A Joint Standard of AASHTO, ITE, and NEMA

NTCIP 1208:2005 v01.12

National Transportation Communications for ITS Protocol

Object Definitions for Closed Circuit Television (CCTV) Switching

October 2005

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This publication was prepared by the NTCIP CCTV Working Group, which is a subdivision of the NTCIP Joint Committee. The Joint Committee is organized under a Memorandum of Understanding among the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Electrical Manufacturers Association (NEMA). The Joint Committee on the NTCIP consists of six representatives from each of the standards organizations, and provides guidance for NTCIP development.

At the time that this document was prepared, the following individuals were members of the NTCIP CCTV Working Group:

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- John McDonough
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- Keith Vennel

In addition to the many volunteer efforts, recognition is also given to those organizations that supported the efforts of the NTCIP CCTV Working Group by providing comments and resources for the development of the standard, including:

- California Department of Transportation
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- Gyyr, Inc
- Image Sensing Systems, Inc.
- Los Angeles Department of Transportation
- Ontario Ministry of Transportation
- Pelco, Inc.
- Sensormatic Electronics Corporation
- Washington State Department of Transportation
- U.S. Department of Transportation Federal Highway Administration

This publication and version is dedicated to the memory of G. Curtis Herrick.

FOREWORD

This document defines the Closed Circuit Television (CCTV) Switch data elements that are supported by the NTCIP.

This document is an NTCIP Device Data Dictionary Standard. Device Data Dictionary standards provide definitions of data elements for use within NTCIP systems.

A Joint NTCIP Device Data Dictionary standards publication is equivalent to these document types at the standards organizations:

AASHTO – Standard Specification
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All User Comments will be referred to the committee responsible for developing and/or maintaining this standards publication. The committee chairperson, or their designee, may contact the submitter for clarification of the User Comment. When the committee chairperson or designee reports the committee's consensus opinion related to the User Comment, that opinion will be forwarded to the submitter. The committee chairperson may report that action on the User Comment may be deferred to a future committee meeting and/or a future revision of the standards publication. Previous User Comments and their disposition may be available for reference and information at www.ntcip.org.

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Approvals

This document was separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization has approved this standard as the following standard type, as of the date:

AASHTO – Standard Specification; October 2004
ITE – Software Standard; May 2005
NEMA – Standard; November 2004

History

From 1996 to 1999, this document was referenced as NEMA TS 3.SWITCH. However, to provide an organized numbering scheme for the NTCIP documents, this document is now referenced as NTCIP 1208. The technical specifications of NTCIP 1208 are identical to the former reference, except as noted in the development history below:

NTCIP 1208 v01.04. July 1999 – Accepted as a User Comment Draft by the Joint Committee on the NTCIP. January 2000 – NTCIP Standards Bulletin B0041 distributed for user comment.

NTCIP 1208 v01.11. August 2003 – Accepted v01.11 as a Recommended Standard by the Joint Committee on the NTCIP. May 2004 – NTCIP Standards Bulletin B0094 referred v01.11d for balloting. Approved by AASHTO in October 2004, approved by ITE in May 2005, and approved by NEMA in November 2004.

NTCIP 1208:2005 v01.12. October 2005 – Edited document for publication; revised front matter.

Compatibility of Versions

All NTCIP Standards Publications have a major and minor version number for configuration management. The version number syntax is "v00.00a," with the major version number before the period, and the minor version number and edition letter (if any) after the period.

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Compliant systems based on later, or higher, version numbers MAY NOT be compatible with compliant systems based on earlier, or lower, version numbers. Anyone using this document should also consult NTCIP 8004 for specific guidelines on compatibility.

INTRODUCTION

This document defines the Closed Circuit Television (CCTV) Switch data elements that are supported by the NTCIP.

The *NTCIP Object Definitions for Closed Circuit Television (CCTV) Switches* defines data elements in ASN.1 using the SNMP Object Type Macro for devices that control discrete input and output video signals. These definitions are intended for CCTV video switching devices.

This standard defines requirements that are applicable to all NTCIP environments and it also contains optional and conditional clauses that are applicable to specific environments for which they are intended.

The following keywords apply to this document: AASHTO, ITE, NEMA, NTCIP, CCTV, switch, data elements.

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began the effort to develop the NTCIP. Under the guidance of the Federal Highway Administration's NTCIP Steering Group, the NEMA effort was expanded to include the development of communications standards for all transportation field devices that could be used in an ITS network.

In September 1996, an agreement was executed among AASHTO, ITE, and NEMA to jointly develop, approve, and maintain the NTCIP standards. In August 1997, the CCTV Working Group was first organized to develop data element definitions for camera control. In June 1998, the CCTV WG began work on the video switch standard.

CONTENTS

Section 1
GENERAL

1.1 SCOPE

The communications between an ITS Management Center or portable computer and a Closed Circuit Television (CCTV) Switch is accomplished by using the NTCIP Application Layer services to convey requests to access or modify values of CCTV Switch objects resident in the device via an NTCIP network. An NTCIP message consists of a specific Application Layer service and a set of data objects. An NTCIP message may be conveyed using any NTCIP defined class of service that has been specified to be compatible with the Simple Transportation Management Framework (STMF).

The scope of this document is limited to the functionality related to CCTV switches within a transportation environment. This publication defines data elements that are specific to CCTV Switches and also defines standardized data element Groups that can be used for conformance statements. The limits and descriptions of the parameters are established to give the user maximum flexibility to operate devices that either exist at the time this document was authored or may exist in the future.

