

C27773
TEXAS DOT EL PASO DISTRICT
VX-2428-64x80-20-RGB
Site Name: _____
Field Test Procedure

DD4557617

Rev:1—11 November 2019

DAKTRONICS



DD4557617
Contract: DD4557617
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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 and Ground resistance tester
- Laptop computer, with vanguard software
- Ethernet Cable
- Common hand tools
- Ground resistance tester
- Flash Drive/Memory Stick

Site Information

Daktronics Representative: _____

Contract number and name: _____

Sign assembly #: _____ # of Displays _____

Sign serial #1: _____ Sign IP port #1: _____

Sign serial #2: _____ Sign IP port #2: _____

Sign serial #3: _____ Sign IP port #3: _____

Sign serial #4: _____ Sign IP port #4: _____

Sign serial #5: _____ Sign IP port #5: _____

Sign serial #6: _____ Sign IP port #6: _____

Sign serial #7: _____ Sign IP port #7: _____

Sign serial #8: _____ Sign IP port #8: _____

Primary IP address _____ Auxiliary IP address: _____

Traffic cabinet assembly no.: _____

Traffic cabinet serial no.: _____

Field controller serial no.: _____

Field controller address no.: _____

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

Version number:

- 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.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

- ___3.1 Check that the front, bottom, and rear light sensors are unobstructed.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Power Connection Inspection

___ 4.0 Turn off the power to the sign, from outside the sign.

___ 4.1 Check that the 2 (or more) positive, negative and ground wires are landed into the DC Breaker Rail Terminals, and Ground. Verify that connections are tight, clean and landed in the correct polarity.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___ 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.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___ 4.3 Check that all DC Breaker rail circuit breakers are off, except for the "Surge Suppressor" breaker, which should be on.

a. Apply power to the sign.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___ 4.4 Using a safe procedure, measure the DC voltage on the breaker input in the Display; it should measure 24 VDC (+/- 10%). This is a No-Load Test reading.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

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).

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___5.2 Check that all conduits that enter the sign are sealed inside at the end that enters the sign.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Sign Power Test

___6.0 Turn on all circuit breakers.

___6.1 Verify that VCB, modules, and Sensors power indicator lights are on

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Functional Test

- ___7.0 Turn on the sign controller power switch, check that the power indicator LED is on.
- ___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 for peripheral config
- ___7.3 Perform software reset through the VFC-3000 controller by selecting the "Reset Only" function on the LCD menus. (This will save the information into memory).
- ___7.4 **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".

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

- ___7.5 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.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

- ___7.6 Check that the value indicated by each of the three light sensors for each display 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: _____

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

Display #2 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #3 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #4 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #5 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #6 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #7 Light sensor readings: 1: _____ 2: _____ 3: _____
 Display #8 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.

Display #1 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #2 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #3 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #4 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #5 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #6 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #7 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

Display #8 ambient temperature (Temp Ambient), degrees F.: _____
 Internal temperature (TempSign1), degrees F.: _____

___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"

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___7.9 **Note: If testing at night run the all on 10% test patterns.** Display the "All On 100%" test pattern, and check that the All-On 100% brightness test pattern is displaying. Turn off one Power Supply.

Check in the "View Peripherals" screen that all power supplies (isolation boards) that are on indicates 24.1 to 25.2 VDC and the one off says fail. Repeat the above step for each remaining power supply.

- a. Turn on all power supply groups

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___7.10 Check that all power supplies (Isolation Boards) in Traffic Cabinet indicate "OK" (figure 8 pattern of the 7 segment display). Check that each power supply indicates pass in peripheral menu.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___7.11 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 do not run this test patterns.** Auto Test Pattern

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___7.12 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.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

___7.13 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% _____

___7.17 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.

___7.18 Reinstall all enclosure covers.

___7.19 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:

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

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.

Display# 1 Display# 2 Display# 3 Display# 4 Display# 5 Display# 6 Display# 7 Display# 8

Final Details

___9.0 **If equipped:** Confirm that all sign and traffic cabinet thermostats are set properly.

___9.1 Equipment covers are installed.

___9.2 Turn off sign interior lights.

___9.3 Verify the sign is blank.

___9.4 Verify that any test messages you created have been removed from the sign controller.

___9.5 Make sure permanent messages have been loaded to each display.

___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

Additional Comments/Punch list Items

FTP completed **Yes/No**

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