A Guide to Use Macros for the FDOT NTCIP Compliance Testing of Closed Circuit Television (CCTV) Cameras

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1. Closed Circuit Television (CCTV) Macros

The CCTV macros have been developed to effect the efficient testing of CCTV Cameras submitted by CCTV manufacturers to the Florida Department of Transportation (FDOT) as a part of the qualification process for the approved product list (APL). These macros are intended to facilitate some degree of automation for the NTCIP testing and to provide a high-level functional interface between a tester and the device under test. The macros are designed for testing devices to the requirements set forth in "The Florida Department of Transportation NTCIP 1205 Specification."

The macros are executed through the NTCIP Exerciser which is chosen as the testing tool because it is free and open source. Before the macros can be used, the Exerciser must be correctly configured. Firstly, Version 3b7 (or a later version) of the Exerciser should be used to run the macros. In addition, it is important to make sure that all data objects used by the macros are defined in the MIB compiled by the Exerciser at run time. It is necessary to ensure that all needed MIB modules are in the Exerciser directory and that these MIB modules are referenced in the Mibi.ini file. Furthermore, the TreeCfg.ini file must be properly configured. This file contains the index limits for all objects within the corresponding tables. If the macro attempts to send a request using an object with an index exceeding that specified in the TreeCfg.ini file, the Exerciser would stop execution. Therefore, it is important to ensure that the index limits in the file are set to sufficiently high values.

There are two macros listed in this document: CCTV Object Check Macro and CCTV Central Macro. The Object Check Macro is first executed to check whether all the required FDOT NTCIP CCTV objects are supported by a CCTV camera or not. After this macro is executed, an output file is generated by the macro listing the objects not supported by the device (responding with "noSuchName" when the object is polled) and the contents of the objects supported by the device. If there are no issues found in the output file and the contents of the corresponding objects checked out, the Central Macro is then executed to check whether the functional requirements specified by FDOT are met. The Central Macro consists of macros corresponding to the various functional requirements.

2. Object Check Macro

2.1 General Description

The object check macro (objectcheck.mac) is intended to be used to quickly identify possible deficiencies in the MIB of the CCTV camera, referred to as the device under test or DUT. The macro reads in a list of objects from input files and performs a "get" operation on each of the objects required by FDOT. To such a "get" request, the device either responds with "noSuchName" or returns the content of the object. The results of the "get" operations are recorded in a report file.

Those objects identified as "noSuchName" in the report file can be classified into two categories: the non-supporting type or the event-driven type. A non-supporting type is unacceptable while an event-driven type requires further testing to determine whether it is truly non-supporting or not. The event-driven type is normally associated with an object in a table, such as "zonePanLeftLimit" in the "zoneTable". When the macro polls the device for such an object while the object has not been created at the time of the test, the device would respond with "noSuchName" although the device may respond properly to such a request once the row in the table is created.

When checking the contents returned by the device and recorded in the output file, occasionally unrecognizable characters may be reported. These are usually associated with objects whose syntax supports hexadecimal strings. As a part of the macro, a subroutine is constructed to convert hexadecimal strings into ASCII strings for the ease of checking the values represented by the strings. When the macro performs the conversion, some general hexadecimal strings may not be represented correctly. For situations like these, the Exerciser log is examined to check out the original string.

In addition, a proper response to a "get" request does not guarantee that the object under test is functional. Detailed functional testing is still required to verify that the object behaves correctly.

In spite of its shortcoming, this macro can be a first-step tool in quickly identifying problems. If large groups of objects do not respond to the "get" requests or respond with unreasonable information, potential deficiency is thus identified. The manufacturer can then be contacted so that the problem can be examined further.

2.2 Operation of the Macro

In order to run the macro, select Macro/Run from the menu bar and type "objectcheck.mac", including the file path if the file is not in the Exerciser's directory. It takes a few moments for the macro to parse. After the macro is parsed, the user is prompted to enter the output file name. The user is then prompted to enter the administrator community name (this is usually just "public".) The user is then prompted to enter the input file path (e.g. C:/CCTV/). The user is then prompted to enter the input file name (the name of the first input file) without the path. The macro then runs through the test, automatically, going through each of the input files (only the first file has to be specified.) All information is written to the report file. An example, including part of the output file, is given below, with user information in bold.

Enter output file name: **C:/CCTV/objectcheckoutManufacturerA**
Enter administrator community name: **public**
Enter the input file path (e.g. C:/CCTVMacros/): **C:/CCTV/**
Enter input file name (without path): **CCTVobjectcheckinput01.txt**
(macro conducts test)

2.2.1 - Example of Object Check Report

User Information

Community Name: public

Input File Name: CCTVobjectcheckinput01.txt

Test Results

Global Configuration Objects

Object: globalSetIDParameter.0
Syntax: INTEGER
Response: 46750

Object: globalMaxModules.0
Syntax: INTEGER (0..255)
Response: 3

Object: moduleNumber.1
Syntax: INTEGER (1..255)
Response: 1

Object: moduleDeviceNode.1
Syntax: ObjectID
Response: +□ □ □ □ ‰6□ □

Object: moduleMake.1
Syntax: OctetString
Response: AAA

Object: moduleModel.1
Syntax: OctetString
Response: NTCIP Translator

Object: moduleVersion.1
Syntax: OctetString
Response:

Object: moduleType.1
Syntax: Enum
Response: 2

Global Time Management Objects

Object: globalTime.0
Syntax: Counter
Response: 104489160

Object: globalDaylightSaving.0
Syntax: Enum
Response: 2

Global Security Objects

Object: communityNameAdmin.0
****

Error Encountered...
No Such Object
Aborting Test

Object: communityNamesMax.0
****
Error Encountered...
No Such Object
Aborting Test

Object: communityNameIndex.1
****
Error Encountered...
No Such Object
Aborting Test

Object: communityNameUser.1
****
Error Encountered...
No Such Object
Aborting Test

Object: communityNameAccessMask.1
****
Error Encountered...
No Such Object
Aborting Test

CCTV PMPP Objects

Object: maxGroupAddresses.0
****
Error Encountered...
Object Mismatch
No Such Object
Aborting Test

Object: hdlcGroupAddressIndex.0
****
Error Encountered...
Object Mismatch
No Such Object
Aborting Test

Object: hdlcGroupAddress.0
****
Error Encountered...
Object Mismatch
No Such Object
Aborting Test

