FLORIDA DEPARTMENT OF TRANSPORTATION

NTCIP TESTING PROCEDURE FOR
CLOSED CIRCUIT TELEVISION CAMERA (DRAFT)

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Note: Sections 0 to 3 were taken from FDOT DMS Qualification Test Procedure created by James Langston.

Reviewing notes:

Modifying notes:
Example testing procedure added at the end of each section in red.
Test setup added at the beginning in blue.
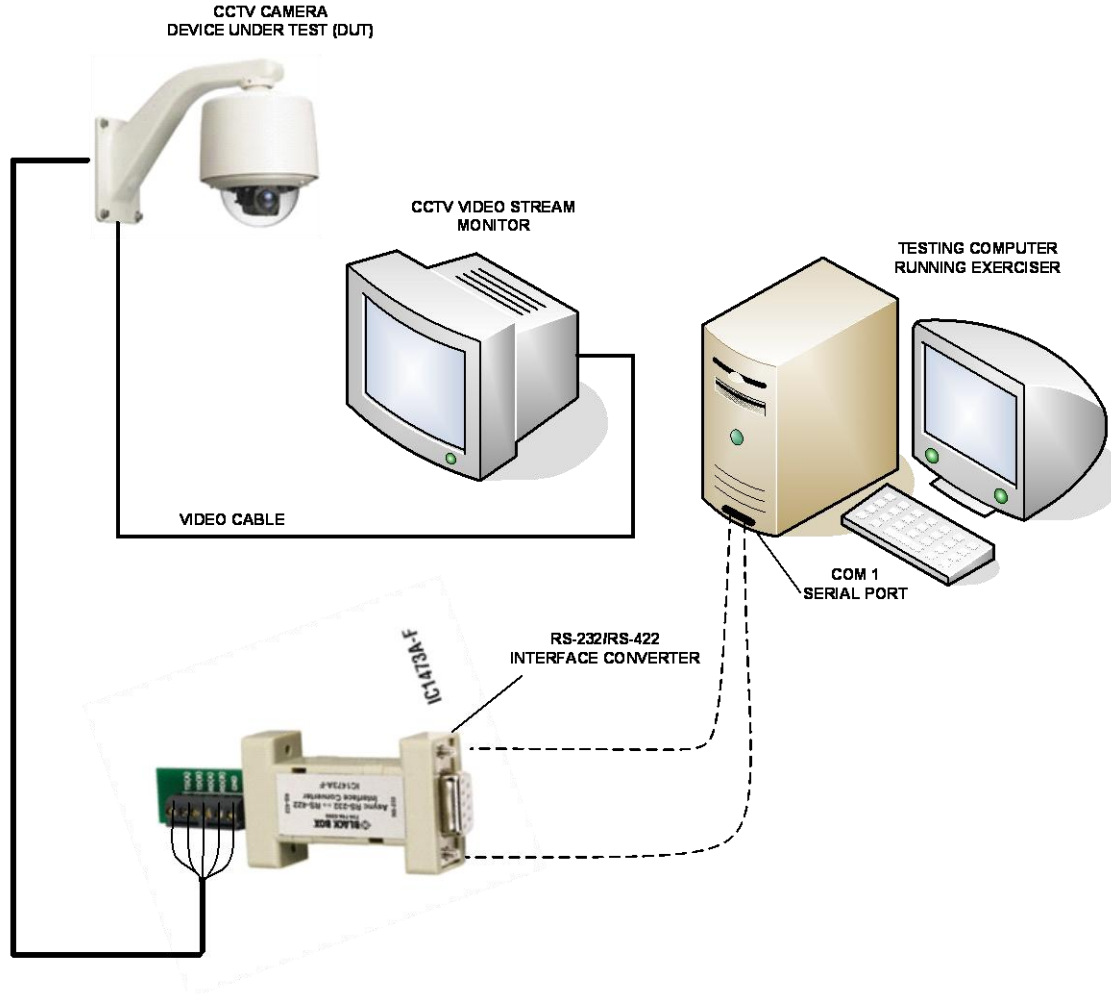Tables inserted after each test section in red

0. Test set-up

Fig 1: Connection diagram between the NTCIP device and the testing computer

1. Hook up the video coaxial cable from the CCTV camera to the CCTV video stream monitor.
2. Connect the video output wires to a Blackbox (or equivalent) RS422/RS232 or RS422/RS485 converter according to the manufacturer wiring diagram and then connect the converter to an available serial COM port on the testing computer.
3. Check whether the NTCIP Exerciser software is loaded on the testing computer. If not, download the newest version of NTCIP Exerciser software, ver. 3.3b7a, from the website www.ntcip.org under the Library tab.
4. Go to the NTCIP folder and open the Configuration Setting file, NExerciser.ini. The file should reads as follows:
   *SERIAL*
   COM1
   9600
   8
   18047964269
   CENTRAL
   SECRET
   Verify that the COM port number in this file matches the COM port in Step 2. Make changes if necessary. Save and close the file.

5. Go to the NTCIP folder and open the file Mibi. Verify that the files 1201(GLO),mib and 1205v0108.mib are included.

6. Go to NTCIP folder and look for the file NTCIPExerciserVer3.exe. Select that file and right click the mouse to choose *Properties*. Select the *Compatibility* tab and check the box next to "*Run this program in compatibility mode for*" and select "*Windows 98/Windows ME*" on the pulldown menu. Select Apply and OK to close the window.
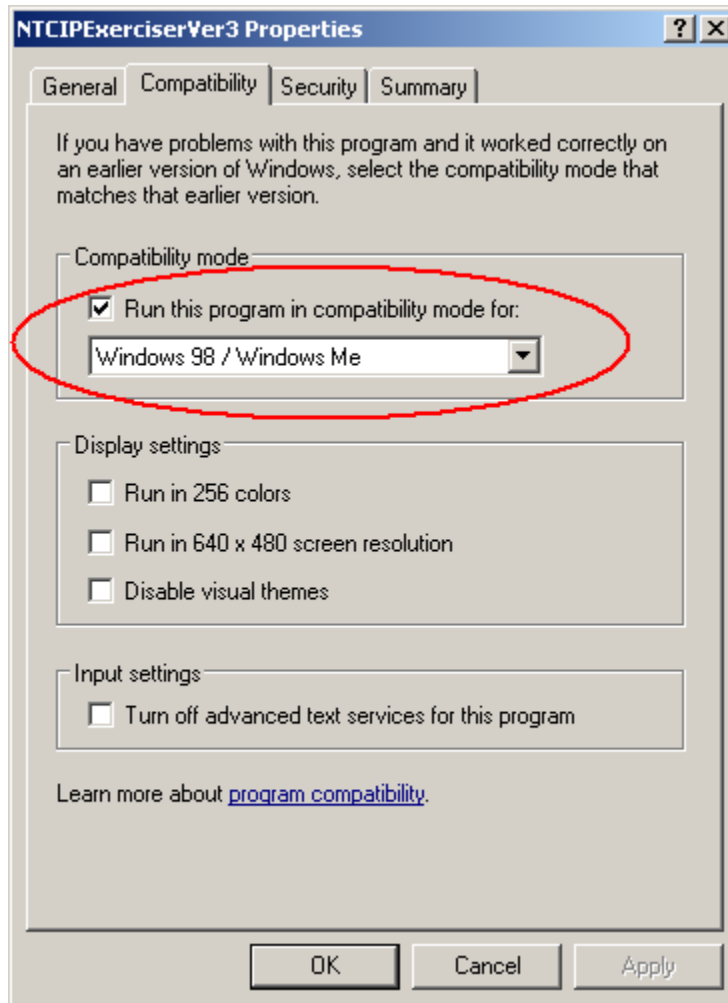

7. Run NTCIP Exerciser. Select *Central* from a pop-up window.
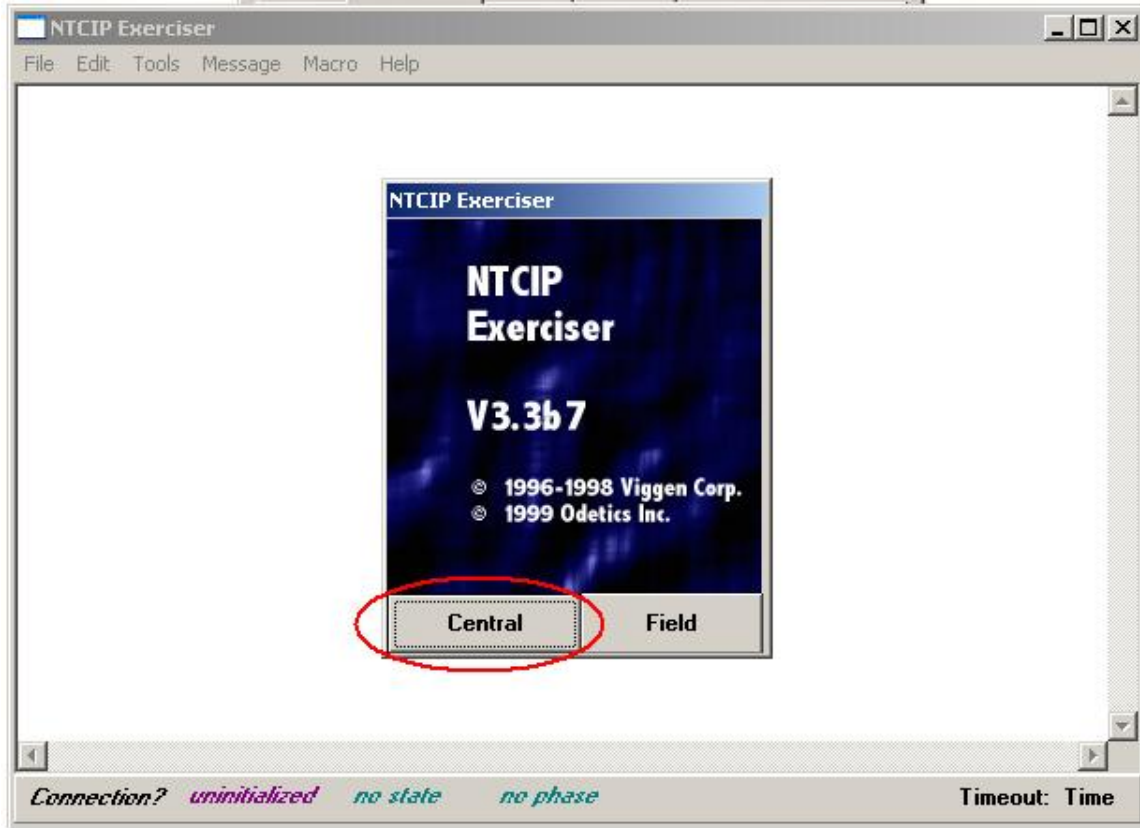
8.   Once the connection is set up between the testing computer and the device under test (DUT), the menu *Macro* is active. Click it and select *Run* and type the path and the CCTV testing macro file objectcheck.mac or cctvcentral,mac. Click *Run* and wait for the macro file to be loaded.
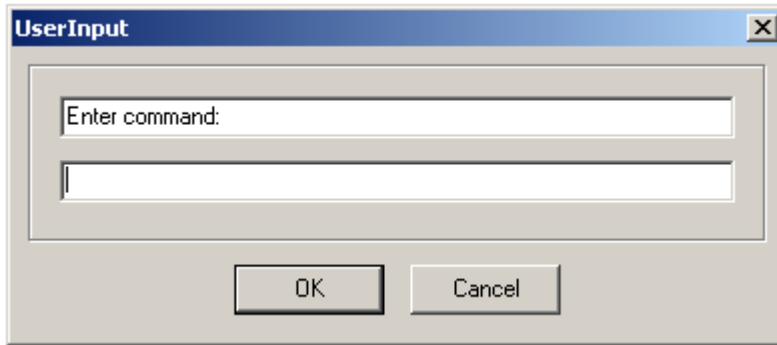

