C26199
MASSACHUSETTS DOT
VF-2020-54X255-34-A
Site Name: _____
Field Test Procedure

DD3925172 **Rev: 1—21 May 2018**

DAKTRONICS

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DAKTRONICS, INC.

Introduction

This test procedure describes the field tests for a LED dynamic message sign site for this project. The purpose of this test is:

1. To check that the sign and related equipment supplied by Daktronics has been installed properly.
2. To check that all sign and related equipment supplied by Daktronics is functioning. Special emphasis is placed on items that, if bad, are not expected to show up as being bad during normal operation. Example: earth grounding not connected.
3. To put the sign into the state needed so that it is ready for normal operation without the need for an additional visit before beginning normal operation.
4. As a record that all tests and setup tasks have been performed at each particular site so that it will not be necessary to re-visit sites later because of not being sure whether or not certain tests or setup items have been done.

Note that this is not a test of all software functions or hardware design limits; this would be very time consuming, and would be redundant, as those tests need to be done only once.

This test should be performed for every sign site at the completion of installation of the particular site.

The test messages to be used should be the test messages listed or messages such as "Testing; Message 1" or moving rows, moving columns, etc., that will not misdirect traffic.

This test requires the cooperation of an operator at the central controller with personnel at the sign site.

Test equipment required:

- Boom truck, or whatever is required to get up into the sign
- Digital multi-meter and Ground resistance tester
- Laptop computer, with vanguard software
- Ethernet Cable
- Common hand tools
- Flash Drive/Memory Stick

Site Information

Daktronics Representative: _____

Contract number and name: _____

Sign assembly no.:_____

Sign serial no.:_____

Traffic cabinet assembly no.:_____

Traffic cabinet serial no.:_____

Field controller serial no.:_____

Field controller address no.:_____

Site IP address Primary: _____ Auxiliary: _____

Important: Make sure that the firmware listed below is the most current version, if not make sure to download the latest version of the firmware from Dakfiles.daktronics.com and save on to flash drive.

Sign dimension: _____

Firmware:	Version number:
1) VFC	_____
2) Player Image	_____
3) Video Processor	_____
4) LCD Board	_____
5) Display Module micro	_____
6) Display Module EPLD	_____
7) ACP Micro	_____
8) ACP EPLD	_____
9) Display interface micro	_____
10) Display interface EPLD	_____

Traffic Cabinet Inspection

____1.0 Turn off the power to the traffic cabinet.

____1.1 Inspect the inside and outside of the traffic cabinet for damage and check for loose parts or connections. Also check that the nuts are installed on the anchor bolts (if ground-mounted traffic cabinet).

____1.2 Check that earth grounding wires are secured to earth ground rod from sign, traffic cabinet conduit grounding collars, traffic cabinet panel board, traffic cabinet case, and power source.

____1.3 Verify that ground wire and ground rods are connected properly per site riser.

____1.4 Remove the panel board cover. Check that the 2 hot wires, neutral, and earth ground wires from the 120/240 VAC power source are connected into the panel board main breaker terminals, neutral bus, and earth ground bus, respectively.

____1.5 Visually inspect the outside of the sign controller for damage, check that all necessary connectors are plugged into the outside of the sign controller, and check that the connector screws (if any) are tight.

____1.6 Inspect the modem panel or other communication interface panel for loose parts or wiring, and check that the wiring or fiber(s) for the communication system is terminated properly.

____1.7 Terminate communication from controller to sign.

Traffic Cabinet Power Test

____2.0 Check that all traffic cabinet panel board circuit breakers are off, except for the "Panel board Surge Suppressor" breaker, which should be on. Apply power to the traffic cabinet only.

____2.1 Using a safe procedure, measure the AC voltage from the panel board main breaker input lugs to neutral; it should measure between 105 and 125 VAC. Also, check the voltage from neutral to

earth ground. It should measure less than 10 VAC. (This is a no-load test of the input voltage.) Record below.

a. L1 to neutral: _____ L2 to neutral: _____ Neutral to earth ground: _____

____2.2 Re-install the panel board cover.

____2.3 Check that all control equipment is plugged into the control equipment outlet strip.

____2.4 Check that all control equipment inside the traffic cabinet is switched off, and turn on the main circuit breaker and all circuit breakers in the traffic cabinet except for the **sign** breaker (if equipped).

____2.5 Check that the traffic cabinet light(s) are on and that all AC outlets inside the traffic cabinet are live. **If equipped with two doors:** Close the door that is currently open and open the other door, and check that the traffic cabinet light(s) are on.

