AlphaEclipse™ 3500 Series B Sign Installation Manual

http://www.adaptivedisplays.com/support/eclipse

STEP 1: Read Safety section before starting, see page 4

STEP 2: Mechanical installation, see page 6

STEP 3: How many signs are installed?

ONE SIGN

- Go to STEP 4.

TWO OR MORE SIGNS

STEP 3a: Must all signs display the *same* message at the *same* time?

YES

All signs must be the same size.

- If two signs are mounted back-to-back, follow directions on page 10. Then go to STEP 4.
- If not, see page 14. Then go to STEP 4.

NO

- If two signs are mounted back-to-back, follow directions on page 12. Then go to STEP 4.
- If not, see page 16. Then go to STEP 4.

STEP 4: How will messages be sent from a computer to the sign(s)?

Method	Directions
WIRED (RS232)	• Follow directions on page 18. Then go to STEP 5.
WIRED (RS485)	• Follow directions on page 19. Then go to STEP 5.
FIBER OPTIC	• Follow directions on page 20. Then go to STEP 5.
ETHERNET	• Follow directions on page 21. Then go to STEP 5.
MODEM	• Follow directions on page 22. Then go to STEP 5.
WIRELESS	• Follow directions on page 23. Then go to STEP 5.
EXTERNAL CONNECTION BOX	• Follow directions on page 24. Then go to STEP 5.

STEP 5: Electrical installation, page 25

STEP 6: Use AlphaNET v2.0.3 or greater software to send messages to the sign(s)

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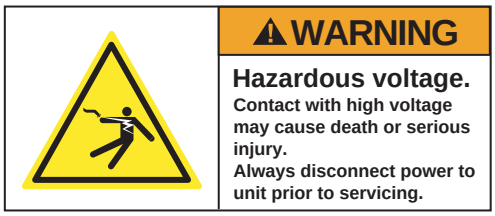
Safety

Equipment symbols

Chassis ground

Mains power (I = ON, 0 = OFF)

Warnings and cautions

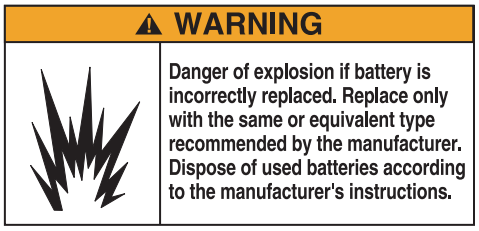


Other warnings and cautions are posted in appropriate locations throughout this manual.

Battery backup

In the event of a power loss, backup batteries in an AlphaEclipse™ sign provide short-term power in order to retain information such as messages and time settings.

Backup batteries are soldered to the Controller board and should not be replaced by anyone other than a qualified Adaptive® technician.



Controlling Electrostatic Discharge (ESD)

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

Changing from Master/Slave to Master/Master operation

Master/Slave sign operation (see page 10 and page 14) — in this mode, a message will be displayed on all the signs at the same time. Also, in this mode, there is just one Master sign, but there can be multiple Slave signs. Messages are sent to the Master sign using a wire, modem, or wireless connection. Then these messages are sent and displayed on all the Slave signs (plus the Master sign) at the same time.

Master/Master sign operation (see page 12 and page 16) — in this mode, each sign can display a different message. However, a message cannot be displayed *simultaneously* on all the signs.

Signs are configured for Master/Slave mode by

1. wiring a RS485 connection to each sign's SERIAL I/O connector (also called the Serial I/O terminal block, see "Appendix A: Sign description" on page 28),
2. wiring a RS485 connection to each sign's TEMP/SYNC PORT connector,
3. setting each sign's Master/Slave DIP switch, depending if the sign is operating as a Master or a Slave. The DIP switches on a sign can be set by either:
   - opening a sign and then physically setting the DIP switches (see "Appendix G: DIP switch settings" on page 47)
   - using AlphaNET v2.0.3 or greater *Diagnostics* software (see the **AlphaNET Version 2.0.3 User Manual** which is available on Adaptive's web site)

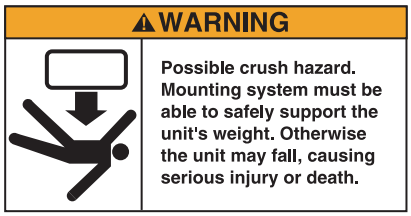
Signs set up as Master/Slave units as described above can NOT be changed to Master/Master operation by just changing a sign's DIP switches (#3 above). In fact, doing so could damage a sign.

To change Master/Slave signs to Master/Master units, use the directions below:

- "Back-to-back Master/Master sign connection" on page 12 or
- "Multiple Master/Master signs" on page 16.

Mechanical installation

Designing the support structure

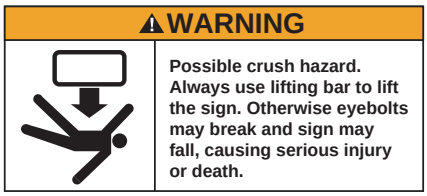


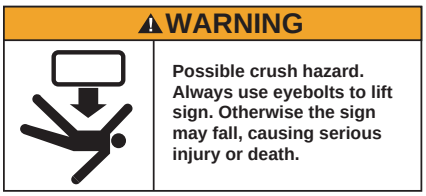
The design of the support structure depends on the mounting methods, sign size, sign weight, and wind loading. Support structure design should only be done by a qualified individual.

It is the customer's responsibility to ensure that the support structure and sign mounting hardware are capable of supporting the sign and are in compliance with all applicable building codes.

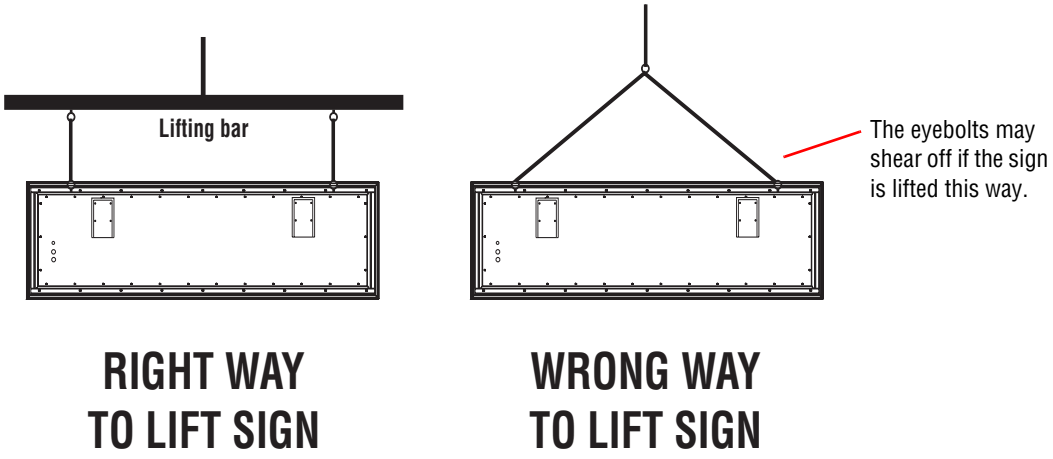
Adaptive Micro Systems is not responsible for installations or the structural integrity of support structures done by others.

Lifting the sign





Use the two eyebolts on the sign with a lifting bar to raise the display:



Mounting the sign

Because every installation site is unique, there is no single Adaptive-approved procedure for mounting AlphaEclipse™ signs.

However, follow these guidelines when installing a sign:

- Consult with a professional sign installer to determine the proper mounting system and to comply with all applicable building codes.
- Only use the sign's mounting support bars to mount the sign. *Mounting to any other parts of the sign will void the warranty.*
- *Both* mounting support bars should be used to mount the sign.
- Drill holes as needed in the sign's mounting support bars for fasteners. *Drilling holes in any other place on the sign will void the warranty.* Follow these guidelines when drilling holes in the mounting support bars:
  - Drill the minimum number of holes necessary.
  - The distance from the center line of a mounting bolt to the outside edge of a mounting support bar should NOT be less than two times the diameter of the fasteners.
  - To prevent bi-metal corrosion, dissimilar material should be isolated when mounting the sign.
- Allow fan clearance as shown below.

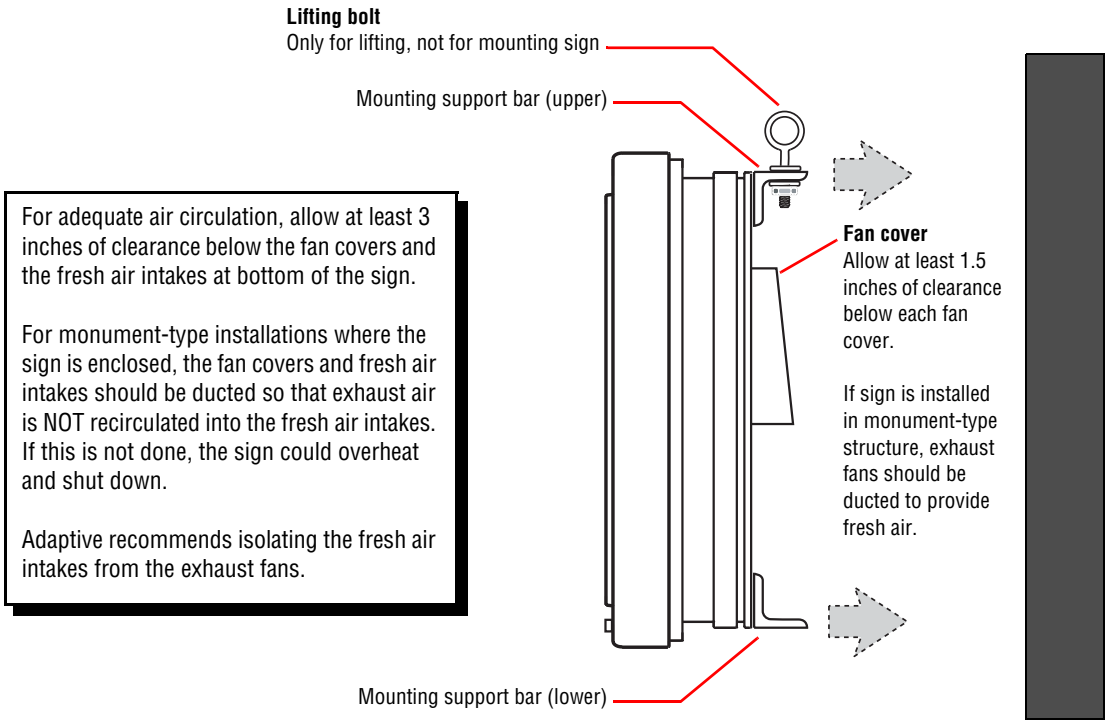


Figure 1: Mounting an AlphaEclipse™ sign

Mounting a temperature probe

See "Appendix E: Sign options" on page 39.

Installation diagram

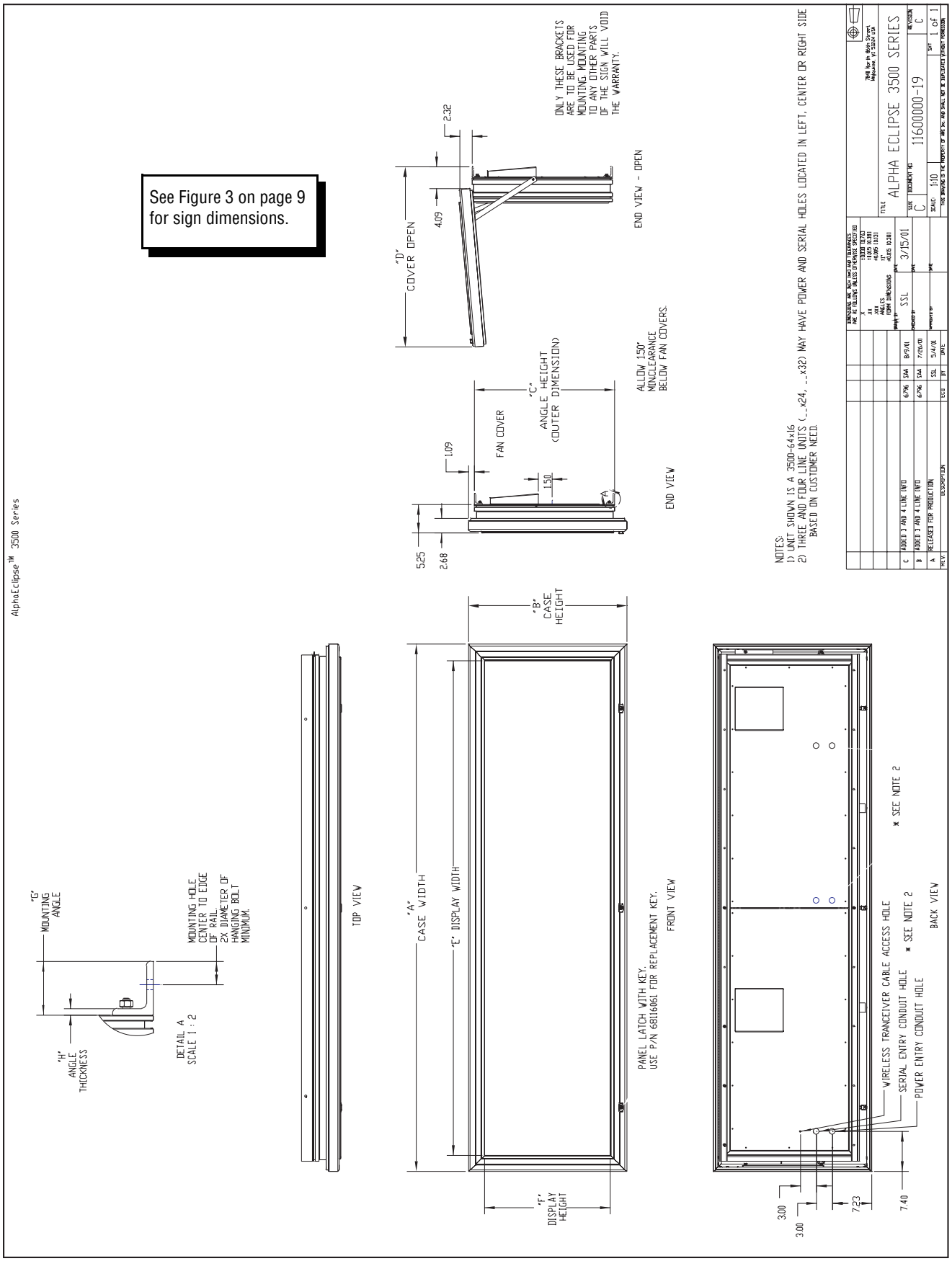


Figure 2: AlphaEclipse™ installation diagram - Part 1

AlphaEclipse™ 3500 Series Rev. C

Model Number Explanation:

35 __ - 64 x 8 R/A

- Red lamp/Amber lamp
- Width (Pixel Columns) x Height (Pixel Rows)
- LED Lamp Type: (2 digit code)
  - 00 = 30 degree lamp
  - 01 = 70 degree lamp
- 1.4" Pitch, 4 LEDs per pixel

ASSEMBLY MODEL NO	WEIGHT (lbs./kg)	DIM "A" (inch/mm)	DIM "B" (inch/mm)	DIM "C"	DIM "D"	DIM "E"	DIM "F"	DIM "G"	DIM "H"
AlphaEclipse 35__-64x8 R/A	140 / 63.5	97.80 / 2484.1	18.31 / 465.1	15.00	22.40	91.80	12.31	2.00	0.25
AlphaEclipse 35__-80x8 R/A	160 / 72.6	119.80 / 3042.9	18.31 / 465.2	15.00	22.40	113.80	12.31	2.00	0.25
AlphaEclipse 35__-96x8 R/A	190 / 86.2	141.80 / 3601.7	18.31 / 465.3	15.00	22.40	135.80	12.31	2.00	0.25
AlphaEclipse 35__-112x8 R/A	220 / 99.8	163.80 / 4160.5	18.31 / 465.4	15.00	22.40	157.80	12.31	2.00	0.25
AlphaEclipse 35__-128x8 R/A	240 / 108.9	185.80 / 4719.3	18.31 / 465.5	15.00	22.40	179.80	12.31	2.00	0.25
AlphaEclipse 35__-144x8 R/A	260 / 117.9	207.80 / 5278.1	18.31 / 465.6	15.00	22.40	201.80	12.31	2.00	0.25
AlphaEclipse 35__-64x16 R/A	185 / 83.9	97.80 / 2484.1	29.31 / 744.5	26.00	33.36	91.80	23.31	2.00	0.25
AlphaEclipse 35__-80x16 R/A	220 / 99.8	119.80 / 3042.9	29.31 / 744.6	26.00	33.36	113.80	23.31	2.00	0.25
AlphaEclipse 35__-96x16 R/A	250 / 113.4	141.80 / 3601.7	29.31 / 744.7	26.00	33.36	135.80	23.31	2.00	0.25
AlphaEclipse 35__-112x16 R/A	285 / 129.3	163.80 / 4160.5	29.31 / 744.8	26.00	33.36	157.80	23.31	2.00	0.25
AlphaEclipse 35__-128x16 R/A	320 / 145.2	185.80 / 4719.3	29.31 / 744.9	26.00	33.36	179.80	23.31	2.00	0.25
AlphaEclipse 35__-144x16 R/A	355 / 161.0	207.80 / 5278.1	29.31 / 744.10	26.00	33.36	201.80	23.31	2.00	0.25
AlphaEclipse 35__-64x24 R/A	440 / 199.6	98.50 / 2501.9	40.00 / 1016.0	37.00	45.07	92.50	34.00	3.00	0.38
AlphaEclipse 35__-80x24 R/A	465 / 210.9	120.50 / 3060.7	40.00 / 1016.1	37.00	45.07	114.50	34.00	3.00	0.38
AlphaEclipse 35__-96x24 R/A	485 / 220.0	142.50 / 3619.5	40.00 / 1016.2	37.00	45.07	136.50	34.00	3.00	0.38
AlphaEclipse 35__-112x24 R/A	515 / 233.6	164.50 / 4178.3	40.00 / 1016.3	37.00	45.07	158.50	34.00	3.00	0.38
AlphaEclipse 35__-128x24 R/A	535 / 242.7	186.50 / 4737.1	40.00 / 1016.4	37.00	45.07	180.50	34.00	3.00	0.38
AlphaEclipse 35__-144x24 R/A	575 / 260.8	208.50 / 5295.9	40.00 / 1016.5	37.00	45.07	202.50	34.00	3.00	0.38
AlphaEclipse 35__-64x32 R/A	480 / 217.7	98.50 / 2501.9	51.00 / 1295.4	48.00	56.03	92.50	45.00	3.00	0.38
AlphaEclipse 35__-80x32 R/A	505 / 229.1	120.50 / 3060.7	51.00 / 1295.5	48.00	56.03	114.50	45.00	3.00	0.38
AlphaEclipse 35__-96x32 R/A	535 / 242.7	142.50 / 3619.5	51.00 / 1295.6	48.00	56.03	136.50	45.00	3.00	0.38
AlphaEclipse 35__-112x32 R/A	560 / 254.0	164.50 / 4178.3	51.00 / 1295.7	48.00	56.03	158.50	45.00	3.00	0.38
AlphaEclipse 35__-128x32 R/A	590 / 267.6	186.50 / 4737.1	51.00 / 1295.8	48.00	56.03	180.50	45.00	3.00	0.38
AlphaEclipse 35__-144x32 R/A	635 / 288.0	208.50 / 5295.9	51.00 / 1295.9	48.00	56.03	202.50	45.00	3.00	0.38

Figure 3: AlphaEclipse™ installation diagram - Part 2

Back-to-back Master/Slave sign connection

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.

Connect signal wire

2. Connect the two signs as shown below:
   - The Master sign will have a modem or wireless transceiver inside, or the Master sign will be connected to a computer by wire, fiber optic cable, or an external connection box.
   - The Slave sign will only be connected to a Master sign.

