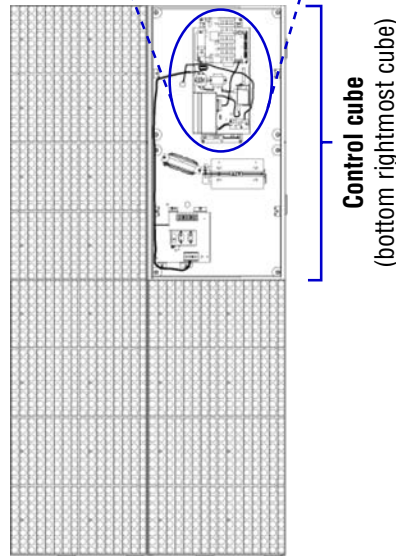
AlphaEclipse StreetSmart sign

In order to display messages on a sign, the messaging computer must be connected to the sign, such as with a pair of telephone modems (a Transmitting modem attached to the messaging computer and a Receiving modem attached to a sign).

Modems can connect to a sign that is almost anywhere. However, a sign must have its own phone line.

Overview

AlphaEclipse StreetSmart sign



Surge suppressor board

Wiring

Modem DIP switch settings:



- Switch #1 = ON
- Switch #2 = OFF
- Switch #3 = ON
- Switch #4 = ON
- Switch #5 = OFF
- Switch #6 = OFF
- Switch #7 = OFF
- Switch #8 = ON

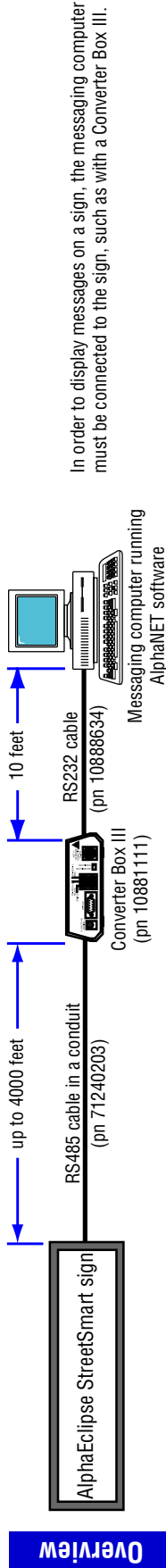
Modem AT command setup string:

AT&H0&R1&B1&N6&Y0&W0

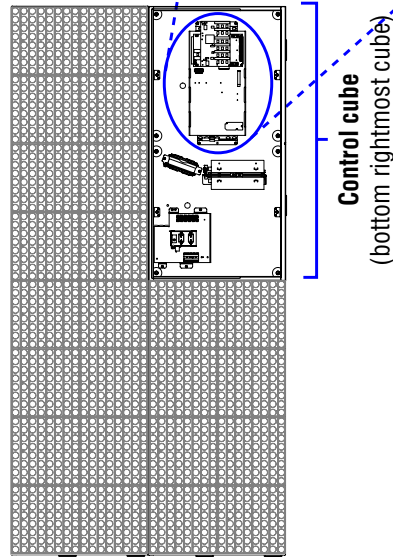
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Converter Box III connection diagram