1.2 REFERENCES

For approved revisions, contact:

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e-mail: www.ntcip.org

Proposed revisions, which are under discussion by the relevant NTCIP Working Group, and revisions recommended by the NTCIP Joint Committee are available on the World Wide Web at http://www.ntcip.org.

The following standards (normative references) contain provisions that, through reference in this text, constitute provisions of this Standard. Other documents and standards (other references) are referenced in these documents, which might provide a complete understanding of the entire protocol and the relations between all parts of the protocol. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of each standard listed below.

1.2.1 Normative References

	NTCIP 1201 v02 (formerly TS 3.4)	*NTCIP – Global Object Definitions*
	NTCIP 1103 v02	*NTCIP – Transportation Management Protocols*
	NTCIP 2301 v02	*NTCIP – Simple Transportation Management Framework Application Profile*
ISO/IEC	8824-1:1998	*Information Technology—Abstract Syntax Notation One (ASN.1): Specification of Basic Notation*

IAB STD 16	RFC1155 - 05/10/1990	*Structure and Identification of Management Information for TCP/IP-based Internets*
IAB STD 16	RFC1212 - 03/26/1991	*Concise MIB Definitions*

1.2.2 Other References

1.2.2.1 Standards

	NTCIP 1201:1997	*NTCIP – Simple Transportation Management Framework*
	NTCIP 8003	*NTCIP – Framework and Classifications of Profiles*
	NTCIP 9001	*The NTCIP Guide*
ISO/IEC	8825-1:1998	*Information Technology—ASN.1 Encoding Rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER).*
IAB STD 15	RFC1157 - 05/10/1990	*A Simple Network Management Protocol (SNMP)*
IAB STD 17	RFC1213 - 03/1991	*Management Information Base for Network Management of TCP/IP-based Internets: MIB-II*

1.2.2.2 Texts

David Perkins and Evan McGinnis, *Understanding SNMP MIBs*, New Jersey, Prentice Hall PTR, 1997, ISBN 0-13-437708-7.

1.2.3 Contact Information

1.2.3.1 ISO/IEC Standards

Members of the ISO maintain registers of currently valid ISO/IEC International Standards. For the USA, the member of ISO is the American National Standards Institute (ANSI), which may be contacted as follows:

American National Standards Institute (ANSI)
11 West 42nd Street, 13th Floor
New York, NY 10036
(212) 642-4900

1.2.3.2 RFC Documents

Obtain Request for Comment (RFC) electronic documents from several repositories on the world wide web, or by “anonymous” File Transfer Protocol (FTP) with several hosts. Browse or FTP to:

http://www.rfc-editor.org/
http://www.rfc-editor.org/repositories.html
for FTP sites, read ftp://ftp.isi.edu/in-notes/rfc-retrieval.txt

1.3 TERMS

For the purposes of this standard, the following terms and definitions apply. For terms not defined in this

clause, English words are used in accordance with their definitions in the latest edition of *Webster's New Collegiate Dictionary*. Electrical and electronic terms not defined in this clause or in *Webster's New Collegiate Dictionary* are used in accordance with their definitions in IEEE Std 100-1992.

alarm	An abnormal system condition that typically requires acknowledgement and correction by trained personnel.
CCTV	Closed Circuit Television, any television system that transmits video information over a hardwire medium such as coax, fiber optic, twisted pair cable.
CCU	Camera Control Unit. A device used to multiplex and distribute multiple camera motion and lens position control inputs to multiple cameras. CCTV is also a distribution system that limits reception of an image to those receivers or monitors which are directly connected to the organization point by coaxial cable or microwave link.
discrete input	Individual and separate input circuits that indicate an on or off.
discrete output	Individual and separate output circuits that can be turned on or off.
label	Text information embedded in the video and displayed on a monitor.
sequential switcher	A video control device that switches multiple video inputs to multiple video outputs in a predetermined timed sequence.
switcher	A unit that allows the operator to switch between video camera signals. Switchers are often used in industrial applications to switch between video cameras monitoring certain areas for display on one monitor.
video	Pertaining to picture signals in a television system. (A): any production using videotape or television technology. (B): Television and the technical equipment and events involved in creating television. (C): The picture portion of a television broadcast. (D): Non-broadcast or private television.