____2.6 Turn the heater thermostat up above the ambient air temperature; the heater should turn on. If the heater is equipped with a fan, the fan should also turn on. Turn the thermostat down below the ambient air temperature; the heater (or heater and fan) should turn off. Set the thermostat to 45° F. (If the ambient temperature is above the highest setting on the thermostat, cool the thermostat with freeze spray.)

____2.7 Press the intake fan override button; the fan should turn on. Check that air blows out of the exterior roof vents. Release the intake fan override button; the fan should turn off.

Sign Exterior Inspection

____3.0 Visually inspect the outside of the sign for damage.

____3.1 Check that the front, bottom, and rear light sensors are unobstructed.

Power Connection Inspection

____4.0 Turn off the power to the sign, from outside the sign.

____4.1 Remove the panel board cover. Check that the two hot wires, neutral, and earth ground wires from the 120/240 VAC power source are connected into the panel board main breaker terminals, neutral bus, and earth ground bus, respectively

____4.2 Check that the earth grounding wire is secure from the case of the sign (inside or outside) to the earth ground rod(s) near the base of the sign.

____4.3 Check that all panel board circuit breakers are off, except for the "Panel board Surge Suppressor" breaker, which should be on. Apply power to the sign.

____4.4 Using a safe procedure, measure the AC voltage from the panel board main breaker input lugs to neutral; it should measure between 105 and 125 VAC. Also, check the voltage from neutral to earth ground; should be less than 10 VAC. (This is a no-load test of the input voltage.) Record below.

L1 to neutral: _____ L2 to neutral: _____ Neutral to earth ground: _____

____4.5 Re-install the panel board cover temporarily.

____4.6 Terminate Communication cable to VCB.

____4.7 Turn on the circuit breaker for the cabinet lights. Check that the "Cabinet Light Timer" switch or switches work properly and check that all lamps light.

Sign Interior Inspection

____5.0 Make sure the Site Information for the sign is filled out: sign serial number, sign model number, sign assembly number, etc.

____5.1 Inspect the inside of the sign for damage and signs of water intrusion. Check for loose parts, connections and wiring, inside of the sign including the inside of the power supply enclosure, and service control panel. Also, verify that the fiber-optic cables are connected to the proper location on the VCB (Vanguard control board).

____5.2 Open each door and verify that all mounting hardware is installed properly.

____5.3 Check that all conduits that enter the sign are sealed inside at the end that enters the sign.

____5.4 Resistance between circuit ground on the VCB and earth ground.

- Verify that power to the display is off.
- Make sure cat5 cable isn't plugged in from controller to VCB when doing this test.
- If equipped; remove P1 (the 4-pin connector) from all Mini CAN I/O board inside the display
- Inside each power supply enclosure temporarily disconnect the green wire from back of display that is connected betweenTB1 and the back wall of the display.
- Using a Multi-Meter Measure the resistance between from the end of the green wire connected to TB1 to the back wall of the display
- Reading should be from 10K to 220K
- Record Value _____
- After test is complete reconnect green wire to the back of the sign and reconnect the cat5 cable.

Sign Power Test

____6.0 Turn on all circuit breakers.

____6.1 Check all sign convenience outlets and control equipment outlets by using a multi-meter, each outlet should measure between 105 and 125 VAC.

Functional Test

____7.0 Turn on the sign controller power switch, check that the power indicator LED is on, and check that the Active LED on the sign controller begins blinking

____7.1 Verify that DS1 and DS2 LED lights illuminating white. This is verifying signal is good for fiber ports A and B.

____7.2 Enter all the necessary data into the sign controller such as address, module type, sign height, sign width, sign type, access type, and peripherals.

a. Reference display configuration sheet if necessary

____7.3 **Note: If testing at night run the all on 10% test patterns and turn the fans and heaters (if equipped) on manually in controller menu.** Display the "**All On 100% Burn**" test pattern; check that all fans and/or heater turn ON. Once complete set test pattern to "**None"**.

____7.4 Push the button in the service control panel for the ventilation fans and verify they turn on. Release it and they should turn off.

____7.5 Check that all power supplies are passing in the peripheral menu.

____7.6 Check that the value indicated by each of the three light sensors appears reasonable for the current ambient lighting conditions. Record below:

a. **Note:** Light sensors utilize digital integrated circuits, which are calibrated at the integrated circuit factory, and do not require additional calibration.

Date: _____ Time: _____ Sky conditions: _____

Light sensor readings: 1: _____ 2: _____ 3:_____

____7.7 Check that the internal and ambient temperatures appear correct, and record below:

Note: Temp sensors utilize digital integrated circuits, which are calibrated at the integrated circuit factory, and do not require additional calibration.