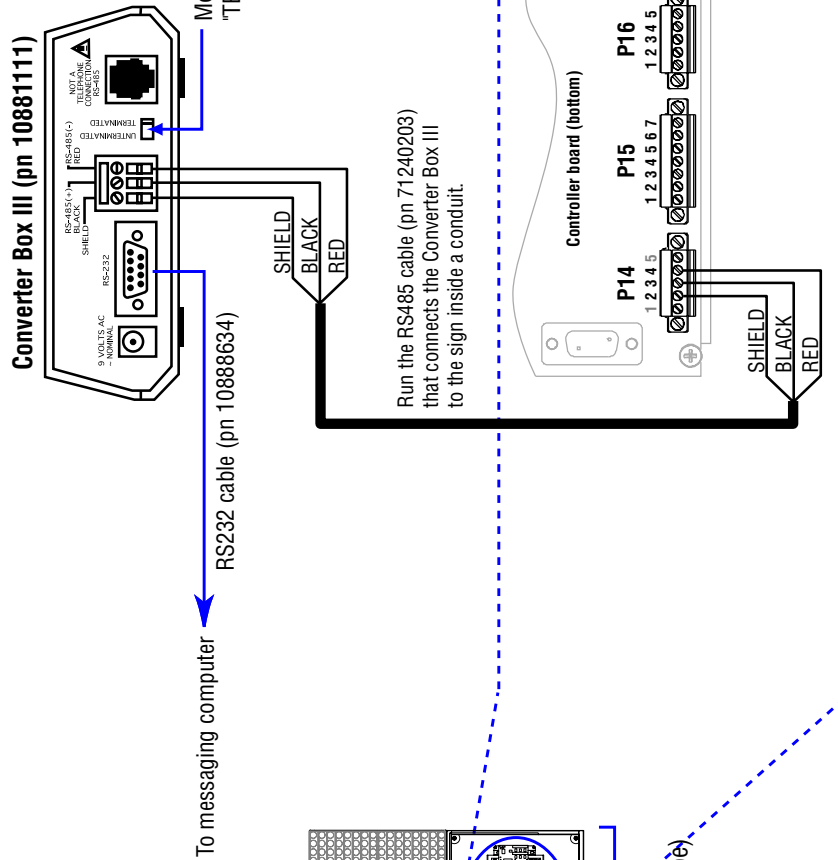
Converter Box III computer-to-sign connection (RS485)