CCTV Configuration Object

Object: rangeMaximumPreset.0

Syntax: INTEGER (0..255)
Response: 99

Object: rangePanLeftLimit.0
Syntax: INTEGER (0..35999)
Response: 35999

Object: rangePanRightLimit.0
Syntax: INTEGER (0..35999)
Response: 35999

Object: rangePanHomePosition.0
Syntax: INTEGER (0..35999)
Response: 0

Object: rangeTrueNorthOffset.0
Syntax: INTEGER (0..35999)
Response: 500

Object: rangeTiltUpLimit.0
Syntax: INTEGER (0..35999)
Response: 201

Object: rangeTiltDownLimit.0
Syntax: INTEGER (0..35999)
Response: 26999

Object: rangeZoomLimit.0
Syntax: INTEGER (0..65535)
Response: 18399

Object: rangeFocusLimit.0
Syntax: INTEGER (0..65535)
Response: 0

Object: rangeIrisLimit.0
Syntax: INTEGER (0..65535)
Response: 0

Object: rangeMinimumPanStepAngle.0
Syntax: INTEGER (0..35999)
Response: 1

Object: rangeMinimumTiltStepAngle.0
Syntax: INTEGER (0..35999)
Response: 1

CCTV Configuration Object

Object: timeoutPan.0
Syntax: INTEGER (0..65535)
Response: 30000

Object: timeoutTilt.0
Syntax: INTEGER (0..65535)

Response: 5000

Object: timeoutZoom.0
Syntax: INTEGER (0..65535)
Response: 500

Object: timeoutFocus.0
Syntax: INTEGER (0..65535)
Response: 2000

Object: timeoutIris.0
Syntax: INTEGER (0..65535)
Response: 2000

CCTV Configuration Object

Object: labelMaximum.0
Syntax: INTEGER (0..255)
Response: 80

Object: labelIndex.1
Syntax: INTEGER (0..255)
Response: 1

Object: labelText.1
Syntax: OctetString (SIZE (0..255))
Response: 74

Object: labelFontType.1
Syntax: INTEGER (0..255)
Response: 1

Object: labelHeight.1
Syntax: INTEGER (0..255)
Response: 6

Object: labelColor.1
Syntax: Enum
Response: 7

Object: labelStartRow.1
Syntax: INTEGER (0..255)
Response: 1

Object: labelStartColumn.1
Syntax: INTEGER (0..255)
Response: 1

Object: labelStatus.1
Syntax: OctetString (SIZE (1))
Response: 0

Object: labelActive.1
Syntax: OctetString (SIZE (1))
Response: 80

Object: labelFontNumber.1
Syntax: INTEGER (1..255)
Response: 2

Object: labelLocationLabel.0
Syntax: INTEGER (0..255)
Response: 5

Object: labelEnableTextDisplay.0
Syntax: OctetString (SIZE (1))
Response: 0

CCTV Extended Object

Object: systemCameraFeatureControl.0
Syntax: OctetString (SIZE (2))
Response: 80

Object: systemCameraFeatureStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: systemCameraEquipped.0
Syntax: OctetString (SIZE (1))
Response: 80

Object: systemLensFeatureControl.0
Syntax: OctetString (SIZE (2))
Response: 80

Object: systemLensFeatureStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: systemLensEquipped.0
Syntax: OctetString (SIZE (1))
Response: 0

CCTV Extended Object

Object: alarmStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmLatchStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmLatchClear.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmTemperatureHighLowThreshold.0

Syntax: OctetString (SIZE (2))
Response: 0

Object: alarmTemperatureCurrentValue.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmPressureHighLowThreshold.0
Syntax: OctetString (SIZE (2))
Response: 0

Object: alarmPressureCurrentValue.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmWasherFluidHighLowThreshold.0
Syntax: OctetString (SIZE (2))
Response: 0

Object: alarmWasherFluidCurrentValue.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: alarmLabelIndex.0
Syntax: OctetString (SIZE (7))
Response: 0

Object: alarmLabelSource.0
Syntax: OctetString (SIZE (1))
Response: 0

CCTV Extended Object

Object: inputStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: inputLatchStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: inputLatchClear.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: inputLabelIndex.0
Syntax: OctetString (SIZE (8))
Response: 0

Object: inputPresetIndex.0
Syntax: OctetString (SIZE (8))
Response: 0

Object: inputLabelSource.0
Syntax: OctetString (SIZE (1))

Response: 0

CCTV Extended Object

Object: outputStatus.0
Syntax: OctetString (SIZE (1))
Response: 0

Object: outputControl.0
Syntax: OctetString (SIZE (2))
Response: 0

Object: outputLabelIndex.0
Syntax: OctetString (SIZE (8))
Response: 0

CCTV Extended Object

Object: zoneMaximum.0
Syntax: INTEGER (0..255)
Response: 7

Object: zoneIndex.1
Syntax: INTEGER (0..255)
Response: 1

Object: zoneLabel.1
Syntax: INTEGER (0..255)
Response: 1

Object: zonePanLeftLimit.1
Syntax: INTEGER (0..35999)
Response: 0

Object: zonePanRightLimit.1
Syntax: INTEGER (0..35999)
Response: 9000

Object: zoneTiltUpLimit.1
Syntax: INTEGER (0..35999)
Response: 1500

Object: zoneTiltDownLimit.1
Syntax: INTEGER (0..35999)
Response: 9000

Object: zoneVideoControl.1
Syntax: OctetString (SIZE (1))
Response: 80

Object: zoneCameraEquipped.0
Syntax: OctetString (SIZE (1))
Response: 0

CCTV Motion Control Objects

Object: presetGotoPosition.0
Syntax: INTEGER (0..255)
Response: 0

Object: presetStorePosition.0
Syntax: INTEGER (0..255)
Response: 28

Object: presetPositionQuery.0
Syntax: INTEGER (0..255)
Response: 0

Object: positionPan.0
Syntax: OctetString
Response:

Object: positionTilt.0
Syntax: OctetString
Response: û

Object: positionZoomLens.0
Syntax: OctetString
Response: ÿ

Object: positionFocusLens.0
Syntax: OctetString
Response:

Object: positionIrisLens.0
Syntax: OctetString
Response:

