LED Sign
Maintenance Manual
2016 v. 1.0

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1. Installation

TEMPERATURE/DIMMING SENSOR INSTALLATION

The Sensor provides both temperature and dimming data to the sender (controller) card located inside the sign. The first step in installing the sensor is to choose a suitable location, such as the shaded under surface of the sign or the building eaves. The sensor should be located in an area:

-where air will circulate freely
-sheltered from direct sunlight or radiated heat
-away from any sources of heat such as lamps or air vents

Once mounted, the sensor is connected to the receiver using a ribbon cable

DISPLAY TESTING

1. Visually inspect the display to see that all boards are secure and that no data cables or power connections have come loose during shipping.
2. With the power ON, and no data, verify that all the +5v power supplies are working by checking to see that the green (PWR) LED on each power supply is ON. If the PWR LED on any power supply fails to light, it would indicate no power or a damaged power supply. Check that the power supply is properly connected to 120 VAC. If the power supply still does not turn on, replace it.
3. Run the sign test from the Controller Board. Observe the sign to see that all the LED Modules are lighting correctly.

2. Checklist

You should receive the following items with the sign:

CD with: LED Software, PDF of User Manual
User Manual

Sign Hardware: Five components make up the LED Display

Power Supplies: The sign operates on 5VDC provided by multiple power supplies located inside the sign cabinet.

LED Modules: Each module consists of LEDs usually in a 8x8, 8x16, or 16x16 matrix.
A power connector with 5vdc and GND inputs
2 16-pin headers for Data Input and Data Output.

Data Cables: There are 16 wire ribbon cables linking each row of LED Modules with the HUB Card. The output connector of each LED Module connects to the input data connector of the next LED Module.

Asynchronous Controller Board: The Controller board accepts data from a computer over Ethernet or wirelessly via antennas. External sensors for light and temperature are also supported. The major components are;
Power connector for GND and +5 VDC.
HUB Board with multiple16-pin data output connectors (1 data output for each row of LED Modules) connecting the Controller Board to the LED Modules.
Ethernet (RJ-45) jack for data input.
Test button used to display test patterns on the sign.

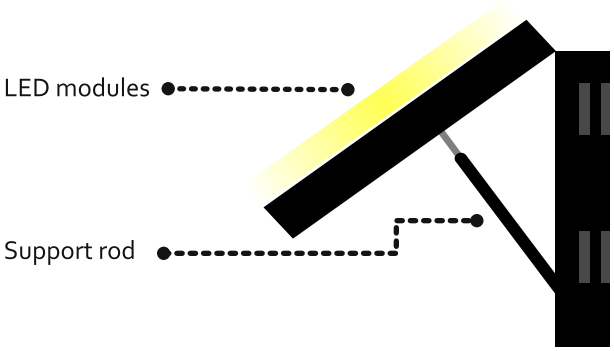
Wireless Connection:
1. Wireless Ethernet Adapter (transmitter) with Antenna for connection to Host computer
2. Wireless Ethernet Adapter (receiver) for connection to the sign