1.4 ABBREVIATIONS AND ACRONYMS

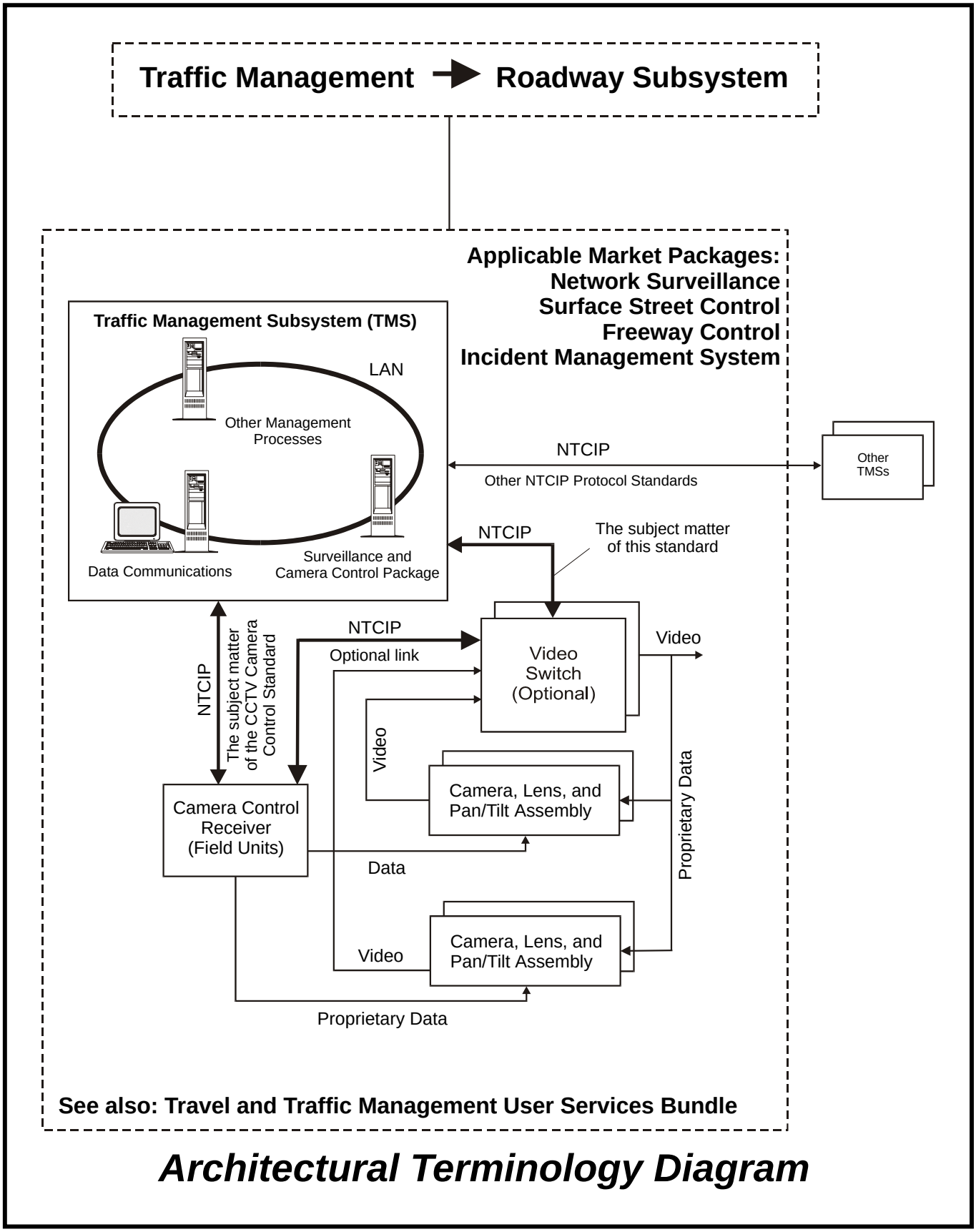
The following abbreviations and acronyms are widely used in either the Transportation or CCTV industry. For additional information, please refer to the extended glossary in Informative Annex A.

AASHTO	American Association of State Highway and Transportation Officials
ACTV	Advanced Compatible Television
ADTV	Advanced Definition Television
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
AIV	Advanced Level Control Video
ALC	Automatic Level Control or Automatic Light Control
ASC	Automatic Sensitivity Control
CATV	Community Antenna Television
CAV	Component Analog Video
CCD	Charge-Coupled Device
CCTV	Closed Circuit Television

CCU	Camera Control Unit
CD	Compact Disc
CD+G	Compact Disc+Graphics
CD-I	Compact Disc-Interactive
CD-IV	Compact Disc-Interactive Video
CD+MIDI	Compact Disc-Musical Instrument Digital Interface
CD-ROM	Compact Disc-Read Only Memory
CLUT	Color Look-Up Table
EDTV	Enhanced Definition Television also Extended Definition Television
HDTV	High-Definition Television
IAB	Internet Architecture Board
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation Systems
LLTV	Low Light Television
MIB	Management Information Base
NEMA	National Electrical Manufacturers Association
NTCIP	National Transportation Communications for ITS Protocol
NTSC	National Television System Committee
PAL	Phase Alternate by Line
PAL-M	Phase Alternate by Line (Brazilian standard)
RFC	Request for Comment
RGB	Red, Green, Blue
SECAM	SEquetial Couleur A Memoire
STD	Standard
VDA	Video Distribution Amplifier
VITC	Vertical Interval Time Code
VTR	Video Tape Recorder