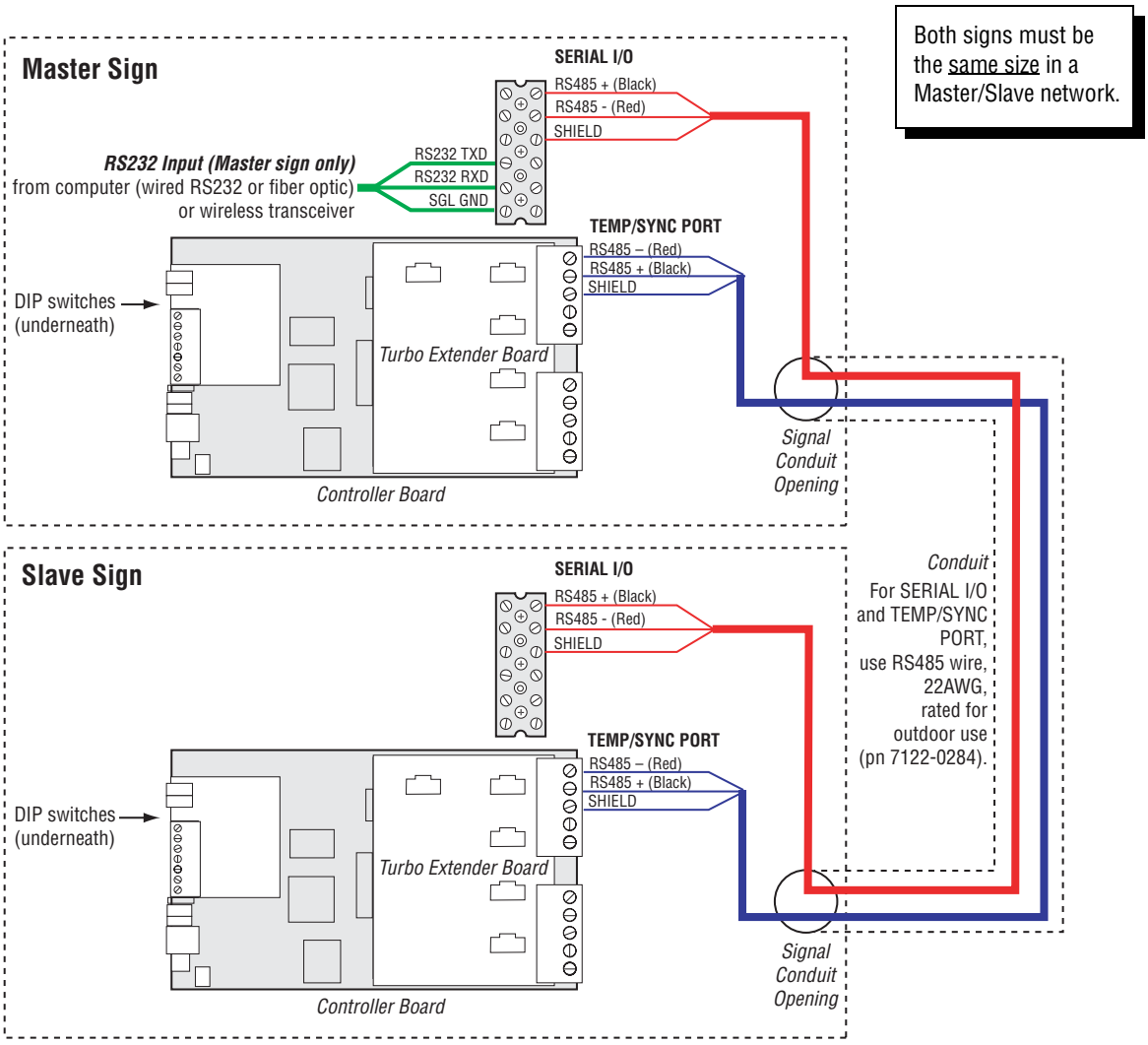
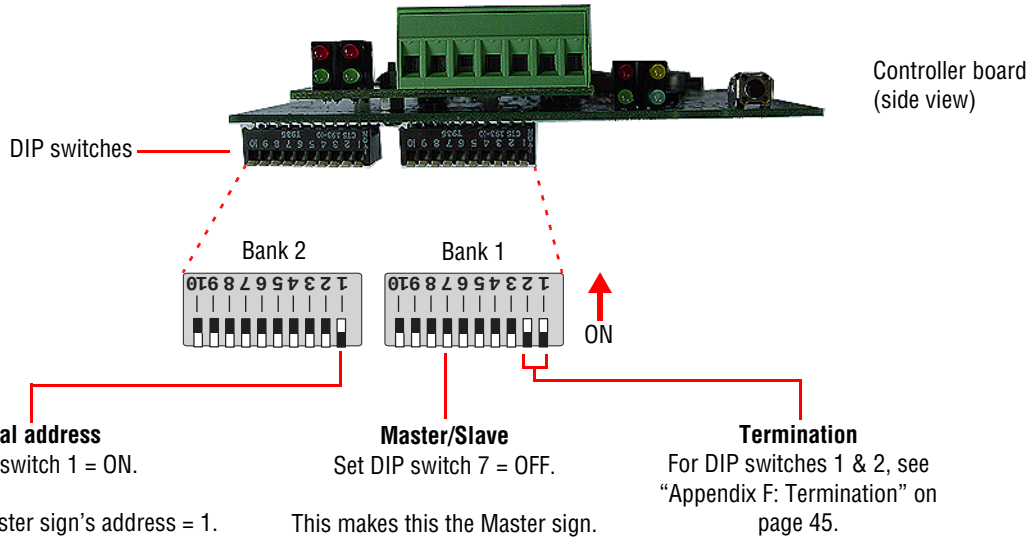


Figure 4: Back-to-back Master/Slave sign connection

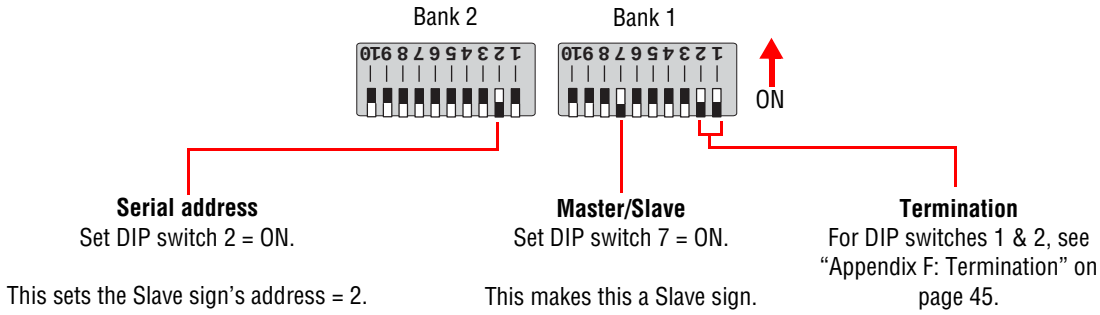
Set DIP switches

These are the recommended DIP switch settings for a Master/Slave back-to-back sign connection:

Master sign settings:



Slave sign settings:



Back-to-back Master/Master sign connection

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.

Connect signal wire

2. Connect the two signs as shown below:
   - *Each* Master sign will have a modem or wireless transceiver inside, or *one* of the Master signs will be connected to a computer by wire, fiber optic cable, or an external connection box.
   - If both Master signs have a modem or a wireless transceiver inside or each sign is connected to an external connection box, then the wire connecting both signs shown below is not necessary.

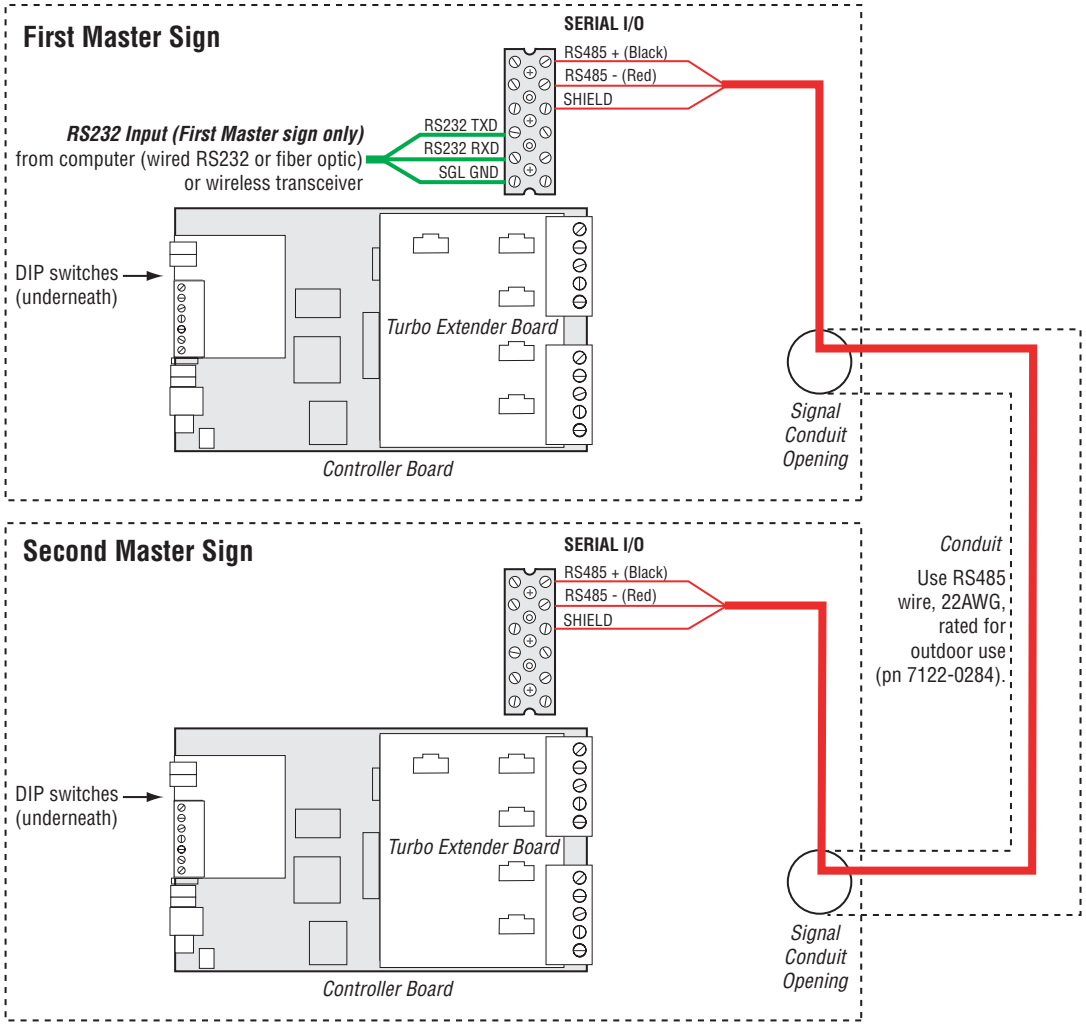
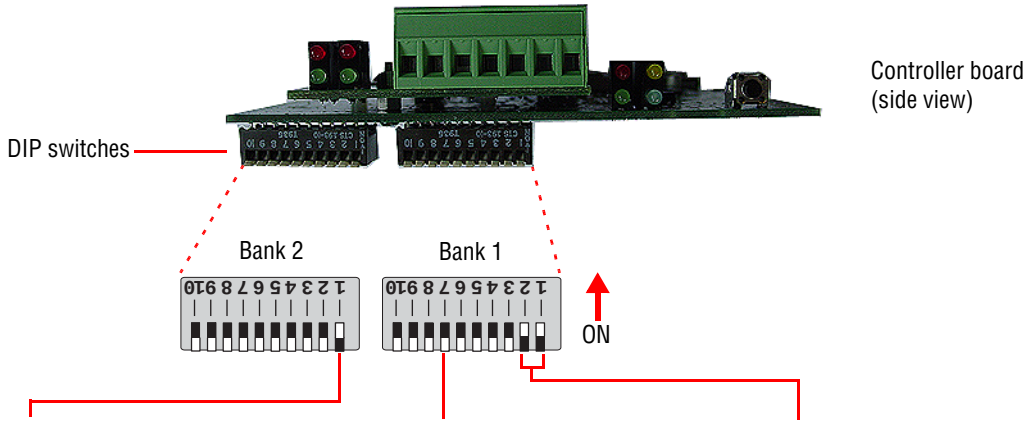


Figure 5: Back-to-back Master/Master sign connection

Set DIP switches

These are the recommended DIP switch settings for a Master/Master back-to-back sign connection:

First Master sign settings:



Serial address
Set DIP switch 1 = ON.

This sets the first Master sign's address = 1.

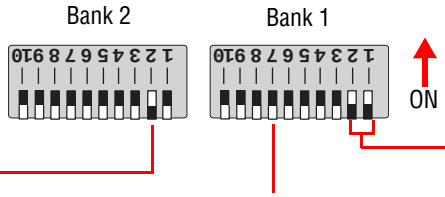
This allows you to send messages to just the first Master sign if you send messages to sign address 1. (See **AlphaNET™ version 2 User Manual** for more information.)

Master/Slave
Set DIP switch 7 = OFF.

This makes this the Master sign.

Termination
For DIP switches 1 & 2, see "Appendix F: Termination" on page 45.

Second Master sign settings:



Serial address
Set DIP switch 2 = ON.

This sets the second Master sign's address = 2.

This allows you to send messages to just the second Master sign if you send messages to sign address 2. (See **AlphaNET™ version 2 User Manual** for more information.)

Master/Slave
Set DIP switch 7 = OFF.

This makes this a Master sign.

Termination
For DIP switches 1 & 2, see "Appendix F: Termination" on page 45.

Multiple Master/Slave sign connection

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35

Connect signal wire

2. Connect the signs as shown below:
   - The Master sign will have a modem or wireless transceiver inside, or the Master sign will be connected to a computer by wire, fiber optic cable, or an external connection box.

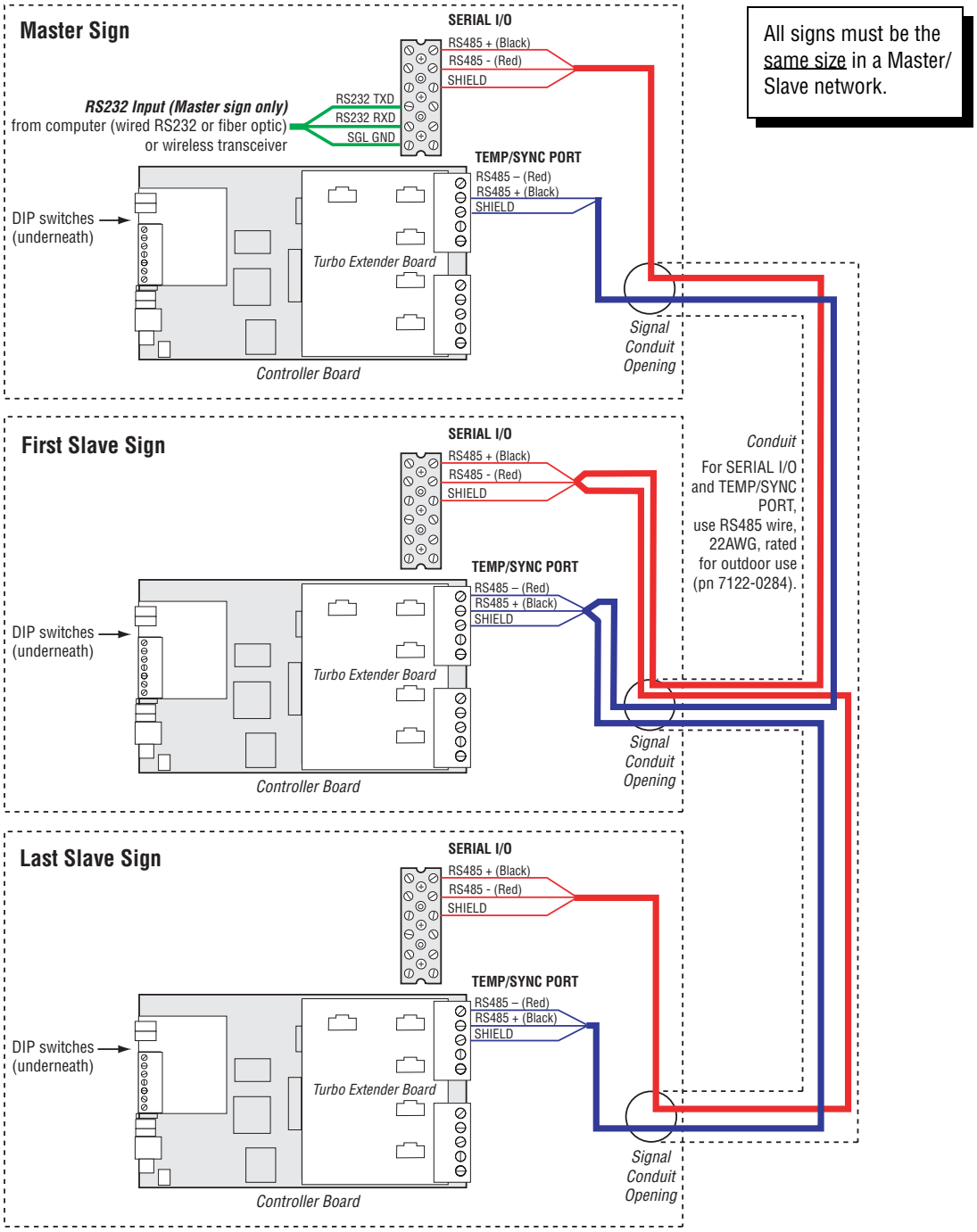
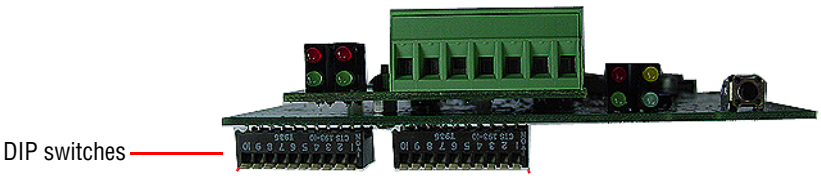


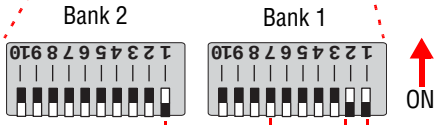
Figure 6: Multiple Master/Slave sign connection

Set DIP switches

These are the recommended DIP switch settings for Master/Slave multiple sign connection:

Master sign settings:





Serial address
Set DIP switch 1 = ON.

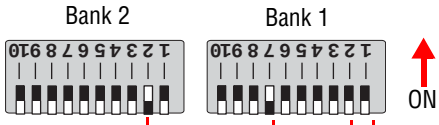
This sets this sign's address = 1.
See the NOTE above.

Master/Slave
Set DIP switch 7 = OFF.

This makes this the Master sign.

Termination
For DIP switches 1 & 2, see "Appendix F: Termination" on page 45.

First Slave sign settings:



Serial address
Set DIP switch 2 = ON.

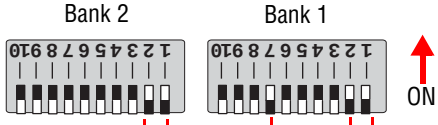
This sets this sign's address = 2.
See the NOTE above.

Master/Slave
Set DIP switch 7 = ON.

This makes this a Slave sign.

Termination
For DIP switches 1 & 2, see "Appendix F: Termination" on page 45.

Last Slave sign settings:



Serial address
Set DIP switches 1 & 2 = ON.
This sets this sign's address = 3.
See the NOTE above.

(If this was the 4th sign, then set the serial address = 4.)

Master/Slave
Set DIP switch 7 = ON.

This makes this a Slave sign.

Termination
For DIP switches 1 & 2, see "Appendix F: Termination" on page 45.

Multiple Master/Master signs

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35

Connect signal wire

2. Connect the signs as shown below:
   - *Each* Master sign will have a modem or wireless transceiver inside, or *one* of the Master signs will be connected to a computer by wire, fiber optic cable, or an external connection box.
   - If all Master signs have a modem or a wireless transceiver inside or each sign is connected to an external connection box, then the wire connecting the signs shown below is not necessary.