Object: positionQueryPan.0
Syntax: INTEGER (0..35999)
Response: 5268

Object: positionQueryTilt.0
Syntax: INTEGER (0..35999)
Response: 0

Object: positionQueryZoom.0
Syntax: INTEGER (0..65535)
Response: 100

Object: positionQueryFocus.0
Syntax: INTEGER (0..65535)
Response: 0

Object: positionQueryIris.0
Syntax: INTEGER (0..65535)
Response: 0

CCTV On-Screen Menu Objects

Object: menuActivate.0
Syntax: INTEGER (0..255)
Response: 255

Object: menuControl.0
Syntax: Enum
Response: 9

Test Completed
Errors Detected: 8

2.2.2 - Some examples of input files :

```
description:"Global Configuration Objects"
numobjects:8
object1:"globalSetIDParameter.0"
object2:"globalMaxModules.0"
object3:"moduleNumber.1"
object4:"moduleDeviceNode.1"
object5:"moduleMake.1"
object6:"moduleModel.1"
object7:"moduleVersion.1"
object8:"moduleType.1"
object9:" "
object10:" "
object11:" "
object12:" "
object13:" "
object14:" "
object15:" "
object16:" "
object17:" "
object18:" "
object19:" "
object20:" "
nextfile:"CCTVobjectcheckinput02.txt"

description:"Global Time Management Objects"
numobjects:2
object1:"globalTime.0"
object2:"globalDaylightSaving.0"
object3:" "
object4:" "
object5:" "
object6:" "
object7:" "
object8:" "
object9:" "
object10:" "
object11:" "
object12:" "
object13:" "
```

object14:" "
object15:" "
object16:" "
object17:" "
object18:" "
object19:" "
object20:" "
nextfile:"CCTVobjectcheckinput03.txt"

description:"Global Security Objects"
numobjects:5
object1:"communityNameAdmin.0"
object2:"communityNamesMax.0"
object3:"communityNameIndex.1"
object4:"communityNameUser.1"
object5:"communityNameAccessMask.1"
object6:" "
object7:" "
object8:" "
object9:" "
object10:" "
object11:" "
object12:" "
object13:" "
object14:" "
object15:" "
object16:" "
object17:" "
object18:" "
object19:" "
object20:" "
nextfile:"CCTVobjectcheckinput04.txt"
…
…
description:"CCTV Motion Control Objects"
numobjects:13
object1:"presetGotoPosition.0"
object2:"presetStorePosition.0"
object3:"presetPositionQuery.0"
object4:"positionPan.0"
object5:"positionTilt.0"
object6:"positionZoomLens.0"
object7:"positionFocusLens.0"
object8:"positionIrisLens.0"
object9:"positionQueryPan.0"
object10:"positionQueryTilt.0"
object11:"positionQueryZoom.0"
object12:"positionQueryFocus.0"
object13:"positionQueryIris.0"
object14:" "
object15:" "
object16:" "
object17:" "
object18:" "
object19:" "
object20:" "

nextfile:"CCTVobjectcheckinput14.txt"

3. CCTV Central Macro

3.1 General Description

The CCTV central macro (CCTVcentral.mac) is intended to simulate a central station controlling a CCTV camera. This macro consists of other macros constructed according to various functional requirements. The macro provides the user with a command line environment, from which high level control commands can be issued. All actions are recorded in a report file. Information is presented in a high level format in the report file (the actual values of objects are hidden from the user and only the interpretations of the values are shown), but the level of detail shown in the file can be set by the user in order to show the actual results of each "set" and "get" request.

3.2 Operation of the Macro

In order to run the macro, select Macro/Run from the menu bar and type "CCTVcentral.mac," including the file path if the file is not in the Exerciser's directory. It may take several minutes to parse the macro. Once the macro is parsed, the user is prompted for several pieces of information. First, the user is asked to provide an output file name (again include the path in the file name if the Exerciser's directory is not to be used.) All control actions taken and all information retrieved from the device will be logged in this file. Next, the user will be asked to provide a community name to be used in the SNMP PDU's. Usually, this community name is simply "public" or "administrator". Once this information is provided, the user will see the main command prompt ("Enter command: "), from which the control actions are issued. A summary of the basic commands used from the main command line is given in Table 2.1. Additional information about some of the commands is presented in the following sections.

Table 3.1 - Basic Commands: More information in details, refer to later sub-sections

More details in	Command	Description
3.2.1	**Global Configuration** (main command : globalconfig)	This command is to request the camera to provide general information about the camera. A table is provided to give information about each module of the camera. 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.
3.2.2	**Global Time Management** (optional) (main command: globaltime)	This conformance group is used to keep track of time for the camera. 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. After entering this command at the main command prompt, the user is given the option of setting the global time parameters or obtaining status information about the current parameter settings.
3.2.3	**Global Security** (main command: changecn)	It is used to handle security for the camera. In each SNMP packet, a community name is used to identify the sender. Different community names imply different access privileges to the camera. 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 camera. 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.
3.2.4	**PMPP** (optional)	To provide communication between multiples on the same communications line/channel using PMPP (Point-to-MultiPoint protocol) – a transportation specific subnetwork layer protocol.
3.2.5	**Motion Control - Position** (main command: position)	It is used to provide general information about the motion control and features. The group provides all basic manipulation of the camera system including: obtaining pan, tilt, zoom, focus lens, iris lens motion control information. After entering the main command to get to the "Position" control group, the user is prompted to enter a bunch of commands to implement different camera manipulation (pan, tilt, zoom, focus,…, etc.)
3.2.6	**Motion Control - Preset** (main command: preset)	It is used to provide general information about the preset control and features. This group verifies the "preset" support of the camera which stores the set position and gets that preset when prompted by command entered by the tester.
3.2.7	**Motion Control - Query** (main command: query)	It is used to provide general information about the query control and features. This command helps us get the value of the different position status of the camera such as pan, tilt, focus, and iris. This object is new to most of the manufacturer, most of the devices failed to implement this "query" request. The manufacturer needs to refer to this object and command for the further development of CCTV cameras.
3.2.8	**Range Configuration** (main command: range)	It is used to obtain general information about the range configuration. After entering the "range" command, the user will be asked to issue other commands to get the information about pan, tilt, zoom limit, and much more; the user should examine the report file to get the exact value of the object they have checked using the corresponding command.
3.2.9	**Time Out Configuration** (main command: timeout)	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. The objects' timeout here are timeout duration of pan, tilt, zoom, focus, and iris. After executing the command, the timeout value will be displayed in the active report window.
3.2.10	**Label configuration** (main command: label)	This 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 & the color of label characters and the activation & the deactivation of