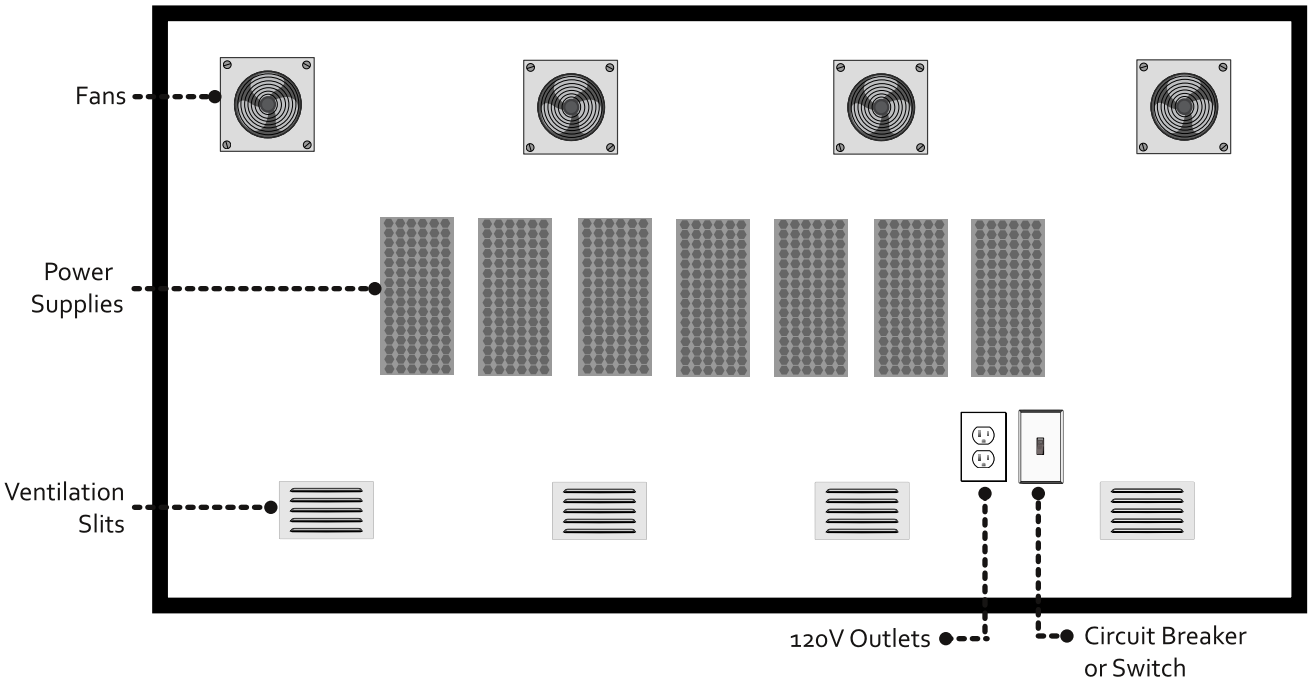
TEMPERATURE/DIMMING Receiver Box: Receiver Box processes data from the Temperature/Dimming Sensor and sends it to the Controller Board over a 8 conductor ribon cable.

3. Maintenance

IMPORTANT: The following procedures are intended for trained service technicians.

Adtronics signs are front-accessible: the cabinet with the LEDs opens outward, allowing access to the electronics. To open the sign you may need to first unlock the latches. Obtain the key, and unlock all the latches. As you pull open each latch, the front cabinet will want to open, making it harder to open the last latch. Apply force to keep the face closed and pull open the last latch.





3.1 Powered-Off Maintenance

Turn the power off to the sign before performing the following maintenance procedures.

There is either a switch or breaker inside the sign. Flip the switch to turn off power to the sign.

Air Vents
Ensure that there is no debris blocking the air vents, and make sure that the screens covering the air vents do not have any holes.

Drain Holes
At the bottom of the cabinet are drain holes that allow water to escape. Ensure that no debris blocks those holes. Also, check that the screens covering those holes are intact.

Fans
Check the fans to ensure that debris is not preventing the fan blades from spinning. There are several fans for air circulation, and each power supply also has a fan.

Loose Components
Check that screws, bolts, wires, and ribbon cables haven't loosened.

Weather Stripping
Check that the weather stripping isn't damaged and has not been dislodged.
Check for water damage or stains. Locate the point of entry and apply a sealant to prevent water from leaking in.

3.2 Powered-On Maintenance

Turn on the power to the sign before performing the following maintenance procedures.

There is either a switch or breaker inside the sign. Flip the switch to turn on the sign.

Check the ventilation fans to ensure that they are spinning when powered up.

Check that the LEDs are operating properly by setting the controller to test mode. There is a button on the side that when held down for several seconds, will bring up a series of test patterns. To transition through each pattern, click the test button. Verify that there are no issues with the LEDs as you transition through the test patterns. Hold down the test button again for several seconds to move out of test mode.

3.3 Frequency of Maintenance

These maintenance procedures can be performed on a yearly basis. However, we leave it up to the service maintenance technician's discretion, based on the type of environment in which the sign is situated, and weather conditions.

4. Troubleshooting

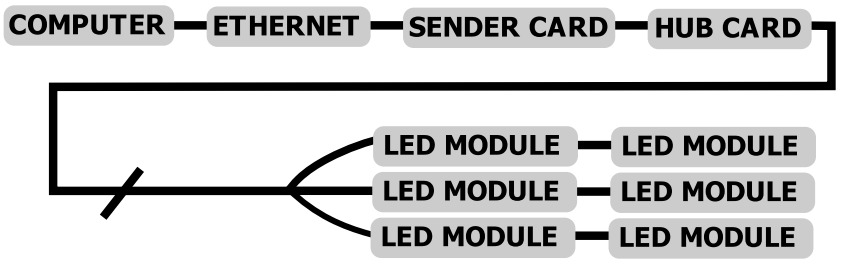
IMPORTANT: The following procedures are intended for trained service technicians.