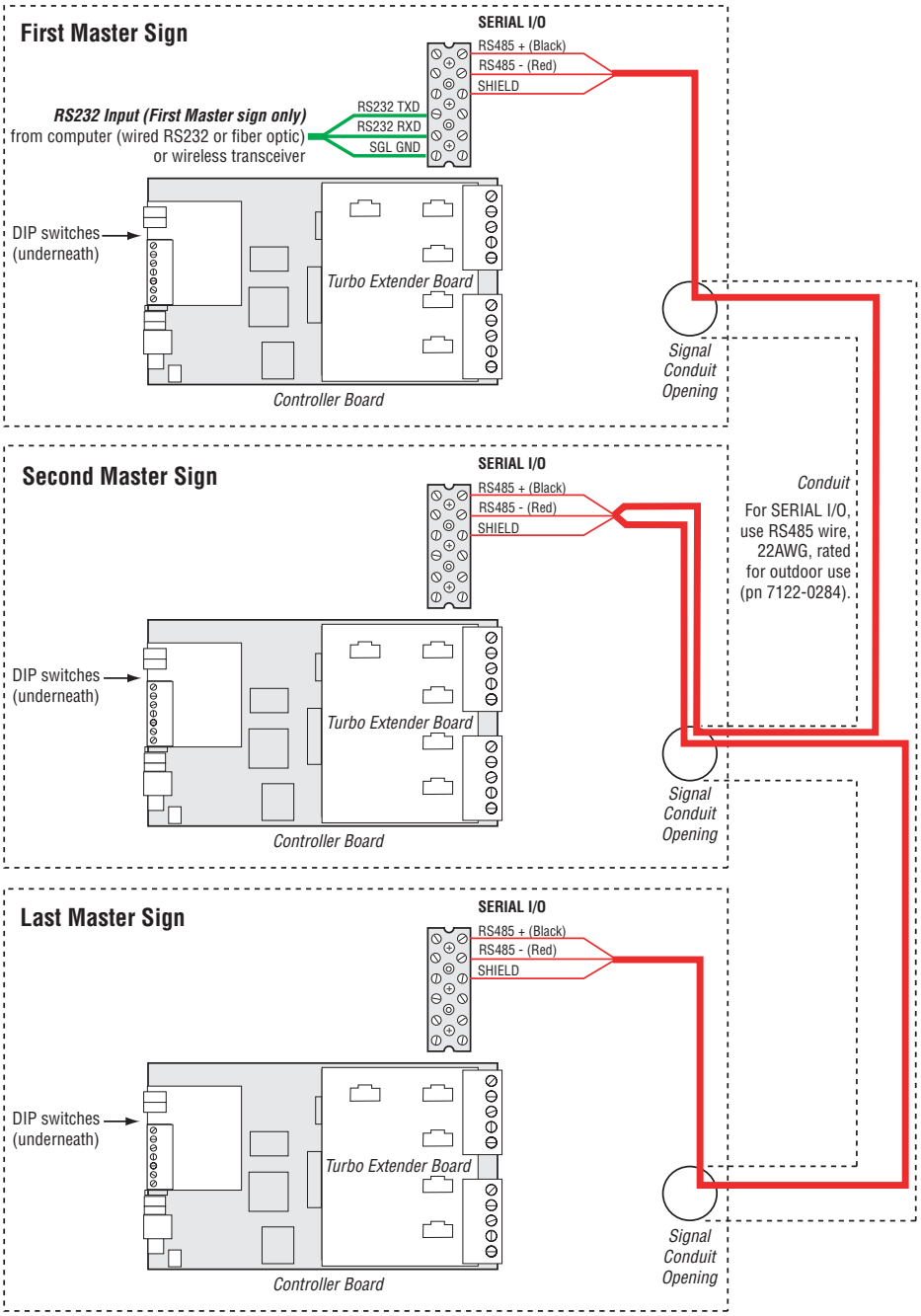
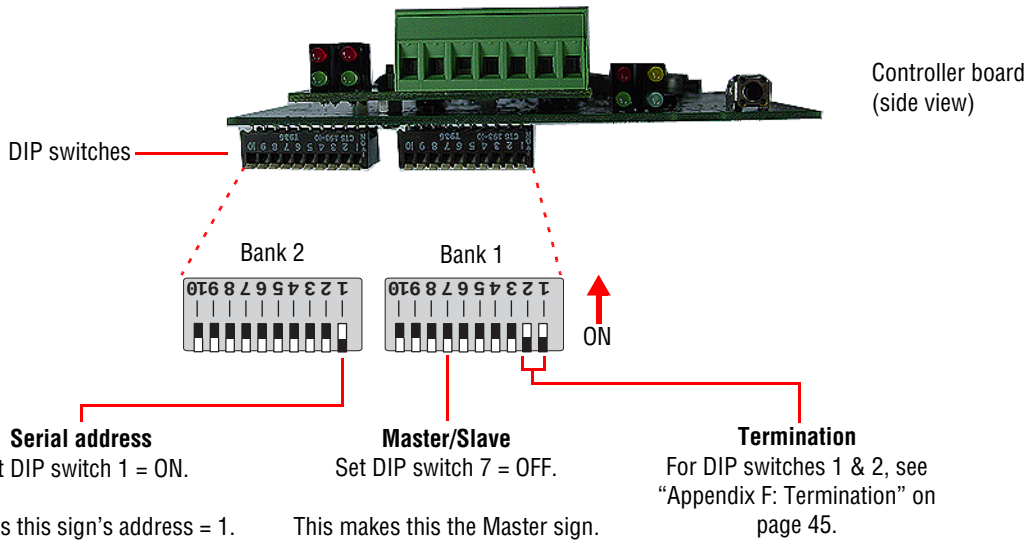


Figure 7: Multiple Master/Master sign connection

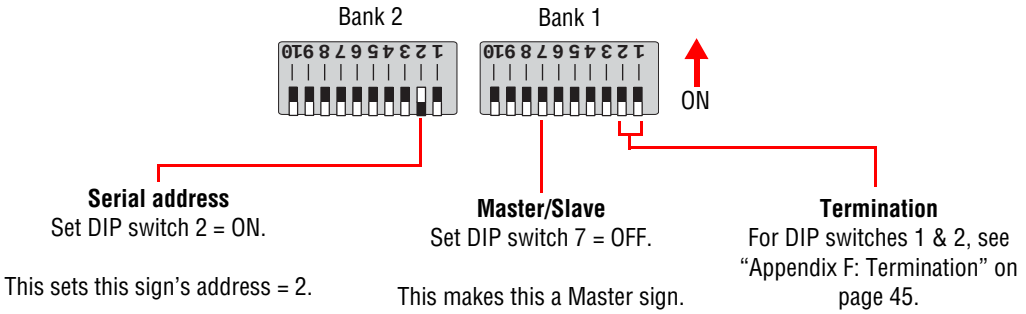
Set DIP switches

These are the recommended DIP switch settings for Master/Master multiple sign connection:

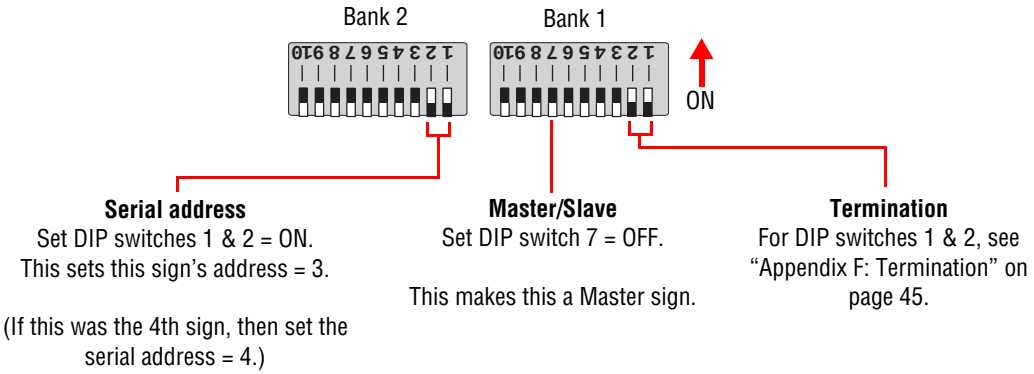
First Master sign settings:



Second Master sign settings:



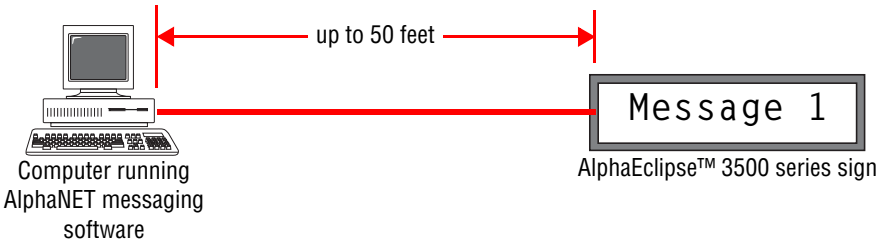
Last Master sign settings:



Wired (RS232) computer-to-sign connection

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.
2. Connect the computer to the sign as shown below:

Overview



Internal sign connections

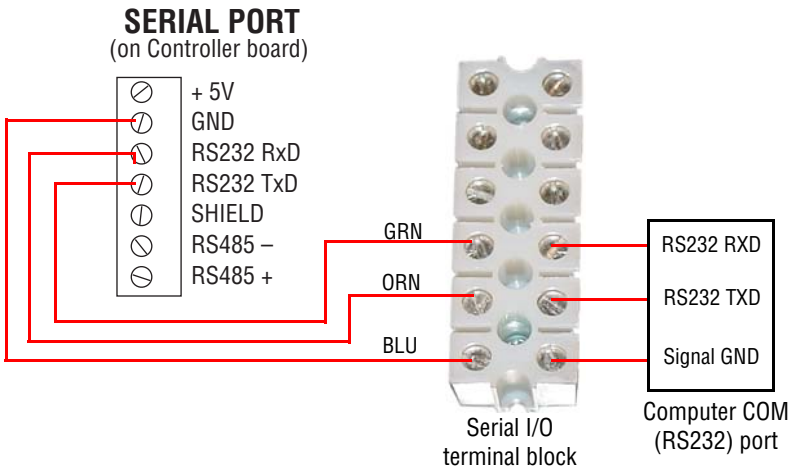


Figure 8: Wired RS232 computer-to-sign connection

Wired (RS485) computer-to-sign connection

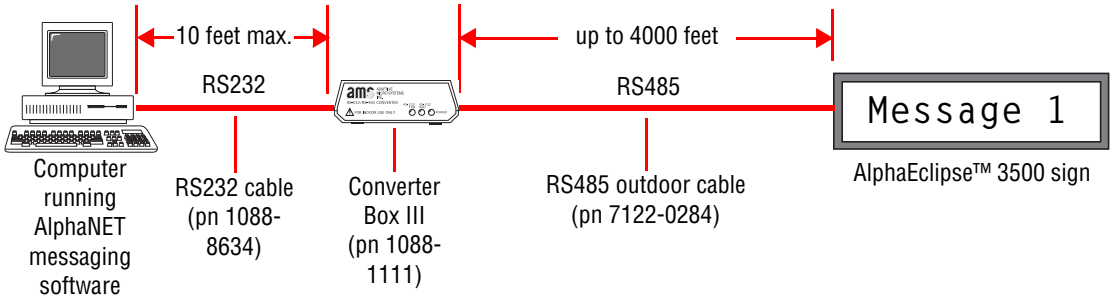
NOTE: Wired (RS485) connection can NOT be used with signs that are part of a Master/Slave network.

1. Open the sign according to "Appendix D: Opening and closing the sign" on page 35.
2. Connect the computer to the sign as shown below:

   NOTE: AlphaEclipse™ signs that are connected using RS485 must be properly terminated in order for the signs to operate. See "Appendix F: Termination" on page 45 for more information.

   NOTE: The Converter Box III cannot be located outdoors.

Overview



Internal sign connections

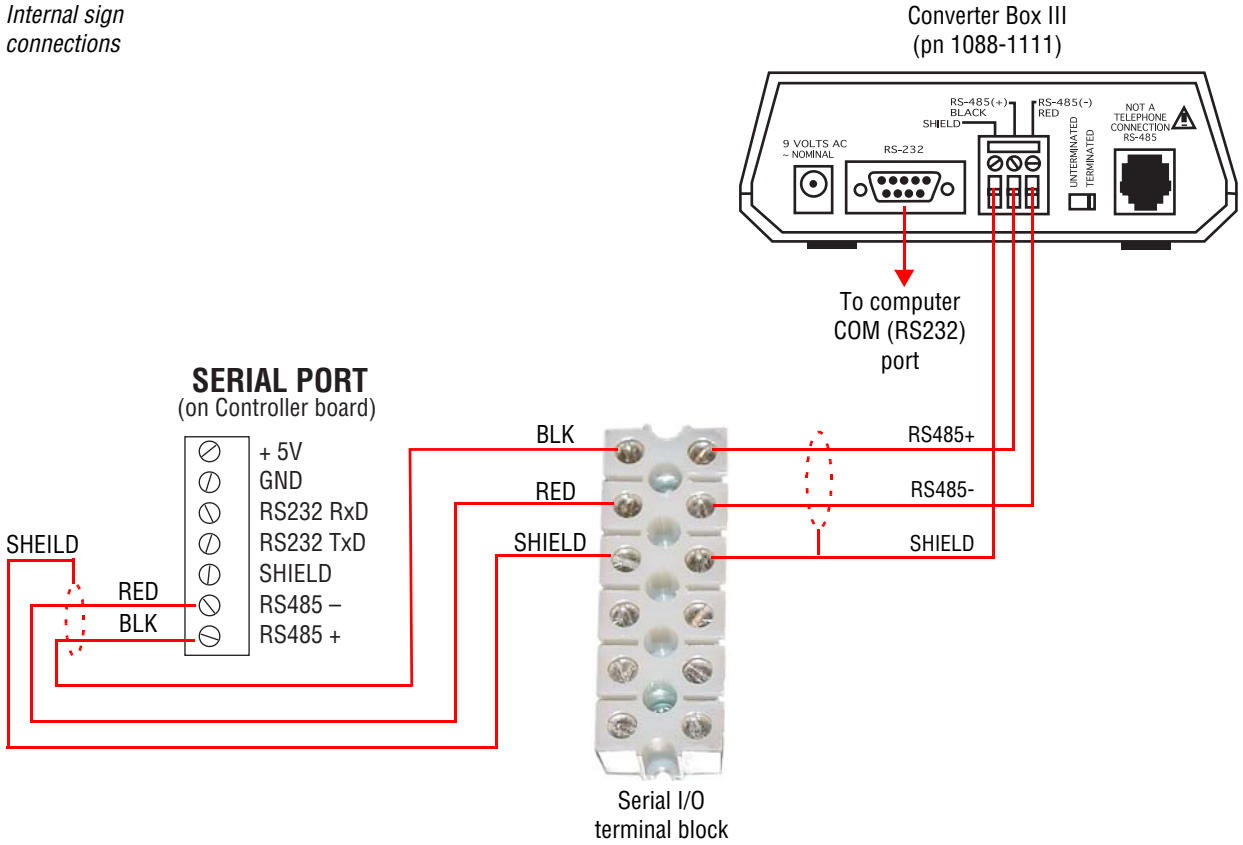


Figure 9: Wired RS485 computer-to-sign connection

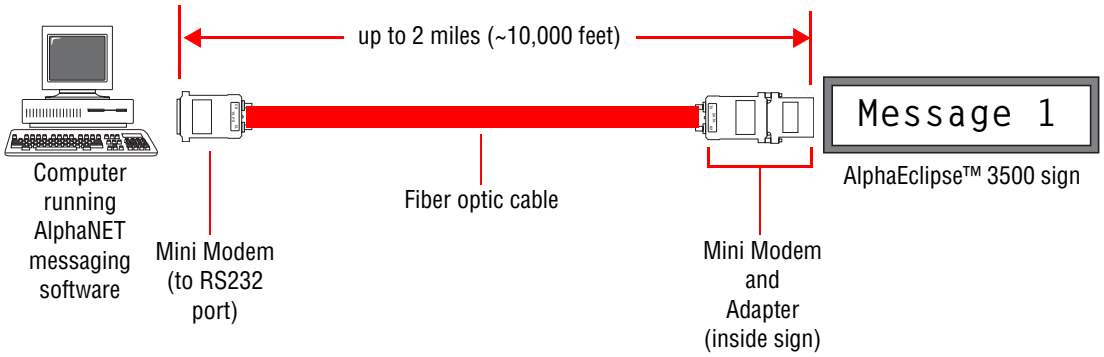
Fiber optic computer-to-sign connection

See also “Fiber optic modem option” on page 43.

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.
2. Connect the computer to the sign as shown below:

   NOTE: Sign networks that use fiber optic cable should only be installed by a qualified fiber optic technician.

Overview



Internal sign connections

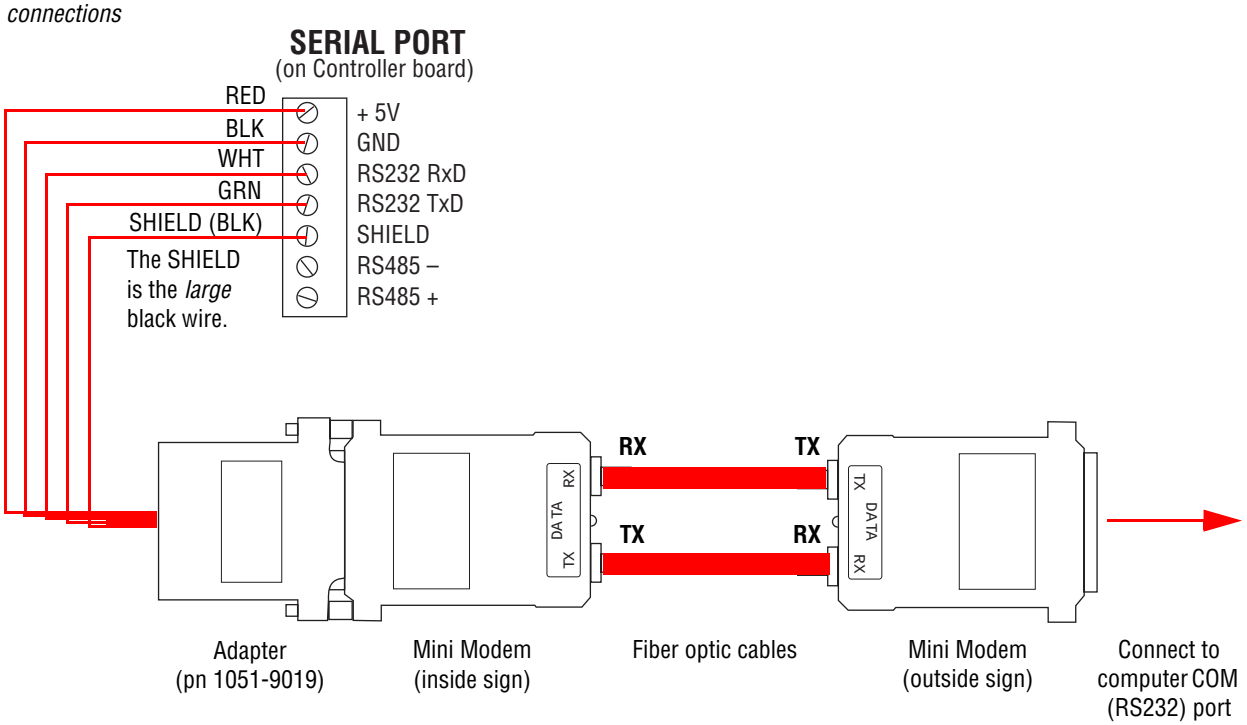


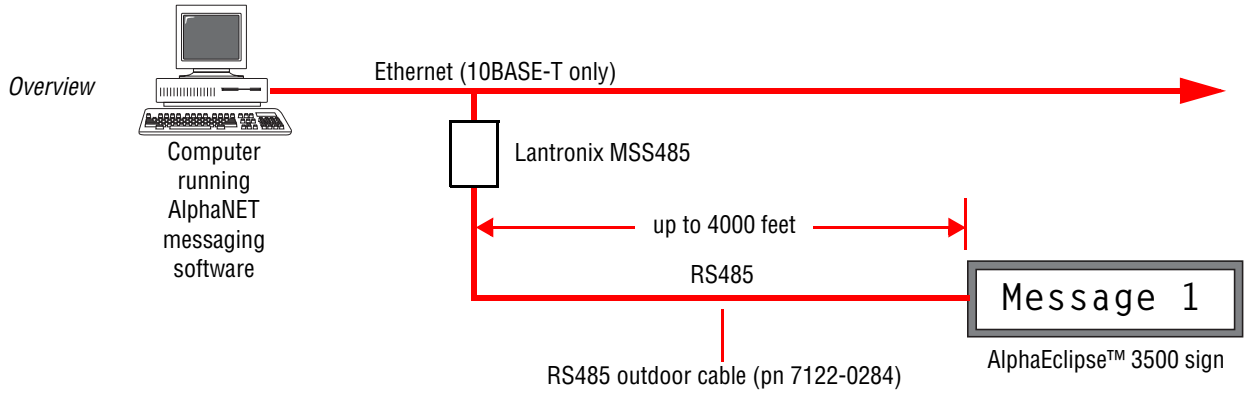
Figure 10: Fiber optic computer-to-sign connection

Ethernet computer-to-sign connection

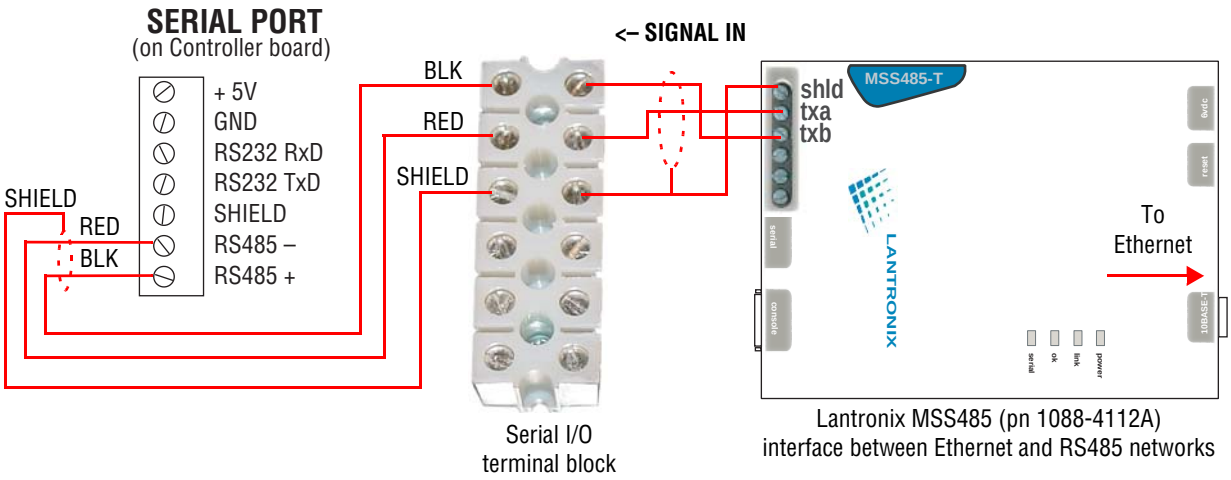
1. Open the sign according to "Appendix D: Opening and closing the sign" on page 35.
2. Connect the computer to the sign as shown below:

NOTE: AlphaEclipse™ signs that are connected using RS485 must be properly terminated in order for the signs to operate. See "Appendix F: Termination" on page 45 for more information.