		labels for display.
3.2.11	**Extended Control – System** (main command: system)	Read information about the status of the system attributes and controllability of camera components. The information about camera status, lens status, availability of controllable camera power supply, and auto focus/iris activation will be tested using corresponding commands.
3.2.12	**Extended Control – Zone** (main command: zone)	It is used to control the zone of the device. A zone is a region in space defined by pan and tilt limits. The information about Maximum number of zones, Video on/off upon entering the zone, Availability of zones, zone labels, and control of video signal within a zone will be tested using corresponding commands.
3.2.13	**On-Screen Menu Control** (main command: menu)	This command 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. If menu's status information is requested, the macro polls the device for the current settings of these parameters and writes the information to the report file. The manipulation to control the menu is also taken into account with the issued commands.
3.2.14	**Extended Control – Alarm** (Optional) **Extended Control – Input** (Optional) **Extended Control – Output** (Optional)	These optional commands are used to control the alarm parameters (alarm, latch, temperature, pressure, washer fluid of the device), input parameters, and output parameters. Since these objects are not mandatory ones required by FDOT, our testing procedure has not supported them.
3.2.15	**Extended Control – Tour** (Florida Specific Group) (for reference)	This 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. This is just proposed for further consideration and it's not available for testing yet. We put it down in the testing procedure for reference in advance.

3.2.1 Global Configuration

By entering the "globalconfig" command, all the information about the device node, manufacturer, model, version, and type will be displayed in the report file. An example taking from the report file of 1 device is as follow:

Report file:

Status: Global Configuration

Number of Modules: 3
Module Number: 1
Module Device Node:
Module Make: XXX
Module Model: NTCIP Translator
Module Version:
Module Type: Hardware
Module Number: 2

Module Device Node:
Module Make: XXX D Protocol
Module Model: Camera controller
Module Version: 1.6.23 Jan 05 2006
Module Type: Software
Module Number: 3
Module Device Node:
Module Make: XXX
Module Model: XXX
Module Version: DD4CBW35 '
Module Type: Software

3.2.2 Global Time Management

Time tracking status can be activated using the "globaltime" command. After entering this command at the main command prompt, the user is asked to choose which action they want to implement ("set" or see the "status" device's time). The summary of the commands is described as follow:

Table 3.2 - Global time Management Commands

Command	Description
set	The user is asked if he/she want to proceed with another request. If the answer is "y", the window command will let the user returned to the previous window which again asks him/her to chose "set" or "status". By selecting "set", the user will go to the "set" phase which requires further settings. At this phase, the user will set the new time for the device and then verify if the device response appropriately. An example of the "set" phase commands is described in the example at the end of this section.
status	Obtain status information about default messages and parameters. If the user selects "status" by typing this command into the command window, the status of the device's time will be shown in the report file.

Report File:

Status: Global Time Parameters

Request: GET globalTime.0
globalDaylightSaving.0
globalLocalTimeDifferential.0
Global Time (s): 0
Daylight Savings Time:
Local Time Differential (s): 0

Enter global time: ***set***
Global Time (s): ***1041426000***
Enable Daylight Savings Time? (y/n) n
Local Time Differential: ***0***

3.2.3 Global Security

Community name is used to identify the privilege of the user. Setting the community name as "admin" will result in the full control privilege by the user. All other community names' privileges will be defined by the

objects set. This conformance group will guide the user to change the community name from "full control" user as "admin" to the normal user name set by the user.
The "admin" community name is recommended if the user want to test and control the device because he/she has to change many parameters of the device under test.
The summary of the commands is described as follow:

Table 2.3 - Global Security Commands

Command	Description
changecn	Set the community name by the macro to the administrator name or user community name. By entering this command from the control command prompt it clears all messages in changeable memory and documents the action in the report file.
status	Obtain control status information. After entering this command at the control command prompt after getting into by the "globalsecurity", the macro polls the device for community name status information. This information is recorded in the report file.
admin	The name of of administrator name.
user	The name of user name. The tester can change to any other name that he/she want.

3.2.4 PMPP: Check out the testing procedure file for reference.

3.2.5 Motion Control – Position

A great deal of the work in this section deals with reaction to the motion control status information from the field devices. The CCTV central macro are designed to allow a user to perform similar functions related to "Motion Control Position" using the "position" command. After entering this command at the main command prompt, the user is free to issue particular motion requests ranging from "Pan", "Tilt", "Zoom", "Focus", and "Iris". After the specific motion control command is issued, the device is polled in order to obtain the appropriate information. The direction of movement and the speed of movement are taken into account as well. The information is then recorded in the report in a manner which can be easily interpreted by the user. The user is then returned to the main command prompt and performs another motion request. A summary of the status commands is given in tables below. These tables are divided into different motion control requests.

Table 3.4 - Basic Position Command

Command	Description
panhome, tilthome, zoomhome	Pan/Tilt/Zoom the camera to the home position (default position).
ps, ts, zs	Stop the camera movement in the Pan/Tilt/Zoom process

Table 3.5 - Position "Pan" Commands

Command	Description
Pan motion in the "Absolute" mode of movement	
ap	(Absolute Pan Slow Speed) Request to pan the camera to angle 45 degree clockwise/counterclockwise from home position at low speed. The direction of movement is ignored for the absolute mode. Examine the report and watch the movement of camera for verification.
apm	(Absolute Pan Medium Speed) Request to pan the camera to angle 90 degree clockwise/counterclockwise. Check if the speed of movement is actually faster than in "ap" mode. The direction of movement is ignored for the absolute mode.

