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Test Plan

Virginia Department of Transportation

VMS Functionality

Daktronics Vanguard™ VMS

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Test Plan for Compliance of Daktronics Vanguard™ Variable Message Signs (VMS) Local Controller

1. Background

This document contains the test plan for Daktronics Vanguard™ variable message sign field controller. This document is intended to test the specifications for the field controller as detailed in the Virginia Department of Transportation Special Provision for Variable Message Sign System document. It is assumed that the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS) has been completed and when applicable, will be referenced to eliminate repetitive testing.

2. Preparations for Testing

2.1 VMS Display Setup

Ensure that the VMS and VMS controller are wired according to the installation manual.

2.2 Class B Connection

For the majority of the tests in this document, the NTCIP Class B profile will be used for communication. A null-modem cable will be used for connecting the test computer with the display under test. The multi-drop address portion of the test requires a set of RS-232 to RS-422 signal converters, one at each node on the network.

2.3 Class D Connection

Testing of the NTCIP Class D protocol requires a pair of analog telephone modems. One at the central test computer and one at the display. Appropriate telephone lines must be provided for the test.

2.4 NTCIP Exerciser

2.4.1 Daktronics MIB

Daktronics will provide a floppy disk and paper printouts containing the MIB used by the Vanguard VMS display system. Copy the contents of the disk into the NTCIP exerciser's directory on the test computer. The following files are included:

MIBI	RFC1155.SMI
RFC1158.SMI	RFC1212.SMI
NEMA.SMI	TMIB1.TXT
RFC1213.MIB	RFC1317.MIB
RFC1381.MIB	TS34BGLO.MIB
TS36BVMS.MIB	VANGUARD.MAN

2.4.2 Exerciser Settings

The following paragraphs describe the procedures that should be performed in preparation of the testing.

1. Start the NTCIP Exerciser.
 - If an error-message (MIB Errors Detected) appears, verify that the MIB files provided by Daktronics have been copied into the exerciser's folder on the test computer.
 - If no error message occurs, the NTCIP Exerciser will open and the main menu will appear. Nothing will be displayed in the main menu mask except for a menu bar. The main display field of this window is used for line activity monitoring which is explained as part of the test plans.
2. For NTCIP Class B profile testing, ensure that the NEXERCISER.INI file contains the following lines of text:
 - SERIAL
 - COM1 (or other serial port as appropriate)
 - 9600
3. For NTCIP Class D profile testing, ensure that the NEXERCISER.INI file contains the following lines of text:
 - MODEM
 - COM1 (or other serial port as appropriate)
 - 9600

2.4.3 Using the Exerciser

2.4.3.1 SNMP Get

1. Open the exerciser and select the "Send" sub-menu from under "Message" of the main window.
2. The "Send Message" window will appear. Select the "Edit" button within this window and the "Browse Object" window will appear.
3. Browse the "Object Tree" display field until the desired object is found. Highlight the object and select the "Add" button. The object will be added to the "Selected Object" list. If multiple objects need to be received, additional objects may be highlighted and added. If the object is within a table, the "Select Instance" window will appear and the user will be required to enter the appropriate index / indexes. Note: If a table object is followed by ".3.1", the object has two indexes which need to be entered in the "Select Instance" window. The first entry index would be 3 and the second entry index would be 1.
4. Select the "OK" button once all the desired objects have been added to the "Selected Object" list. The "Browse Object" window will disappear and the "Send Message" window will reappear.
5. Make sure the "Get" radio button is selected and select the "Send" button to get the object values. The main window will reappear and communications will be initiated. While communicating, the line activity window of the main window will display the status of the communications. After a short time, communications will cease and the desired object values should be received.

6. To view the requested values, select “Message” and “Send” from the drop down menu. The “Send Message” window will appear. Select the “Edit” button within this window. The “Browse Object” window will then appear. Highlight the object in the “Selected Object” list to view the current value. The current value will be displayed in the “Current Value” field.

2.4.3.2 SNMP Set

1. Open the exerciser and select the “Send” sub-menu from under “Message” of the main window.
2. The “Send Message” window will appear. Select the “Edit” button within this window.
3. The “Browse Object” window will appear. Browse the “Object Tree” display field until the desired object is found. Highlight the object and select the “Add” button. The object will be added to the “Selected Object” list. If multiple objects need to be set, additional objects may be highlighted and added. If the object is within a table, the “Select Instance” window will appear and the user will be required to enter the appropriate index / indexes. Note: If a table object is followed by “.3.1”, the object has two indexes which need to be entered in the “Select Instance” window. The first entry index would be 3 and the second entry index would be 1.
4. Select the object from the “Selected Object” list and then select the radial button indicating the desired display mode. Valid display modes are “Decimal”, “Hexadecimal”, “ASCII String”, and “Object Identifier”.
5. Select the “New Value” edit field to enter the desired value for the object and select the “Enter Value” button to set the new value. The new value will be displayed across from the object in the “Value” list.
6. Select the “OK” button once all new values have been entered for the objects. The “Browse Object” window will disappear and the “Send Message” window will reappear. Finally, make sure the “Set” radial button is selected and select the “Send” button to set the object values. The main window will reappear and communications will be initiated. While communicating, the line activity window of the main window will display the status of the communications. After a short time, communications will cease and the desired objects should be set.