9.   Type in the path and a file name for the output log file (the output file must be a text file with the extension .txt). The Output log file contains the testing result for the DUT.
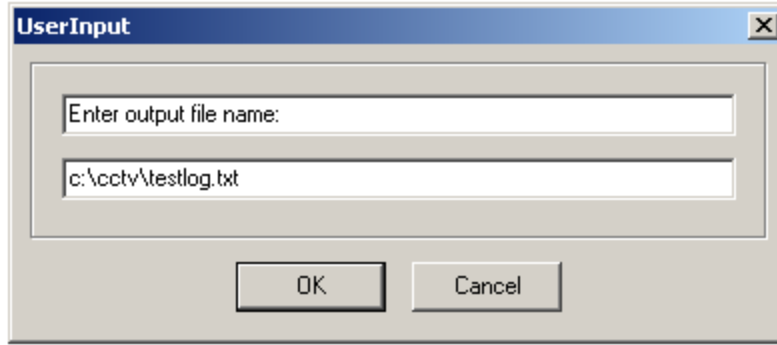
10.   Enter a community name: either *public* or *administrator* (all low cases), depending on the test.
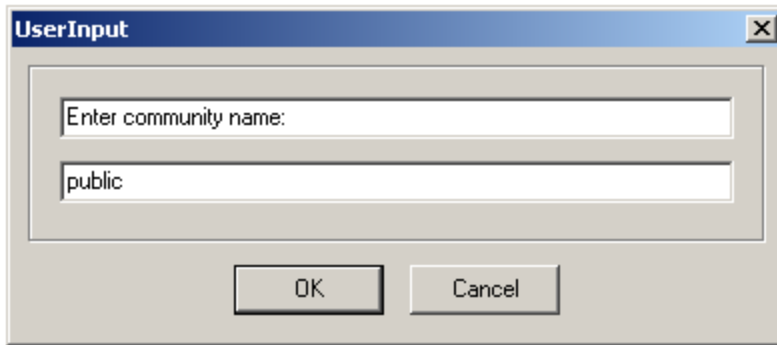
11.   Enter a command according to the test procedure that follows to begin to test the DUT.

00. Object Support

This part of the test is meant to serve as a preliminary test of objects supported by a device. The device should support all the mandatory objects as specified by the FDOT CCTV Functional Requirements.

Requirements

0.1 Object Support - *Verify that all of the mandatory objects are supported by the device. If any object deemed necessary for a critical functional test is not supported by the device, the manufacturer should be contacted to add support of such an object before the test proceeds further.*

Requirement	Status/Date	Related Files	Comments
0.1 Object Support			

1. Global Configuration

This conformance group is meant to provide general information about the device. A table is provided to give information about each module of the device. The information provided for each module includes the device node, manufacturer, model, version, and type. This information is needed so that the device can be identified by other devices.

> *Objects: globalMaxModules.0, moduleNumber.x, moduleDeviceNode.x, moduleMake.x, moduleModel.x, moduleVersion.x, moduleType.x*

Requirements

1.1 Obtain the Global Configuration Information – *Verify that all of the required Global Configuration objects respond properly to SNMP "get" requests, and verify that the information provided by these objects is correct for the device.*

Requirement	Status/Date	Related Files	Comments
1.1 Obtain Global Configuration Information			

Global Configuration □ Pass □ Fail □ Conditional Pass				
Maximum number of modules	3		Module number 2	
			Module device node	
			Module make	
			Module model	
			Module version	
			Module type	
Module number 1			Module number 3	
Module device node			Module device node	
Module make			Module make	
Module model			Module model	
Module version			Module version	
Module type			Module type	
Notes:				

2. Global Time Management *(Optional)*

This conformance group is used to keep track of the time for the device. The objects in this conformance group keep track of the global time (number of seconds since midnight on January 1, 1970) and whether or not daylight savings time is used.

> *Objects: globalTime.0, globalDaylightSaving.0*

Requirements

2.1 Obtain Time Information – *Verify that all Global Time Management objects correctly respond to SNMP "get" requests. Also verify that the actual time reported by the device is correctly constructed from the parameters.*

2.2 Set Time Parameters – *Verify that each of the Global Time Management objects can be set and that the actual time reported by the device is correctly constructed from the new parameter values.*

Requirement	Status/Date	Related Files	Comments
2.1 Obtain Time Information			

2.2 Set Time Parameters			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. Obtain information about time parameters. At the main command prompt, enter "globaltime". At the Global Time command prompt, enter "status".
3. Examine the report file. Verify that the device correctly reports all the time information.
4. Set the global time. At the main command prompt, enter "globaltime". At the Global Time command prompt, enter "set". As prompted, enter the following information:
    Global Time (s): **1041426000**
    Enable Daylight Savings Time? (y/n) **n**
    Local Time Differential: **0**
5. Repeat Steps 2 and 3.
6. Verify that the time for the device has changed to 1:00 P.M. January 1, 2003.
7. Repeat Step 4, entering the following time information:
    Global Time (s): **1041426000**
    Enable Daylight Savings Time? (y/n) **n**
    Local Time Differential: **3600**
8. Verify that the time for the device has changed to 2:00 P.M. January 1, 2003.
9. Examine the report file.
    - Verify that the device correctly reported all time information **(Successful completion of Steps 3 and 5 Satisfy Requirement 2.1 Obtain Time Information)**.
    - Verify that no errors are reported in the report file **(Successful results for Steps 6 and 8 Satisfy Requriement 2.2 Set Time Parameters)**.

3. Global Security

This conformance group is used to handle security for the device. In each SNMP packet, a community name is used to identify the sender. Different community names imply different access privileges to the device. Thus, the objects in this conformance group are used to specify which privileges are to be given to which community names. The administrator community name (which can be any name) is the only community name given access to the security node. This community name implies total access to the device. All other community names are considered user community names, and the privileges associated with each one of these names are defined by the objects in this conformance group.

> *Objects: communityNameAdmin.0, communityNamesMax.0, communityNameIndex.x, communityNameUser.x, communityNameAccessMask.x*

Requirements

3.1 Obtain Security Information – *Verify that all Global Security objects correctly respond to SNMP "get" requests with the administrator community name. Verify that these objects do not respond to SNMP "get" requests that do not contain the administrator community name.*
3.2 Set Administrator Community Name – *Verify that the administrator community name can be modified, by setting it to FDOTadmin and verify that this new administrator community name, and only this new administrator community name, is given access to the security node.*

3.3 Set User Access – *Verify that user community names can be added, and that these names are recognized by the device with the appropriate privileges.*

Requirement	Status/Date	Related Files	Comments
3.1 Obtain Security Information			
3.2 Set Administrator Community Name			
3.3 Set User Access			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. Set the community name used by the macro to the administrator community name. At the main command prompt, enter "changecn". When prompted, enter the administrator community name for the device.
3. Access administrator community name information. At the main command prompt, enter "globalsecurity". At the Global Security command prompt, enter "status". When prompted to enter the number for the user community name for which information is requested, enter "admin".
4. Examine the report file and verify that the device appropriately responded to the request, providing the administrator community name.
5. Obtain the user community name information. At the main command prompt, enter "globalsecurity". At the Global Security command prompt, enter "status". When prompted to enter the number for the user community name for which information is requested, enter "1".
6. Examine the report file and verify that the device appropriately responded to the request, providing the specified user community name and access mask (note: the access mask will not be shown correctly in the output file, see the Exerciser log).
7. Set the community name used by the macro to the user community name obtained in Step 6. At the main command prompt, enter "changecn". When prompted, enter the user community name obtained in Step 6.
8. Verify that the device recognizes the user community name. At the main command prompt, enter "single". As prompted enter the following information:
   Request Type: **get**
   Object Name: **globalMaxModules.0**
   Syntax: **d**
   Verify that the device responded appropriately to the request.
9. Repeat Step 2.
10. Modify the user community name. At the main command prompt, enter "globalsecurity". At the Global Security command prompt, enter "user". As prompted, enter the following information:
    User Community Name Number: **1**
    New User Community Name: **FDOTuser**
    Access Mask: **4294967295**
11. Repeat Steps 5 and 6.
12. Set the community name used by the macro to the community name originally obtained in Step 6. At the main command prompt, enter "changecn". When prompted, enter the user community name originally obtained in Step 6.

13. Verify that the device no longer recognizes the old user community name. At the main command prompt, enter "single". As prompted enter the following information:

> Request Type: **get**
> Object Name: **globalMaxModules.0**
> Syntax: **d**

Verify that the device did not respond with the requested information.

14. Set the community name used by the macro to "FDOTuser". At the main command prompt, enter "changecn". When prompted to enter the community name, enter "FDOTuser".
15. Repeat Step 8.
16. Verify that the device does not allow security node access. At the main command prompt, enter "single". As prompted, enter the following information:

> Request Type: **get**
> Object Name: **communityNameAdmin.0**
> Syntax: **s**

Verify that the device did not respond with the requested information.

17. Repeat Step 2.
18. Change the administrator community name. At the main command prompt, enter "globalsecurity". At the Global Security command prompt, enter "admin". When prompted to enter the new administrator community name, enter "FDOTadmin".
19. Repeat Step 16.
20. Change the community name used by the macro to the new administrator community name. At the main command prompt, enter "changecn". When prompted to enter the new community name, enter "FDOTadmin".
21. Repeat Steps 3 and 4.
22. Examine the report file.
    - **(Successful results for Steps 4, 6, 11, 16, 19, and 21 Satisfy Requirement 3.1 Obtain Security Information)**
    - **(Successful results for Steps 18 through 21 Satisfy Requirement 3.2 Set Administrator Community Name)**.
    - **(Successful results for Steps 10 through 16 Satisfy Requirement 3.3 Set User Access)**.