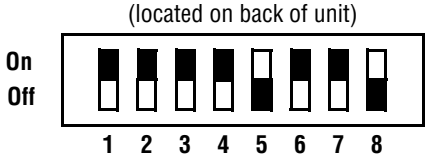
NOTE: The Lantronix MSS485 cannot be located outdoors.



Internal sign connections



MSS485 DIP switch settings
(located on back of unit)



Switch(es)	Setting	Meaning
1, 2, 3	On / On / On	2-wire RS485
4, 5	On / Off	2-wire RS485 termination
6, 7	On / On	RX biasing
8	Off	Float shield

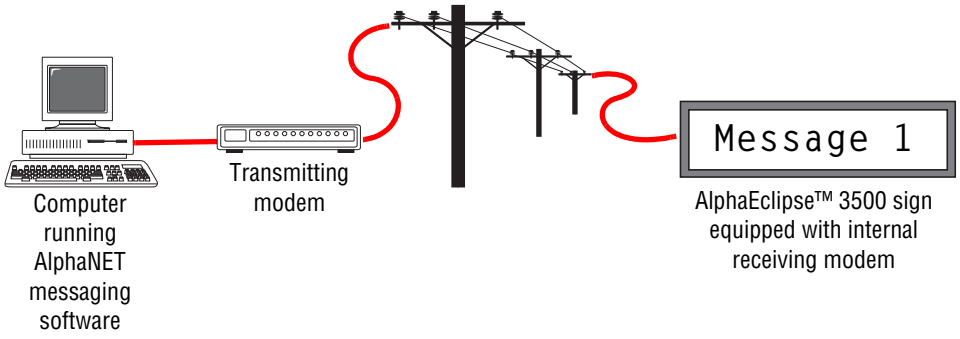
Figure 11: Ethernet computer-to-sign connection

Modem computer-to-sign connection

See also “Modem option” on page 40.

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.
2. Connect the computer to the sign as shown below:

Overview



Internal sign connections

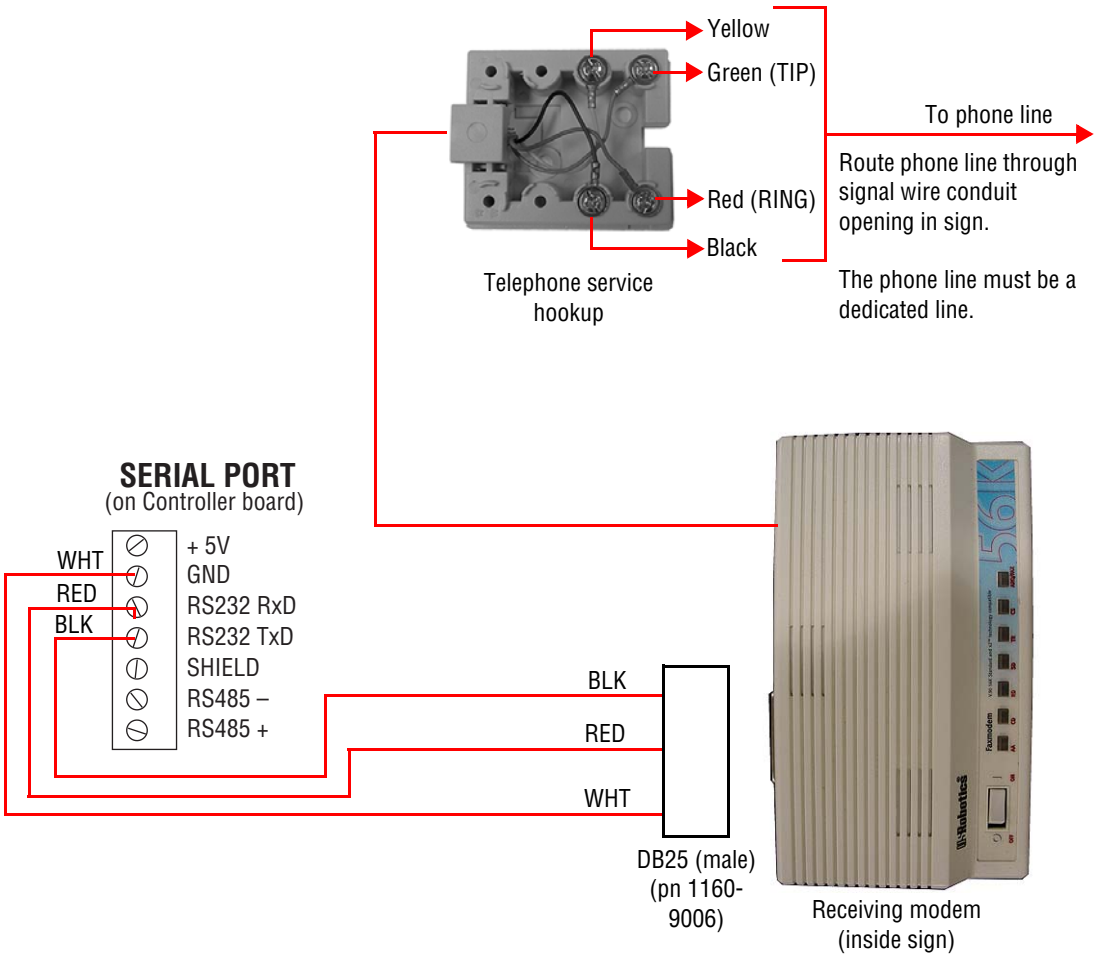


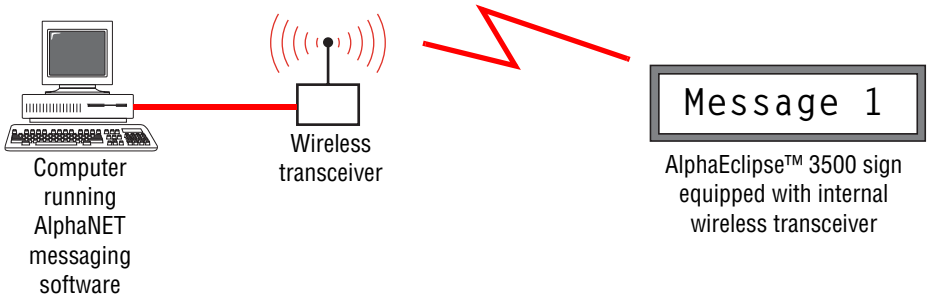
Figure 12: Modem computer-to-sign connection

Wireless computer-to-sign connection

See also “Wireless transceiver option” on page 41.

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.
2. Connect the computer to the sign as shown below:

Overview



Internal sign connections

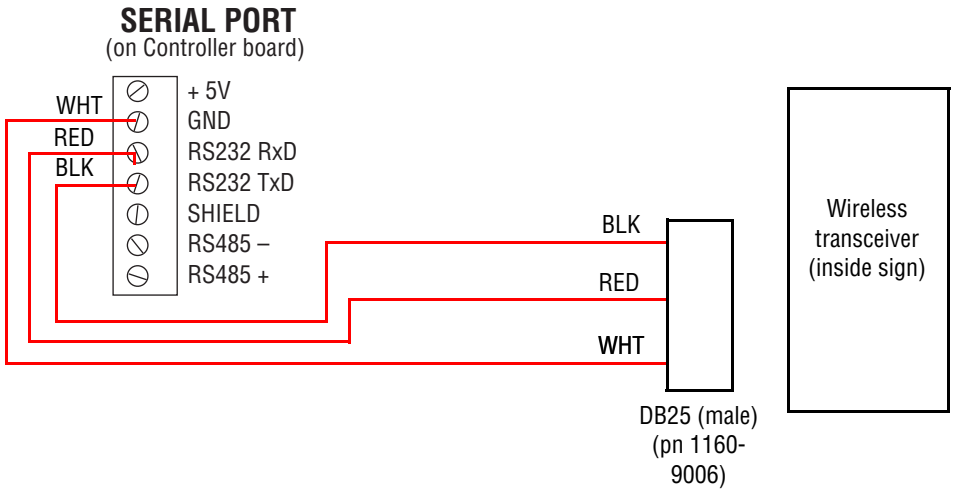


Figure 13: Wireless computer-to-sign connection

External connection box computer-to-sign connection

When a sign is not permanently connected to a computer, use this option to create a temporary RS485 connection to a computer:

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.
2. Connect the computer to the sign as shown below:

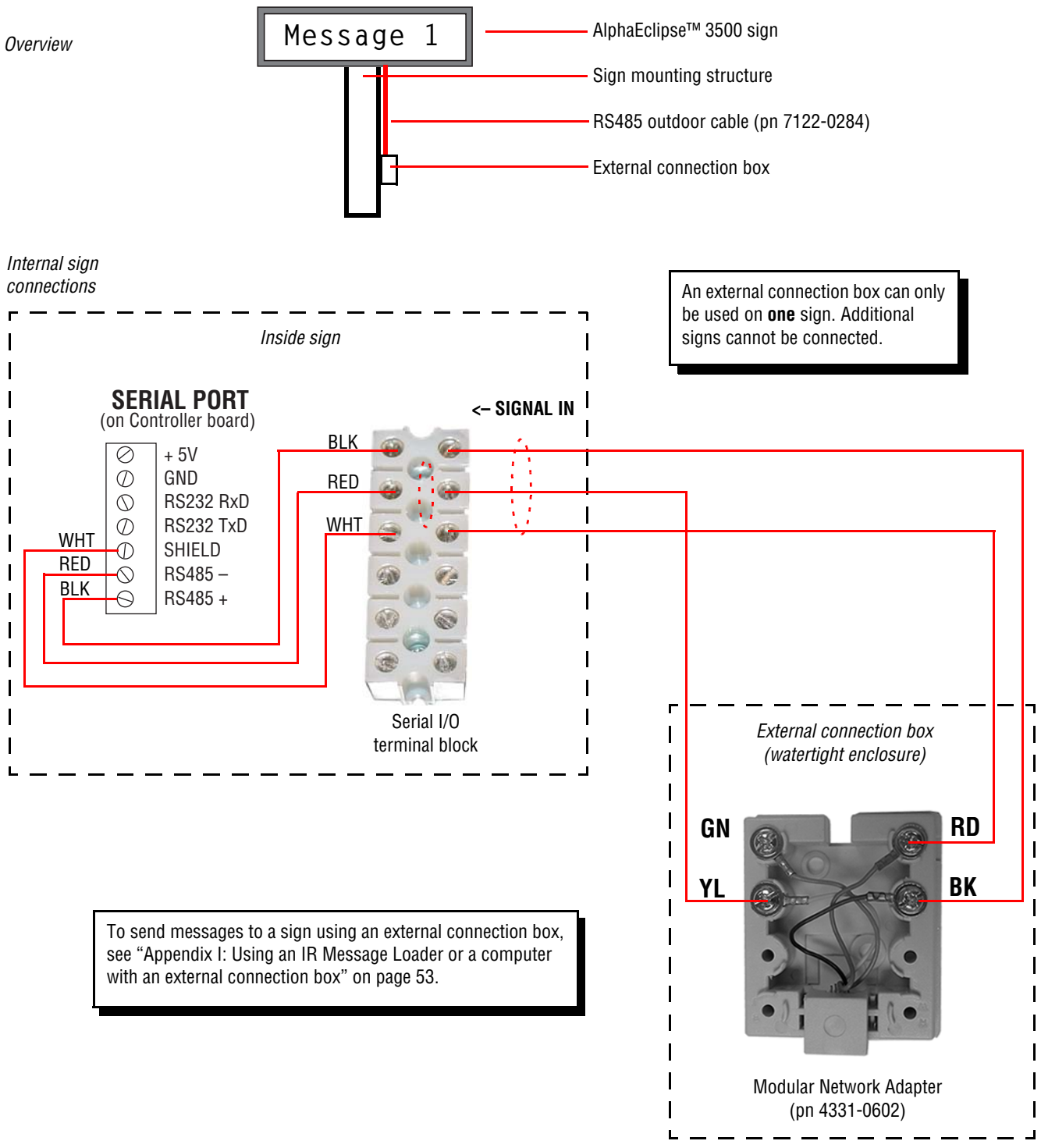
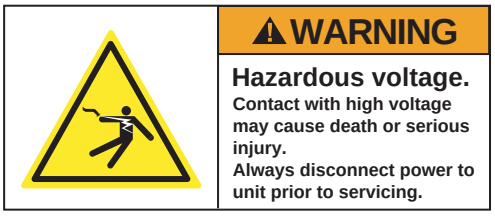
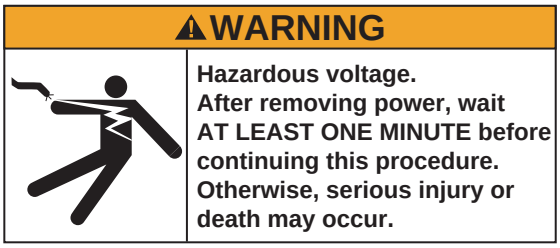


Figure 14: External connection box

Electrical installation

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





Guidelines for electrical installation

- Inspect all internal sign cabling for proper connection and seating.
- All power wiring must be from circuit breaker-protected lines.
- A two-pole disconnect device must be installed in the building wiring for each branch circuit supplying the sign.
- The sign must be properly earth grounded. The sign's support structure should NOT be used as ground.
- Run separate conduits for signal wires (for example, RS232, RS485) and for power wires.
- All electrical connections must be watertight.
- Use minimum 85° C copper wire only.

  Utiliser uniquement un fil en cuivre pouvant supporter 85° C minimum.

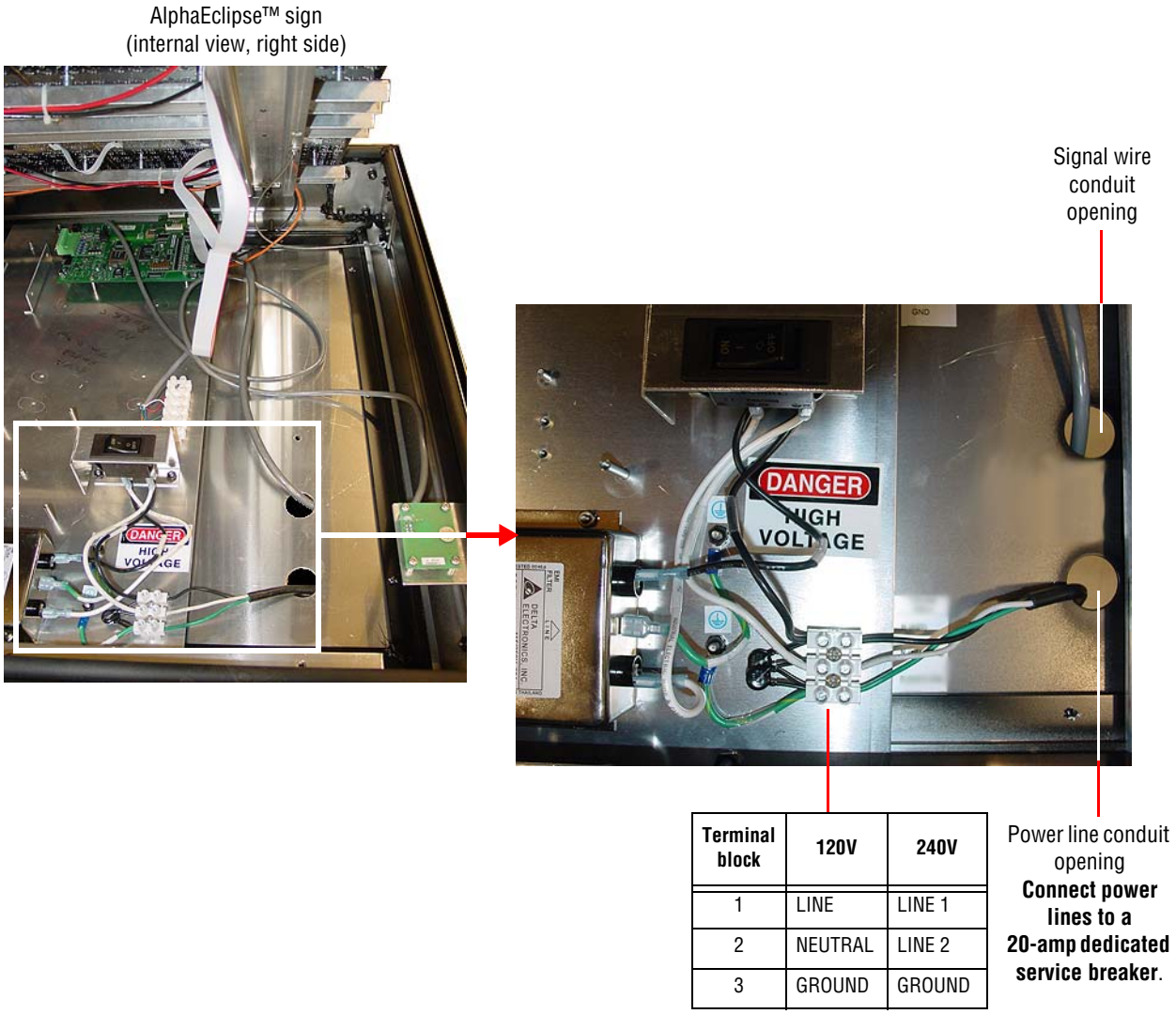
Open the sign

1. Open the sign according to “Appendix D: Opening and closing the sign” on page 35.

Connect power to the sign

2. Connect the sign to an appropriate power source using either a single- or dual-ganged breaker. See “Technical specifications” on page 52 to determine which type of breaker to use.

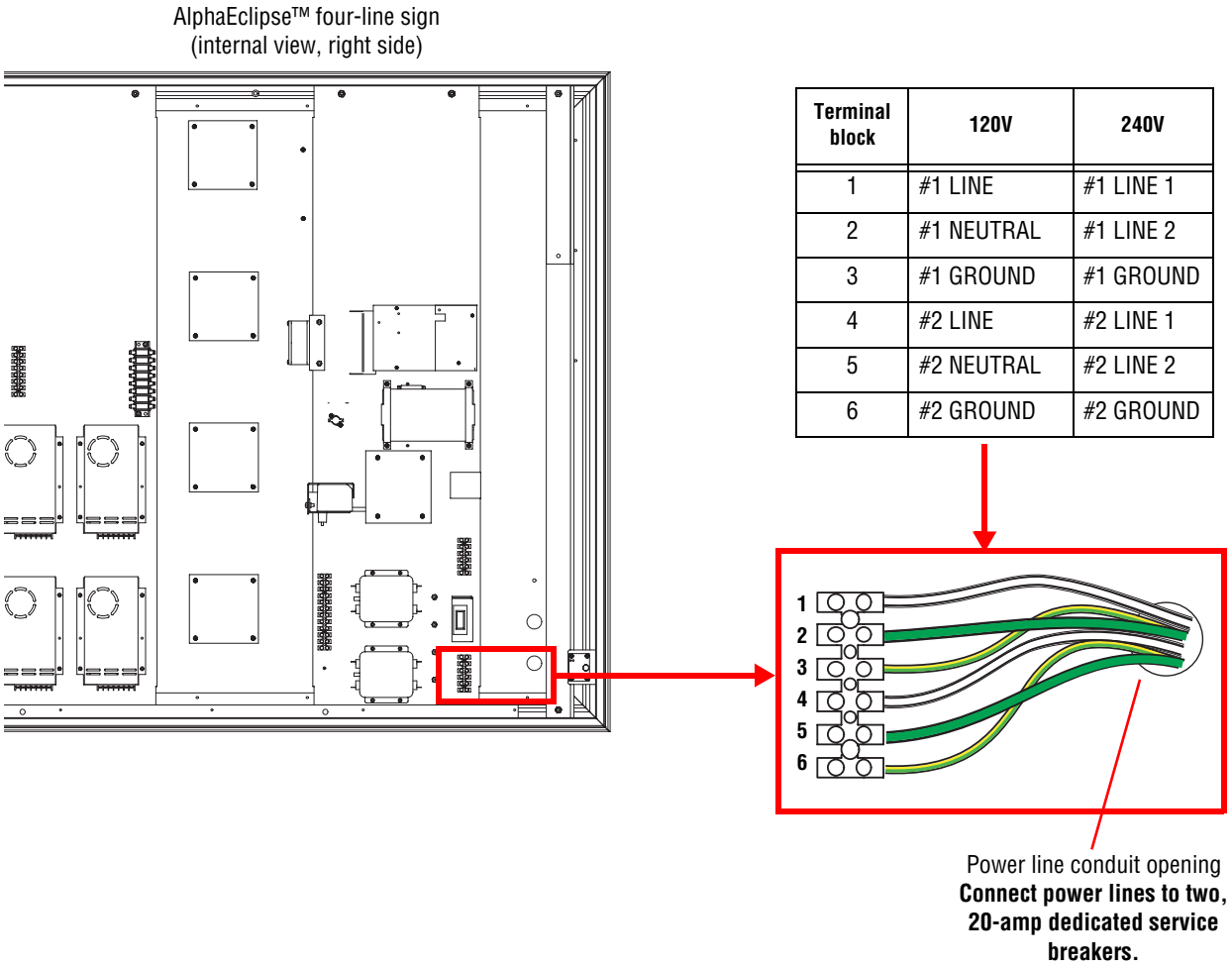
Single-ganged breaker power wiring



Terminal block	120V	240V
1	LINE	LINE 1
2	NEUTRAL	LINE 2
3	GROUND	GROUND

Figure 15: Single-ganged breaker power wiring

Dual-ganged breaker power wiring



Terminal block	120V	240V
1	#1 LINE	#1 LINE 1
2	#1 NEUTRAL	#1 LINE 2
3	#1 GROUND	#1 GROUND
4	#2 LINE	#2 LINE 1
5	#2 NEUTRAL	#2 LINE 2
6	#2 GROUND	#2 GROUND

Figure 16: Dual-ganged breaker power wiring

Ground the sign

3. The sign must be properly earth grounded. *The sign's support structure should NOT be used as ground*.

Test the exhaust fans

4. Apply power to the sign.
5. Push **1** on the sign's internal power switch.
6. If the exhaust fans are not already on, press the fan test button which is located on the sign's internal power switch. All the exhaust fans should start up.