AlphaEclipse StreetSmart sign

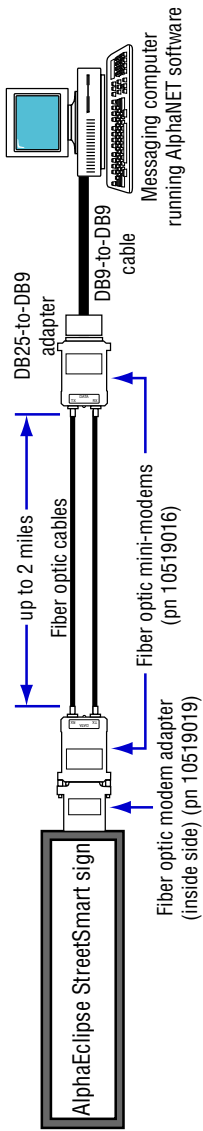


Wiring



Fiber Optic connection diagram

Fiber optic computer-to-sign connection

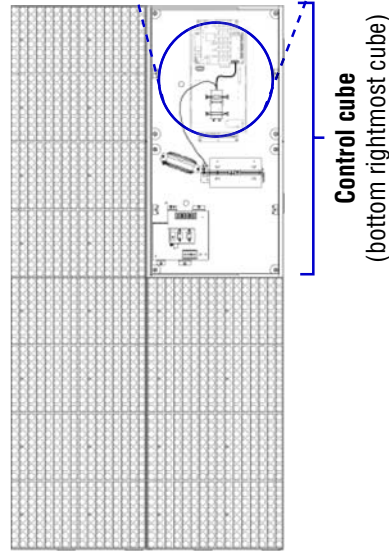


AlphaEclipse StreetSmart sign

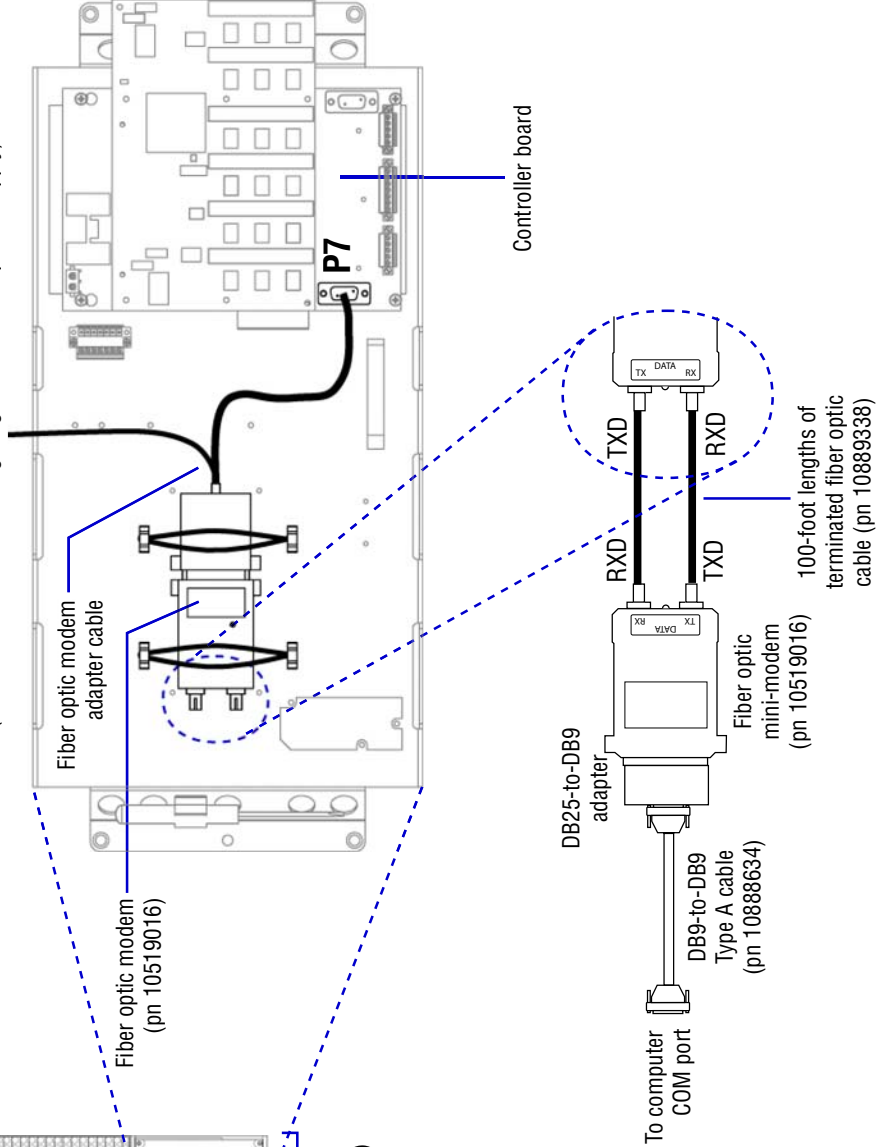
In order to display messages on a sign, the messaging computer must be connected to the sign, such as with fiber optic modems.

Fiber optic modems allow the messaging computer to connect to a sign up to 2 miles away from the computer. The fiber optic modems send data to a sign over an optical RS232 connection.

AlphaEclipse StreetSmart sign



DC power for fiber optic modem (connects to the cube's voltage regulator board or power supply)



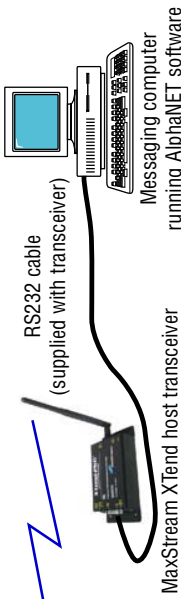
DRAWING REVISION 1

Wireless transceiver connection diagram

Wireless computer-to-sign connection (MaxStream XTend 900MHz transceiver) AlphaEclipse StreetSmart sign

In order to display messages on a sign, the messaging computer must be connected to the sign, such as with a pair of wireless transceivers (a transmitting transceiver attached to the messaging computer and a receiving transceiver attached to a sign).