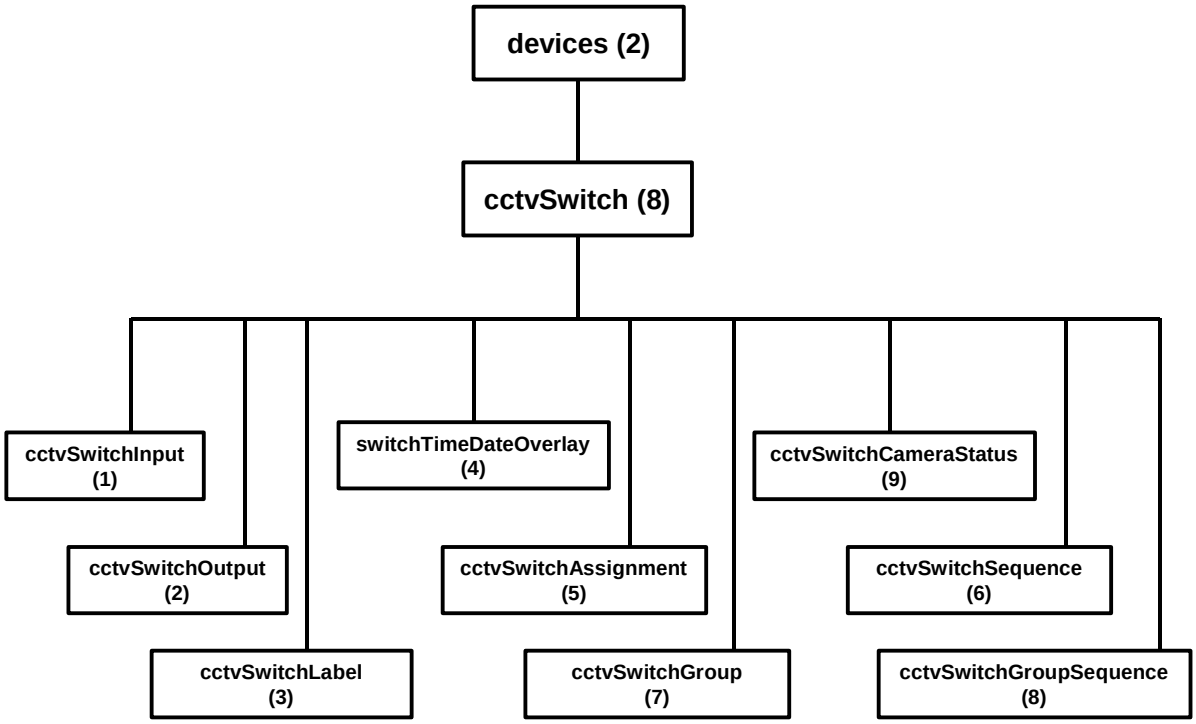
1.5 SUPPLEMENTAL FIGURES

The following two figures provide a pictorial representation of the CCTV Switch architecture and the Closed Circuit Television Switch Branch and Tree Structure. This is an architecture that is a proposed component for the National ITS Architecture. The architecture diagram identifies some of the terms and acronyms described above, in addition to identifying the focus of this standard. The tree structure identifies how the object definitions are combined under specific nodes.



Architectural Terminology Diagram

Closed Circuit Television Switch Branch and Tree Structure



Section 2
CCTV SWITCH OVERVIEW

2.1 INTRODUCTION TO CCTV

The context of the NTCIP is one part of the Intelligent Transportation Systems (ITS) standardization activities covering base standards, profiles, and registration mechanisms.

- Base Standards define procedures and rules for providing the fundamental operations associated with communications and information that is exchanged over fixed-point communications links.

- Profiles define subsets or combinations of base standards used to provide specific functions or services. Profiles prescribe particular subsets or options available in base standards necessary for accomplishing a particular function or service. This provides a basis for the development of uniform, nationally recognized conformance.

- Registration Mechanisms provide a means to specify and uniquely identify detailed parameters within the framework of base standards and/or profiles.

Within the Joint AASHTO/ITE/NEMA Committee on the NTCIP, other working groups are concerned with the methodology of defining profiles, and their documentation in Standards Publications. The objective is to facilitate the specification of ITS systems characterized by a high degree of interoperability and interchangeability of its components.

NTCIP 1208 covers the control and status requirements of video switches. Another standard, NTCIP 1205, defines the data elements for control of cameras, lenses, and pan/tilt units, and is issued separately from this NTCIP 1208.

Unfortunately, there are no existing standards that define how these devices communicate with other related equipment. As a result, each manufacturer has developed its own protocol to meet their particular needs. To integrate systems manufactured by different companies, considerable extra work must be performed resulting in increased costs. This shortcoming limits interchangeability of components between different vendors and restricts the sharing of information and control within and between user organizations.

These problems have not been limited to CCTV surveillance systems. Many other devices also need to share network infrastructure and exchange information. In surface transportation, examples include traffic signal controllers, dynamic message signs, bus priority sensors, etc. To address these problems, the NTCIP is developing a family of open standards for communications among field devices and between field devices and central management stations, known as Traffic Management Subsystems (TMS).

2.2 BENEFITS OF STANDARDIZATION

As transportation systems become more sophisticated, planners, users, and equipment manufacturers recognize the need for system interoperability and integration. Currently, there is no common protocol with which different types of equipment can communicate. If CCTV is to be integrated with ITS, common communications standards must be established.

Before the NTCIP development started, each vendor of electronic devices used in transportation adopted a different protocol for data communications. This made it very difficult to mix equipment from different

vendors in the same system, and to communicate between systems operated by adjacent agencies. The NTCIP is now providing a common standard that can be used by all vendors.

The NTCIP offers increased flexibility and choice for agencies operating traffic management systems. It removes barriers to inter-jurisdictional coordination and allows equipment of different types and manufacturers to be mixed on the same communications line. For these reasons, operating agencies will benefit from specifying that the NTCIP is included in all future purchases and upgrades.

Benefits of adopting open standards based on the NTCIP include:

- *Avoiding Early Obsolescence*: Though it may not be practical to retrofit NTCIP support in some old equipment, most CCTV vendors will offer NTCIP support in current and future products. An operating agency can ensure that its equipment remains useful and compatible long into the future by requiring NTCIP support for all future purchases and upgrades. This will include central computers and CCTV field devices, such as cameras, pan/tilt mechanisms, lens, and video switchers.
- *Providing Choice of Vendor*: Once an agency has a CCTV surveillance system that includes support for NTCIP it can buy field devices from any manufacturer offering NTCIP-compatible products, and they will communicate with the agency's "Traffic Management Subsystem" ('TMS', typically termed CPU).
- *Allowing Interjurisdictional Coordination*: In the future, an agency may want to communicate with CCTV devices owned by other users and/or procured from different vendors. Under NTCIP, these various devices can be added onto an existing communications channel and mixed with different types of devices on the same line.
- *Using one Communications Network for All Devices*: NTCIP also allows a central computer to communicate with a range of field devices on the same communications channel. For example, if a dynamic message sign is installed near a CCTV camera control receiver, the central computer could communicate with the sign controller using the communications channel already in place for the CCTV camera control receiver. The communications network is usually the most expensive component of a transportation management system and use of the NTCIP maximizes that investment.