2.4.3.3 How to Perform an SNMP GetNext Command

Follow the same procedure as for the SNMP Get command, but specify “Get Next” on the “Send” screen. Instead of returning the object specified, it will return the next available object stored in the MIB.

3. Power Supply Failure Test

This test will verify that the controller is capable of sensing power supply failures as stated in Section III,D paragraph 3 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Get and verify the following objects in a single query:

Note: Each of these objects has a base tree path of: iso / organization / dod / internet / private / experimental / exp-global / auxiliaryIO / auxIOTable / auxIOEntry /.

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- auxPortType.3.17: 3 (digital)
- auxPortNumber.3.17: 17
- auxDescription.3.17: “DCOK01-001” (power supply status)
- auxResolution.3.17: 1 (bit)
- auxValue.3.17: 0 or 1 (0 = power good / 1 = power bad)
- auxPortDirection.3.17: 2 (input)

1. Switch off breaker X and verify that auxValue.3.17 has changed.

- auxValue.3.17: 0 or 1 (0 = power good / 1 = power bad)

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

4. Static Message Test

This test will verify that the controller is capable of displaying static text as stated in Section III,M,1, a of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 10.2 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

5. Flashing Message Test

This test will verify that the controller is capable of displaying flashing text in ½ second increments as stated in Sections III,M,1,b and IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

"[flt10o05]FLASH[/fl][flt10o10]TEST[/fl]"

(displays “FLASH” with an on-time of 1.0 seconds and an off-time of .5 seconds, and “TEST” with an on-time of 1.0 seconds and an off-time of 1.0 seconds). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration:	10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority:	255 (highest priority to ensure that message will always start)
MessageMemoryType:	3
MessageNumber:	1
MessageMultiString:	[flt10o05]FLASH[/fl][flt10o10]TEST[/fl]
MessageCRC:	xxxx (determined automatically by the software)
SourceAddress:	1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that the text is flashing at the indicated rates.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

6. Multi Page Message Test

This test will verify that the controller is capable of displaying multiple pages (frames) of text as stated in Section 3,M,1,c and capable of using the new page MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

"PAGE 1 [np]PAGE 2 [np]PAGE 3"

(displays “PAGE 1” on the first page, “PAGE 2” on the second page, and “PAGE 3” of the third page) .

The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X.

Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration:	10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority:	255 (highest priority to ensure that message will always start)
MessageMemoryType:	3

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MessageNumber: 1
MessageMultiString: PAGE 1[
PAGE 2[
PAGE 3
MessageCRC: xxxx (determined automatically by the software)
SourceAddress: 1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

1. Verify that the appropriate text was seen on the multiple page message.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

7. Double Stroke Font Test

This test will verify that the controller is capable of displaying double stroke fonts as stated in Section 3,M,2 and capable of using the font MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

“ [f o 2] DOUBLE STROKE FONT ”

(display “DOUBLE STROKE FONT” using font 2, font 2 is a double stroke font) . The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod /

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It is assumed that the message of the previous test is still being displayed. Please note that this message has the highest priority.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

“LOW PRIORITY”

The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration:	10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority:	125 (lower priority)
MessageMemoryType:	3
MessageNumber:	1
MessageMultiString:	LOW PRIORITY
MessageCRC:	xxxx (determined automatically by the software)
SourceAddress:	1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that the message is not displayed and that the previous message is still being displayed.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

10. Power Interruption Test

This test will verify that the sign shall retain the currently running message in the event of a power failure as stated in Sections III,M,4 and IV,A,7 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 15.1 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

11. Character Data Test

This test will verify that the controller is capable of displaying different characters as stated in Section III,N of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

"ABC XYZ . , ! ? - ` " / () # & * + < > "

The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

15. Daylight Savings Test

This test will verify that the controller is capable of adjusting its system clock for daylight savings as stated in Section IV,D of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 5.4 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

16. Leap Year Test

This test will verify that the controller is capable of adjusting its system clock for leap year as stated in Section IV,D of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 5.2.3 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

17. Password Protection Test

This test will verify that the controller is capable of password protection as stated in Section IV,E of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test requires the Central Software to test through the use of the Community Name in the NTCIP Protocol. The Field Controller Password Protection Test will be tested in the Test Plan for Daktronics Vanguard Variable Message Signs (VMS) Central Software.