Global Security □ Pass □ Fail □ Conditional Pass	
User community name changeable	□ Pass □ Fail
Administrator community name changeable	□ Pass □ Fail
Device does not allow security node access	□ Pass □ Fail

4. PMPP *(Optional)*

This conformance group is used to provide communication between multiples on the same communications line/channel using PMPP (Point-to-MultiPoint protocol) – a transportation specific subnetwork layer protocol.

> *Objects: maxGroupAddresses.0, hdlcGroupAddressIndex.1, hdlcGroupAddress.1.*

Requirements

4.1 Obtain PMPP Information – *Verify that the maximum number of group addresses this device supports is the maximum number of rows in the hdlcGroupAddress table.*

Requirement	Status/Date	Related Files	Comments
4.1 Obtain PMPP			

Information			

5. Motion Control - Position

This conformance group is used to provide general information about the motion control and features. The group provides all basic manipulation of the camera system.

>*Objects: positionPan.0, positionTilt.0, positionZoomLens.0, positionFocusLens.0, positionIrisLens.0.*

Requirements

5.1 Obtain Pan motion control information – *Verify that Pan control information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

>Checklist:
>5.1.1 Verify that the camera Pan motion can be controlled using 4 command types defined for movement: stopMovement (a cessation in camera movement), delta (an incremental camera movement), absolute (movement to an absolute position value), and continuous (start moving and continue until told to stop).
>5.1.2 If variable speeds are supported, verify that the speeds of -1 and +1 are the slowest speed for a given direction of movement while the speeds of -127 and +127 are the fastest speeds for a given direction of movement, and values of -64 and +64 result in movement at half the maximum pan speed. The value of zero (0) means a stoppage in movement. The direction of movement is denoted by the positive (+) and negative (-) portion of the signed values.

5.2 Obtain Tilt motion control information – *Verify that Tilt control information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

>Checklist:
>5.2.1 Verify that the camera Tilt motion can be controlled using 4 command types defined for movement: stopMovement (a cessation in camera movement), delta (an incremental camera movement), absolute (movement to an absolute position value), and continuous (start moving and continue until told to stop).
>5.2.2 If variable speeds are supported, verify that the speeds of -1 and +1 are the slowest speed for a given direction of movement while the speeds of -127 and +127 are the fastest speeds for a given direction of movement, and values of -64 and +64 result in movement at half the maximum tilt speed. The value of 0 means a stoppage in movement. The direction of movement is denoted by the positive (+) and negative (-) portion of the signed values.

5.3 Obtain Zoom Lens motion control information – *Verify that Zoom Lens control information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

>Checklist:
>5.3.1 Verify that the camera Zoom Lens motion can be controlled using 4 command types defined for movement: stopMovement (a cessation in camera movement), delta (an incremental camera movement), absolute (movement to an absolute position value), and continuous (start moving and continue until told to stop).

5.3.2 If variable speeds are supported, verify that the speeds of -1 and +1 are the slowest speed for a given direction of movement while the speeds of -127 and +127 are the fastest speeds for a given direction of movement, and values of -64 and +64 result in movement at half the maximum zoom speed. The value of 0 means a stoppage in movement. The direction of movement is denoted by the positive (+) and negative (-) portion of the signed values.

5.4 Obtain Focus Lens motion control information – *Verify that Focus Lens control information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

      Checklist:
5.4.1 Verify that the camera Focus Lens motion can be controlled using 4 command types defined for movement: stopMovement (a cessation in camera movement), delta (an incremental camera movement), absolute (movement to an absolute position value), and continuous (start moving and continue until told to stop).
5.4.2 If variable speeds are supported, verify that the speeds of -1 and +1 are the slowest speed for a given direction of movement while the speeds of -127 and +127 are the fastest speeds for a given direction of movement, and values of -64 and +64 result in movement at half the maximum focus speed. The value of 0 means a stoppage in movement. The direction of movement is denoted by the positive (+) and negative (-) portion of the signed values.

5.5 Obtain Iris Lens motion control information – *Verify that Iris Lens control information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

      Checklist:
5.5.1 Verify that the camera Iris Lens motion can be controlled using 4 command types defined for movement: stopMovement (a cessation in camera movement), delta (an incremental camera movement), absolute (movement to an absolute position value), and continuous (start moving and continue until told to stop).
5.5.2 If variable speeds are supported, verify that the speeds of -1 and +1 are the slowest speed for a given direction of movement while the speeds of -127 and +127 are the fastest speeds for a given direction of movement, and values of -64 and +64 result in movement at half the maximum iris speed. The value of 0 means a stoppage in movement. The direction of movement is denoted by the positive (+) and negative (-) portion of the signed values.

Requirement	Status/Date	Related Files	Comments
5.1 Obtain Position Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

A – Automatic Motion Control Test Procedure:

The function of this procedure is to help the tester shorten the test time by reducing the number of test commands. By typing some automatic commands, the tester just has to look at the camera monitor and visual check the camera's operation. If the tester wants to scrutinize the motion control in more details, proceed to Section B later.
The automatic motion control procedure is described as follow:
1. At the main command prompt, enter "**positionauto**" to go to the "POSITION AUTO" mode.

2. When prompted "Enter POSITION AUTO mode: PANAUTO/TILTAUTO/ZOOMAUTO", enter the auto motion mode you want the camera to go.

3. Enter "**panauto**" (Pan Auto Mode) to access to the Pan Auto mode.

4. Enter "**deltaauto**" (Delta Pan Auto Mode) to access to the Delta Pan Auto mode.
   Check if the camera obeys the operation as described below:
   4.1 The camera pans right to a new position 45 degrees clockwise from current position. Visually check the movement's direction. Then, the camera stops for 1 second.
   4.2 The camera pans right to a new position 123 degrees clockwise from current position with a faster speed. Visually check the movement's direction and check if the speed of movement is actually faster than in Step 4.1. Then, the camera stops for 1 second.
   4.3 The camera pans right to a new position 90 degrees clockwise from current position with a faster speed. Visually check the movement's direction and check if the speed of movement is actually faster than in Step 4.2. Then, the camera stops for 1 second.
   4.4 The camera pans left to a new position 45 degrees counterclockwise from current position. Visually check the movement's direction. Then, the camera stops for 1 second.
   4.5 The camera pans left to a new position 123 degrees counterclockwise from current position with a faster speed. Visually check the movement's direction and check if the speed of movement is actually faster than in Step 4.4. Then, the camera stops for 1 second.
   4.6 The camera pans left to a new position 180 degrees counterclockwise from current position with a faster speed. Visually check the movement's direction and check if the speed of movement is actually faster than in Step 4.5.

5. Enter "**absoluteauto**" (Delta Pan Auto Mode) to access to the Absolute Pan Auto mode.
   Check if the camera obeys the operation as described below:
   5.1 The camera goes back to pan home position. Then, the camera stops for 1 second.
   5.2 The camera pans to angle 45 degrees clockwise/counterclockwise from home position. The direction of movement is ignored for this absolute mode choice. Then, the camera stops for 1 second.
   5.3 The camera pans to angle 90 degrees clockwise/counterclockwise. Check if the speed of movement is actually faster than in Step 5.3. The direction of movement is ignored for this absolute mode choice. Then, the camera stops for 1 second.
   5.4 The camera pans to angle 270 degrees clockwise/counterclockwise. Check if the speed of movement is actually faster than in Step 5.5. The direction of movement is ignored for this absolute mode choice.

6. Enter "**continuousauto**" (Continuous Pan Auto Mode) to access to the Continuous Pan Auto mode.
   6.1 The camera pans clockwise continuously from current position and stop after 3 seconds. Then, the camera stops for 1 second.
   6.2 The camera pans clockwise continuously from current position with a faster speed than that in Step 6.1 and stops after 3 seconds. Check the movement's direction and camera's speed. Then, the camera stops for 1 second.
   6.3 The camera pans clockwise continuously from current position with a faster speed than that in Step 6.3 and stops after 3 seconds. Check the movement's direction and camera's speed. Then, the camera stops for 1 second.
   6.4 The camera pans counterclockwise continuously from current position and stop after 3 seconds. Then, the camera stops for 1 second.
   6.5 The camera pans counterclockwise continuously from current position with a faster speed than that in Step 6.4 and stops after 3 seconds. Check the movement's direction and camera's speed. Then, the camera stops for 1 second.
   6.6 The camera pans counterclockwise continuously from current position with a faster speed than that in Step 6.5 and stops after 3 seconds. Check the movement's direction and camera's speed.

7. Enter "**tiltauto**" (Tilt Auto Mode) to access to the Tilt Auto mode.

8. Enter "**deltatiltauto**" (Delta Tilt Auto Mode) to access to the Delta Tilt Auto mode.
   Check if the camera obeys the operation as described below:
   8.1 The camera goes to the tilt home position. Then, the camera stops for 3 second.
   8.2 The camera tilts down to angle 10 degrees from current position. Then, the camera stops for 3 seconds.

8.3 The camera tilts down to angle 20 degrees from current position with faster speed than that in Step 8.2. Then, the camera stops for 3 seconds.

8.4 The camera tilts down to angle 30 degrees from current position with faster speed than that in Step 8.3. Then, the camera stops for 3 seconds.

8.5 The camera tilts up to angle 10 degrees from current position. Then, the camera stops for 3 seconds

8.6 The camera tilts up to angle 20 degrees from current position with faster speed than Step 8.5. Then, the camera stops for 3 seconds

8.7 The camera tilts up to angle 30 degrees from current position with faster speed than Step 8.6.

9. Enter "**absolutetiltauto**" (Absolute Tilt Auto Mode) to access to the Absolute Tilt Auto mode.

9.1 The camera goes to the tilt home position. Then, the camera stops for 1 second.

9.2 The camera tilts to angle 30 degrees from tilt home position. Then, the camera stops for 1 second. The tilt direction is ignored.

9.3 The camera tilts to angle 60 degrees from tilt home position. Then, the camera stops for 1 second. The tilt direction is ignored.

9.4 The camera tilts to angle 90 degrees from tilt home position. Then, the camera stops for 1 second. The tilt direction is ignored.