Several state and local transportation agencies already have a number of CCTV surveillance systems deployed for traffic and transportation management. At present, however, these systems often include proprietary elements that limit expansion and upgrade opportunities.

The development of the NTCIP will allow a more open-systems approach, not only among CCTV equipment, but also with a wide variety of other field devices. It is expected that this open-systems approach will result in lower deployment and equipment costs similar to the PC industry. This in turn will allow for more devices to be deployed resulting in better decision-support to decrease maintenance costs.

To make best use of these advancements, CCTV should be viewed in the much broader context of Intelligent Transportation Systems (ITS). The key to these benefits is open standards, allowing agencies to share data and avoid becoming locked into proprietary systems.

2.3 EXISTING STANDARDS

There are great benefits of adopting existing standards where possible. These include:

- reuse of software modules during development
- faster implementations
- reducing risks
- ability to integrate components from different manufacturers
- unambiguous meanings of terminology
- building on proven technologies

2.3.1 Internet Standards

The Internet Engineering Task Force (IETF) is responsible for developing and maintaining the standards, guidelines and procedures for communications over the Internet. This group has become increasingly important over the last few years as the Internet has gained popularity. A wide range of Internet standards exist, including:

- Point-to-Point Protocol (PPP) - which may be used for NTCIP dial-up links
- Internet Protocol (IP) - which may be used for NTCIP communications over networks
- Transport Control Protocol (TCP) - which may be used to provide connection-oriented transport services over NTCIP networks
- User Datagram Protocol (UDP) - which may be used to provide connectionless transport services over NTCIP networks
- Simple Network Management Protocol (SNMP) - which may be used to exchange NTCIP data elements such as those defined within this document.

2.3.2 International Organization of Standardization Standards

The International Organization of Standardization (ISO) also develops various communication standards among a wide variety of other standards. The Open Systems Interconnect Reference Model (OSI) is a widely-referenced ISO standard which defines the standard seven-layered communications model. While most implementations do not strictly conform to this standard, virtually all modern communications schemes, including the NTCIP, use many of the concepts defined within the standard. In addition, NTCIP communications may use the High Level Data Link Control Protocol (HDLC), another ISO standard, in specifying how to send a message over a single communications link.

2.3.3 NTCIP

To support ITS developments, US DOT funded the design of a National ITS Architecture. This architecture defines major ITS subsystems and the needs for information exchange among them. The National Transportation Communications for ITS Protocol (NTCIP) group is now developing standards for these information exchanges. NTCIP – a joint initiative of AASHTO, ITE, and NEMA – recognizes that closed circuit television is a vital component of traffic and transportation management systems. The family of NTCIP standards will enhance CCTV implementation and provide a mechanism for the manipulation of the basic camera control functions within CCTV systems.

2.3.4 NTCIP System Design

NTCIP was initially designed to support traffic signal controllers because that was seen by the FHWA as an area of most pressing need. However, the development process planned that the protocol would be extended to other transportation environments (e.g., ITS) and, where appropriate, to other environments.

The NTCIP family of protocols is continually expanding to address additional needs. Work is in progress on additional protocols for computer-to-computer or center-to-center data exchange, transit communications, and communications with or between moving vehicles. The NTCIP, along with other US DOT standards efforts, will eventually provide a comprehensive family of communications protocols covering all appropriate ITS applications.

There may also be a future demand to use the system for communications to field devices that are not transportation related. The ultimate scope of NTCIP cannot be rigidly determined. The key is to determine how those changes might affect the system design and to provide flexible standards that accommodate these changes. NTCIP will seek to utilize existing telecommunications and computer industry standards to the extent possible.

2.4 CLOSED CIRCUIT TELEVISION (CCTV) SWITCHING

2.4.1 General

Closed Circuit Television (CCTV) is a method of distributing video signals such that access to said signals is confined to devices directly connected to a common circuit or system. By contrast, broadcast television signals are available to an unlimited number of receivers, and access to such signals cannot easily be restricted or controlled.

CCTV video information is then normally transmitted within a closed system through a restricted-access medium in the form of signals conforming to the Electronic Industry Association (EIA) RS-170 standard for video signaling. This signaling is characterized by the combination of a voltage-encoded video luminance (brightness or intensity) signal, a color signal encoded on an amplitude-and-phase-modulated carrier, and additional voltage encoded synchronization signals. Since the luminance and synchronization signals are not modulated, RS-170 video is referred to as "base-band video." Also because the brightness, color and synchronization signals are combined onto a single wire, RS-170 is characterized as "composite video." By contrast, broadcast TV signals are also composite video, but are amplitude modulated onto pre-established frequency carriers to permit transmission of multiple channels over a common medium.

Each individual, discrete base-band, composite video signal in a CCTV system is normally transmitted over a dedicated coaxial cable. However, discrete CCTV signals are often modulated and/or combined for transmission over fiber optics cables or other access-secured transmission media to increase transmission distances or to achieve cost savings.

Video signal transmission is currently outside the scope of the NTCIP. Standards for video transmission may be added at some later date, but will not be discussed in this document. In addition to the video signal, CCTV systems provide a data communications connection between the traffic management center and field devices for the purpose of manipulating camera position, lens adjustment, and video switching. Camera positioning includes panning the camera in the horizontal plane both right and left, and tilting the camera in the vertical plane both up and down. Lens adjustments include zoom adjustments for wide and telephoto, focus adjustments for both far and near, and iris adjustments for both closed and open. Video switching devices provide a mechanism for manipulating input and output assignments to effectively utilize available network capacity. This document specifically addresses the data communications link between the traffic management center and the video switching devices.