Close the sign

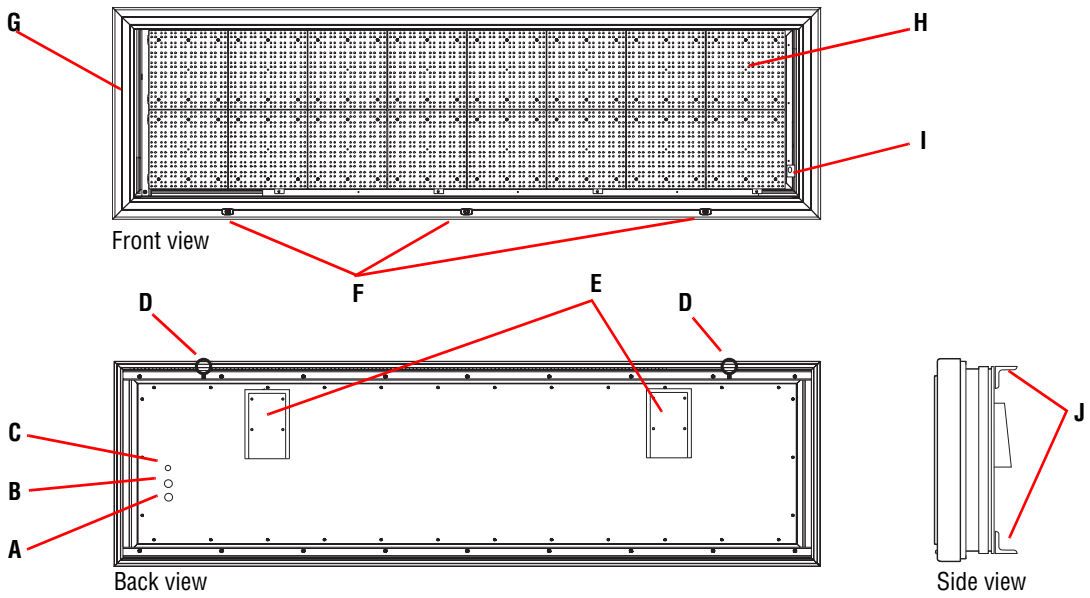
7. See "Appendix D: Opening and closing the sign" on page 35.

Appendix

Appendix A: Sign description

Outside view

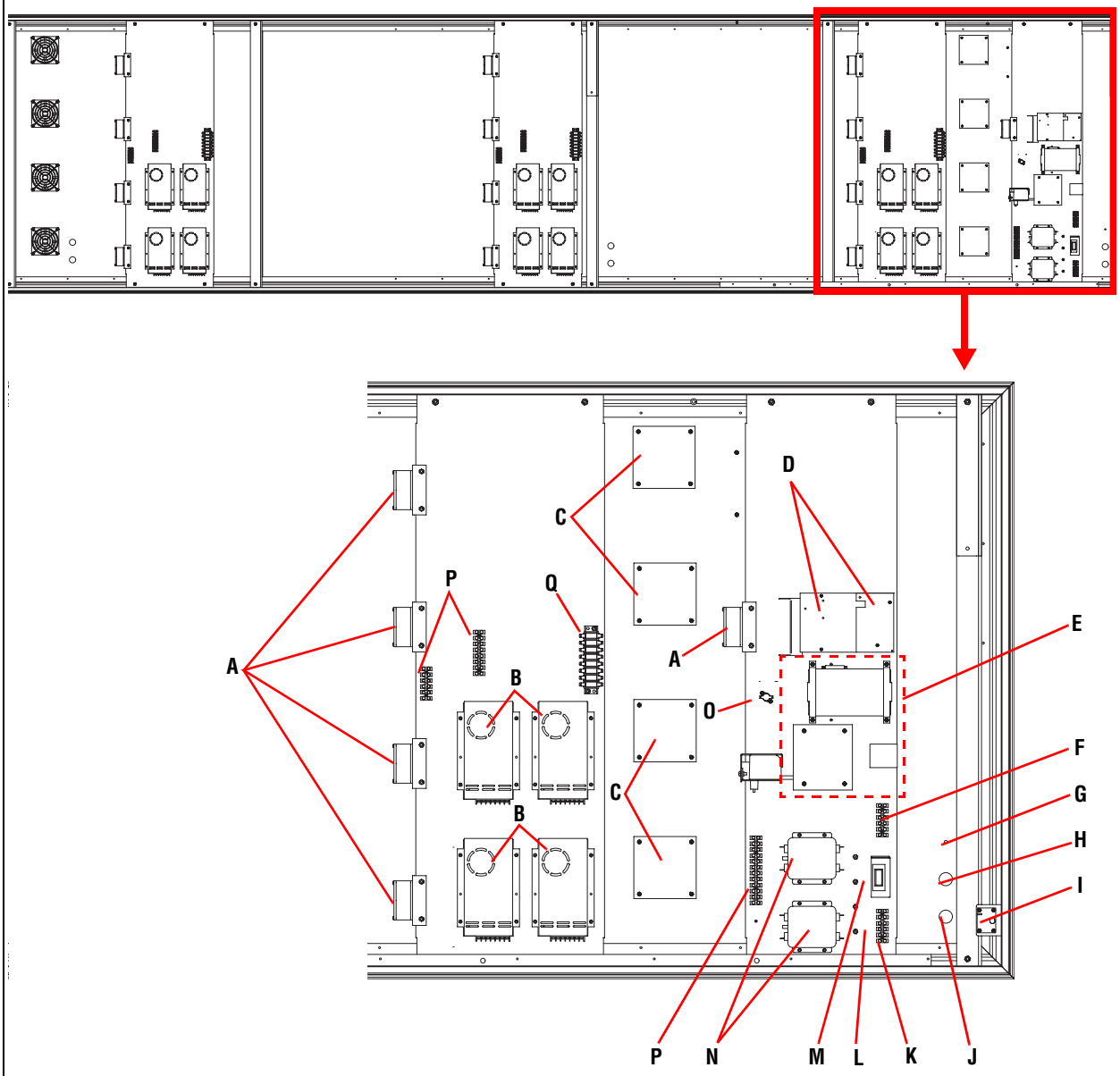
Shown below is a 2-line sign (64 x 16 LED matrix)
Other sign sizes are similar.



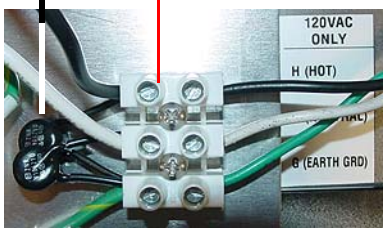
Item	Name	Description
A	Power conduit	Access for electrical power. Must be sealed with weather-proof conduit during installation.
B	Signal and temperature probe conduit	Access for communication signals and temperature probe. Must be sealed with weather-proof conduit during installation.
C	Wireless transceiver antenna conduit	Access for antenna for optional wireless transceiver
D	Lifting eyebolt	Used to lift the sign. Should NOT be used to mount the sign.
E	Fan covers	Weather-resistant louvers allow air movement through the sign
F	Locking latch	Locks the sign closed. Requires key (included). Number of latches depends on the width of the sign.
G	Door	Opens for access to internal sign components. Gas cylinders hold the open door in place.
H	LED lens cover	Polycarbonate lens cover in the front access cover
I	Photocell	Senses available light and dims the LEDs at sunset. The LEDs are dimmed by 50% (default setting).
J	Mounting brackets	Used to attach the sign to a structure.

Inside view

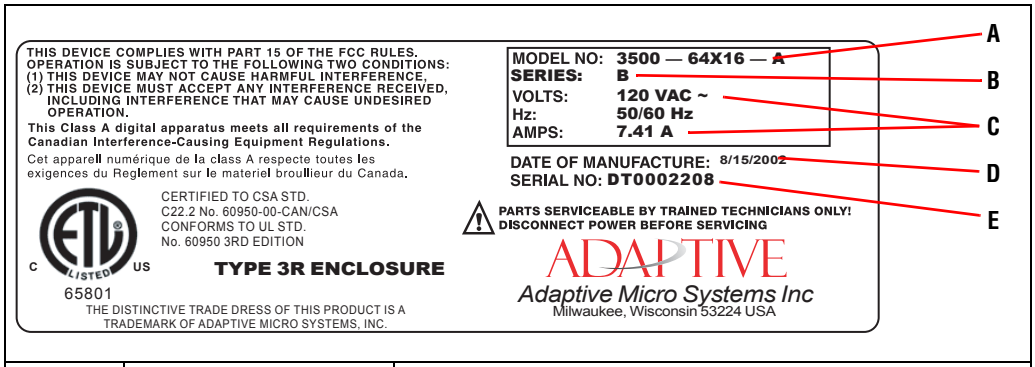
Shown below is a 4-line sign.
Other sign sizes are similar.



Item	Name	Description
A	Internal fan, 120V Internal fan, 240V	Circulates air in the sign
B	Power supply	Supplies power to fans, Controller board, and LED boards
C	Exhaust fan, 120V Exhaust fan, 240V	Dissipates heat from sign
D	Controller board	Controls sign operation
	Turbo Extender board	Plugs into the Controller board.

E	Modem kit, 120V	Allows sending messages to sign via a modem (optional)
	Modem kit, 240V	
	Transceiver kit, 120V	Allows sending messages to sign via wireless transmitter (optional)
	Transceiver kit, 240V	
F	Signal I/O terminal block	Used for RS232 or RS485 communication with sign:  **RS485 +** **RS485 -** **SHIELD** **RS232 TXD** **RS232 RXD** **SGL GND**
G	Wireless transceiver antenna conduit opening	Used to connect antenna to the optional wireless transceiver
H	Signal wire conduit opening	Used to run a RS232 or RS485 signal wire or fiber optic cable to sign
I	Photocell	Contains light-sensitive photocell used to dim the sign's LEDs
J	Power line conduit opening	Wires from power supply terminal block are run though this opening to a suitable power source.
K	Power supply terminal block	Used to connect the sign to an appropriate power supply
L	Surge suppressors	Protects the sign from electrical surges. Two surge suppressors (circled below) are used per sign. Surge suppressors — Power supply terminal block 
M	Power switch	Used to disconnect sign from power source
N	Line filter	Removes electrical noise (EMI) from power supply connection
O	Exhaust fan thermostat	Turns on exhaust fans when inside of unit gets too hot
P	5V connection terminal	Provides power to LED boards
Q	120/240V connection terminal	An all-plastic terminal strip that provides power to the power supplies and fans

Appendix B: Equipment identification



Item	Name	Description
A	Model number	3500 — 64X16A LED lamp color: • A = Amber • R = Red Width (pixel columns) Height (pixel rows) LED lamp viewing angle: • 00 = 30 degree • 01 = 70 degree LED pitch: • 35 = 1.4-inch pitch
B	Series letter	Used to differentiate sign versions
C	Electrical information	Input voltage, frequency, and amperage
D	Date of manufacture	Month, day, and year the sign was made
E	Serial number	Consecutive, unique identification number

Appendix C: Networking signs

NOTE: Sign networks that use fiber optic cable should only be installed by a qualified fiber optic technician.

NOTE: In order to display messages on an AlphaEclipse™ sign, a sign must be connected to a computer that has sign messaging software, like AlphaNET software, installed.

Computer-to-sign communication methods

There are a number of ways to connect an AlphaEclipse™ sign to a computer:

- Wired (RS232, RS485)
- Fiber optic
- Modem
- Wireless
- External connection box

Distance from computer to sign (feet)	Indoor use					Outdoor use				
	Networking method									
	Wired			Modem[1]	Wireless[1,2]	Wired			Modem[1]	Wireless[1,3]
	RS232	RS485	Fiber optic			RS232	RS485	Fiber optic		
up to 50	Yes	Yes	Yes[4]	Yes	Yes	Yes	Yes	Yes[4]	Yes	Yes
50 to 1000	No	Yes	Yes[4]	Yes	Yes	No	Yes	Yes[4]	Yes	Yes
1000 - 4000	No	Yes	Yes[4]	Yes	Yes	No	Yes	Yes[4]	Yes	Yes
4000+	No	No	Yes[4]	Yes	No	No	No	Yes[4]	Yes	Yes

NOTES:

[1] Installed and configured at the factory.

[2] Maximum *indoor* range of a Locus OS2400-232 wireless transceiver is about 1500 feet. Actual operating range depends on local environment, including obstructions and electrical interference.

[3] Maximum range of a Locus OS2400-232 wireless transceiver is about 10,000 feet (about 2 miles). Actual operating range depends on local environment, including obstructions and electrical interference.

[4]For a fiber optic data connection, the maximum distance between the sign and computer is 2 miles (~10,000 feet).

Sign-to-sign communication methods

NOTE: Each sign in a network should have its own unique serial address. To set a sign address, see "Sign operation settings (Bank 1 and Bank 2 DIP switches)" on page 48.

Also, there are several ways to *interconnect* two or more AlphaEclipse™ signs together:

- Wired (RS485)
- Modem
- Wireless

Networking method		Description
Wired	Master/Master	Signs connected this way can each display a unique message. One of the signs must be connected to a computer which is used to create and send messages. NOTES: • Messaging — a message can be displayed on all the signs in a Master/Master network by sending the message to sign address "00". Also, if each sign in a Master/Master network has a unique serial address (for example, "01", "02", and so on), then a different message can be sent to and displayed on each sign. • Temperature — to display the temperature on the signs in a Master/Master network, a temperature probe must be connected to *each* sign. If a sign attempts to display the temperature and does not have a temperature probe attached, the sign will display "ERR" in place of the temperature. • Time — Each Master sign must have its own temperature probe in order to show the temperature on each sign. Otherwise, a Master sign without a temperature probe will display "ERR" instead of the temperature.
	Master/Slave	Signs connected this way display the same message at the same time. This is called *simultaneous messaging* and is often used when signs are mounted back-to-back. The Master sign must be connected to a computer. The computer is used to create and send messages. NOTES: • Messaging — a message will be displayed *simultaneously* on all the signs in a Master/Slave network by sending the message to sign address "00" or to the sign address of the Master sign. *Messages should only be sent to the Master sign, not any of the Slave signs.* Otherwise, the message on the Slave sign(s) could get out of sync with the Master sign. • Temperature — to display the temperature on the signs in a Master/Slave network, a temperature probe must be connected to the Master sign. • Time — in Master/Slave mode, the time is synchronized at the top of every hour and also whenever a message is sent using the AlphaNET software.
Modem (option)		Each sign must be equipped with the internal receiving modem which requires a dedicated telephone line per sign. Messages are sent to the sign from a computer that is connected to a transmitting modem.
Wireless (option)		Each sign must be equipped with an internal wireless transceiver. Messages are sent to the sign from a computer that is connected to a wireless transceiver.

Sign network design

- Signs that are networked using RS485 should be “daisy chained” or connected one sign after the other. “Star” type network connections should not be used.

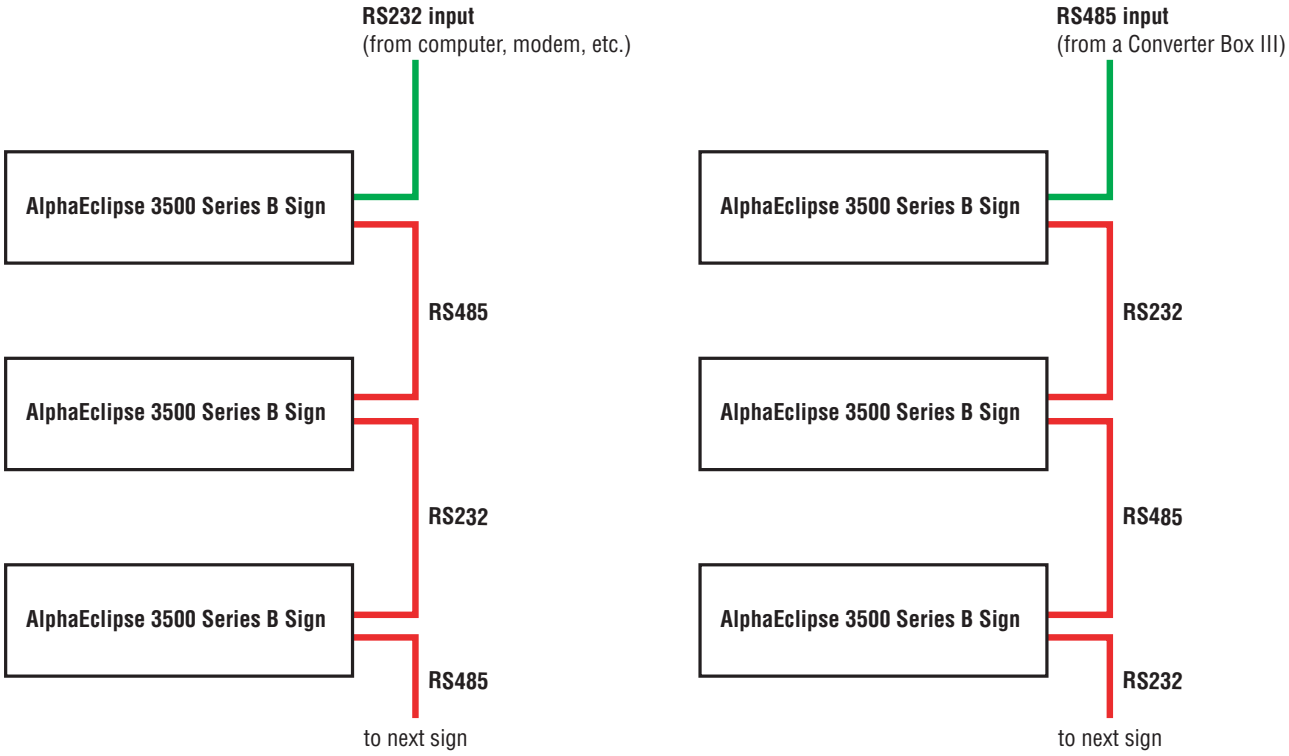
- In multi-sign networks, set a unique serial address for each sign. *However, don’t use serial address 0.* For example, set the serial address = 1 for the first sign, set the serial address = 2 for the second sign, and so on. See “Sign operation settings (Bank 1 and Bank 2 DIP switches)” on page 48.

RS232/485 daisy chaining

Multiple signs can be networked using alternating RS232 and RS485 connections between each sign (as shown below).

NOTE: Remember: the maximum distance for an RS232 connection is 50 feet.

NOTE: Master/Slave sign networks require additional wiring to what is shown below.



Appendix D: Opening and closing the sign

NOTE: Do NOT attempt to open the door on a sign in windy conditions because if winds are sufficiently strong, the door could be damaged or blown off the sign.