10. Enter "**continuoustiltauto**" (Continuous Tilt Auto Mode) to access to the Continuous Tilt Auto mode.

10.1 The camera goes to the tilt home position. Then, the camera stops for 2 second.

10.2 The camera tilts down continuously from current position and stop after 1 second. Then, the camera stops for 2 seconds.

10.3 The camera tilts down continuously from current position and stop after 1 second with faster speed than Step 10.2. Then, the camera stops for 2 seconds.

10.4 The camera tilts down continuously from current position and stop after 1 second with faster speed than Step 10.3. Then, the camera stops for 2 seconds.

10.5 The camera tilts up continuously from current position and stop after 1 second. Then, the camera stops for 2 seconds.

10.6 The camera tilts up continuously from current position and stop after 1 second with faster speed than Step 10.5. Then, the camera stops for 2 seconds.

10.7 The camera tilts up continuously from current position and stop after 1 second with faster speed than Step 10.6.

11. Enter "**zoomauto**" (Zoom Auto Mode) to access to the Zoom Auto mode.

12. Enter "**deltazoomauto**" (Delta Zoom Auto Mode) to access to the Delta Zoom Auto mode.

12.1. The camera goes to the zoom home position. Then, the camera stops for 2 second.

12.2. The camera zooms in to half range and then stops for 2 seconds.

12.3. The camera zooms out to quarter range.

13. Enter "**absolutezoomauto**" (Absolute Zoom Auto Mode) to access to the Absolute Zoom Auto mode.

13.1. The camera goes to the zoom home position.

13.2. The camera zooms in to maximum zoom range from zoom home position. Then, the camera stops for 2 second.

13.3. The camera zooms in to half zoom range from zoom home position. Then, the camera stops for 2 second.

13.4. The camera zooms out for 3 seconds. Then, the camera stops for 2 second.

13.5. The camera zooms out for 3 seconds with faster speed than Step 13.4.

14. Enter "**continuouszoomauto**" (Continuous Zoom Auto Mode) to access to the Continuous Zoom Auto mode.

14.1. The camera goes to the zoom home position.

14.2. The camera zooms in for 5 seconds continuously. Then, the camera stops for 2 second.

14.3. The camera zooms out for 5 seconds continuously.

B - Manual Motion Control Test Procedure:
1. Run the macro CCTVcentral.mac.

Move camera to Home position (Pan: 0.00 degree, Tilt: 0.00 degree, Zoom: minimum zoom)

2. At the main command prompt, enter "position" to go to Motion Control – Position group.
3. At position command prompt, enter "panhome". Check if camera moves to home position.
4. At position command prompt, enter "tilthome". Check if camera tilts to horizontal plane.
5. At position command prompt, enter "zoomhome". Check if zoom lens zooms to minimum zoom.

Pan motion in Absolute mode of movement
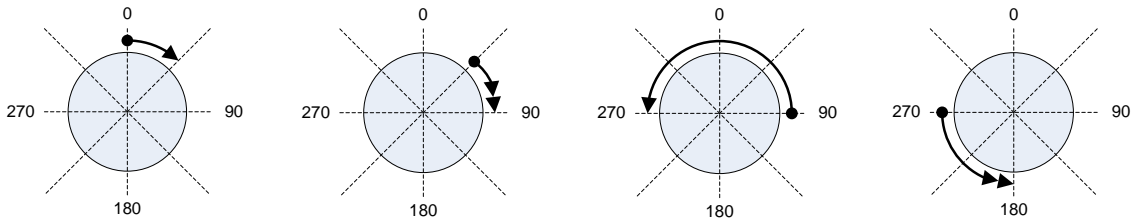
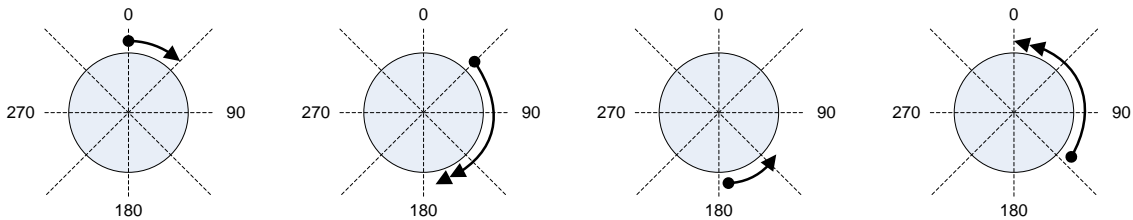| *Illustration for Step 6* | *Illustration for Step 7* | *Illustration for Step 8* | *Illustration for Step 9* |

Note: Double arrows: medium speed. Single arrow: slow speed

6. At the main command prompt, enter "position", then enter "ap" (Absolute Pan) to pan camera to angle 45 degrees clockwise/counterclockwise from home position. The direction of movement is ignored for this absolute mode choice.
7. Enter "apm" (Absolute Pan Medium speed) to pan camera to angle 90 degrees clockwise/counterclockwise. Check if the speed of movement is actually faster than in "ap" mode. The direction of movement is ignored for this absolute mode choice.
8. Enter "apf" (Absolute Pan Fast) to pan camera to angle 270 degrees clockwise/counterclockwise. Check if the speed of movement is actually faster than in "apm" mode. The direction of movement is ignored for this absolute mode choice.

Absolute mode: □ Pass □ Fail □ Conditional Pass				
Speed			**Direction**	
Slow	**Medium**	**Fast**	**Right**	**Left**
□ Pass □ Fail	□ Pass □Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail

Pan motion in Delta mode of movement

| *Illustration for Step 10* | *Illustration for Step 11* | *Illustration for Step 12* | *Illustration for Step 13* |

Note: Double arrows: medium speed. Single arrow: slow speed

9. Enter "dpr" (Delta Pan Right) to pan camera to a new position 45 degrees clockwise from current position. Visually check the direction of movement.
10. Enter "dprm" (Delta Pan Right Medium speed) to pan camera to a new position 123 degrees clockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dpr" mode.
11. Enter "dprf" (Delta Pan Right Fast) to pan camera to a new position 90 degrees clockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dprm" mode.
12. Enter "dpl" (Delta Pan Left) to pan camera to a new position 45 degrees counterclockwise from current position. Visually check the direction of movement.
13. Enter "dplm" (Delta Pan Left Medium speed) to pan camera to a new position 123 degrees counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dpl" mode.
14. Enter "dplf" (Delta Pan Left Fast) to pan camera to a new position 180 degrees counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dplm" mode.

Delta mode: □ Pass   □ Fail   □ Conditional Pass

Speed			Direction	
Slow	**Medium**	**Fast**	**Right**	**Left**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Pan motion in Continuous mode of movement

15. Enter "cpr" (Continuous Pan Right) to pan camera clockwise from current position. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued.
16. Enter "cprm" (Continuous Pan Right Medium speed) to pan camera clockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "cpr" mode. Check if the camera stops after *timeout* seconds or when a new command is issued.
17. Enter "cprf" (Continuous Pan Right Fast) to pan camera clockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "cprm" mode. Check if the camera stops after *timeout* seconds or when a new command is issued.
18. Enter "cpl" (Continuous Pan Left) to pan camera counterclockwise from current position. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued.
19. Enter "cplm" (Continuous Pan Left Medium speed) to pan camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "cpl" mode. Check if the camera stops after *timeout* seconds or when a new command is issued.
20. Enter "cplf" (Continuous Pan Left Fast) to pan camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "cplm" mode. Check if the camera stops after *timeout* seconds or when a new command is issued.

**Continuous mode**: □ Pass   □ Fail   □ Conditional Pass

Speed	Direction

Slow	Medium	Fast	Right	Left
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Pan motion in stopMovement mode of movement

21. Enter "cpr", "cpl", "cprf", or "cplf" to pan the camera.
22. While the camera is in motion, enter "ps" (Pan Stop) to stop the movement of the camera before *timeout* seconds. (**Steps 1-22 satisfy Requirement 5.1 Pan Motion Control**)

Stop mode: □ Pass □ Fail □ Conditional Pass				
Speed			Direction	
Slow	Medium	Fast	Right	Left
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Tilt motion in Absolute mode of movement
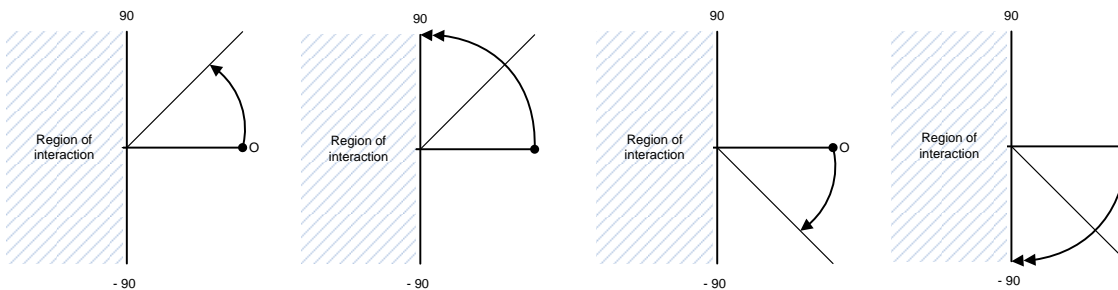
 Illustration for Step 20　　*Illustration for Step 21*　　*Illustration for Step 12*　　*Illustration for Step 13*
Note: Double arrows: fast speed. Single arrow: slow speed

23. At the main command prompt, enter "position". Then, enter "at" (Absolute Tilt Up) to tilt the camera to an angle 270 degrees from home position.   Visually check the direction of movement. The direction of movement in the absolute mode is ignored.
24. Enter "atm" (Absolute Tilt Up Medium speed) to tilt the camera up to an angle of 280 degrees. Check if the speed of movement is actually faster than in the "at" mode. Visually check the direction of movement. The direction of movement in the absolute mode is ignored.
25. Enter "atf" (Absolute Tilt Up Fast) to tilt the camera to an angle of 290 degrees. Check if the speed of movement is actually faster than in the "atm" mode. Visually check the direction of movement. The direction of movement in the absolute mode is ignored.

Absolute mode: □ Pass □ Fail □ Conditional Pass				
Speed			Direction	
Slow	Medium	Fast	Up	Down
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Tilt motion in Delta mode of movement

26. Enter "dtu" (Delta Tilt Up) to tilt the camera to a new position of 10 degrees upward from current position. Visually check the direction of movement.
27. Enter "dtum" (Delta Tilt Up Medium speed) to tilt the camera to a new position 20 degrees upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "dtu" mode.
28. Enter "dtuf" (Delta Tilt Up Fast) to tilt the camera to a new position 30 degrees upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "dtum" mode.
29. Enter "dtd" (Delta Tilt Down) to tilt the camera to a new position of 10 degrees downward from current position. Visually check the direction of movement.
30. Enter "dtdm" (Delta Tilt Down Medium speed) to tilt the camera to a new position 20 degrees downward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "dtd" mode.
31. Enter "dtdf" (Delta Tilt Down Fast) to tilt the camera to a new position 30 degrees downward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "dtdm" mode.