Ambient temperature (Temp Ambient), degrees F.: _____
Internal temperature (TempSign1), degrees F.: _____
If equipped: Internal temp #2 (TempSign2), degrees F.: _____
If equipped: Internal temp #3 (TempSign3), degrees F.: _____

____7.8 Check that the humidity sensor is functioning, and record the reading below:

a. Relative humidity: _____

____7.9 Parallel surge suppressor with remote reporting: Display the "View Peripherals" screen on the LCD, and check that the Surge Suppressor entry indicates "Pass".

____7.10 **Note: If testing at night turn the fans on manually in controller menu.** RPM Sensors with electronically controlled fans.

a. Display the "All On 100% Burn" test pattern to turn on the ventilation fans. Checks that all RPM sensors report values other than 0 on the sign controller; check that the same quantities of RPM sensors that exist in the sign are indicated on the sign controller.

b. Blank the sign to turn off the "All On 100% Burn" test pattern, and check that the fans turn off. Check that all RPM sensors indicate "pass"

____7.11 **Note: If testing at night do the all on 10% test patterns**. Display the "All On 100%" test pattern and check that it is displaying. Turn off one power supply. Check in the "View Peripherals" screen that all power supplies (isolation boards) that are on indicate 24.1 to 25.2 VDC. Repeat the above step for each remaining power supply. Turn on all power supplies.

____7.12 Run the following test patterns and verify that all the test patterns display properly.

a. Alphabet
b. Line ID
c. Module ID
d. **Note if testing at night don't do this test pattern.** Auto Test Patterns

____7.13 Set to "Normal Mode" to exit the test pattern mode.

____7.14 Sign door signal switches: Display the View Peripherals Menu on the LCD. Close all sign doors, and check that the LCD indicates that the doors are closed.
Note: It may take up to 10 seconds after the door position is changed to indicate the change

____7.15 Using Vanguard software display a message that will not misdirect traffic and that has characters that butt up to the top, bottom, left, and right edges of the sign and verify that it displays correctly. This verifies proper message display capability for this sign size.

a. Using a test message check visually that the dimming level of the display appears reasonable for the light conditions with automatic dimming set and record the level. Dimming Level%_____

____7.16 Set the time, date, and correct time zone.

____7.17 **Note: If testing at night run the all on 10% test patterns.** Run the "All On 100% Burn" test pattern and leave the brightness set to 100%. Using a safe procedure, check and record the AC voltage from the sign panel board main breaker input lugs to neutral; it should measure between 105 and 125 VAC. Also, check the voltage from neutral to earth ground; it should measure less than 10 VAC. (This is a loaded test of the input voltage.) Record below.

a. L1 to neutral: _____ L2 to neutral: _____ Neutral to earth ground: _____

____7.18 Perform a pixel test and verify that all pixels are reported as good.

____7.19 Reinstall all enclosure covers.

_____7.20 Record the installed firmware version numbers (from the sign controller "Version Information" page), and the dimensions of the sign. (If the dimension of the sign doesn't match the actual sign size, correctly configure the sign controller for this site.) Record the following information under the Site Information:

Final Details

____8.0 **If equipped:** Confirm that all sign and traffic cabinet thermostats are set properly, and all

____8.1 Equipment covers are installed.

____8.2 Verify the sign is blank.

____8.3 Verify that any test messages you created have been removed from the sign controller.
____8.4 Record if main breaker is left on or off: On: ___ Off: ___ Date: _____

____8.5 Make sure the Site Information is filled out: serial numbers, site location, phone number, sign dimension, firmware versions, etc.

It is acknowledged that the following field test procedure has been completed for this site and the display is operational.

Daktronics Technician

_____	_____	_____
Printed Name	Signature	Date

Customer

_____	_____	_____
Printed Name	Signature	Date

DAKTRONICS PERSONNEL MUST RETURN THIS COMPLETED DOCUMENT AND QUALITY FEED BACK FORM TO THE DAKTRONICS CONTRACT PROJECT MANAGER.

Transportation Quality Feedback form

For Internal Daktronics use only. This is not part of the field Test Procedure. This form needs field out and sent back to Daktronics with the Field Test Procedures

Submitted By_____ Contract#_____

Display Type (i.e. VF2400_27x105-66-A) _____

Location of Display_____

Display Serial #_____ nearest City and State _____

Commissioning Date_____ Project Manager_____

Did you experience any issues or unplanned work during the commission of this display? **Yes/ No** (if no skip to additional comments/Punch list items)

Failed Part Description	Part Number	Part Serial #

Describe the issues and or unplanned work

_____
_____
_____
_____
_____
_____
_____
_____

Additional Comments /Punch list Items

_____
_____
_____
_____
_____
_____
_____
_____

FTP completed **Yes / No**

Site Complete **Yes / No** (if no documents punch list items above)