	Examine the report and watch the movement of camera for verification.
apf	(Absolute Pan Fast Speed) Request to pan the camera to angle 270 degree clockwise/counterclockwise. Check if the speed of movement is actually faster than in "apr" mode. The direction of movement is ignored for this absolute mode choice. Examine the report and watch the movement of camera for verification.
Pan motion in the "Delta" mode of movement	
dpr	(Delta Pan Right) Request to pan the camera to a new position 45 degree clockwise from current position. Examine the report file and visually check the direction of movement.
dprm	(Delta Pan Right Medium Speed) Request to pan the camera to a new position 123 degree clockwise from current position. Examine the report file and visually check the direction of movement to see if the speed is faster than the "dpr" mode.
dprf	(Delta Pan Right) Request to pan the camera to a new position 90 degree clockwise from current position. Examine the report file and visually check the direction of movement to see if the speed is faster than the "dprm" mode.
dpl	(Delta Pan Left) Request to pan the camera to a new position 45 degree counterclockwise from current position. Examine the report file and visually check the direction of movement.
dplm	(Delta Pan Left Medium Speed) Request to pan the camera to a new position 123 degree counterclockwise from current position. Examine the report file and visually check the direction of movement to see if the speed is faster than the "dpl" mode.
dplf	(Delta Pan Left Medium Speed) Request to pan the camera to a new position 180 degree counterclockwise from current position. Examine the report file and visually check the direction of movement to see if the speed is faster than the "dplm" mode.
Pan motion in the "Continuous" mode of movement	
cpr	(Continuous Pan Right Slow Speed) Request the camera to pan clockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera).
cprm	(Continuous Pan Right Medium Speed) Request the camera to pan clockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera) and if the speed is faster than the "cpr" mode.
cprf	(Continuous Pan Right Fast Speed) Request the camera to pan clockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera) and if the speed is faster than the "cprm" mode.
cpl	(Continuous Pan Left Slow Speed) Request the camera to pan counterclockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera).
cplm	(Continuous Pan Left Medium Speed) Request the camera to pan counterclockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera) and if the speed is faster than the "cpl" mode.

cplf	(Continuous Pan Left Fast Speed) Request the camera to pan counterclockwise from current position continuously. Visually check the direction of movement. Check if the camera stops after *timeout* seconds or when a new command is issued (such as "ps" or "cs" to stop the camera) and if the speed is faster than the "cplm" mode.

Table 3.6 - Position "Tilt" Commands

Command	Description
Tilt motion in the "Absolute" mode of movement	
at	(Absolute Tilt Up) to tilt camera to angle 30 degree from home position. Visually check the direction of movement. The direction of movement in the absolute mode is ignored.
atm	(Absolute Tilt Up Medium speed) to tilt camera to angle 60 degree. Check if the speed of movement is actually faster than in "at" mode. Visually check the direction of movement. The direction of movement in the absolute mode is ignored.
atf	(Absolute Tilt Up Fast speed) to tilt camera to angle 90 degree. Check if the speed of movement is actually faster than in "atm" mode. Visually check the direction of movement. The direction of movement in the absolute mode is ignored.
Tilt motion in the "Delta" mode of movement	
dtu	(Delta Tilt Up) to tilt camera to a new position 10 degree upward from current position. Visually check the direction of movement.
dtum	(Delta Tilt Up Medium speed) to tilt camera to a new position 20 degree upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dtu" mode.
dtuf	(Delta Tilt Up Fast) to tilt camera to a new position 30 degree upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dtum" mode.
dtd	(Delta Tilt Down) to tilt camera to a new position 10 degree downward from current position. Visually check the direction of movement.
dtdm	(Delta Tilt Down Medium speed) to tilt camera to a new position 20 degree downward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dtd" mode.
dtdf	(Delta Tilt Down Fast) to tilt camera to a new position 30 degree downward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "dtdm" mode.
Tilt motion in the "Continuous" mode of movement	
tu	(Continuous Tilt Up) to tilt 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.
tum	(Continuous Tilt Up Medium speed) to tilt camera upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "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.
tuf	(Continuous Tilt Up Fast) to tilt camera upward from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "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.
td	(Continuous Tilt Down) to tilt 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.
tdm	(Continuous Tilt Down Medium) to tilt camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "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.
tdf	(Continuous Tilt Down Fast) to tilt camera counterclockwise from current position. Visually check the direction of movement and check if the speed of movement is actually faster than in "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.

Table 3.7 - Position "Zoom Lens" Commands

Command	Description
Zoom motion in the "Absolute" mode of movement	
azi	(Absolute Zoom In) to zoom in camera to maximum zoom value. Examine the report file and visually check.
azh	(Absolute Zoom Half) to zoom camera to a half of zoom range. Examine the report file and visually check.
azo	(Absolute Zoom Out) to zoom out camera to minimum zoom value. Examine the report file and visually check.
Zoom motion in the "Delta" mode of movement	
dzi	(Delta Zoom IN) to zoom out camera to a half of zoom range. Examine the report file and visually check.
dzo	(Delta Zoom Out) to zoom out camera to a quarter of zoom range. Examine the report file and visually check.
Zoom motion in the "Continuous" mode of movement	
zi	(Continuous Zoom In) to zoom in camera to 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.
zo	(Continuous Zoom Out) to zoom in camera to 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.

An example of how some of these commands are used to obtain position information is given below, with information provided by the user in bold. Also shown are examples of the information recorded in the report file.

Enter command: **position**
Enter status command
Enter command: **cprf**

Enter command: **ps**

Report File

Community Name: public

CCTV Command: Absolute Speed Pan Slow - Move to angle 45.00 degrees from Home position
Request: SET positionPan.0 to 02 05 11 94
CCTV Command: Absolute Speed - Pan Medium speed - Move to angle 90.00 degrees from Home position
Request: SET positionPan.0 to 02 3C 23 28
CCTV Command: Continuous Speed - Pan Right Fast
Request: SET positionPan.0 to 03 7F 00 00
CCTV Command: Pan Stop
Request: SET positionPan.0 to 00 00 00 00

3.2.6 Motion Control – Preset

Preset control commands can be issued using the "preset" command at the main command window. After entering this command at the main command prompt, the user then types in the store/goto/query command to get the information about the camera's preset position. The preset commands are summarized in the table below:

Table 3.8 - Preset Commands

Command	Description
store	To store the current position of the camera including pan/tilt/zoom position. After entering this command, the user will be provided by the store number prompt and the user must enter any value from 1 to maximum number of preset specified for the camera (normally 64 for dome-type and 32 for positioner-type camera). All information is then recorded in the report file. The user should remember this stored number and stored position by examining report file and visually check for later use.
goto	After store a position as implemented by the "store" command, the user pan/tilt/zoom the camera to different position using position commands described in Section 3.2.5. And then the user goes back to preset window to enter the command "goto". At this point, the user can verify if the "goto" position that the camera moves to is the position stored before.
query	Obtain status information about preset position properties. This information includes the pan/tilt/zoom position of the camera under test. All of the information is recorded in the report file.

An example of the use of the preset commands and report file is given below.