Delta mode: □ Pass □ Fail □ Conditional Pass				
Speed			**Direction**	
Slow	**Medium**	**Fast**	**Up**	**Down**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Tilt motion in Continuous mode of movement

32. Enter "tu" (Continuous Tilt Up) to tilt the camera upward from current position. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way up.
33. Enter "tum" (Continuous Tilt Up Medium speed) to tilt the camera upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "tu" mode. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way up.
34. Enter "tuf" (Continuous Tilt Up Fast) to tilt the camera upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "tum" mode. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way up.
35. Enter "td" (Continuous Tilt Down) to tilt the camera downward from current position. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way down.
36. Enter "tdm" (Continuous Tilt Down Medium) to tilt the camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "td" mode. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way down.
37. Enter "tdf" (Continuous Tilt Down Fast) to tilt the camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in the "tdm" mode. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is tilted all the way down.

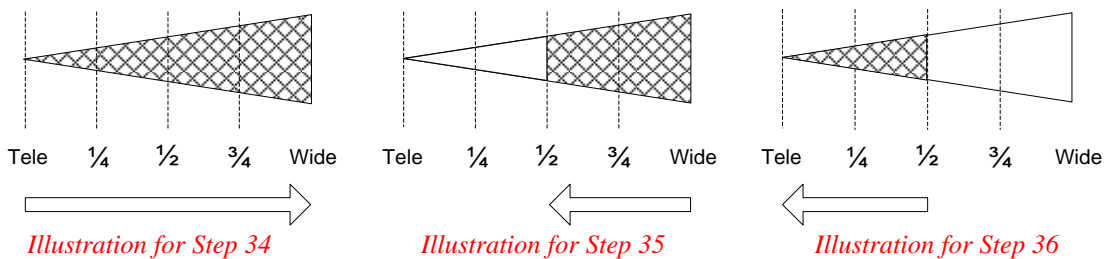| **Continuous mode**: □ Pass □ Fail □ Conditional Pass	
Speed	**Direction**

Slow	Medium	Fast	Up	Down
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes: DUT runs smoothly.				

Tilt motion in stopMovement mode of movement

38. Enter "tu" or "td" to tilt the camera up or down.
39. While the camera is in motion, enter "ts" (Tilt Stop) to stop the movement of the camera before *timeout* seconds. (**Steps 23-39 satisfy Requirement 5.2 Tilt Motion Control**)

Stop mode: □ Pass □ Fail □ Conditional Pass				
Speed			Direction	
Slow	Medium	Fast	Up	Down
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Zoom Lens motion in Absolute mode of movement

Tele ¼ ½ ¾ Wide	Tele ¼ ½ ¾ Wide	Tele ¼ ½ ¾ Wide
Illustration for Step 34	*Illustration for Step 35*	*Illustration for Step 36*

40. At the main command prompt, enter "position". Then, enter "azi" (Absolute Zoom In) to zoom in the camera to the maximum zoom value.
41. Enter "azh" (Absolute Zoom Half) to zoom the camera to a half of the zoom range.
42. Enter "azo" (Absolute Zoom Out) to zoom out the camera to the minimum zoom value.

Absolute mode: □ Pass □ Fail □ Conditional Pass				
Speed			Direction	
Slow	Medium	Fast	**Zoom In**	**Zoom Out**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Note				

Zoom Lens motion in Delta mode of movement

Tele ¼ ½ ¾ Wide	Tele ¼ ½ ¾ Wide	Tele ¼ ½ ¾ Wide
Illustration for Step 38	*Illustration for Step 39*	*Illustration for Step 40*
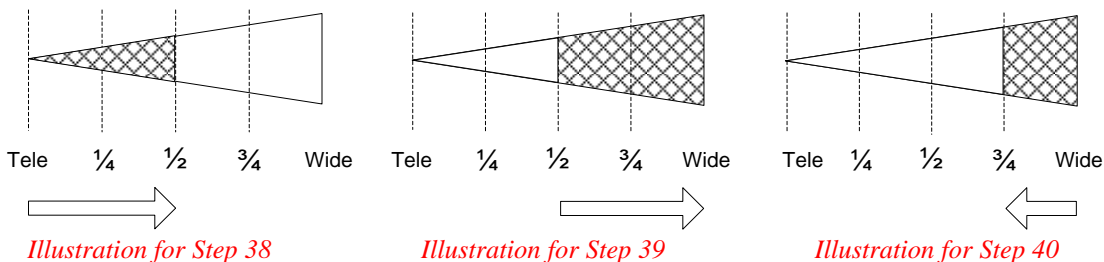
43. At position command prompt, enter "zoomhome". Check if zoom lens zooms to the minimum zoom.
44. Enter "dzi" (Delta Zoom In) to zoom in the camera to a half of zoom range.
45. Repeat Step 38. Check if the camera is zoomed in to the maximum value.
46. Enter "dzo" (Delta Zoom Out) to zoom out the camera to a quarter of zoom range.
47. Repeat Step 40 three times. Check if the camera is zooming out to the minimum value.

Delta mode: □ Pass □ Fail □ Conditional Pass				
Speed			**Direction**	
Slow	**Medium**	**Fast**	**Zoom In**	**Zoom Out**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Note				

Zoom Lens motion in Continuous mode of movement

48. Enter "zi" (Continuous Zoom In) to zoom in the camera to the maximum zoom value. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is zoomed all the way in.
49. Enter "zo" (Continuous Zoom Out) to zoom in the camera to the minimum zoom value. Check if the camera stops after *timeout* seconds or when a new command is issued or the camera is zoomed all the way out.

Continuous mode: □ Pass □ Fail □ Conditional Pass				
Speed			**Direction**	
Slow	**Medium**	**Fast**	**Zoom In**	**Zoom Out**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

Zoom Lens motion in stopMovement mode of movement

50. Enter "zi" or "zo" to zoom the camera all the way in or out.
51. While the camera is in motion, enter "zs" (Zoom Stop) to stop the movement of the camera before *timeout* seconds.

Stop mode: □ Pass □ Fail □ Conditional Pass				
Speed			**Direction**	
Slow	**Medium**	**Fast**	**Zoom In**	**Zoom Out**
□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail	□ Pass □ Fail
Notes:				

6. Motion Control - Preset

This conformance group is used to provide general information about the preset control and features.

Objects: presetGotoPosition.0, presetStorePosition.0, presetPositionQuery.0

Requirements

6.1 Obtain Preset information – *Verify that Preset information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

Checklist:
6.1.1 Verify that the number of preset positions could be read from the device.
6.1.2 Verify the device could be moved to a specified preset if that preset exists.
6.1.3 Verify that the current positions (P/T/Z) could be saved to a specified preset.
6.1.4 Verify that the number of preset could be indicated where the device is currently positioned.

Requirement	Status/Date	Related Files	Comments
6.1 Obtain Preset Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. *Store P/T/Z to a preset.* At the main command prompt, enter "preset". At the Preset command prompt, enter "store" then pick any number X between 1 and the maximum number of preset positions specified for the camera (64 for dome-type camera, 32 for external positioner-type camera) to store the current position (P/T/Z) to the preset position number X. Note the values of P/T/Z on the monitor.
3. Rotate the camera to a different position. (Different values of P/T/Z). Hint: go back to Section 5: Motion Control – Position to get the appropriate commands for P/T/Z.
4. *Verify the maximum number of preset.* At the Preset command prompt, enter "store" then enter the maximum number of preset positions specified for the camera (64 for dome-type camera, 32 for External Positioner-type camera). Note the values of P/T/Z at this position.
5. At the Preset command prompt, enter "goto" and then enter previous stored preset X to go back to the previous stored position number X. Verify if the camera returns to the previous stored position by checking and comparing the values of P/T/Z from the monitor with previous noted values.
6. Examine the report file. **(Satisfies Requirement 6.1.2 and 6.1.3)**.
7. At the Preset command prompt, enter "query".
8. Examine the report file. Check if current position is X. **(Satisfies Requirement 6.1.1).**
9. Rotate the camera to arbitrary position (not at any previous stored presets).
10. At the Preset command prompt, enter "query".
11. Examine the report file. Check if response is 0 indicating that the camera is not currently at any preset position. **(Satisfies Requirement 6.1.4)**

Motion Control – Preset □ Pass □ Fail □ Conditional Pass			
	P/T/Z or preset value	FDOT req' value	
Store a preset	/ /		□ Pass □ Fail
Query a preset			□ Pass □ Fail
Go to preset			□ Pass □ Fail
Get maximum preset	/ /	64 (dome) / 32 (positioner)	□ Pass □ Fail
Notes:			

7. Motion Control - Query

This conformance group is used to provide general information about the query control and features.

> *Objects: positionQueryPan.0, positionQueryTilt.0, positionQueryZoom.0,
> positionQueryFocus.0 (optional), positionQueryIris.0 (optional).*

Requirements

7.1 Obtain Query information – *Verify that query information provided by the objects in this conformance group is correct for the device and in accordance with FDOT specifications.*

Checklist:

7.1.1 Verify that the angle of the current pan position in the horizontal plane could be read in $1/100^{th}$ degree unit from the device. Verify that the angle is within 0 degree to 359.99 degrees.

7.1.2 Verify that the angle of the current tilt position in the vertical plane, measured from the horizontal plane, could be read in the $1/100^{th}$ degree unit from the device. Verify that tilting upward indicates a positive direction. Verify that the reported values between 270 degrees to 359.99 degrees and 0 degree to 90 degrees.

7.1.3 Verify that the value of the current zoom position could be read from the device. Verify that the wide position returns the value of one (1) and telephoto returns the value of 65535.

Optional:

7.1.4 Verify that the value of the current focus position could be read from the device. Verify that the near position returns the value of one (1) and far position returns the value of 65535.

7.1.5 Verify that the value of the current iris position could be read from the device. Verify that the open position returns the value of one (1) and closed position returns the value of 65535.

Requirement	Status/Date	Related Files	Comments
7.1 Obtain Query Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

Query Pan
1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "query".
3. At the query command prompt, enter "pan".
4. Examine the report file. Check out the position indicated in the report matches with the value on the monitor. **(Satisfies Requirement 7.1.1)**.

Query Tilt

5. Run the macro CCTVcentral.mac.
6. At the main command prompt, enter "query".
7. At the query command prompt, enter "tilt".
8. Examine the report file. Check out the position indicated in the report matches with the value on the monitor. **(Satisfies Requirement 7.1.2)**.