⚠WARNING

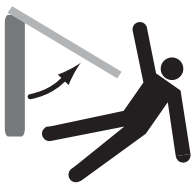
**Hazardous voltage.
Contact with high voltage may cause death or serious injury.
Always disconnect power to unit prior to servicing.**

1. Disconnect power from the sign.

Unlock and open the door

2. Use a latch key to unlock and open the locking latches along the lower edge of the sign's front door:

⚠WARNING



**Possible fall hazard.
Remain clear of access door when opening.
Install safety bar when door is open.**

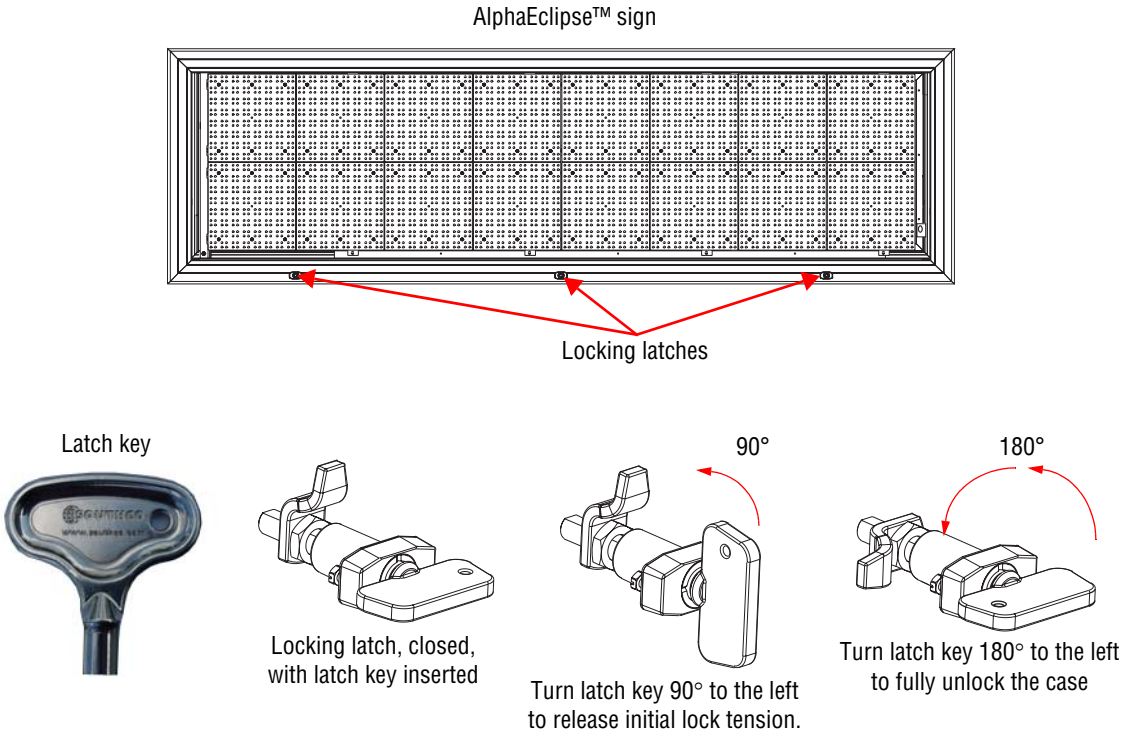


Figure 17: Opening/closing sign door

3. Stand away from the front of the unit. Then lift the door upward. Swing each safety bar up and attach it to the bolt inside the sign using the supplied wing nut. (See Figure 18 on page 36.)

4. Unscrew and remove the wing nut on each safety bar. Then swing each safety bar down and attach it to the bolt *outside* the sign using the wing nut:

   NOTE: If there is a plastic sleeve on the bolt, remove and save it.

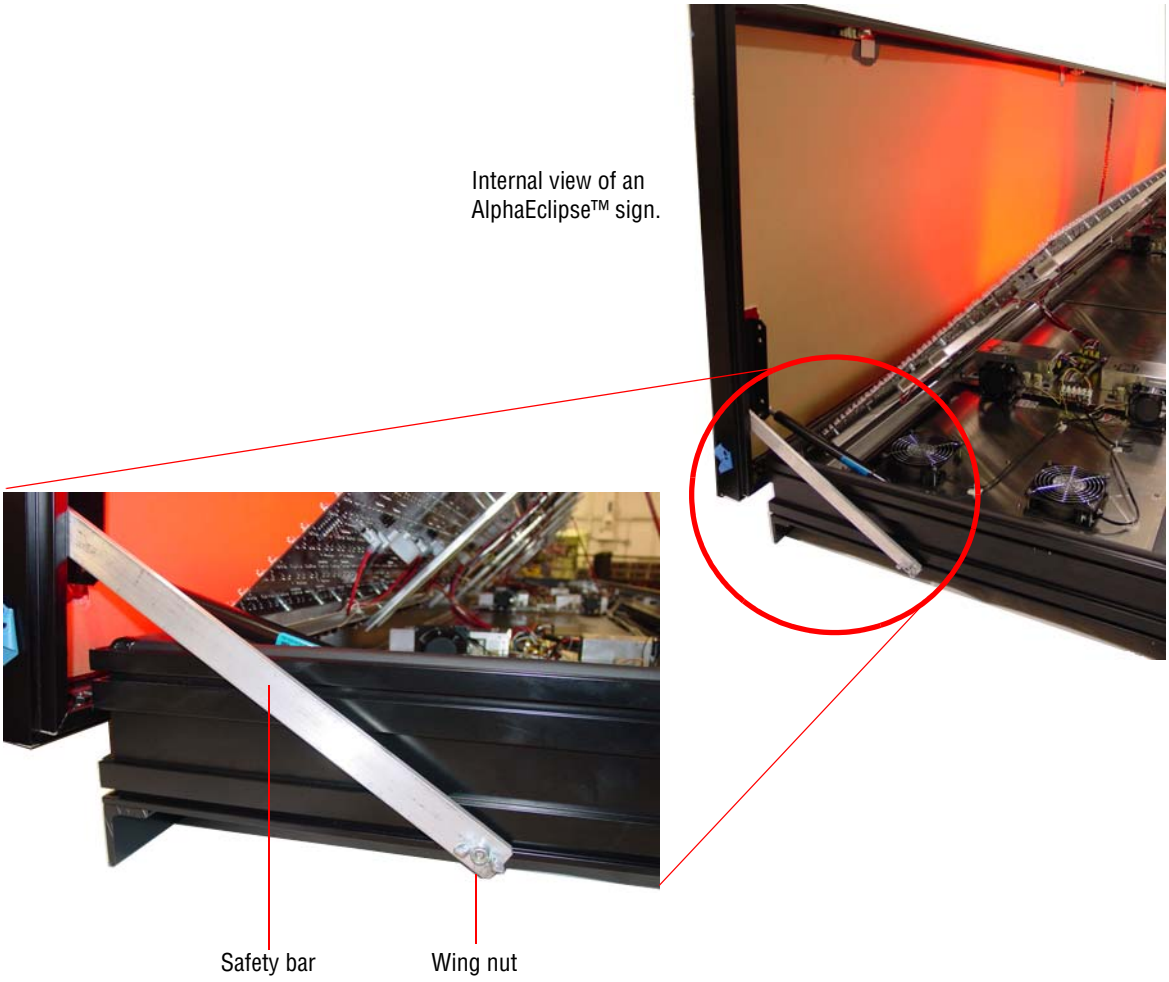
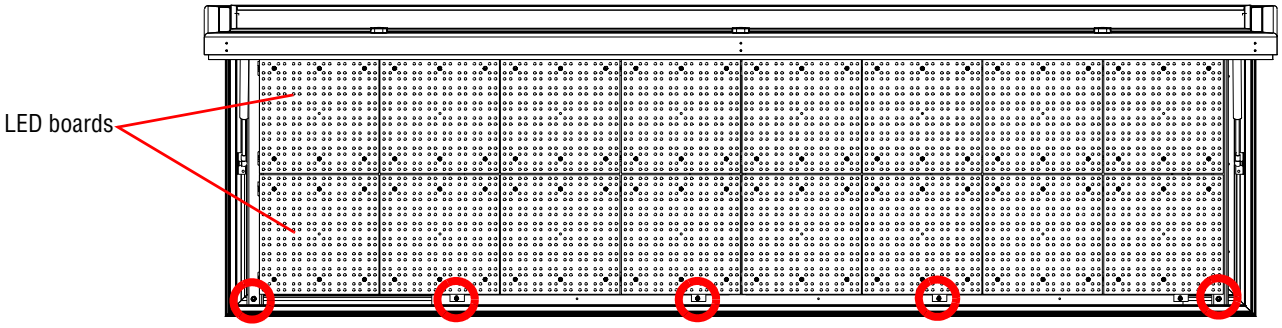


Figure 18: Safety bar location

Raise the LED boards

5. Remove the rail screws (circled below) at the bottom of each internal vertical rail. The number of rail screws varies with the size of the sign:



6. Carefully lift the LED boards up by placing your hands underneath the mounting rails — not an LED board — as shown below:

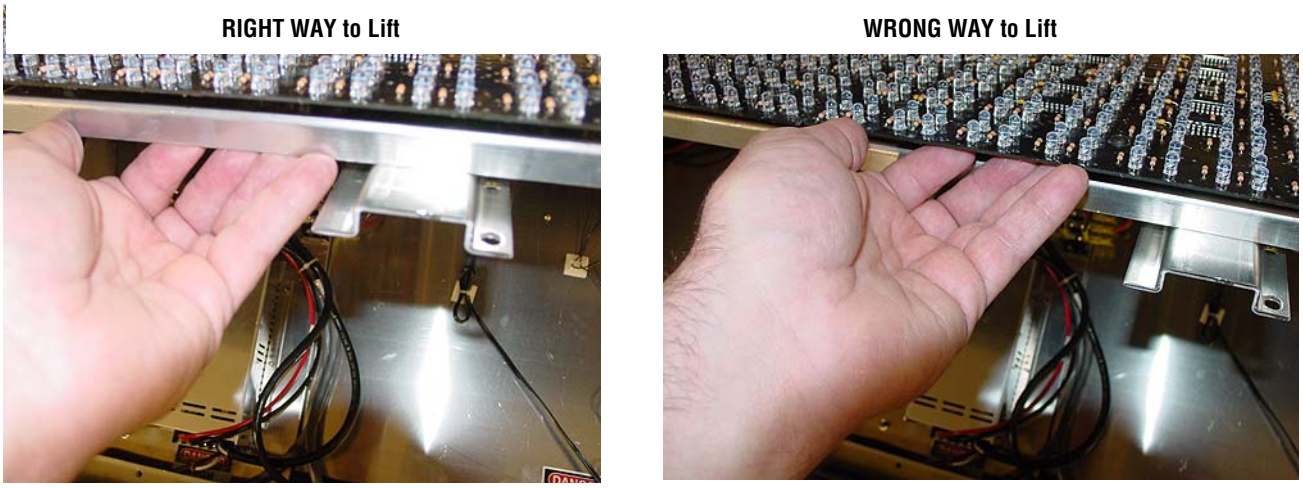


Figure 19: Correct way to lift LED boards

7. Lower and fasten each prop rod to support the LED boards:

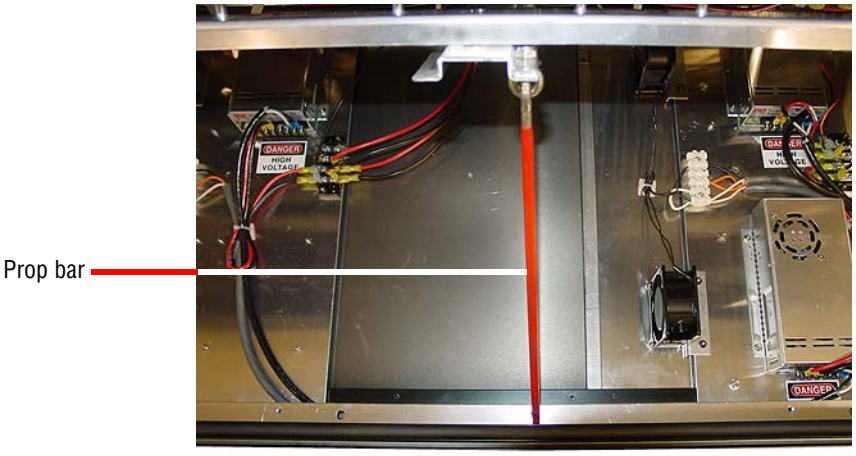


Figure 20: Installing prop bar under LED boards

8. After the LED boards are raised and all the prop rods are fastened, turn off the sign's internal power switch by pressing **0** on the internal power switch.

Closing the sign

1. Push **1** on the sign's internal power switch.
2. Raise each red prop rod and fasten each rod to a clip underneath the LED boards.

   NOTE: If a prop rod is not fastened, it could swing free and damage internal sign components.
3. Lower the LED boards.
4. Refasten the rail screws to the internal vertical rails.
5. Unfasten each safety bar and place inside the sign.
6. Lower the sign's door.
7. Use the locking latch to lock the door shut.
8. Apply power to the sign.

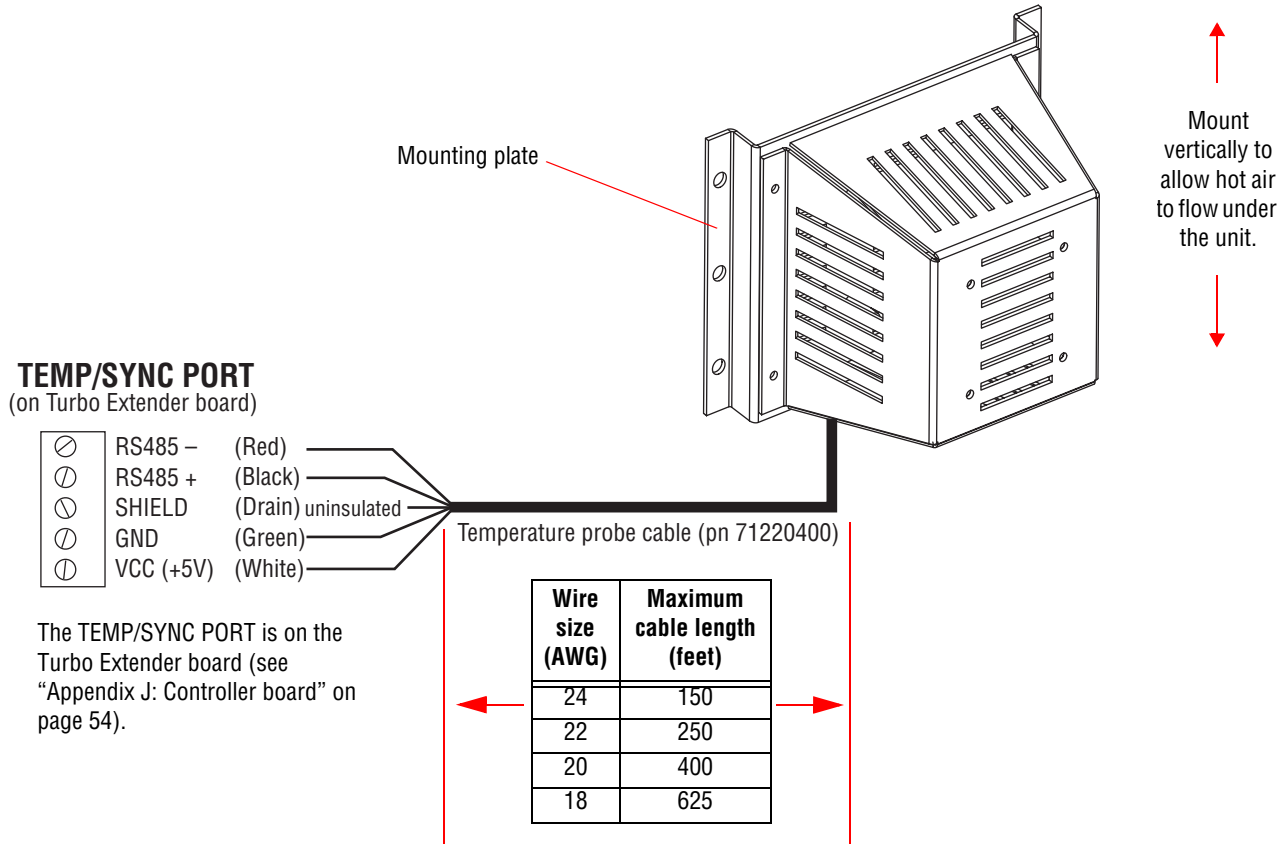
Temperature probe option

Mounting guidelines

- A good place to locate the temperature probe is underneath the eaves of a protected overhang. Choose a location where air movement is not restricted by nearby walls or other obstructions. Mount the temperature probe housing so that convection currents, or rising hot air flows, are not blocked by the mounting plates.
- A location on the north side of a building, at least 6 feet off the ground, or other large structure will afford protection from the afternoon sun. Shield the probe from the effect of the direct sun, reflected heat, or any nearby sources of heat, such as chimneys, vents, or HVAC ducts.
- A light-colored background is preferable to a dark-colored mounting background. A location above vegetation is preferable to a location above asphalt or blacktop.

Installation

1. Mount the temperature probe vertically using the mounting plate on each side of the probe. The temperature probe can be mounted on either a flat or a curved surface.
2. Run the temperature probe cable into the sign through the signal wire conduit opening. Connect the temperature probe cable to the TEMP/SYNC PORT on the Turbo Extender board (see “Appendix J: Controller board” on page 54):



Wire size (AWG)	Maximum cable length (feet)
24	150
22	250
20	400
18	625

Figure 21: Temperature probe installation

Modem option

This option allows messages to be sent from a computer that has a transmitting modem to a sign that has a receiving modem installed. Each modem must be attached to its own phone line.

NOTE: The modem option only includes the installation of a receiving modem in a sign. The purchase and installation of the transmitting modem, which is attached to a computer, is the responsibility of the sign buyer.

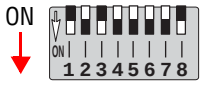
The US Robotics 56K modem is used as the receiving modem. This brand is also recommended as the transmitting modem.

Figure 22: US Robotics 56K modem

Receiving modem

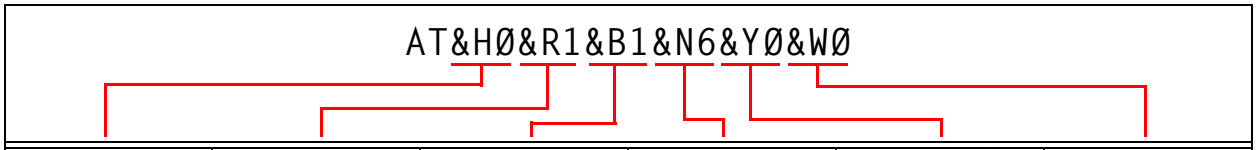
The receiving modem is installed inside a sign at the factory. For more information, see “Modem option” on page 40.

- Receiving modem DIP switch settings — The eight DIP switches on the US Robotics receiving modem are set as follows:



1	2	3	4	5	6	7	8
On	Off	On	Off	Off	Off	Off	On
Modem ignores DTR	Verbal (word) result codes	Display result codes	Echo offline commands	Auto answer on	Carrier detect on	Load user-defined configuration from memory.	Smart mode (recognize AT command set)

- Receiving modem internal configuration — The following AT command is sent to the modem with a program like HyperTerminal:



Disables flow control	Modem ignores RTS	Fixed serial port rate	Connection speed = 9600 baud	Loads Profile Ø into memory when modem is powered on.	Writes this current setup to Profile Ø in memory.

Transmitting modem

The US Robotics 56K modem is recommended for use as the transmitting modem. This modem does not require any special setup for sending messages to a sign.

Wireless transceiver option

For this option, one wireless transceiver (the “master”) is connected to a computer and sends messages to another transceiver (the “remote”) inside a sign. Both transceivers require antennas and both are programmed at the factory.

On the remote transceiver, this antenna would be mounted outside of the sign. See “Antenna installation” on page 42.

Figure 23: Locus OS2400-232 wireless transceiver

Transceiver setup

NOTE: This information is based on Adaptive document number OTI00313A.

NOTE: For more information about the Locus OS2400-232, see the product manual **OS2400 Radio Modem User’s Manual** or visit the company’s web site: http://www.overairsolutions.com.

Using the OverAir Solutions software from Locus, the following parameters were set for the master and the remote transceivers:

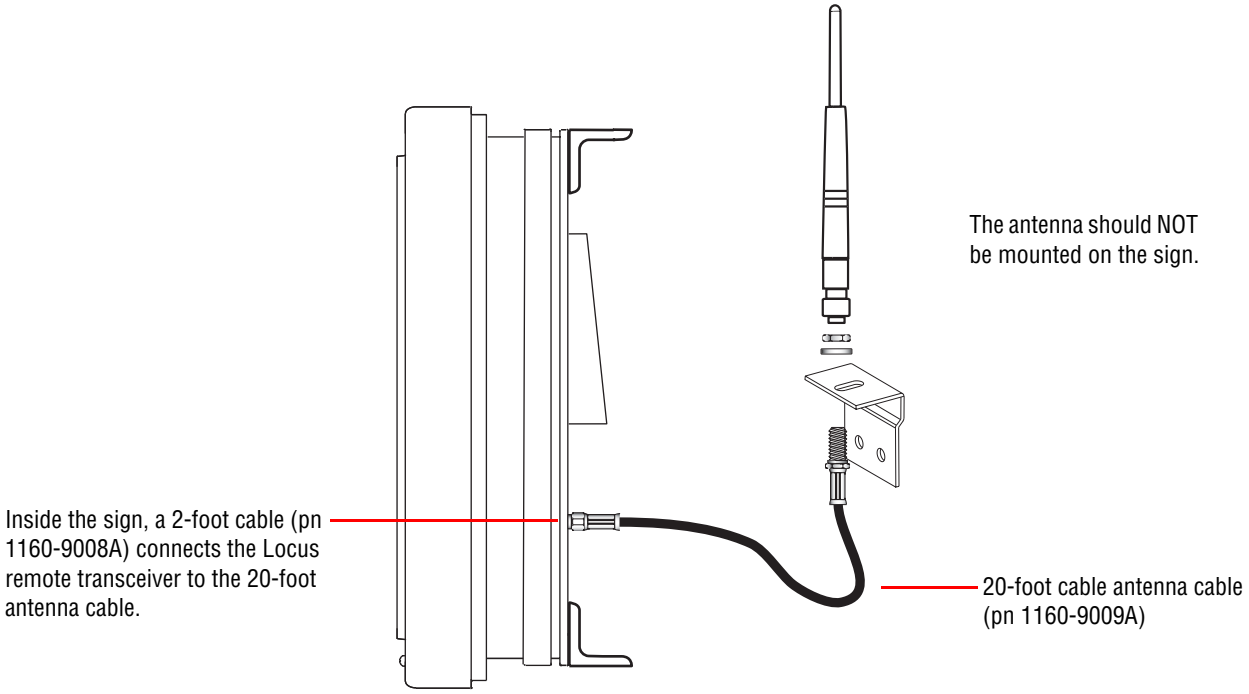
Parameter	Master transceiver (connected to computer)	Remote transceiver (installed inside sign)
Network Name	Network 1	
Network Type	Point to point	
Network Channel	1	
Radio Name	Master	Receive
Baud Rate	9600	9600
Parity	None	None
Data Bits	8	8
Stop Bits	1	1
Handshaking	None	None
Transmit Power	Max	Max

Antenna installation

Follow these guidelines for mounting the remote transceiver antenna:

- Install the antenna and bracket on a support structure other than the sign or the sign's mounting brackets. Do NOT drill a hole in the sign enclosure.
- Install the antenna in a location that will allow optimum line-of-sight transmission and reception of signals between the sending transceiver and the antenna. Do not install the antenna so that the sign is between the sending transceiver and the receiving antenna.
- Install the antenna in an unobstructed area, keeping adequate clearance from any objects that could block the signal.
- Install the antenna in a more elevated location than the sign, and, if possible, keep it vertical.