Enter command: **preset**
Enter PRESET command: **store**
Enter preset number to store (1-255): **28**
Enter PRESET command: **quit**
Enter command: **position**
Enter POSITION command: **ap**
Enter POSITION command: **quit**
Enter command: preset
Enter PRESET command: **goto**
Enter preset number to go to (1-255): **28**

Report File

CCTV Command: Store a preset at current position
Request: SET presetStorePosition.0 to 28
CCTV Command: Go to preset
Request: SET presetGotoPosition.0 to 28
CCTV Command: Store a preset at current position
Request: SET presetStorePosition.0 to 28
CCTV Command: Absolute Speed Pan Slow - Move to angle 45.00 degrees from Home position
Request: SET positionPan.0 to 02 05 11 94
CCTV Command: Go to preset
Request: SET presetGotoPosition.0 to 28

3.2.7 Motion Control – Query

The information about the angle of current pan/tilt position in the horizontal and vertical plane respectively could be read using this command group. This conformance group is a little bit new so most of the devices at the moment failed to reply when this report is written. Future devices should support this function to meet the requirement of FDOT.
After entering "query" command at the main window, the user will be asked to type in which function he/she want to query the information; it could be "pan","tilt", "zoom", "focus", or "iris".

The commands using in this conformance group described as the table below:

Table 3.9 – Query Commands

Command	Description
pan	After entering this command, the information about the current pan position will be displayed on the NTCIP central station window and in the report file as well. Check this information to see whether or not it matches the value on the camera's monitor.
tilt	After entering this command, the information about the current tilt position will be displayed on the NTCIP central station window and in the report file as well. Check this information to see whether or not it matches the value on the camera's monitor.
zoom	After entering this command, the information about the current zoom position will be displayed on the NTCIP central station window and in the report file as well. Check this information to see whether or not it matches the value on the camera's monitor.
focus	After entering this command, the information about the current focus position will be displayed on the NTCIP central station window and in the report file as well. Check this information to see whether or not it matches the value on the camera's monitor.
iris	After entering this command, the information about the current iris position will be displayed on the NTCIP central station window and in the report file as well. Check this information to see whether or not it matches the value on the camera's monitor.

An example of the use of the preset commands and report file is given below:

Enter command: **query**
Enter QUERY command: **pan**
Enter QUERY command: **tilt**

Enter QUERY command: **zoom**
Enter QUERY command: **focus**
Enter QUERY command: **iris**

Report File

CCTV Command: Get current position of Pan
Request: GET positionQueryPan.0
Response: 17273
CCTV Command: Get current position of Tilt
Request: GET positionQueryTilt.0
Response: 0
CCTV Command: Get current position of Zoom
Request: GET positionQueryZoom.0
Response: 100
CCTV Command: Get current position of Focus
Request: GET positionQueryFocus.0
Response: 0

3.2.8 - Range Configuration

All the information about the range limit of the camera will be displayed when using the corresponding command as described in the table. By checking the responded value, the user would know if that value matches the FDOT requirement. The range commands are listed in Table 3.10:

Table 3.10 – Range Commands

Command	Description
maxpreset	Invoke the maximum number of presets supported by the device. The user should examine the report file to see the responded value matches the FDOT requirement value/range (64 for dome-type and 32 for positioner-type camera.)
panleftlimit	Check out the pan left limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range (0..35999)
panrightlimit	Check out the pan right limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (0..35999)
panhomeposition	Check out the pan home position of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (0)
truenorthoffset	Check out the true north offset of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (0..35999)
settruenorthoffset	Set the true north offset of the camera under test. The user can enter any value (1/100 unit degrees) between 0 and 35999. The user should also examine the report file to see the responded value matches the FDOT requirement value/range. (0..35999)
tiltuplimit	Check out the tilt up limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (Tilt Up Limit = 1499 for dome-type, Tilt Up Limit = 5999 for positioner-type camera)
tiltdownlimit	Check out the tilt down limit of the camera under test.

	The user should examine the report file to see the responsed value matches the FDOT requirement value/range. (Tilt down limit = 8999)
minpanstepangle	Check out the min pan step angle of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (min pan step angle = 10)
mintiltstepangle	Check out the min tilt step angle of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (min tilt step angle = 10)
zoomlimit	Check out the zoom limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (zoom limit = 65535)
focuslimit	Check out the focus limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (focus limit = 65535)
irislimit	Check out the iris limit of the camera under test. The user should examine the report file to see the responded value matches the FDOT requirement value/range. (iris limit = 65535)

An example of the use of the range commands and report file is given below:

Enter command: **range**
Enter RANGE command: **maxpreset**
Enter RANGE command: **panleftlimit**
Enter RANGE command: **panrightlimit**
Enter RANGE command: **panhomeposition**
Enter RANGE command: **truenorthoffset**
Enter RANGE command: **settruenorthoffset**
Enter RANGE command: **tiltuplimit**
Enter RANGE command: **tiltdownlimit**
Enter RANGE command: **minpanstepangle**
Enter RANGE command: **mintiltstepangle**
Enter RANGE command: **zoomlimit**
Enter RANGE command: **focuslimit**
Enter RANGE command: **irislimit**
Enter RANGE command: **quit**

Report File

CCTV Command: Get total number of presets supported by the device
Request: GET rangeMaximumPreset.0
Response: 99
CCTV Command: Get panning left range limit
Request: GET rangePanLeftLimit.0
Response: 35999
CCTV Command: Get panning right range limit
Request: GET rangePanRightLimit.0
Response: 35999
CCTV Command: Get arbitrary position as home position
Request: GET rangePanHomePosition.0
Response: 0
CCTV Command: Get offset value from Home to True North position
Request: GET rangeTrueNorthOffset.0
Response: 500

CCTV Command: Set the True North offset
Request: SET rangeTrueNorthOffset.0 to 500

CCTV Command: Get tilting up range limit
Request: GET rangeTiltUpLimit.0
Response: 201
CCTV Command: Get tilting down range limit
Request: GET rangeTiltDownLimit.0
Response: 26999
CCTV Command: Get minimum incremental angle in 1/100th degree unit for pan
Request: GET rangeMinimumPanStepAngle.0
Response: 1
CCTV Command: Get minimum incremental angle in 1/100th degree unit for tilt
Request: GET rangeMinimumTiltStepAngle.0
Response: 1
CCTV Command: Get zooming range limit
Request: GET rangeZoomLimit.0
Response: 18399
CCTV Command: Get focus range limit
Request: GET rangeFocusLimit.0
Response: 0
CCTV Command: Get iris range limit
Request: GET rangeIrisLimit.0
Response: 0

3.2.9 – Timeout Configuration

As described above, timeout is the continuing of action time without the reissue of a control command. The timeout of a CCTV camera refers to the timeout of the control action of pan, tilt, zoom, focus, or iris. The user should verify the timeout value received for each control action and check by implementing the corresponding control command and measure the actual timeout to see if it meets the value received.
Please be noted that the value received here is in milliseconds unit. For example, if the value received is 30000, that means the timeout duration is 30000/1000 = 30 seconds
The timeout duration can be changed by entering set timeout command that is described in more details below. After changing the timeout duration, the user should verify again this configuration.