Query Zoom
9. Run the macro CCTVcentral.mac.
10. At the main command prompt, enter "query".
11. At the query command prompt, enter "zoom".
12. Examine the report file. Check out the position indicated in the report matches with the value on the monitor.
13. Go back to main command prompt. Enter "position" and "zi" to zoom in to the wide position.
14. Go back to main command prompt.
15. Repeat Steps 10 to 12. Check out the position indicated in the report is "1".
16. Go back to main command prompt. Enter "position" and "zo" to zoom out to the telephoto position.
17. Repeat Steps 14 to 15. Check out the position indicated in the report is "65535". **(Satisfies Requirement 7.1.3)**.

Optional test

Query Focus
18. Run the macro CCTVcentral.mac.
19. At the main command prompt, enter "query".
20. At the query command prompt, enter "focus".
21. Examine the report file. **(Satisfies Requirement 7.1.4)**.

Query Iris
22. Run the macro CCTVcentral.mac.
23. At the main command prompt, enter "query".
24. At the query command prompt, enter "iris".
25. Examine the report file. **(Satisfies Requirement 7.1.5)**.

Motion Control – Query □ Pass □ Fail □ Conditional Pass			
	Query value	As seen on monitor value	
Query pan			□ Pass □ Fail
Query tilt			□ Pass □ Fail
Query zoom			□ Pass □ Fail
Query focus			□ Pass □ Fail
Query iris			□ Pass □ Fail
Notes:			

8. Range Configuration

This conformance group provides information about the range configuration of the device.

>   *Objects: rangeMaximumPreset.0, rangePanLeftLimit.0, rangePanRightLimit.0,*
>   *rangePanHomePosition.0, rangeTrueNorthOffset.0, rangeTiltUpLimit.0,*
>   *rangeTiltDownLimit.0, rangeZoomLimit.0, rangeFocusLimit.0, rangeIrisLimit.0,*
>   *rangeMinimumPanStepAngle.0, rangeMinimumTiltStepAngle.0.*

Requirements

8.1 Obtain Range Configuration Information – *Verify that the information provided by each of the objects is correct for the device and in accordance with FDOT specifications.*

Checklist:

8.1.1 Verify the number of preset which is a number indicating the total number of possible present positions supported by the device.

8.1.2 Verify the panning left range limit in $1/100^{th}$ degree unit in a clockwise direction from the Home Position.

8.1.3 Verify the panning right range limit in $1/100^{th}$ degree unit in a clockwise direction from the Home Position.

8.1.4 Verify an arbitrary point on a circle from which the left and right limits are measured in $1/100^{th}$ degree units.

8.1.5 Verify the offset from the Home Position to True North in a clockwise direction in $1/100^{th}$ degree units.

8.1.6 Verify the tilting up range limit in $1/100^{th}$ degree units.

8.1.7 Verify the tilting down range limit in $1/100^{th}$ degree units.

8.1.8 Verify the zoom range in arbitrary units. Used for absolute or offset control with the value representing the scalar zoom positioning beginning with one (1) for wide and ending with 65535 for telephoto. *(optional test)*

8.1.9 Verify the focus range in arbitrary units. Used for absolute or offset control with the value representing the scalar focus positioning beginning with one (1) for near and ending with 65535 for far. *(optional test)*

8.1.10 Verify the iris range in arbitrary units. Used for absolute or offset control with the value representing the scalar iris positioning beginning with one (1) for open and ending with 65535 for closed. Open is defined as the largest aperture setting. Closed is defined as the smallest aperture setting. *(optional test)*

8.1.11 Verify the minimum incremental angle in $1/100^{th}$ degree units for the minimum pan step size to guarantee movement in the horizontal plane.

8.1.12 Verify the minimum incremental angle in $1/100^{th}$ degree units for the minimum tilt step size to guarantee movement in the vertical plane.

Requirement	Status/Date	Related Files	Comments
8.1 Obtain Range Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "range".
3. At the range command prompt, enter "maxpreset".
4. Examine the report file. Check out that the maximum number of presets indicated in the report matches with FDOT requirement (support a minimum of 64 presets for dome type camera, a minimum of 32 presets for positioner type camera). **(Satisfies Requirement 8.1.1)**.
5. At the range command prompt, enter "panleftlimit".
6. Examine the report file. Check out the returned value of pan left limit indicated in the report file. **(Satisfies Requirement 8.1.2**: Pan Left Limit = 35999**)**.
7. At the range command prompt, enter "panrightlimit".

8. Examine the report file. Check out the returned value of pan right limit indicated in the report file. **(Satisfies Requirement 8.1.3**: Pan Right Limit = 35999**)**.
9. At the range command prompt, enter "panhomeposition".
10. Examine the report file. Check out the returned value of pan home position indicated in the report file. **(Satisfies Requirement 8.1.4**: Pan Home Position = 0**)**.
11. At the range command prompt, enter "truenorthoffset".
12. Examine the report file. Check out the returned value of true north offset indicated in the report file. **(Satisfies Requirement 8.1.5**: True North Offset = 0..35999**)**.
13. At the range command prompt, enter "settruenorthoffset".
14. Enter any offset value (1/100 unit degree) between 0 to 35999.
15. At the range command prompt, enter "truenorthoffset".
16. Examine the report file. Check out the new returned value of true north offset indicates in the report file. **(Satisfies Requirement 8.1.5)**.
17. At the range command prompt, enter "tiltuplimit".
18. Examine the report file. Check out the returned value of tilt up limit indicated in the report file. **(Satisfies Requirement 8.1.6**: Tilt Up Limit= 1499 for dome-type, Tilt Up Limit = 5999 for positioner-type camera)**.
19. At the range command prompt, enter "tiltdownlimit".
20. Examine the report file. Check out the returned value of tilt down limit indicated in the report file. **(Satisfies Requirement 8.1.7**: Tilt Down Limit = 8999**)**.
21. At the range command prompt, enter "minpanstepangle".
22. Examine the report file. Check out the returned value of minimum pan step angle indicated in the report file. **(Satisfies Requirement 8.1.11**: Minimum Pan Step Angle = 10**)**.
23. At the range command prompt, enter "mintiltstepangle".
24. Examine the report file. Check out the returned value of minimum tilt step angle indicated in the report file. **(Satisfies Requirement 8.1.12**: Minimum Tilt Step Angle = 10**)**.
25. At the range command prompt, enter "zoomlimit".
26. Examine the report file. Check out the returned value of zoom limit indicated in the report file. **(Satisfies Requirement 8.1.8**: Zoom Limit = 65535**)**.
27. At the range command prompt, enter "focuslimit".
28. Examine the report file. Check out the returned value of focus limit indicated in the report file. **(Satisfies Requirement 8.1.9**: Focus Limit = 65535**)**.
29. At the range command prompt, enter "irislimit".
30. Examine the report file. Check out the returned value of iris limit indicated in the report file. **(Satisfies Requirement 8.1.10**: Iris Limit = 65535**)**.

Range Configuration □ Pass □ Fail □ Conditional Pass

Objects	Test value/range	FDOT req' value/range	Pass/Fail
Maximum of preset	99	64 (dome) / 32 (positioner_	□ Pass □ Fail
Pan left limit	35999	35999	□ Pass □ Fail
Pan right limit	35999	35999	□ Pass □ Fail
Pan home position	0	0	□ Pass □ Fail
True north offset	0	0..35999	□ Pass □ Fail
Set true north offset	500	0..35999	□ Pass □ Fail
Tilt up limit	201	1499/5999	□ Pass □ Fail
Tilt down limit	26999	8999	□ Pass □ Fail
Min pan step angle	1	10	□ Pass □ Fail
Min tilt step angle	1	10	□ Pass □ Fail
Zoom limit	18399	65535	□ Pass □ Fail
Focus limit	0	65535	□ Pass □ Fail
Iris limit	0	65535	□ Pass □ Fail
Notes:			

9. Time Out Configuration

This conformance group provides information about the timeout configuration of the device. Timeout is defined as the continuing of action (movement/motion) without the reissue of a control command.

Objects: timeoutPan.0, timeoutTilt.0, timeoutZoom.0, timeoutFocus.0, timeoutIris.0.

Requirements

9.1 Obtain Time Out Information – – *Verify that the information provided by each of the objects is correct for the device and in accordance with FDOT specifications.*

Checklist:
9.1.1 Verify the timeout value (the total number of milliseconds) that a panning motion can continue without the reissue of a pan command.
9.1.2 Verify the timeout value (the total number of milliseconds) that a tilting motion can continue without the reissue of a tilt command.
9.1.3 Verify the timeout value (the total number of milliseconds) that a zoom motion can continue without the reissue of a zoom command. *(optional test)*
9.1.4 Verify the timeout value (the total number of milliseconds) that a focus motion can continue without the reissue of a focus type command. *(optional test)*
9.1.5 Verify the timeout value (the total number of milliseconds) that an iris motion can continue without the reissue of an iris type command. *(optional test)*

Requirement	Status/Date	Related Files	Comments
9.1 Obtain Time Out Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

Required accessories:
- Sports watch

Timeout Pan
1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "timeout".
3. At timeout command prompt, enter "pan".
4. Examine the report file. Note the timeout value of pan.
5. Enter "quit" or "exit" to leave the timeout menu, go back to the main menu.
6. At main command prompt, enter "position" then "cpr" (Continuous Pan Right) or "cpl" (Continuous Pan Left). Verify the continuous motion of pan until the timeout expires.
7. At the Time Out command prompt, enter "setpan". Enter any value between 0 and 65535 millisecond. Enter "pan" to check the new timeout value for pan.
8. Repeat Step 6.
9. Examine the report file. **(Satisfies Requirement 9.1.1)**.

Timeout Tilt
10. Run the macro CCTVcentral.mac.
11. At the main command prompt, enter "timeout".
12. At timeout command prompt, enter "tilt".
13. Examine the report file. Note the timeout value of pan.
14. Enter "quit" or "exit" to leave timeout menu, go back to main menu.
15. At main command prompt, enter "position" then "tu" (Continuous Tilt Up) or "td" (Continuous Tilt Down). Verify the continuous motion of tilt until the timeout expires.
16. At the Time Out command prompt, enter "settilt". Enter any value between 0 and 65535 millisecond. Enter "tilt" to check the new timeout value for tilt.
17. Repeat Step 6.
18. Examine the report file. **(Satisfies Requirement 9.1.2)**.