This section provides a list of common symptoms and suggested troubleshooting steps.

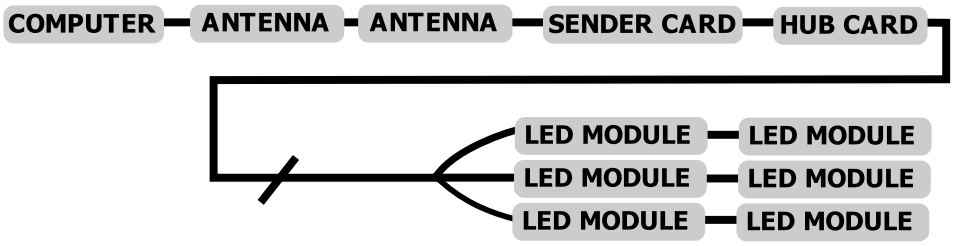
4.1 Power and Signal Paths

There are several different ways for the signal to flow, depending on your setup and your sign.

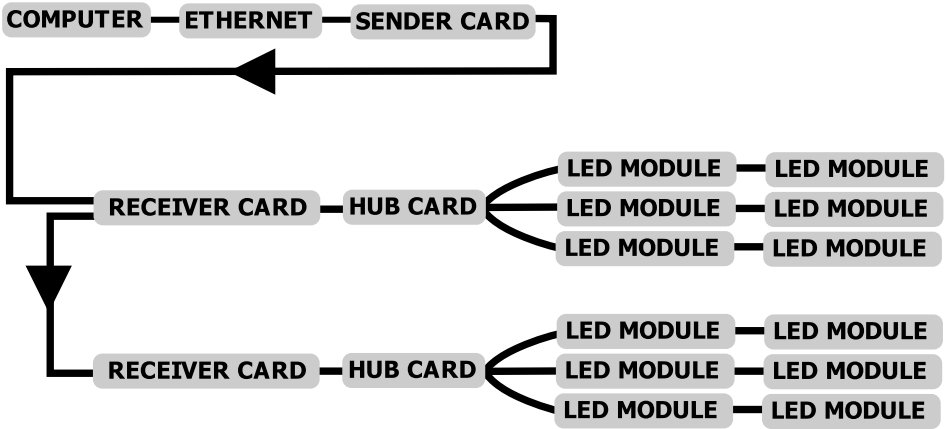
The simplest setup consists of a hardwired connection, along with a sender card and a hub card.

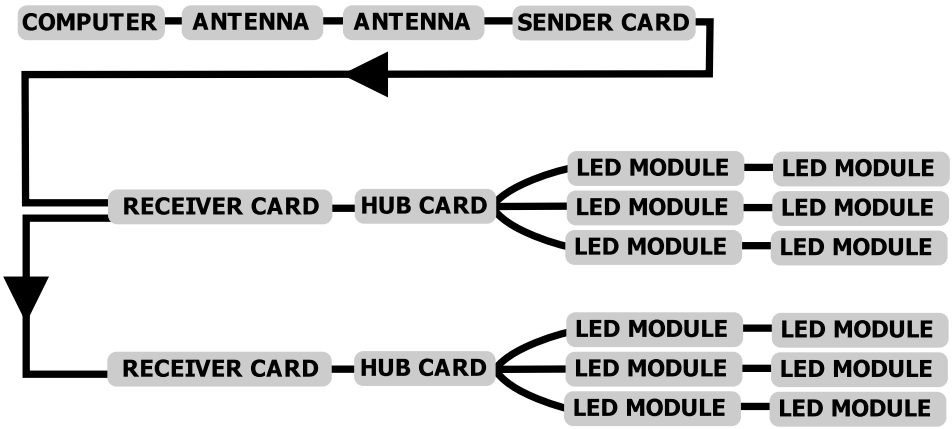


Another way to communicate with the sign is through a pair of antennas.

