

**C26360**  
**Nevada DOT**  
**VF-2420-27x75-46-A**  
**Site Name: \_\_\_\_\_**  
**Field Test Procedure**

**DD3918628**

**Rev:1—5 May 2018**

# **DAKTRONICS**

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**DD3918628**  
**Contract: C26360**  
**Rev:1—5 May 2018**

## **DAKTRONICS, INC.**

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## 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
- Laptop computer, with central controller software, miscellaneous software, and null modem cable.
- Common hand tools
- Ground resistance tester
- Cellular telephone or other means of communication with the central controller operator.

# 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.**

Sign dimension: \_\_\_\_\_

Firmware:

- 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

Version number:

\_\_\_\_\_  
\_\_\_\_\_  
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## 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 Test the earth ground rods, wires, and connections by use of the ground resistance tester, and record below. Check each time that the tester does not indicate "noise". ("Noise" should not be indicated, and the resistance should be 25 Ohms or less. Ask the contractor to make corrections, if needed.) **Note: Depending on your power source or power sources, some of the following tests below may not apply.**
- a. Ground resistance, earth ground wire from power source to traffic cabinet: \_\_\_\_\_
  - b. Ground resistance, earth ground wire from power source to sign: \_\_\_\_\_
  - c. Ground resistance, wire to ground rod(s) at base of traffic cabinet: \_\_\_\_\_
  - d. Ground resistance, wire to sign from traffic cabinet: \_\_\_\_\_
  - e. Ground resistance, wire at sign to ground rod(s) at base of sign: \_\_\_\_\_
- \_\_\_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 Check that the hot, neutral, and earth ground wires from the 120/240 VAC power source are connected into the AC breaker rail terminal, neutral bus, and earth ground 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 AC Breaker rail circuit breakers are off, except for the “Surge Suppressor” breaker, which should be on. Apply power to the sign.

\_\_\_4.4 Using a safe procedure, measure the AC voltage from the breaker rail 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.)

L1 to neutral: \_\_\_\_\_ L2 to neutral: \_\_\_\_\_ Neutral to earth ground: \_\_\_\_\_

### **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. Also, verify that the fiber-optic or Cat-5 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.

### **Sign Power Test**

\_\_\_6.0 Turn on all circuit breakers.

\_\_\_6.1 Check all sign utility outlets and Dual Duplex outlets (if equipped) 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.

\_\_\_7.1 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 for peripheral config

\_\_\_7.2 Verify that DS1 and DS2 LED lights illuminating white. This is verifying signal is good for fiber ports A and B.

\_\_\_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 vent fan override 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 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: \_\_\_\_\_

\_\_\_7.6 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.: \_\_\_\_\_

\_\_\_7.7 Check that the humidity sensor is functioning, and record the reading below:

a. Relative humidity: \_\_\_\_\_

\_\_\_7.8 Parallel surge suppressor with remote reporting

a. Display the "View Peripherals" screen on the controller, and check that the Surge Suppressor entry indicates "Pass"

\_\_\_7.9 Check that all Power Supplies have the green indicator illuminated, except Power Supply(s) dedicated to fan operation.

a. Check that each power supply indicates pass on the controller.

\_\_\_7.10 Run the following test patterns and verify they display properly on the sign.

a. Alphabet



- b. Line Identification
- c. Module ID
- d. **Note: If testing at night do not run this test pattern.** Auto Test

\_\_\_7.11 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 level. Dimming Level% \_\_\_\_\_

\_\_\_7.12 Set the time, date, and correct time zone.

\_\_\_7.13 **If equipped with Beacons or Strobes:** Display any message that includes beacons and verify that all beacons or strobe flash while the message is displayed. Then blank the sign and check that the beacons or strobe and message turned off.

\_\_\_7.14 Sign door signal switches.

Note: It may take up to 10 seconds after the door position is changed to indicate the change:

- a. Display the View Peripherals Menu on the controller. Open the doors and check that the controller indicates the doors are open. Close all sign doors, and check that the LCD indicates that the doors are closed.

\_\_\_7.15 **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 breaker rail 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: \_\_\_\_\_

\_\_\_7.16 Perform a pixel test and verify that all pixels are reported as good.

\_\_\_7.17 **Note: If testing at night turn the fans on manually in the controller menu.** RPM Sensors with electronically controlled fans.

- a. Display the "All On 100% Burn" test pattern in order to turn on the ventilation fans. Checks that all RPM sensors indicate "pass" 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".

\_\_\_7.18 Traffic cabinet door detection switches. **Note:** Operate the doors, not just the switches, to be sure that the switches adjustments are correct. It may take up to 10 seconds after the door position is changed to indicate the change. Some traffic cabinets have only one door:

- a. Display the View Peripheral Menu on the LCD. Close both traffic cabinet doors for 15 seconds and then open the door, and quickly check that the LCD indicates that the doors are closed.
- b. With the door currently open, wait 15 seconds for the controller to update, and then check that the LCD indicates that the door is open.
- c. Open the other door and wait 15 seconds for the controller to update, then check
- d. That the LCD indicates that the door is open.

\_\_\_7.19 UPS communication with sign controller. **Note:** Not all contracts that include a UPS have this feature:

- a. Display the View Peripherals Menu on the LCD, and check that the UPS entry indicates "AC line".
- b. Note which AC outlet the UPS input AC power cord is plugged into, and unplug it. Check that the UPS entry changes to "Battery". It may take a few seconds for the entry to change.
- c. Plug the UPS input AC power cord back into the correct AC outlet. Plug into a surge protected outlet, not a GFCI outlet. Check that the UPS entry changes to "AC line".

\_\_\_7.20 Reinstall all enclosure covers.

\_\_\_7.21 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:

### Communication Test Procedure

\_\_\_8.0 **If comm. equipment is installed and operational:** Have the central controller operator connect to the sign, download a new test message that will not misdirect traffic into the field controller, and display the message.

\_\_\_8.1 **If comm. equipment is installed and operational:** Verify that the message displays properly on the sign. Then have the central controller operator blank the sign and delete the message. Have the central controller operator disconnect from the sign.

### Final Details

\_\_\_9.0 If equipped: Confirm that all sign and traffic cabinet thermostats are set properly.

\_\_\_9.1 Turn off sign interior lights.

\_\_\_9.2 Verify the sign is blank.

\_\_\_9.3 Verify that any test messages you created have been removed from the sign controller.

\_\_\_9.4 Verify that Web interface, LCD simulator, Telnet interface and ICMP ping interfaces are disabled on the controller.

\_\_\_9.5 Set the controller to enable event logging with vanguard software.

\_\_\_9.6 Record if main breaker is left on or off: On: \_\_\_ Off: \_\_\_ Date: \_\_\_\_\_

\_\_\_9.7 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**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

**Additional Comments/Punch list Items**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

FTP completed **Yes/ No**

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