Mount the sign as shown:



Fiber optic modem option

Description

The fiber optic modem option allows messages to be sent from a computer to a sign at distances up to 2 miles. Fiber optic transmissions are not subject to electrical noise, ensure data security because eavesdropping is virtually impossible, and electrically isolate a computer from a sign so there is no spark hazard.

Two mini modems are necessary:

- a mini modem inside the sign connected with the 1051-9019 adapter, and
- a mini modem connected to the computer which will be used to send messages to the sign. The 1051-9019 adapter is not used. However, a RS232 cable (DB25-to-DB9 or DB25-to-DB25) is needed to connect this mini modem to a computer COM (RS232) port.

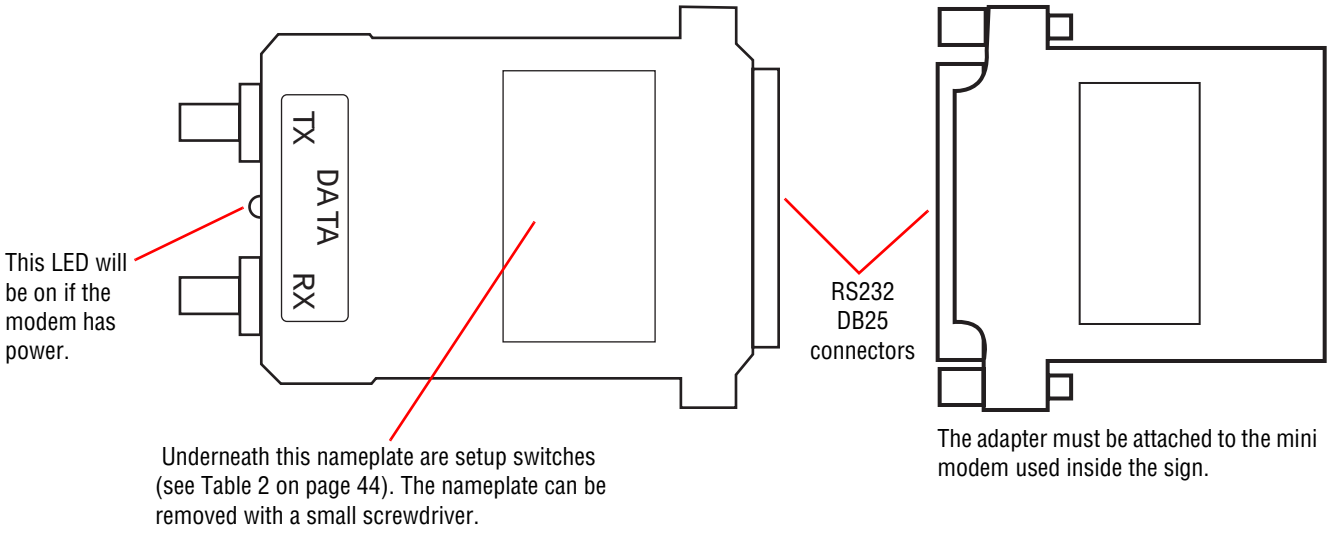


Figure 24: Black Box ME605A async fiber optic mini modem (left) and 1051-9019 adapter (right)

Specifications

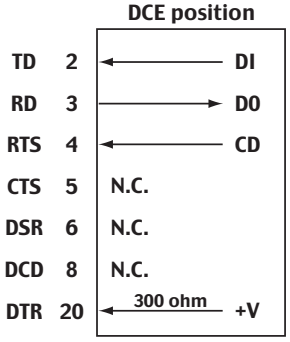
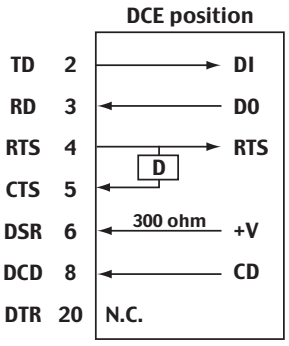
Table 1: Fiber optic mini modem specifications

Data rate:	Up to 19.2 Kbps
Pulse width distortion:	Less than 25%
Transmission line:	Duplex optical cable
Transmission mode:	Asynchronous, full- or half-duplex
Transmission controls:	Carrier constantly on or controlled by RTS
Optical output levels:	-28 dBm into 100/140 fiber -32 dBm into 62.5/125 fiber -36 dBm into 50/125 fiber
Receiver sensitivity:	-45 dBm
Operating wavelength:	850 nm

Table 1: Fiber optic mini modem specifications

Operating range:	Maximum range is 2 miles (3 km) of continuous fiber with the following fibers: • 100/140 fiber with attenuation of 4 dB/km • 62.5/125 fiber with attenuation of 3.5 dB/km • 50/125 fiber with attenuation of 3 dB/km
Indicators:	One power LED
Terminal interface:	One ITU V.24/EIA RS232C integral DB25 connector
Fiber optic interface:	Two ST connectors
Operating conditions:	• Temperature — 32 to 122°F (0 to 50°C) • Humidity — up to 90%, non condensing
Size:	0.7 x 2.1 x 3.1 in (1.8 x 5.3 x 7.8 cm)
Weight:	1.3 oz (36 g)

Table 2: Fiber optic modem setup switches

Switch	Function	Position	Factory setting
CARR	Selects carrier constantly on or controlled by RTS.	• ON — carrier constantly on • CL — carrier controlled by RTS	ON
DLY	Selects RTS/CTS delay	• 2 msec • 15 msec	2 msec
DCE/DTE	Selects DCE or DTE	• DTE  • DCE 	DCE

Appendix F: Termination

Location of termination DIP switches

A sign must be correctly terminated in order to work properly. Termination is either ON or OFF. A pair of DIP switches on the sign's Controller board are used to terminate a sign:

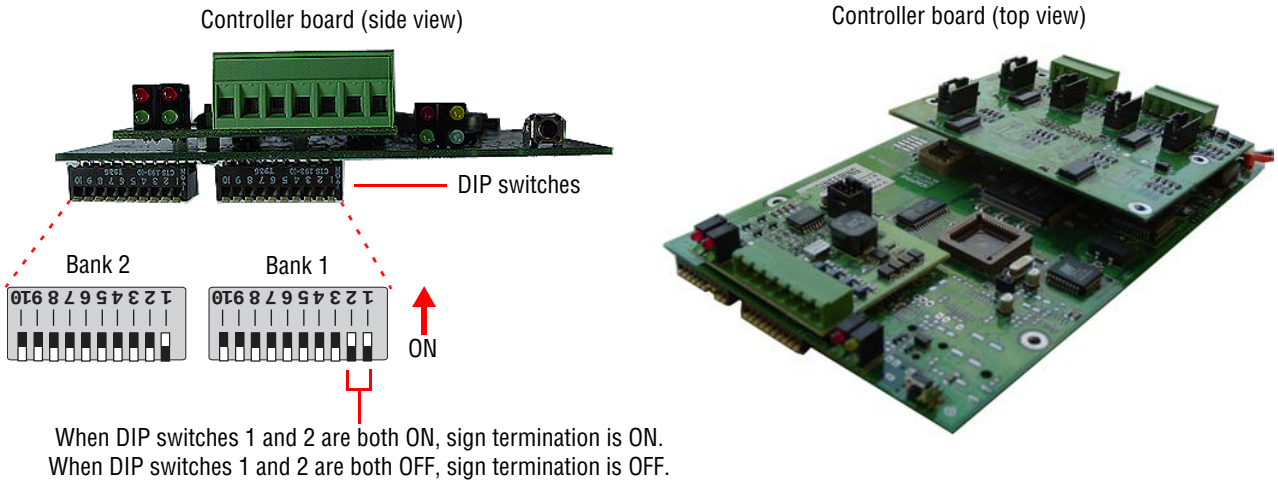


Figure 25: Location of termination DIP switches

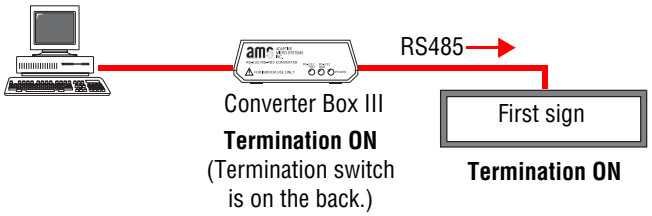
How to set the termination DIP switches

When the sign receives messages from a computer connected to the sign using RS485 wiring

In this case, a Converter Box III is used to connect a computer to a sign. To terminate a Converter Box III, set the switch on the back of this unit to "Terminated".

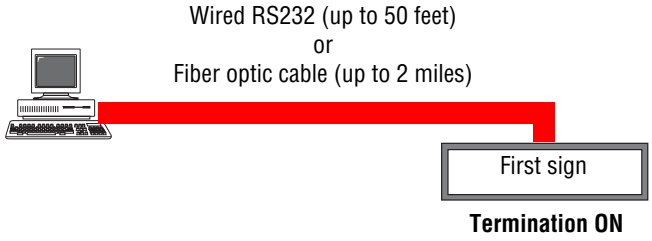
NOTE: When a Converter Box III is used, only one sign can be connected to the Converter Box.

One sign network:

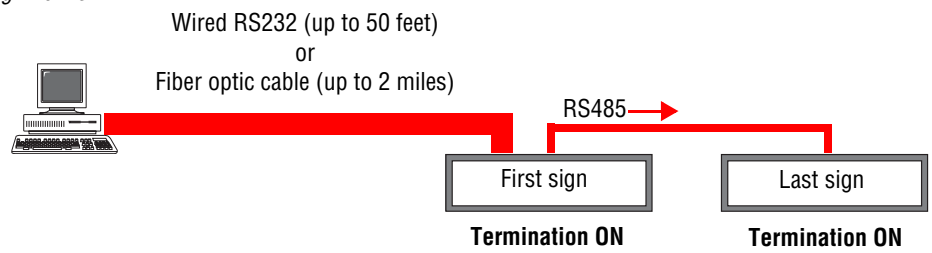


When the sign receives messages from a computer connected to the sign using RS232 or fiber optic cable

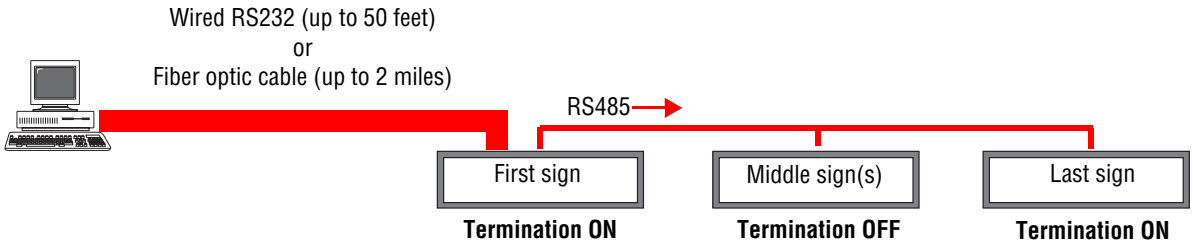
One sign network:



Two sign network:

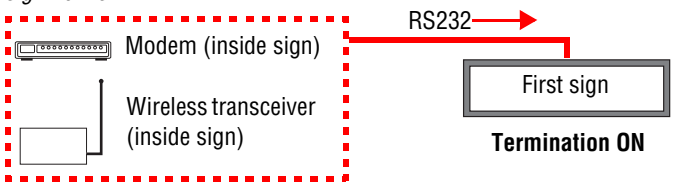


Three sign network:



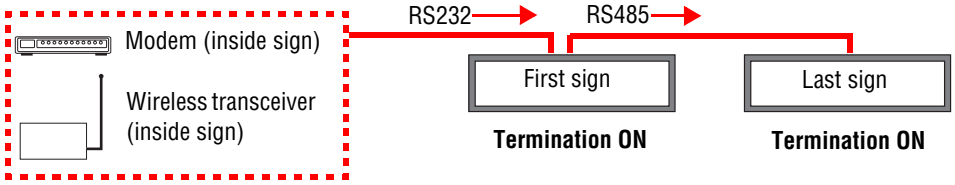
When the sign receives messages from an internal modem or wireless transceiver

One sign network:

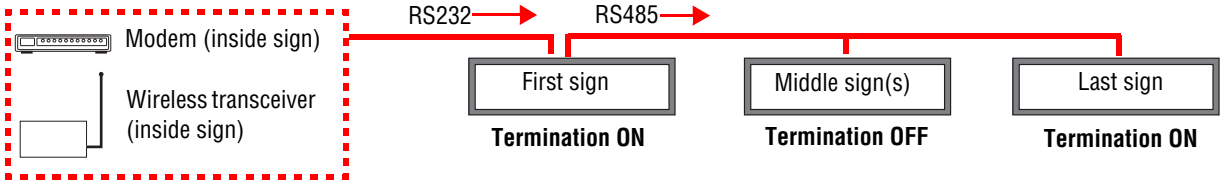


If there is a modem or wireless transceiver in *each* sign, then set termination to ON in each sign.

Two sign network:



Three sign network:



Appendix G: DIP switch settings

DIP switch locations

DIP switches are used to set various sign parameters. DIP switches are located on the Controller board: Bank 1, Bank 2, and Bank 3:

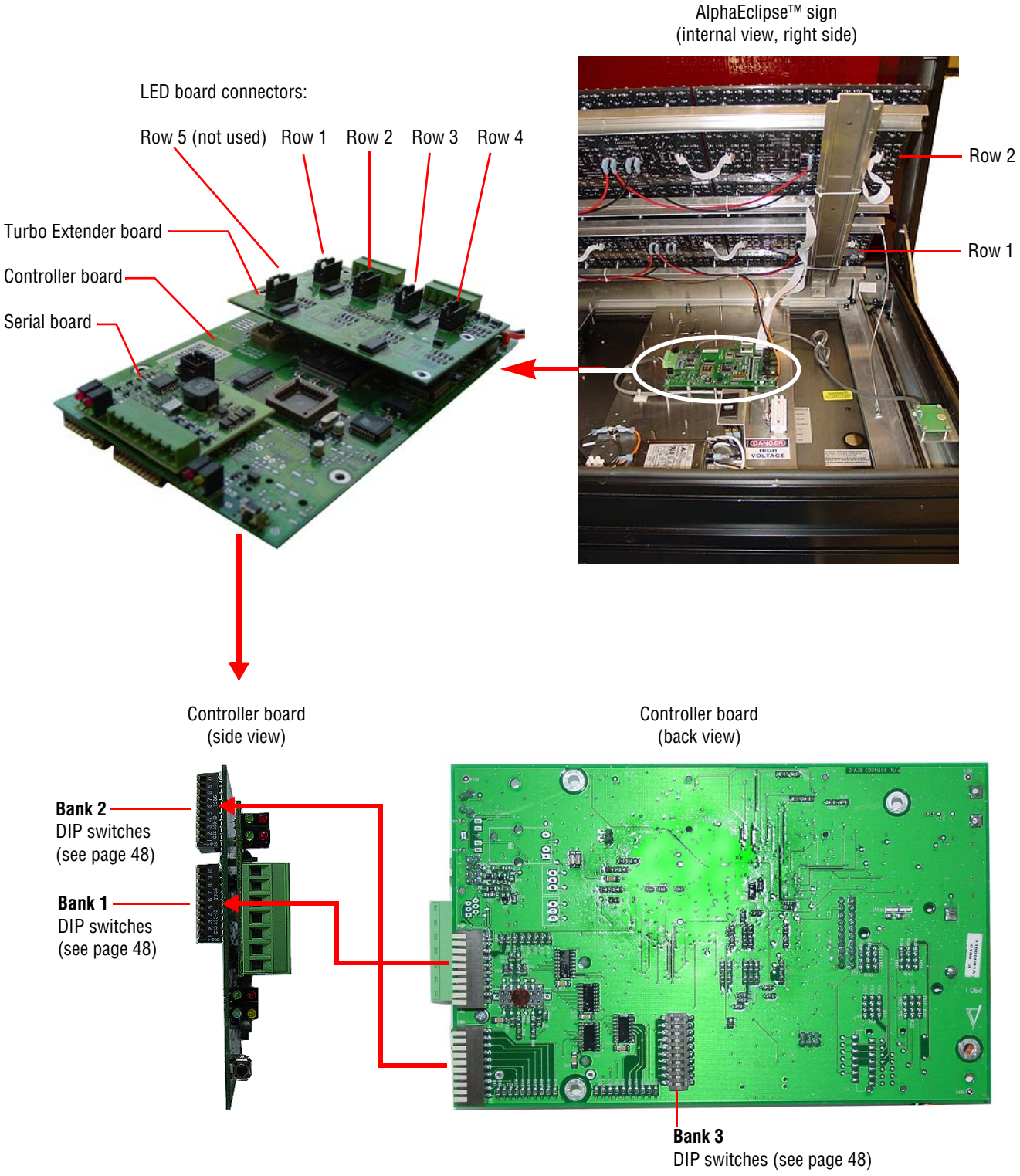
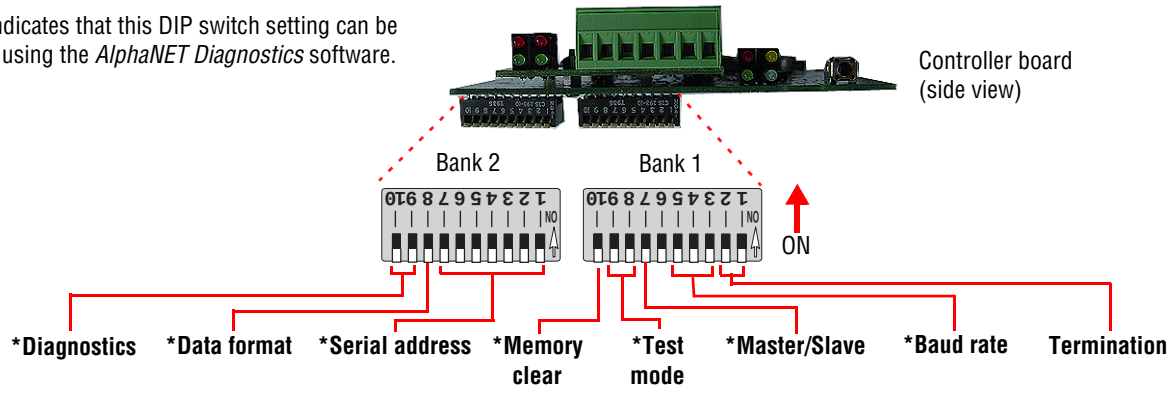


Figure 26: DIP switch locations

Sign operation settings (Bank 1 and Bank 2 DIP switches)

* indicates that this DIP switch setting can be set using the *AlphaNET Diagnostics* software.