Timeout Zoom
19. Run the macro CCTVcentral.mac.
20. At the main command prompt, enter "timeout".
21. At timeout command prompt, enter "zoom".
22. Examine the report file. Note the timeout value of zoom.
23. Enter "quit" or "exit" to leave timeout menu, go back to main menu.
24. At main command prompt, enter "position" then "zi" (Continuous Zoom In) or "zo" (Continuous Zoom Out). Verify the continuous motion of zoom until the timeout expires.
25. At the timeout command prompt, enter "setzoom". Enter any value between 0 and 65535 millisecond. Enter "zoom" to check the new timeout value for zoom.
26. Repeat Step 6.
27. Examine the report file. **(Satisfies Requirement 9.1.3)**.

Timeout Focus
28. Run the macro CCTVcentral.mac.
29. At the main command prompt, enter "timeout".
30. At timeout command prompt, enter "focus".
31. Examine the report file. **(Satisfies Requirement 9.1.4)**.

Timeout ris
32. Run the macro CCTVcentral.mac.
33. At the main command prompt, enter "timeout".
34. At timeout command prompt, enter "iris".
35. Examine the report file. **(Satisfies Requirement 9.1.5)**.

Note: Set timeout for focus and iris motions are not tested.

Time Out □ Pass □ Fail □ Conditional Pass				
	Get value	**Set value**	**FDOT req'**	
Pan	30		N/A	□ Pass □ Fail
Tilt	5		N/A	□ Pass □ Fail
Zoom	5		N/A	□ Pass □ Fail
Focus	5	N/A	N/A	□ Pass □ Fail
Iris	5	N/A	N/A	□ Pass □ Fail
Notes:				

10. Label Configuration

This conformance group is used to provide information about the attributes of the label. Information is provided about the height and the color of the label. Information is also provided about the vertical and

the horizontal positions of the label text, color of label characters, and activation & deactivation of labels for display.

Objects: labelMaximum.0, labelIndex.1, labelText.1, labelFontType.1, labelHeight.1, labelColor.1, labelStartRow.1, labelStartColumn.1, labelStatus.1, labelActive.1, labelFontNumber.1, labelLocationLabel.0, labelEnableTextDisplay.0.

Requirements

10.1 Obtain Label Configuration Information – *Verify that the information provided by each of the objects is correct for the device and in accordance with FDOT specifications.*

Checklist:

10.1.1 Verify the maximum number of labels in the camera control label table. A label is defined as text with position, font and color information.

10.1.2 Verify the number associated with each individual label.

10.1.3 Verify that the label text is fitted within the frame-size available for the application.

10.1.4 Verify the type of font to be displayed. Verify that ASCII font style is supported and that font style is taken to be default style.

10.1.5 Verify the height of label text represented as a percent of screen fitted by the text and scaled to a range of zero (0) and 255 to fit the height of screen. Verify that, when read, the actual label height implemented will be returned.

10.1.6 Verify the color of label characters. Verify that the default color of white must always be supported.

10.1.7 Verify the start of text row number representing the vertical position on the screen where the text is to be displayed with the display being scaled to a range of zero (0) to 255. Zero (0) is designated as the upper-most row on the display.

10.1.8 Verify the start of text column number representing the horizontal position on the screen where the text is to be displayed with the display being scaled to a range of zero (0) to 255. Zero (0) is designated as the left-most column on the display.

10.1.9 Verify if the current label is being displayed.

10.1.10 Verify if the current label is enabled for display.

10.1.11 Verify the font number to be displayed.

10.1.12 Verify if the user can set a new value for label's index, height, color, star of text row/column, label font number... by using "set" commands described below in the test procedure.

10.1.13 Verify the label index in the camera control label table for this camera location. The location label is commonly used to identify the street name, intersection or other pertinent information to be displayed on the monitor.

10.1.14 Verify the control mechanism for activating or deactivating all labels regardless of individual display status.

Requirement	Status/Date	Related Files	Comments
10.1 Obtain Label Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "label".
3. *Get the maximum number of labels*. At label command prompt, enter "max".

4. Examine the report file. Verify that the maximum number of labels indicated in the report matches or exceed the FDOT requirement. (**Satisfies Req. 10.1.1**)
5. At the label command prompt, enter "display". When asked "Enter label number:", enter any number between 1 and maximum number obtained from Step 4. The user should enter 1 (the value set corresponding to the set procedure described below)
6. Examine the report file. Verify that the text, font type, height, color (default value: #7), start row, start column and label font type (default: #2) are proper represented.
7. At label command prompt, enter "setheight" to change the height of the label got from Step 6. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label height (0..255):", enter any number from 0 to 255.
8. At label command prompt, enter "setfont" to change the font of the label got from Step 6. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label font (0..255):", enter any number from 0 to 255.
9. At label command prompt, enter "setcolor" to change the color of the label get from Step 6. When asked"Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label color (1..16):", enter any number from 0 to 16 corresponding to 16 different colors.
10. At label command prompt, enter "setstartrow" to change the start row of the label get from Step 6. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label start row (0..255):", enter any number from 0 to 255.
11. At label command prompt, enter "setstartcolumn" to change the start column of the label get from Step 6. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label start column (0..255):", enter any number from 0 to 255.
12. At label command prompt, enter "setlabelactive" to disable/enable the label. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enable (80) or Disable Label (00):", enter accordingly to the action you want the DUT to obey.
13. At label command prompt, enter "setlabellocation" to change the information about the label camera location: value 0 turns the location reference label off at its location. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label location (0..255):", enter any number from 0 to 255 (prefer 0).
14. At label command prompt, enter "setlabelfontnumber" to change the font number to be displayed of the label get from Step 6. Only 1 font style may be supported and that will be the default one. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Enter label font number (0..255):", enter any number from 0 to 255. Please note that 2 designates the ASCII font.
15. At label command prompt, enter "enabletext" to access to the enable text label display. When asked "Enter label number:", enter any number from 0 to the device's maximum number of label you got from Step 3. And then when asked "Activate|Deactivate of Text Active (a = activate | d = deactivate):", type in "a" to activate and "d" to deactivate the label text display.

Label □ Pass □ Fail □ Conditional Pass			
	Value	**FDOT req'**	
Maximum number of labels	80		□ Pass □ Fail
Label text			□ Pass □ Fail
Label Index			□ Pass □ Fail
Type of font		2	□ Pass □ Fail
Height of font		N/A	□ Pass □ Fail
Color of label		7	□ Pass □ Fail

Start row		N/A	□ Pass □ Fail
Start column		N/A	□ Pass □ Fail
Label active		N/A	□ Pass □ Fail
Label Status			□ Pass □ Fail
Label Font Number			□ Pass □ Fail
Label Location Number			□ Pass □ Fail
SET label parameters (height,color,font,start row/column, label active…)			□ Pass □ Fail
Label Enable Text Display			□ Pass □ Fail

11. Extended Control - System

This conformance group is used to provide information about the status of the system attributes and the controllability of camera components.

> *Objects: systemCameraFeatureControl.0, systemCameraFeatureStatus.0, systemCameraEquipped.0, systemLensFeatureControl.0, systemLensFeatureStatus.0, systemLensEquipped.0.*

Requirements

11.1 Obtain System Camera Status Information – *Verify that the information about the system camera status parameters is correctly reported by the device and in accordance with FDOT specifications.*

> Checklist:
> 11.1.1 Verify the statuses of Camera Power, Heater Power, Wiper, Washer, and Blower (ON/OFF).
> 11.1.2 Verify the availabilities of controllable Camera Power supply, Heater Power supply, Wiper, Washer, and Blower. (YES/NO)
> 11.1.3 Verify if Auto Iris status and Auto Focus status are ON or OFF.
> 11.1.4 Verify the availabilities of controllable Auto Iris and Auto Focus features (YES/NO).

11.2 Obtain System Camera Control Information – *Verify that the information about system camera control parameters is correctly reported by the device and in accordance with FDOT specifications.*

> Checklist:
> 11.2.1 Verify the activation and deactivation of camera components (Camera Power, Heater Power, Wiper, Washer, and Blower).
> 11.2.2 Verify the selection of Auto Iris and Auto Focus features (ON/OFF).

Requirement	Status/Date	Related Files	Comments
11.1 Obtain System Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

Required accessories:
- Scientific calculator capable of converting from hexadecimal values to binary values.

Camera Status and Control

1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "system".
3. At system command prompt, enter "camerastatus".
4. Examine the report file. If the response value is 80 (hex) (equivalent to 1000 0000 in binary), then the status of Camera Power is ON, other components (Heater Power, Wiper, Washer, and Blower) are OFF. (**Satisfies Req. 11.1.1)**
5. At system command prompt, enter "camereequipped".
6. Examine the report file. If the response value is 80 (hex), then the availability of a controllable Camera Power supply is YES (available), availabilities of all other components are NO (un-available). **(Satisfies Requirement 11.1.2)**

Lens Status and Control

7. Run the macro CCTVcentral.mac.
8. At the main command prompt, enter "system".
9. At system command prompt, enter "lensequipped".
10. Examine the report file. If the response value is C0 (hex) (equivalent to 1100 0000 in binary), then the availabilities of controllable Auto Iris and Auto Focus are confirmed. If the response value is 80 (hex) then only availability of controllable Auto Iris is confirmed. If the response value is 40 (hex) then only availability of controllable Auto Focus is confirmed. (**Satisfies Req. 11.1.4).**
11. At system command prompt, enter "lensstatus".
12. Examine the report file. If the response value is C0 (hex), then both Auto Iris and Auto Focus statuses are ON. If the response value is 80, then only Auto Iris status is ON. If the response value is 40 then only Auto Focus status is ON. **(Satisfies Requirement 11.1.3).**
13. At system command prompt, enter "autoiris". Select "a" or "d" to activate or deactivate Auto Iris capability.
14. At system command prompt, enter "autofocus". Select "a" or "d" to activate or deactivate Auto Focus capability.
15. Verify with the camera if Auto Focus and Auto Iris are ON or OFF (**Satisfies Req. 11.2.2**).

System □ Pass □ Fail □ Conditional Pass			
	Response value (hex)	**FDOT req'**	
Camera status	C0	80	□ Pass □ Fail
Avail of controllable camera power supply		80	□ Pass □ Fail
Lens status		C0	□ Pass □ Fail
Auto Focus ON/OFF activation		N/A	□ Pass □ Fail
Auto Iris ON/OFF activation		N/A	□ Pass □ Fail
Notes:			

12. Extended Control - Zone

This conformance group is used to control the zone of the device. A zone is a region in space defined by pan and tilt limits.