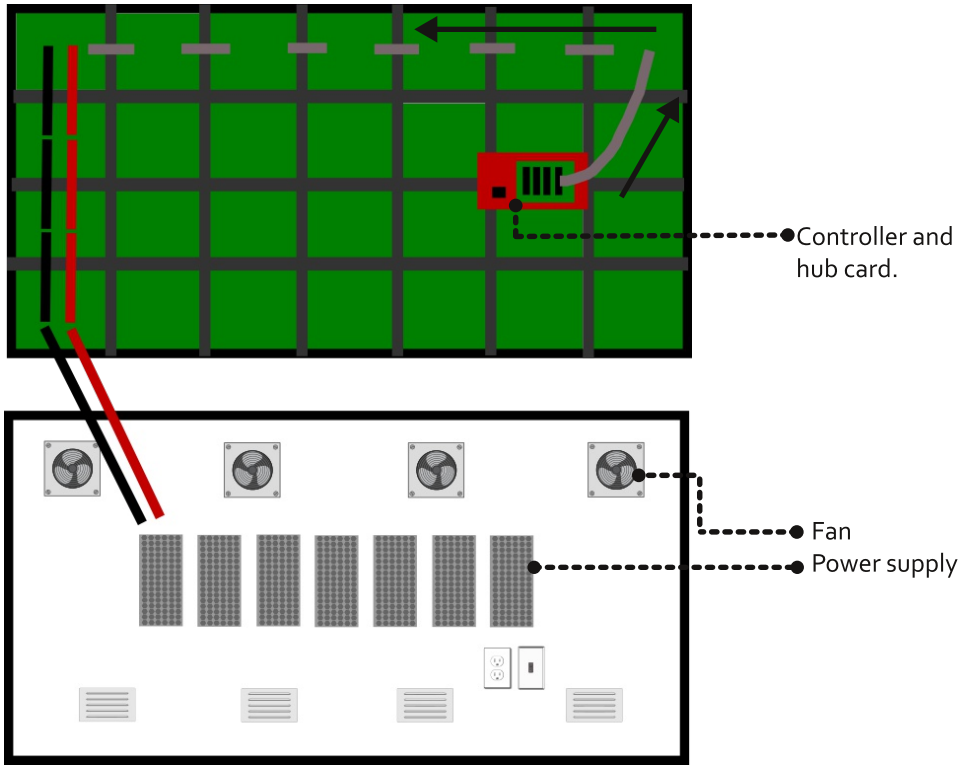


Some signs, especially if they are double-faced, will have one sender card and a receiver and hub card in each face. To view test patterns you must disconnect the connection to the sender card and then push the test button on the receiver card.





In the diagram below, 120 VAC enters the sign, to the switch or breaker, and then onto the power supplies. They convert 120 VAC to 5V DC. Each power supply provides power to a column of LED panels. One power supply will also provide power to the controller.Each LED panel in a column is connected in parallel to the power supply.



The data from the controller moves out through the hub card, and horizontally along each ribbon cable.

Because of the way power and data are transmitted, Issues appearing on a particular LED module may be caused by a malfunction on the previous LED module.

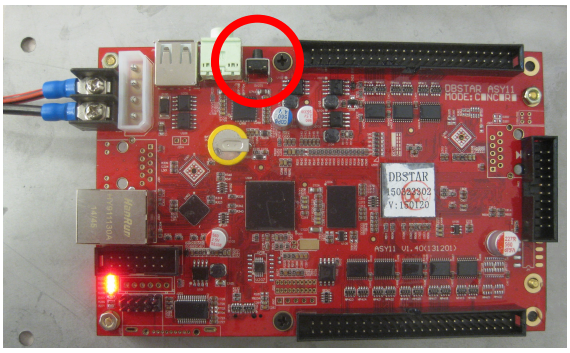
NOTE: The particular sign you are working on may be different. Observe how your sign is wired up before performing any troubleshooting.

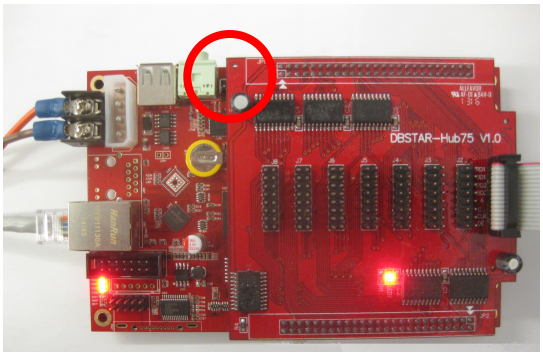
4.2 Test Mode

To aid in troubleshooting, bring the controller into test mode to confirm the issue.