Bank 2 DIP switches

	10	9	Description
Diagnostics	Off	Off	Normal messaging (default)
	Off	On	Goes through several test patterns to test for unlit LEDs and other irregularities
	On	Off	All LEDs are lit to test for uniform LED display
	On	On	Software override — When enabled, prevents setting DIP switches from software, and the sign will operate using the current DIP switch settings. *Also, Bank 1 DIP switches 9 and 8 must both be on.*

	8	Description
Data format	Off	8N1 — 8 data bits, No parity, 1 stop bit (default)
	On	7E2 — 7 data bits, Even parity, 2 stop bits

	7 (MSB)	6	5	4	3	2	1 (LSB)	Address	
								Dec	Hex
Serial address (address 0 = default)	Off	Off	Off	Off	Off	Off	Off	0	00
	Off	Off	Off	Off	Off	Off	On	1	01
	Off	Off	Off	Off	Off	On	Off	2	02
	Off	Off	Off	Off	Off	On	On	3	03
	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
	On	On	On	On	On	Off	On	125	7D
	On	On	On	On	On	On	Off	126	7E
	On	On	On	On	On	On	On	127	7F

Bank 1 DIP switches

	10	Description
Memory Clear	Off	Do NOT clear memory (default))
	On	Clear memory on powerup

	9	8	Description
Test Mode	Off	Off	Normal mode (default)
	Off	On	Production test mode
	On	Off	Display temperature test
	On	On	Software override — When enabled, prevents setting DIP switches from software, and the sign will operate using the current DIP switch settings. *Also, Bank 2 DIP switches 10 and 9 must both be on.*

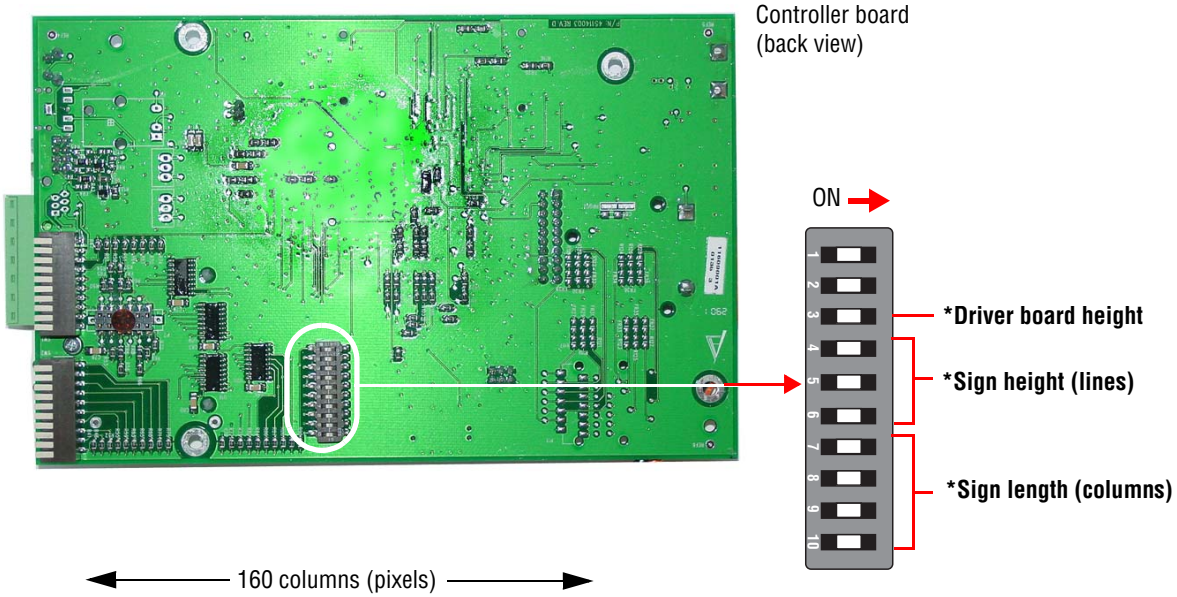
	7	Description
Master/ Slave	Off	Master mode (default)
	On	Slave mode

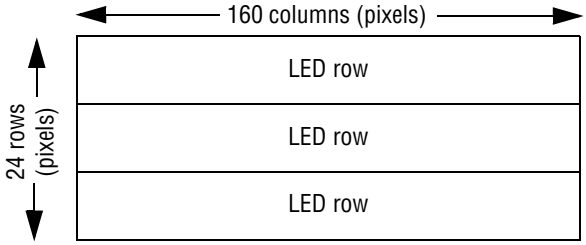
	5	4	3	Description
Baud rate	Off	Off	Off	Autobaud (see NOTE below)
	Off	Off	On	1200
	Off	On	Off	2400
	Off	On	On	4800
	On	Off	Off	9600
	On	Off	On	19200
	On	On	Off	38400
	On	On	On	Autobaud (see NOTE below)
	NOTE: When Autobaud is on, the sign will automatically try to set itself to the baud rate and data format (8N1 or 7E2) of the transmitting device (for example, a modem). Also, make sure that Data format (Bank 2, switch 8) is set to Off.			

	2	1	Description (see page 45)
Termination	Off	Off	Termination off (default)
	On	On	Termination on

Sign size settings (Bank 3 DIP switches)

* indicates that this DIP switch setting can be set using the *AlphaNET Diagnostics* software.





160 x 24 sign

How to calculate Sign height and Sign length:

Sign size is typically represented in pixels, like 160 (columns) x 24 (rows). This means the sign is 160 pixels long and 48 pixels high. In AlphaEclipse™ 3500 signs, each line is 8 pixels high. So a 160 x 24 sign has a Sign height = 3 (24/8) and a Sign length = 160.

Bank 3 DIP switches

Sign length (columns)				
10	**9**	**8**	**7**	**Description**
Off	Off	Off	Off	64 columns (default)
Off	Off	Off	On	16 columns
Off	Off	On	Off	32 columns
Off	Off	On	On	48 columns
Off	On	Off	Off	64 columns
Off	On	Off	On	80 columns
Off	On	On	Off	96 columns
Off	On	On	On	112 columns
On	Off	Off	Off	128 columns
On	Off	Off	On	144 columns
On	Off	On	Off	160 columns
On	Off	On	On	176 columns
On	On	Off	Off	192 columns
On	On	Off	On	208 columns
On	On	On	Off	224 columns
On	On	On	On	240 columns

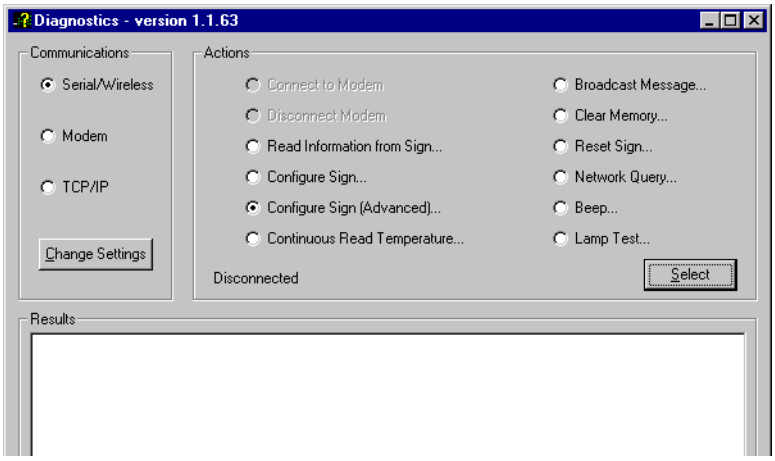
Sign height (lines)				
6	**5**	**4**	**Description**	
Off	Off	Off	1 line (default)	
Off	Off	On	2 lines	
Off	On	Off	3 lines	
Off	On	On	4 lines	
On	Off	Off	5 lines	Not valid for 3500 signs
On	Off	On	6 lines	
On	On	Off	7 lines	
On	On	On	8 lines	

Driver board height	
3	**Description**
Off	8-row high (default)
On	16-row high

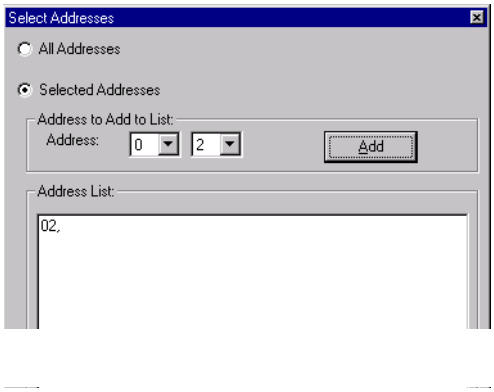
Using AlphaNET software to set DIP switches

AlphaNET software version 2.0.3 and greater can be used to set the Bank 1, 2, or 3 DIP switches explained previously.

1. To do this, select the AlphaNET *Diagnostics* software:

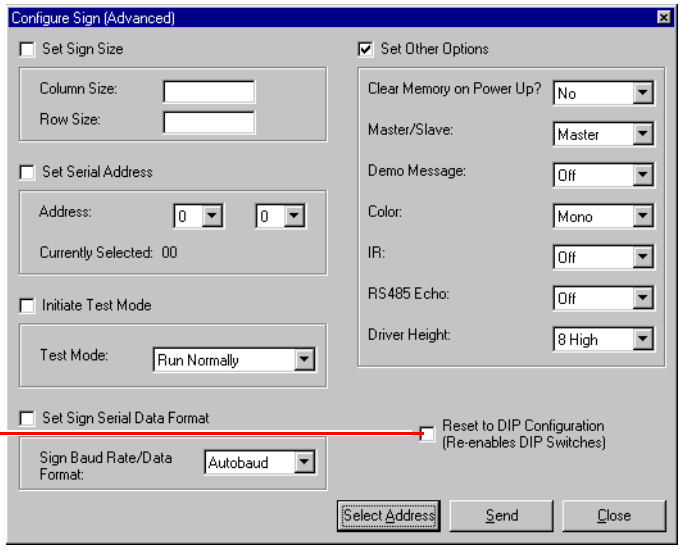


2. Select *Configure Sign (Advanced)* > *Select Address*:



Select the serial address(es) of the signs you want to configure.

3. Select one or more of the available options (*Set Sign Size*, *Set Serial Address*, and so on) and click on *Send*:



To set the sign to its DIP switch settings, check this box.

The sign will reset after **Send** is pressed.

Appendix H: Sign Specifications

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.

Temperature protection

In order to protect itself from damage, a sign will automatically turn on its exhaust fans and dim or turn off its LEDs when the sign reaches a predetermined internal temperature.

Internal sign temperature:	**< 30°C (85°F)**	**30° - 49°C (85° - 120°F)**	**50° - 70°C (122° - 158°F)**	**71° - 81°C (160° - 178°F)**	**82°C or greater (180°F)**
LEDs:	Normal		Dim[1]	Off[2]	Off[3]
Controller board:	Normal				Off
Exhaust fans:[4]	Off	On			

NOTES:

[1] Between 50° - 60°C (122° - 140°F), LED brightness can decrease between 62.5% - 100% of normal, depending on display load. Between 60° - 65°C (140° - 149°F), LED brightness can decrease between 50% - 87.5% of normal, depending on display load. Between 65° - 70°C (149° - 158°F), LED brightness can decrease between 37.5% - 75% of normal, depending on display load. (*Display load* means the number of LEDs that are on. For example, a graphic that lights up most of a sign's LEDs will have more of a display load than a simple text message that lights up only some LEDs.)

[2] When the LEDs are turned off because the sign is too hot, two LEDs in the left most corner will remain on to indicate a thermal shutdown.

[3] All LEDs will be off.

[4] At or above 30° C (85° F), the exhaust fans are switched on by the exhaust fan thermostat. If the temperature drops to 20° C (67° F), then the exhaust fans are turned off.

Technical specifications

Table 3: AlphaEclipse™ 3500 sign technical specifications

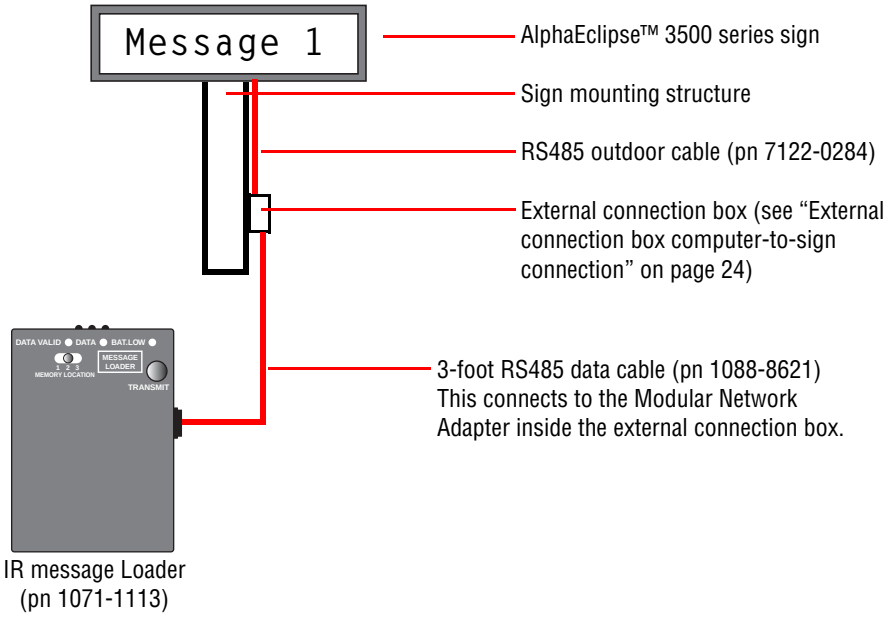
Lines	Rows (pixels)	Columns (pixels)	Maximum Current (amperes)		LED boards	Power supplies	Power panels	Main panels	Fans	
			at 120 VAC[1]	at 240 VAC					Exhaust (120 mm)	Internal (80 mm)
1	8	64	6.0	3.0	8	2	2	1	2	2
	8	80	6.5	3.3	10	2	2	1	2	2
	8	96	7.0	3.5	12	2	2	1	2	2
	8	112	8.5	4.3	14	3	3	1	2	3
	8	128	9.0	4.5	16	3	3	1	2	3
	8	144	9.5	4.8	18	3	3	1	2	3
2	16	64	9.0	4.5	16	3	2	1	2	4
	16	80	11.0	5.5	20	4	2	1	4	4
	16	96	12.0	6.0	24	4	2	1	4	4
	16	112	14.5	7.3	28	5	3	1	4	6
	16	128	16.5	8.3	32	6	3	1	4	6
	16	144	17.5	8.8	36	6	3	1	4	6
3	24	64	12.0	6.0	24	4	2	1	4	6
	24	80	13.5	6.8	30	5	2	1	4	6
	24	96	15.0	8.0	36	6	2	1	4	6
	24	112	19.0*	9.5	42	7	3	1	6	9
	24	128	20.5*	10.3	48	8	3	1	6	9
4	32	64	14.0	7.0	32	6	2	1	4	8
	32	80	16.0	8.0	40	7	2	1	6	8
	32	96	18.0*	9.0	48	8	3	1	6	8

NOTES:

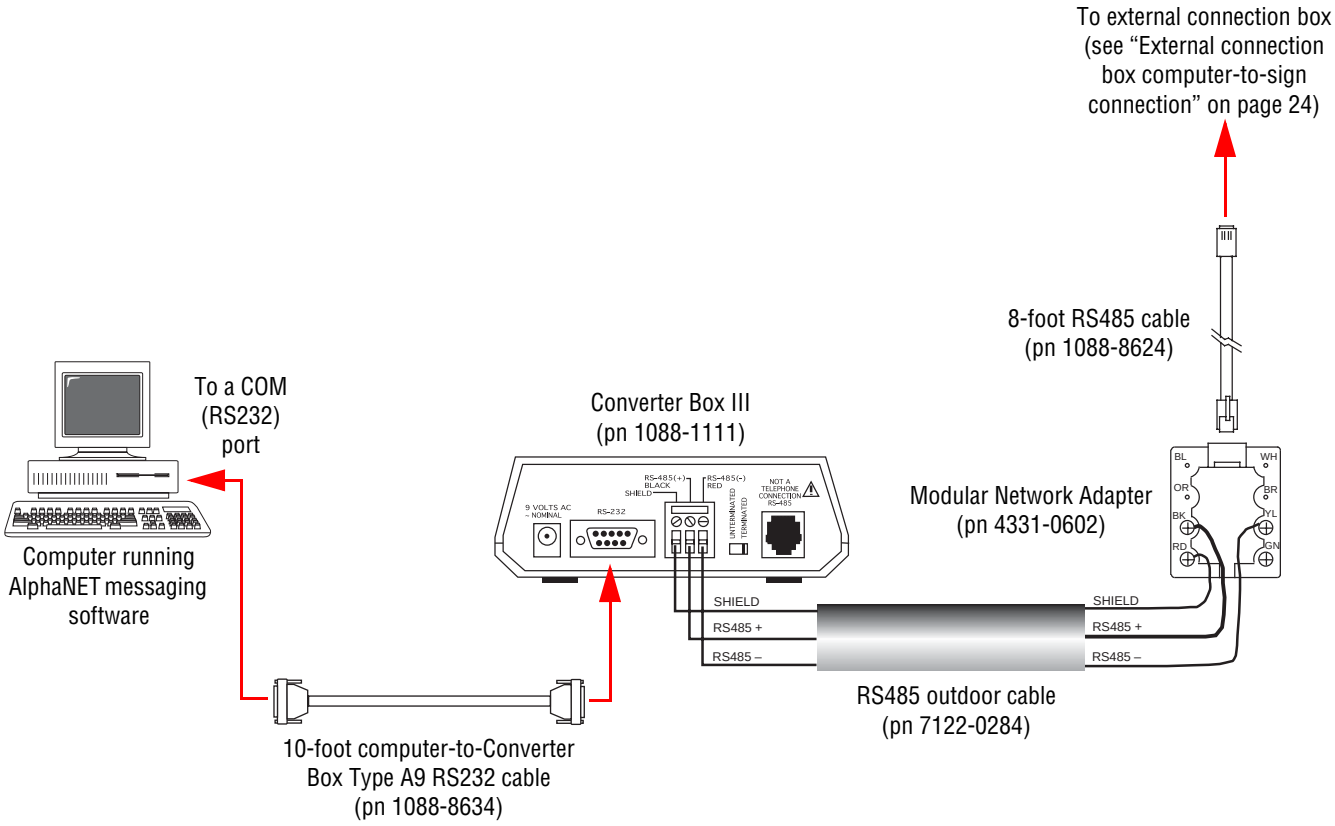
[1] Signs are connected to a power source with either:
- 1 line of power (single ganged, see “Single-ganged breaker power wiring” on page 26)
- 2 lines of 120 VAC power (dual ganged, see “Dual-ganged breaker power wiring” on page 27). Marked with asterisk (*) in above table.

Appendix I: Using an IR Message Loader or a computer with an external connection box

IR Message Loader

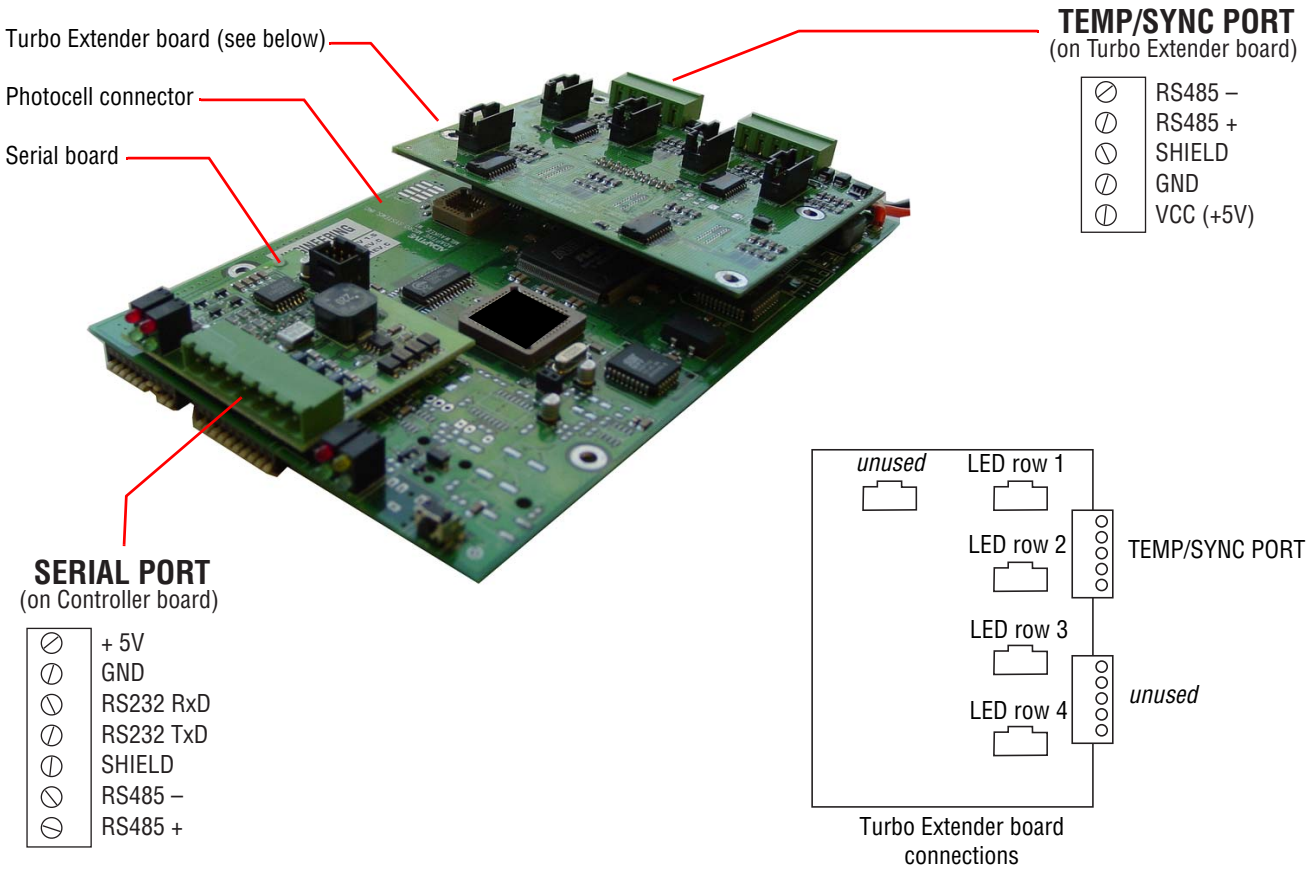


Computer



Appendix J: Controller board

Description



LED row numbering