> *Objects: zoneMaximum.0, zoneIndex.1, zoneLabel.1, zonePanLeftLimit.1, zonePanRightLimit.1, zoneTiltUpLimit.1, zoneTiltDownLimit.1, zoneVideoControl.1, zoneCameraEquipped.0.*

Requirements

12.1 Obtain Zone Parameters Information – *Verify that information about the camera zone parameters is correctly reported by the device and in accordance with FDOT specifications.*

Checklist:

12.1.1 Verify the maximum number of zones for this device. A zone is a region in space defined by pan and tilt limits.

12.1.2 Verify the number associated with each individual zone.

12.1.3 Verify the label index from the camera control label table that is associated with this zone number. When the camera enters a particular zone, verify that the label text associated with the label index is displayed. If zones overlap, verify that at least one label will be displayed in the overlapped area.

12.1.4 Verify the panning left zone limit in $1/100^{th}$ degree units in a clockwise direction from the Home Position.

12.1.5 Verify the panning right zone limit in $1/100^{th}$ degree units in a clockwise direction from the Home Position.

12.1.6 Verify the tilt up zone limit in $1/100^{th}$ degree units. The zero point for measurement is the horizontal plane.

12.1.7 Verify the tilt down zone limit in $1/100^{th}$ degree units. The zero point for measurement is the horizontal plane.

12.1.8 Verify if the video signal output could be turned off upon entering the zone. Verify that the default video signal shall be ON.

12.1.9 Verify the availabilities of zones, zone labels and the control of video signal within a zone.

Requirement	Status/Date	Related Files	Comments
12.1 Obtain Zone Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "zone".
3. At zone command prompt, enter "max".
4. Examine the report file. Verify the maximum number of zone for the device. (**Satisfies Req. 12.1.1**)
5. At zone command prompt, enter "get". Enter the zone number (from 1 to the max value).
6. Examine the report file.
7. At zone command prompt, enter "set". As prompted, enter the following information:
    Zone number: *n* (any number between 1 and the max value obtained from Step 4)
    Label number: 1
    Pan left limit: 0
    Pan right limit: 18000
    Tilt up limit: 65535
    Tilt down limit: 65535
8. Navigate camera to any position between 0 degree and 180 degrees and see if the zone number and its associated label text are showed on the monitor.
9. Navigate camera out of zone and check if the zone number and its associated label text would disappear.
10. At zone command prompt, enter "get". Enter the zone number *n* above.
11. Examine the report file. Verify if label, pan left and pan right limits, tilt up and tilt down limits are set according to Step 7.

12. At zone command prompt, enter "videocontrol". When asked to "Enable/Disable" the camera video control, enter 80 or 00 corresponding to activation or deactivation of the camera's video control.
13. At zone command prompt, enter "cameraequipped". Examine the report file. Verify the availabilities of zones, zone labels, and control of a video signal within a zone. (1110 0000 = E0)

Zone □ Pass   □ Fail   □ Conditional Pass

	Response value	FDOT req'	
Maximum number of zones	7	8	□ Pass □ Fail
Get zone number		N/A	□ Pass □ Fail
Set zone		N/A	□ Pass □ Fail
Video on/off upon entering the zone		N/A	□ Pass □ Fail
Availability of zones, zone labels and control of video signal within a zone		1110 0000 = E0	□ Pass □ Fail
Notes:			

13. On-Screen Menu Control

This conformance group is used to control on-screen menu of the device. Objects within this conformance group handle the navigation of the internal camera menu as well as the activation of menu and specify the time duration of activated menu.

> *Objects: menuActivate.0, menuControl.0*

Requirements

13.1 Obtain On-Screen Menu Information – *Verify that the default internal menu for the device is properly reported and that the internal menu can be navigated by the user.*

> Checklist:
> 13.1.1 Verify that the internal camera menu can be turned off. Verify the activation of internal camera menu in the specified duration of time between 1 and 254 seconds or indefinite duration of time.
> 13.1.2 Verify the navigation of internal camera menu (1-Page Down, 2-Page Up, 3-Cursor Up, 4-Cursor Down, 5-Cursor Right, 6-Cursor Left, 7-Increment value pointed at current cursor position, 8-Decrement value pointed at current cursor position, 9-Enter value shown).

Requirement	Status/Date	Related Files	Comments
13.1 Obtain Menu Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None

1. Run the macro CCTVcentral.mac.
2. At the main command prompt, enter "menu".

3. At menu command prompt, enter "activate". Enter 0 to turn off the internal camera menu, 255 to turn on the menu indefinite period of time, or enter a value from 1 to 254 to activate the internal camera menu for the number of second between 1 and 254.
4. Verify the internal camera menu behavior according to your selections. (**Satisfies Req. 13.1.1**)
5. At menu command prompt, enter "control" and then enter the number to manipulate the camera menu. (1-Page Down, 2-Page Up, 3-Cursor Up, 4-Cursor Down, 5-Cursor Right, 6-Cursor Left, 7-Increment value pointed at current cursor position, 8-Decrement value pointed at current cursor position, 9-Enter value shown). Verify the navigation of menu according to your selections. (**Satisfies Req. 13.1.2**).
6. Examine the report file.

On-Screen Menu Control □ Pass □ Fail □ Conditional Pass				
Activate			**Control**	
Menu on (indefinite time)	□ Pass □ Fail		1-Page Down	□ Pass □ Fail
			2-Page Up	□ Pass □ Fail
			3-Cursor Up	□ Pass □ Fail
			4-Cursor Down	□ Pass □ Fail
			5-Cursor Right	□ Pass □ Fail
Menu on in …. Seconds	□ Pass □ Fail		6-Cursor Left	□ Pass □ Fail
			7-Value Increment	□ Pass □ Fail
			8-Value Decrement	□ Pass □ Fail
			9-Enter value	□ Pass □ Fail
Notes:				

14. Extended Control – Alarm (*Optional)*

This conformance group is used to control the alarm parameters. The objects in this group control the alarm, latch, temperature, pressure, washer fluid of the device.

> Objects: *alarmStatus.0, alarmLatchStatus.0, alarmLatchClear.0,*
> *alarmTemparatureHighLowThreshold.0, alarmTemparatureCurrentValue.0,*
> *alarmPressureHighLowThreshold.0, alarmPressureCurrentValue.0,*
> *alarmWasherFluidHighLowThreshold.0, alarmWasherFluidCurrentValue.0,*
> *alarmLabelIndex.0, alarmLabelSource.0.*

Requirements

14.1 Obtain Alarm Parameter Information – *Verify that the information about the alarm parameters is properly reported by the device. Also, verify that these parameters are implemented by the device.*

> Checklist:
> 14.1.1 Verify the current status of alarms.
> 14.1.2 Verify the presence of latched alarms, indicating that an alarm has occurred since previous latch was clear.
> 14.1.3 Verify the high and low thresholds for the temperature alarm in degrees C.
> 14.1.4 Verify the current value for the temperature within the camera enclosure measured in degrees C.
> 14.1.5 Verify the high and low thresholds for the pressure alarm in psig.
> 14.1.6 Verify the current value for the pressure within the camera enclosure measured in psig.
> 14.1.7 Verify the high and low thresholds for the washer fluid alarm in psig.
> 14.1.8 Verify the current value for the washer fluid level measured as the amount of filled capacity between zero (0) and 100 percent.

14.1.9 Verify the label number identifying the entry into the camera control label table that provides additional text information or on-screen text information. Labels are text strings with formatting, positioning, and display information. Labels are displayed while the alarm status is ON.

14.1.10 Verify the source of the alarm label as being displayed upon the current status of the alarm as indicated by the alarmStatus parameter or continuously displayed during the presence of a latched alarm as indicated by the alarmLatchStatus.

15. Extended Control – Input (*Optional*)

This conformance group is used to control the user input parameters.

> *Objects: inputStatus.0, inputLatchStatus.0, inputLatchClear.0, inputLabelIndex.0, inputPresetIndex.0, inputLabelSource.0.*

Requirements

15.1 Obtain Input Parameter Information – *Verify that the information about the input parameters is properly reported by the device. Also, verify these parameters are implemented by the device.*

> Checklist:
> 15.1.1 Verify input status indicating the current states of eight (8) user-defined discrete inputs.
> 15.1.2 Verify latch status indicating the presence of latched input for eight (8) user-defined discrete inputs showing that an input has occurred since the previous latch was cleared.
> 15.1.3 Verify latch clear that clears the presence of latched input for eight (8) user-defined discrete inputs.
> 15.1.4 Verify the label number identifying the entry into the camera control label table that provides additional text information or on-screen text information. Labels are text strings with formatting, positioning, and display information. Labels are displayed while the input latch status is ON.
> 15.1.5 Verify the preset index representing the preset to which the device is commanded to move to upon the active status of a discrete input as indicated by the inputStatus parameter.
> 15.1.6 Verify the source of the input label as being displayed upon the current status of the input as indicated by the inputStatus parameter or continuously displayed during the presence of a latched input as indicated by the inputLatchStatus.

16. Extended Control – Output (*Optional*)

This conformance group is used to control the output parameters.

> *Objects: outputStatus.0, outputControl.0, outputLabelIndex.0*

Requirements

16.1 Obtain Output Parameter Information – *Verify that the information about the output parameters is properly reported by the device. Also, verify that these parameters are implemented by the device.*

> Checklist:
> 16.1.1 Verify output status indicating the current states of eight (8) user-defined discrete outputs.
> 16.1.2 Verify the output control for activation and deactivation of individual user-defined discrete output.

16.1.3 Verify the label number identifying the entry into the camera control label table that provides additional text information or on-screen text information. Labels are text strings with formatting, positioning, and display information.

17. Extended Control – Tour (Florida Specific Group)

This conformance group is used to control the tour of the device. A tour is a series of events or actions defined by a sequence of presets and dwell times.

> *Objects: tourMaximum.0, tourIndex.1, tourLabel.1, tourPresetIndex.1, tourDwellIndex.1, tourCameraEquipped.0.*

Requirements

17.1 Obtain Tour Parameters Information – *Verify that information about the camera tour parameters is correctly reported by the device and in accordance with FDOT specifications.*

Checklist:
17.1.1 Verify the maximum number of tours for this device. A tour is a series of events or actions defined by a sequence of presets and dwell times.
17.1.2 Verify the number associated with each individual zone.
17.1.3 Verify the label index from the camera control label table that is associated with this tour number. When the camera starts a tour, verify the label text associated with the label index is displayed.
17.1.4 Verify sequence of preset in a tour.
17.1.5 Verify sequence of dwell time in a tour.
17.1.6 Verify the availabilities of tours, tour labels.

Requirement	Status/Date	Related Files	Comments
17.1 Obtain Tour Information			

Example Test Procedure

Required Macros
- CCTVcentral.mac

Required Input Files
None