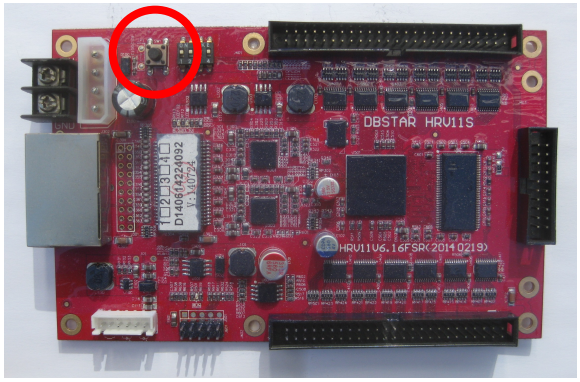
If your sign consists only of one sender card and one hub card, enter the test mode by:

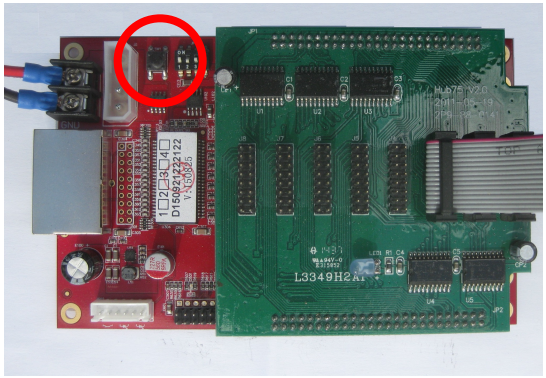
1) locating the test button on the controller. Depending on your controller, the button may face the side or the front.
2) holding it down for five seconds, and then releasing.





The button is on the side. It is obscured by the hub card but still accessible.





The button is on the front.

In test mode, press and release the test button to advance to the next test pattern. The test patterns consist of:

Red → Green → Blue → White → Dim White → Diagonal Lines →
Horizontal lines → Vertical Lines → Horizontal and Vertical Lines

If you double-click the test button you will, again, see the test patterns but the dim white screen will have gradations, and will scroll. Also the diagonal, horizontal and vertical

4.3 General Troubleshooting

The following is a list of symptoms and suggested actions to take when troubleshooting the display:

LED Issues
Symptom: Several lines in an LED module do not light up.
Possible Cause:
• IC on PCB is faulty: replace LED module

Symptom: One LED module is blank.
Possible Cause:
• Power failure at the module due to a loose power cable
• Faulty data ribbon cable connection: Check that data cable is securely attached and latched in place.

Symptom: More than one LED module in a column is blank.
Possible Cause:
• Power failure at the module due to a loose power cable.

Symptom: More than one LED module in a row is blank.
Possible Cause:
• Faulty data ribbon cable connection: Check that data cable is securely attached and latched in place.
• Faulty output on the previous LED module: Move that module to the end of the data chain and verify that the LEDs display data.

Symptom: The entire sign is blank.
Possible Cause:
• No AC input power: Check the switch or breaker; use a DMM to verify 120 VAC is presento
• Controller isn't receiving power: check power connection to controller
• Faulty Controller: Remove and replace.
• Faulty hub card: Remove and replace.

Symptom: You receive a "Cancel Space Selection" error message on a DBStar ARM9 controller.
• Faulty SD card slot. Remove card and attach a USB memory stick

Temperature Issues
The Temperature and Light Sensor connects to the sender card. The temperature sensor is a digital device and is not adjustable.

Symptom: Temperature reads correctly in the morning or nighttime but too high during the day.
Possible cause:
• Sensor is poorly placed and needs to be relocated to where it will not be subjected to direct sunlight or radiated heat.

4.3 General Troubleshooting

Symptom: Temperature reading unstable
Possible cause:
• Faulty connection (corroded or loose connection). Check all connections.
• Faulty sensor. Change sensor
• Faulty receiver. Change Receiver Box

Brightness/Dimming Issues
The Dimming / Temperature Sensor connects to the sender card via a ribbon cable.

Symptom: Display will not dim
Possible cause:
• In the firmware, the minimum value needs to be set lower
• Sensor is being affected by artificial light. If sensor is facing parking lot or street lighting the display may not dim.
Faulty sensor. Change sensor
Faulty receiver. Change Receiver Box

Symptom: Display will not brighten
Possible cause:
• In the firmware, the maximum value needs to be set higher
• Sensor is being obstructed or covered by an object.
Faulty sensor. Change sensor
Faulty receiver. Change Receiver Box