18. Scheduler Test

This test will verify that the controller is capable of running a schedule as stated in Section IV.F.2 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 18.1 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____ _____ _____		
_____	_____	_____
Tester	Date	Time

19. Automatic Dimming Test

This test will verify that the controller is capable of automatic dimming as stated in Section IV,F,3,b of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in 17.3 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____ _____ _____		
_____	_____	_____
Tester	Date	Time

20. Manual Dimming Test

This test will verify that the controller is capable of manual dimming as stated in Section IV,A,3,b of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in Section 17.2 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____ _____ _____		
_____	_____	_____
Tester	Date	Time

21. Pixel Diagnostic Test

This test will verify that the controller is capable of a pixel diagnostics as stated in Section IV,F,6 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. This test was completed in 21 of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). Copy the results found in the test to the test results box below.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____ _____ _____		
_____	_____	_____
Tester	Date	Time

22. NTCIP Object Requirements

This test will verify that the controller is NTCIP compliant as stated in Section IV,F,9 paragraph 6 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document. Most of the following conformance groups / objects were tested in the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). The table below shows the object followed by the Section of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS) where the value can be found. The objects in bold are those that can not be tested because hardware does not support these objects (further clarification may be required for these objects).

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<i>Conformance Group / Object</i>	<i>Pass</i>	<i>Fail</i>
Time Managemnt (5)		
Timebase Event Sechedule (18)		
Report (6)		
STMF		
PMPP (7)		
VMS Sign Configuration (11)		
Font Configuration (10)		
Default Message Control (15)		
Pixel Service Control (16)		
Illumination/Brightness Control (17)		
Scheduling (18)		
Auxiliary I/O (19)		
Sign Status (20)		
Pixel Error Status (16)		
Fan Error Status		
dmsSWReset (14.2-3)		
dmsMessage-Time-Remaining (14.7)		
dmsMemoryMgmt (14.9)		
dmsShortPowerRecoveryMessage (15.1)		
dmsLongPowerRecoveryMessage (15.1)		
dmsShortPowerLossTime (15.1)		
dmsCommunicationsLossMessage (15.20)		
dmsTimeCommLoss (15.2)		
dmsPowerLossMessage (15.1)		

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dmsEndDurationMessage (15.3)		
DmsMulti-Other-Error-Description		
dmsIllumLightOutputStatus		
watchdog-Failure-Count (20.4)		
dmsStat-Door-Open		
fanFailures		
fan Test-Activation		
LineVolts		

23. Object Requirements

This test will verify that the controller is capable of the object requirements listed in the tables in Section IV,F,9. Most of the following items were tested in the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS). The table below shows the object followed by the Section of the Test Plan for NTCIP Compliance of Daktronics Vanguard™ Variable Message Signs (VMS) where the value can be found. Verify that the test met and/or exceeded the minimum requirements and indicate whether it passed or failed.

<i>Object</i>	<i>Min Requirement</i>	<i>Pass</i>	<i>Fail</i>
maxTimeBaseScheduleEntries (18.1.4)	7		
maxDayPlans (18.1.3)	7		
maxDayPlanEvents (18.1.3)	7		
maxEventLogConfigs (6.2)	50		
eventConfigMode (6.2)	2,3,4		
maxEventLogSize (6.3)	200		
maxEventClasses (6.1)	7		
numFonts (10.1)	2		
defaultBackgroundColor (12.1)	0		
defaultForegroundColor (12.1)	2, 7, 8, or 9		

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defaultJustificationLine (12.1)	2, 3, or 4		
defaultJustificaitonPage (12.1)	2, 3, or 4		
dmsNumPermanentMsg (13.1)	0		
dmsMaxChangeableMsg (13.1)	0		
dmsMaxVolatileMsg (13.1)	21		
dmsFreeVolatileMemory (13.1)	5kb		
dmsControlMode (14.1)	2, 4, and 5		
numActionTableEntries (18.1.2)	15		

1. Get the maxGroupAddress.0 Object. Record the value in the space provided below and compare to the value in parentheses. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / protocols / profiles / profilesPMPP /.

maxGroupAddress.0: _____ (>= 1)

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

2. Get the maxFontCharacters.0 Object. Record the value in the space provided below and compare to the value in parentheses. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / fontDefinition /.

maxFontCharacters.0: _____ (>= 255)

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL		
Notes: _____		

_____	_____	_____
Tester	Date	Time

24. MULTI Tag Tests

24.1 Flash Text Test

This test was completed earlier in Section 5.