2.4.2 CCTV Switching Overview

The NTCIP CCTV Switching standard (NTCIP 1208) documented here is intended for data communications with video switching devices that control discrete input and output video signals (e.g., analog base-band composite video.) The video inputs can be any video source (e.g., cameras, stored-video playback devices, outputs of other video switches, digital video decoders, etc.) and the video switch outputs can be any destination (e.g. display monitors, video recorders, image capture/processor devices, etc.). This switching standard provides objects that control switching of inputs to outputs (including block switching of input and output groups, and timed sequential programs of multiple inputs). This switching standard also provides for control of title/label generation by the video switch, and discrete input/output and switch status monitoring.

The NTCIP 1208 CCTV Switching standard describes data elements that control video switching devices. NTCIP 1205 defines data elements that control cameras, lenses, pan/tilt units, and camera-generated titles/labels.

The intent of this section is to provide a clear understanding of the tasks or operations that are supported

by the standard and the methodology for achieving the desired operation.

Figure 2-1 shows the entity relationship between each of the tables in the NTCIP CCTV Switching standard.

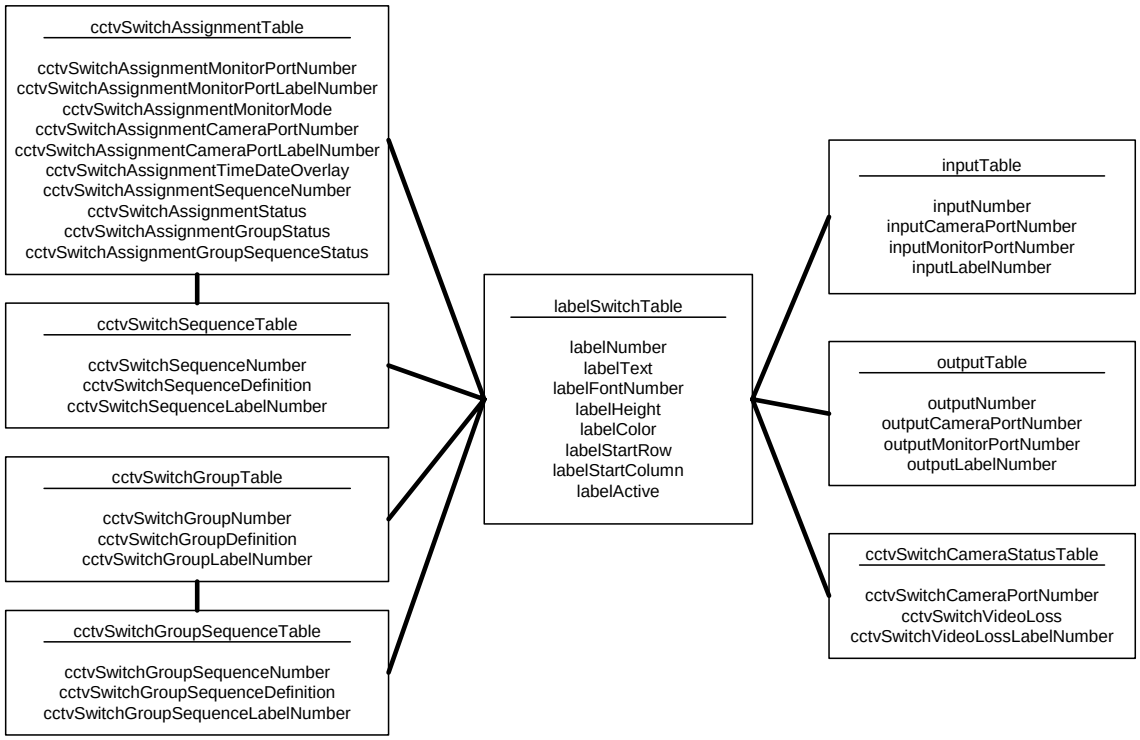


Figure 2-1
Entity Relationships for CCTV Switching Tables

2.4.3 Control Functions

The control functions provided by the NTCIP CCTV Switching standard include three primary areas: switching, labels, and discrete inputs/outputs.

2.4.3.1 Switching

The NTCIP CCTV Switching standard establishes a standardized mechanism for controlling which camera will be displayed on a given monitor. The standard allows a sequence of cameras to be displayed on a given monitor. A sequence is defined as a timed sequential display of cameras on a given monitor. The standard also allows for groups of cameras to be displayed on a given group of monitors. A group is defined as a collection of cameras that are displayed on a given collection of monitors. The standard also allows for group sequences to be displayed on a group of monitors. A group sequence is defined as the timed sequential display of a collection of cameras to be displayed on a collection of monitors.

2.4.3.1.1 Switching a camera to a monitor

The maximum camera ports [cctvSwitchAssignmentMaximumCameraPorts] parameter defines the maximum number of assignable physical camera ports. The maximum monitor ports [cctvSwitchAssignmentMaximumMonitorPorts]

parameter defines the maximum number of assignable physical monitor ports. The switch assignment table establishes the monitor to camera relationship. The table is indexed by the monitor port number parameter. The camera port number parameter identifies which camera is to be displayed on the given monitor. Switching is accomplished through the use of the monitor mode [cctvSwitchAssignmentMonitorPortNumber] parameter, which controls the display of the camera on the monitor.