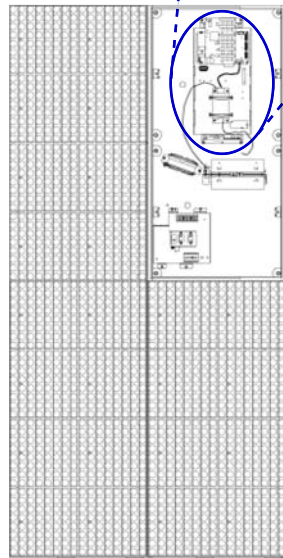
At 9600 baud, MaxStream XTend transceivers have an indoor transmission range of up to 3000 feet and an outdoor range of up to 40 miles line-of-site.



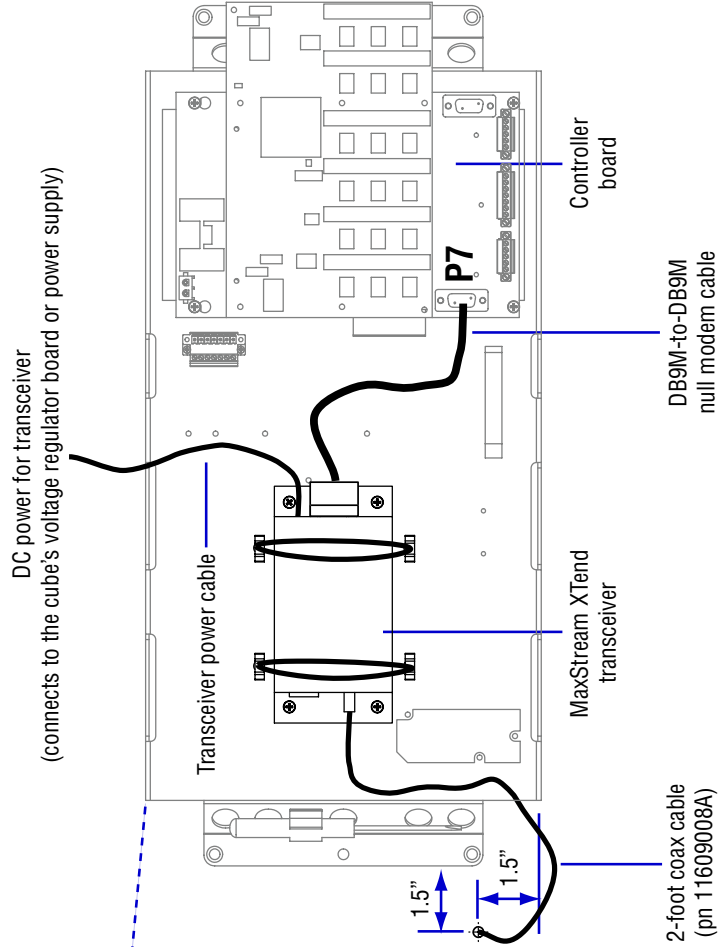
Overview



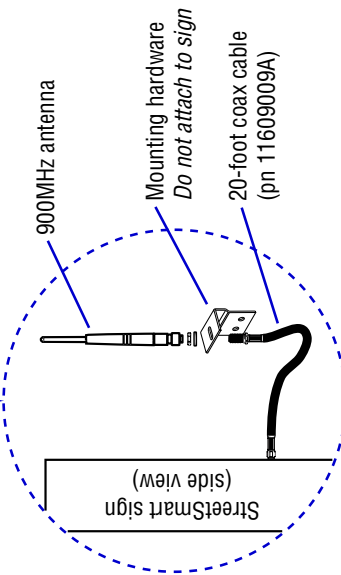
AlphaEclipse StreetSmart sign



Wiring



Drill 0.25" hole for antenna mount.



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