24.2 Font Test

This test was completed earlier in Section 7.

24.3 Line Justification Test

This test will verify that the controller is capable of using the line justification MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

“ [j13]CENTER”

(displays “CENTER” in the horizontal center of the first line). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration:	10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority:	255 (highest priority to ensure that message will always start)
MessageMemoryType:	3
MessageNumber:	1
MessageMultiString:	[j13]CENTER
MessageCRC:	xxxx (determined automatically by the software)

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SourceAddress: 1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that “CENTER” is center justified on the first line.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

24.4 Page Justification Test

This test will verify that the controller is capable of using the page justification MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

“ [j p 3] MIDDLE ”

(displays “MIDDLE” in the vertical center of the first line). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

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4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration: 10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority: 255 (highest priority to ensure that message will always start)
MessageMemoryType: 3
MessageNumber: 1
MessageMultiString: [jp3]MIDDLE
MessageCRC: xxxx (determined automatically by the software)
SourceAddress: 1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the "Output String" field of "DMS.exe". The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that "MIDDLE" is vertically in the center of the display.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____
_____ Tester Date Time

24.5 Moving Text Test

This test will verify that the controller is capable of using the moving text MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of "6" (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

`"[mvcr50,1,3,MOVING TEXT TEST]"`

(displays "MOVING TEXT TEST" which moves circularly to the right within a windows of 50 pixels and a rate of 1 pixel per 3 tenths of a second). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of "7" (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises /

Daktronics VMS Functionality Test Procedure

nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.
4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration: 10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority: 255 (highest priority to ensure that message will always start)
MessageMemoryType: 3
MessageNumber: 1
MessageMultiString: [mvcr50,1,3,MOVING TEXT TEST]
MessageCRC: xxxx (determined automatically by the software)
SourceAddress: 1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the "Output String" field of "DMS.exe". The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that the appropriate text is displayed.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____

Tester Date Time

24.6 New Line Test

This test will verify that the controller is capable of using the new line MULTI tag as stated in Section IV,F,9 paragraph 10 of the Virginia Department of Transportation Special Provision for Variable Message Sign System document.

Daktronics VMS Functionality Test Procedure

1. Set the dmsMessageStatus.3.1 Object to a Decimal value of “6” (modifyReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

2. Set the dmsMessageMultiString.3.1 Object to an ASCII String of

“LINE 1[nl]LINE 2”

(displays “LINE 1” on line 1 and “LINE 2” on line 2). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageMultiString.X. Set the dmsMessageStatus.3.1 Object to a Decimal value of “7” (validateReq). The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

3. Get the dmsMessageStatus.3.1 Object. The Decimal value of this particular object may have different values depending on the processing speed of the device and the complexity of the messageMultiString. If the value is 3 (validating), repeat this test, if the value is 4 (valid), the message content has been validated successfully, and if the value is 5 (error), the message content had some error and the message text cannot be used. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / dmsMessage / dmsMessageTable / dmsMessageEntry / dmsMessageStatus.X.

4. Before setting the dmsActivateMessage Object, activate another application called "DMS.exe". This application will provide the appropriate value needed to activate the message that is already stored within the VMS Controller.

Enter the following values:

Duration:	10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority:	255 (highest priority to ensure that message will always start)
MessageMemoryType:	3
MessageNumber:	1
MessageMultiString:	LINE 1[nl]LINE 2
MessageCRC:	xxxx (determined automatically by the software)
SourceAddress:	1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that the appropriate text is displayed.

Daktronics VMS Functionality Test Procedure

Enter the following values:

Duration: 10 (expresses the time in minutes that a message is to be displayed)
ActivatePriority: 255 (highest priority to ensure that message will always start)
MessageMemoryType: 3
MessageNumber: 1
MessageMultiString: [pt30o5]PAGE 1-ON3[np][pt20o5]PAGE 2-ON2[np][pt20o5]PAGE 3-ON1
MessageCRC: xxxx (determined automatically by the software)
SourceAddress: 1 (transmitted as 4-byte IP Address, set to a fictitious value in this example)

Now, set the dmsActivateMessage Object to the Hexadecimal string found in the “Output String” field of “DMS.exe”. The tree path is: iso / organization / dod / internet / private / enterprises / nema / transportation / devices / dms / signControl / dmsActivateMessage.

5. Verify that the appropriate text and page times are seen on the display.

TEST RESULTS: <input type="checkbox"/> PASS <input type="checkbox"/> FAIL
Notes: _____ _____ _____

Tester Date Time