Switch Assignment Table [cctvSwitchAssignmentTable]									
Monitor Port Number	Monitor Port Label Number	Monitor Mode	Camera Port Number	Camera Port Label Number	Display Time Date Overlay	Sequence Number	Assignment Status	Group Status	Group Sequence Status
1-65535	0-65535	1-7	1-65535	0-65535	1-5	1-65535	1-6	1-3	1-3
[cctvSwitchAssignmentMonitorPortNumber]	[cctvSwitchAssignmentMonitorPortLabelNumber]	[cctvSwitchAssignmentMonitorMode]	[cctvSwitchAssignmentCameraPortNumber]	[cctvSwitchAssignmentCameraPortLabelNumber]	[cctvSwitchAssignmentTimeDateOverlay]	[cctvSwitchAssignmentSequenceNumber]	[cctvSwitchAssignmentStatus]	[cctvSwitchAssignmentGroupStatus]	[cctvSwitchAssignmentGroupSequenceStatus]

Example: A user wants to switch Camera 6 to Monitor 2. In order to do this, the following operations would need to occur:

SET [cctvSwitchAssignmentCameraPortNumber] to 6 in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to make the camera to monitor assignment.

SET [cctvSwitchAssignmentMonitorMode] to 2 (the enumerated value for displaying the camera) in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to display the camera on the monitor.

2.4.3.1.2 Switching a sequence of cameras to a monitor

The switch assignment table is also used for the display of sequences on a monitor. Similar to the display of the camera on the monitor, the monitor mode [cctvSwitchAssignmentMonitorMode] parameter is also used to control the sequence of cameras to be displayed on the monitor. The sequence identified by the sequence number [cctvSwitchAssignmentSequenceNumber] parameter can be displayed on the monitor. The monitor mode [cctvSwitchAssignmentMonitorMode] parameter can also be used to hold the sequence and step to the next sequential camera in either forward or reverse order. The sequence can also be restarted using the monitor mode [cctvSwitchAssignmentMonitorMode] parameter.

Switch Assignment Table [cctvSwitchAssignmentTable]									
Monitor Port Number	Monitor Port Label Number	Monitor Mode	Camera Port Number	Camera Port Label Number	Display Time Date Overlay	Sequence Number	Assignment Status	Group Status	Group Sequence Status
1-65535	0-65535	1-7	1-65535	0-65535	1-5	1-65535	1-6	1-3	1-3
[cctvSwitchAssignmentMonitorPortNumber]	[cctvSwitchAssignmentMonitorPortLabelNumber]	[cctvSwitchAssignmentMonitorMode]	[cctvSwitchAssignmentCameraPortNumber]	[cctvSwitchAssignmentCameraPortLabelNumber]	[cctvSwitchAssignmentTimeDateOverlay]	[cctvSwitchAssignmentSequenceNumber]	[cctvSwitchAssignmentStatus]	[cctvSwitchAssignmentGroupStatus]	[cctvSwitchAssignmentGroupSequenceStatus]

The maximum sequences [cctvSwitchMaximumSequences] parameter defines the maximum number of sequences that are allowed. The sequence table establishes the parameters of the timed sequence. The table is indexed by the sequence number [cctvSwitchSequenceNumber] parameter. The sequence definition [cctvSwitchSequenceDefinition] parameter uses a three (3) byte string to define the camera port number and the dwell time for camera display on the monitor.

Sequence Table [cctvSwitchSequenceTable]		
Sequence Number	Sequence Definition	Sequence Label Number
1-65535	String	0-65535

[cctvSwitchSequenceNumber]	[cctvSwitchSequenceDefinition]	[cctvSwitchSequenceLabelNumber]

Example: A user wants to display a sequence of Cameras 6, 8 and 9 to Monitor 2 with a 3 second dwell time for each camera. In order to do this, the following operations would need to occur:
SET [cctvSwitchSequenceDefinition] to (6,3)(8,3)(9,3) in Row 1 [cctvSwitchSequenceNumber] of the [cctvSwitchSequenceTable] to define the first sequence.
SET [cctvSwitchAssignmentSequenceNumber] to 1 in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to make the sequence to monitor assignment.
SET [cctvSwitchAssignmentMonitorMode] to 3 (the enumerated value for displaying the sequence) in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to display the sequence on the monitor.

2.4.3.1.3 Switching a group of cameras to monitors

The maximum group [cctvSwitchMaximumGroups] parameter defines the maximum number of groups that are allowed. The group table establishes the parameters of the collection of cameras and monitors that make up the group. The table is indexed by the group number [cctvSwitchGroupNumber] parameter. The group definition [cctvSwitchGroupDefinition] parameter uses a four (4) byte string to define the camera port number and the monitor port number on which the camera will be displayed.

Group Table [cctvSwitchGroupTable]		
Group Number	Group Definition	Group Label Number
1-65535	String	0-65535
[cctvSwitchGroupNumber]	[cctvSwitchGroupDefinition]	[cctvSwitchGroupLabelNumber]

The activate group [cctvSwitchActivateGroup] parameter is used to command the display of the group or turn off the group display.

Example: A user wants to display a group of Cameras 6, 8 and 9 to Monitors 1, 2 and 3, respectively. In order to do this, the following operations would need to occur:

SET [cctvSwitchGroupDefinition] to (6,1)(8,2)(9,3) in ROW 1 [cctvSwitchGroupNumber] of the [cctvSwitchGroupTable] to define the first group of camera to monitor associations.
SET [cctvSwitchActivateGroup] to 1 to activate the display of the first group of cameras on their respective monitors.

2.4.3.1.4 Switching a sequence of groups of cameras to monitors

The maximum group sequences [cctvSwitchMaximumGroupSequences] parameter defines the maximum number of group sequences that are allowed. The group sequence table establishes the parameters of the timed sequence of groups as defined by the group table. The table is indexed by the group sequence number [cctvSwitchGroupSequenceNumber] parameter. The group sequence definition [cctvSwitchGroupSequenceDefinition] parameter uses a three (3) byte string to define the group number and the dwell time for group to be displayed.