Table 3.11 – Timeout Commands

Command	Description
pan	*Verify the timeout value (the total number of milliseconds) that a panning motion can continue without the reissue of a pan command.*
tilt	*Verify the timeout value (the total number of milliseconds) that a tilting motion can continue without the reissue of a pan command.*
zoom	*Verify the timeout value (the total number of milliseconds) that a zoom motion can continue without the reissue of a pan command.*
focus	*Verify the timeout value (the total number of milliseconds) that a focus motion can continue without the reissue of a pan command.*
iris	*Verify the timeout value (the total number of milliseconds) that an iris motion can continue without the reissue of a pan command.*
setpan	Help the user set the new pan timeout duration, the user can type any value between 0 to 65535 milliseconds. After entering the value, the user should come back to the corresponding pan position control to verify the actual timeout.
settilt	Help the user set the new tilt timeout duration, the user can type any value between 0 to 65535 milliseconds. After entering the value, the user should come back to the corresponding tilt position control to verify the actual timeout.

setzoom	Help the user set the new zoom timeout duration, the user can type any value between 0 to 65535 milliseconds. After entering the value, the user should come back to corresponding zoom position control to verify the actual timeout.
setfocus	Help the user set the new focus timeout duration, the user can type any value between 0 to 65535 milliseconds. After entering the value, the user should come back to corresponding focus position control to verify the actual timeout.
setris	Help the user set the new iris timeout duration, the user can type any value between 0 to 65535 milliseconds. After entering the value, the user should come back to corresponding iris position control to verify the actual timeout.

An example of the use of the timeout commands and report file is given below:

Enter command: **timeout**
Enter TIMEOUT command: **pan**
Enter TIMEOUT command: **setpan**
Enter time out value (0-65535 milliseconds):**30000**
Enter TIMEOUT command: **quit**

Report File

CCTV Command: Get the time out value (in milliseconds) for pan
Request: GET timeoutPan.0
Response: 5000
CCTV Command: Set the time out value (in milliseconds) for pan
Request: SET timeoutPan.0 to 3000

3.2.10 – Label Configuration

This group helps 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 horizontal positions of the label text, the color of label characters, and activation & deactivation of labels for display. The user can use the commands described in the following to get information about the label's parameters such as height, color, font number, label status, start row and start column. After getting the label's information, the user can set/edit these label information by using the commands starting with "set".
All the basic commands used in the Label group are listed in the following table.

Table 3.12 – Label Commands

Command	Description
max	Define the maximum number of labels in the camera control label table. The user should pay attention to this number. The user should not type in any value larger than this value when asked for label number in the later test commands. Otherwise, the device under test will not respond.
display	Display all the label information including label height, label color, label font number, label start row and start column. The user should refer to the report file to get this information.
setheight	Set the label height. The height represented as a percent of screen filled by the text scaled to a range from 0 to 255. A value of 0 indicates the height is not displayed while a value of 255 indicates the label is presented at a maximum height. Check the report file for verification.
setfont	Set the label font number. This designates the font number to be displayed. Only one font type is to be supported and that's the default value 1. The value of 2 designates the default ASCII encoded text characters. Check the report file for verification.
setcolor	Described the color of the label characters. There are 16 different colors

	corresponding to 16 different integers from 1 to 16. The user is free to change the color with relevant integer value. Check the report file for verification.
setstartrow	Set the start row number which represents the vertical position on the screen where the text is to be displayed on the range from 0 to 255. The value of 0 is the upper-most row of the display.
setstartcolumn	Set the start row number which represents the horizontal position on the screen where the text is to be displayed on the range from 0 to 255. The value of 0 is the left-most row of the display.
enabletext	This command provides a control mechanism for activating or deactivating all labels regardless of individual display status. The sub command of this is "a" and "d" which represent activate and deactivate the text label.

An example of the use of the label commands and report file is given below:

Enter command: **label**
Enter LABEL command: **display**
Enter LABEL command: **setheight**
Enter label number: 4
Enter label height (0..255): **6**
Enter LABEL command: **setfont**
Enter label number**: 4**
Enter label font (0..255): **7**
Enter LABEL command: **setcolor**
Enter label number **: 4**
Enter label fcolor (1..16): **4**
Enter LABEL command**: enabletext**
Activate|Deactivate of Text Active (a = activate | d = deactivate): **a**
Activate|Deactivate of Text Active (a = activate | d = deactivate): **d**

Report File

Label command: Get multiple objects
Request: GET labelIndex.5
labelHeight.5
labelColor.5
labelStartRow.5
labelStartColumn.5
labelFontNumber.5
Response: 5
6
7
1
1
2
0
Request: GET labelActive.5
Response: 80
Request: SET labelHeight.2 to 6
Request: SET labelColor.4 to 7
Request: SET labelStartRow.5 to 1
Request: SET labelStartColumn.6 to 1
CCTV Command: Activate or deactivate of active text (a=activate|d=deactivate)
Request: SET labelEnableTextDisplay.0 to 80
CCTV Command: Activate or deactivate of active text (a=activate|d=deactivate)
Request: SET labelEnableTextDisplay.0 to 00

3.2.11 – Extend Control – System

The information about camera status, lens status, availability of controllable camera power supply, auto focus/iris activation will be tested using corresponding commands.
The commands in details are described as follows:

Table 3.13 – Range Commands

Command	Description
camerastatus	Obtain information about the camera parameters status: Heater Power, Wiper, Washer, Blower, and Camera Power. If the response value is 80 (hex) (equivalent to 1000 0000 in binary), then the status of Camera Power is ON and other components (Heater Power, Wiper, Washer and Blower) are OFF. The user should check the report file for test result.
cameraequipped	Obtain information about Camera Power Supply. If the response value is 80 (hex), then the availability of a controllable Camera Power supply is YES (available) and the availabilities of all other components are NO (un-available). The user should check the report file for test result.
lensequipped	Obtain information about the availability of the autoiris and autofocus function of the camera. 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 the availability of controllable Auto Iris is confirmed. If the response value is 40 (hex) then only the availability of controllable Auto Focus is confirmed. The user should check the report file for test result.
lensstatus	Obtain the information about the status of the autoiris and autofocus if supported by the camera. If the response value is C0 (hex), then the 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. The user should check the report file for test result.
autoiris	After entering this command, the user will be asked to activate or deactivate autoiris function of the camera under test. Letter "a" is to activate while Letter "d" is for deactivate. The user should come back to use "lensstatus" command to check whether the autoiris activate/deactivate implementation is valid or not.
autofocus	After entering this command, the user will be asked to activate or deactivate autofocus function of the camera under test. Letter "a" is to activate and Letter "d" is for deactivate. The user should come back to use "lensstatus" command to check whether the autoiris activate/deactivate implementation is valid or not.

An example of the use of the System commands and report file is given below:

Enter command: **system**
Enter SYSTEM command: **camerastatus**
Enter SYSTEM command: **lensequipped**
Enter SYSTEM command: **lensstatus**
Enter SYSTEM command: **autofocus**
Activate/Deactivate of Autofocus: **a**

Report File

CCTV Command: Get the statuses of camera components (Power,Heater,Wiper, Washer and Blower)
Request: GET systemCameraFeatureStatus.0
Response: 0
CCTV Command: Get the availability of controllable camera components
Request: GET systemCameraEquipped.0
Response: 80

CCTV Command: Get the availability of controllable lens (Auto Iris and Auto Focus)
Request: GET systemLensEquipped.0
Response: 0
CCTV Command: Get the status of camera lens
Request: GET systemLensFeatureStatus.0
Response: 0
CCTV Command: Activate or deactivate of Auto Focus (a=activate|d=deactivate)
Request: SET systemLensFeatureControl.0 to 40 00
CCTV Command: Get the status of camera lens
Request: GET systemLensFeatureStatus.0
Response: 80

3.2.12 – Extend Control – Zone

The information about the maximum zone number, label associated with the label index which is displayed on screen, pan/tilt left limit and availability of the zones, zone label, and control of video signal.
The commands in details are described as follows:

Table 3.14 – Zone Commands

Command	Description
max	Verify the maximum number of zone for the device. The user should pay attention to this number. The user should not type in any value larger than this value when asked for zone number in the later test commands. Otherwise, the device under test will not respond.
get	Get the information about the pan and tilt limit of the camera. Examine the report file for test result.
set	Help to set the information obtained from "get" command. The user can edit the pan/tilt limit and then navigate the camera to any position using position command and check if the zone number and its associate label text are shown on the monitor.
cameraequipped	Verify the availability of zones, zone labels, and the control of video signal within a zone. (1110 0000 = E0)

An example of the use of the Zone commands and report file is given below:

Enter command: **zone**
Enter ZONE command: **max**
Enter ZONE command: **get**
Enter ZONE command: **set**
Zone number: **n** (any number between 1 and 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**
Enter ZONE command: **cameraequipped**

Report File

Zone command: Show the max number of zones
Request: GET zoneMaximum.0
Response: 7
Zone command: Get multiple objects
Request: GET zoneLabel.2
zonePanLeftLimit.2

zonePanRightLimit.2
zoneTiltUpLimit.2
zoneTiltDownLimit.2
Response: 2
9000
18000
1500
9000
Zone command: Get multiple objects
Request: SET zoneLabel.3 to 1
zonePanLeftLimit.3 to 0
zonePanRightLimit.3 to 18000
zoneTiltUpLimit.3 to 65535
zoneTiltDownLimit.3 to 65535
Zone command: Availabilities of zones, zone labels and control of video signals
Request: GET zoneCameraEquipped.0
Response: 0

3.2.13 – On-Screen Menu Control

This command group helps to handle the navigation of the internal camera menu as well as the activation of menu and specify the time duration of activated menu. If the status information of the menu is requested, the macro polls the device for the current settings of these parameters and writes the information to the report file.

Table 3.15 – Menu Commands

Command	Description
activate	To activate the camera control, a value of 0 is to turn off while a value of 255 is to turn on continously without any timeout duration. Any value from 1 to 254 is the specific time duration which the menu is displayed in that period.
control	To control the menu manipulation, the sub commands used to control the menu are: 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, and 9-Enter value shown. The user should verify by looking at the menu on the monitor screen.

An example of the use of the Menu commands and report file is given below:

Enter command: **menu**
Enter MENU command: **activate**
Enter 0:turn off;255:turn on forever;1..254: the time period (in seconds) for menu activation: **255**
Enter MENU command: control
Enter 1-9 for manipulation (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): **1**
Enter 1-9 for manipulation (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): **3**
Enter 1-9 for manipulation (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): **4**

Report File

CCTV Command: Activate internal menu

Request: SET menuActivate.0 to 255
CCTV Command: Manipulate menu
Request: SET menuControl.0 to 1
CCTV Command: Manipulate menu
Request: SET menuControl.0 to 3
CCTV Command: Manipulate menu
Request: SET menuControl.0 to 4

3.2.14 – Extend Control – Alarm (Optional)
Verify that the information about the alarm parameters is properly reported by the device. Also, verify these parameters are implemented by the device. This function is not required to be tested and supported by FDOT. The user can take a look at Testing Procedure File for further information and extend reference.

3.2.15 – Extend Control – Alarm (Optional)
Verify that the information about the input parameters is properly reported by the device. Also, verify these parameters are implemented by the device. This function is not required to be tested and supported by FDOT. The user can take a look at Testing Procedure File for further information and extend reference.

3.2.16 – Extend Control – Alarm (Optional)
Verify that the information about the output parameters is properly reported by the device. Also, verify these parameters are implemented by the device. This function is not required to be tested and supported by FDOT. The user can take a look at Testing Procedure File for further information and extend reference.

3.2.17 – Extend Control – Tour (Florida Specific Group) (for reference**)**
This test procedure is just proposed by TERL and it needs further consideration for future use. The user can take a look at Testing Procedure File for further information and extend reference.