Group Sequence Table [cctvSwitchGroupSequenceTable]		
Group Sequence Number	Group Sequence Definition	Group Sequence Label Number
1-65535	String	0-65535
[cctvSwitchGroupSequenceNumber]	[cctvSwitchGroupSequenceDefinition]	[cctvSwitchGroupSequenceLabelNumber]

The activate group sequence [cctvSwitchActivateGroupSequence] parameter is used to command the display of the group sequence or turn off the group sequence display.

Example: A user wants to display a sequence of camera groups with Cameras 6, 8 and 9 in the first group and Cameras 12, 15 and 19 in the second group to Monitors 1, 2 and 3, respectively, with a dwell time of 4 seconds. In order to do this, the following operations would need to occur:
SET [cctvSwitchGroupDefinition] to (6,1)(8,2)(9,3) in ROW 1 [cctvSwitchGroupNumber] of the [cctvSwitchGroupTable] to define the first group of camera to monitor associations.
SET [cctvSwitchGroupDefinition] to (12,1)(12,2)(19,3) in ROW 2 [cctvSwitchGroupNumber] of the [cctvSwitchGroupTable] to define the second group of camera to monitor associations.
SET [cctvSwitchGroupSequenceDefinition] to (1,4)(2,4) in ROW 1 [cctvSwitchGroupSequenceNumber] of the [cctvSwitchGroupTable] to define the first group.
SET [cctvSwitchActivateGroupSequence] to 1 to activate the display of the sequence of camera groups on their associated monitors.

2.4.3.2 Labels

The NTCIP CCTV Switching standard establishes a standardized mechanism for setting up and displaying labels, along with time and/or date overlays on a given monitor.

2.4.3.2.1 Program a label into the label table

The maximum number of labels [labelMaximum] parameter defines the maximum number of labels in the label table. The label table establishes the parameters associated with the label text, font, height, color and display position. The switch label table is indexed by the label number [labelNumber] parameter. The label text [labelText] parameter contains the text string for the label. The standard defines the default font in the font number [labelFontNumber] parameter for use in displaying labels as ASCII encoded text characters [0-9, A-Z, colon (:), period (.), slash (/), apostrophe (‘), and space ( )]. The label height [labelHeight] parameter controls the height of the label text and is represented as the percent of screen filled and scaled from 0-255 to fit the height of the screen. Sixteen (16) colors are allowed by the label color [labelColor] parameter and these colors are: blue, green, cyan, red, magenta, brown, white, grey, light blue, light green, light cyan, light red, light magenta, yellow, bright white and black. The start row [labelStartRow] parameter identifies the vertical position, designated from the upper left corner of the screen, where the label text is to be displayed. The start column [labelStartColumn] parameter identifies the horizontal position, designated from the upper left corner of the screen, where the label text is to be displayed. Both of these text position parameters are scaled to a range of 0-255 to fit the size of the screen. The label active [labelActivate] parameter indicated whether the label is DISABLED or ENABLED.

Switch Label Table [labelSwitchTable]							
Label Number	Text	Font Number	Height	Color	Start Row	Start Column	Active
1-65535	String	1-2	0-255	1-16	0-255	0-255	String
[labelNumber]	[labelText]	[labelFontNumber]	[labelHeight]	[labelColor]	[labelStartRow]	[labelStartColumn]	[labelActivate]

Example: A user wants to define label number 5 of MAPP RD in the label table. The label is intended to be displayed using the default font type, with a height of about 10% of the screen, with a white color, near the upper left corner of screen (assume about a 5% screen width and screen height separation between the edge of the screen and the beginning of the label). In order to do this, the following operations would need to occur:

SET [labelText] to MAPP RD in Row 5 [labelNumber] of the [labelSwitchTable] to define the label text.
SET [labelFontNumber] to 2 (the enumerated value for the ASCII encoded text characters) in Row 5 [labelNumber] of the [labelSwitchTable] to designate the font type.
SET [labelHeight] to 26 in Row 5 [labelNumber] of the [labelSwitchTable] to indicate the height of the label as being about 10% of the 0-255 range allowed for this value.
SET [labelColor] to 7 (the enumerated value for white) in Row 6 [labelNumber] of the [labelSwitchTable] to define the label color. Please note that this value assumes a beginning point as being the upper left corner of the time and date overlay.
SET [labelStartRow] to 13 in Row 5 [labelNumber] of the [labelSwitchTable] to indicate the starting row of the label as being about 5% of the 0-255 range allowed for this value.
SET [labelStartColumn] to 13 in Row 5 [labelNumber] of the [labelSwitchTable] to indicate the starting column of the label as being about 5% of the 0-255 range allowed for this value.

2.4.3.2.2 Display a text label on a monitor

Labels can be associated with monitor ports, camera ports, sequences, groups and/or group sequences. In the switch assignment table, the monitor port label [cctvSwitchAssignmentMonitorPortLabelNumber] number parameter identifies the label from the label table that is associated with the monitor port. The camera port label number [cctvSwitchAssignmentCameraPortLabelNumber] parameter identifies the label from the label table that is associated with the camera port.

Switch Assignment Table [cctvSwitchAssignmentTable]									
Monitor Port Number	Monitor Port Label Number	Monitor Mode	Camera Port Number	Camera Port Label Number	Display Time Date Overlay	Sequence Number	Assignment Status	Group Status	Group Sequence Status
1-65535	0-65535	1-7	1-65535	0-65535	1-5	1-65535	1-6	1-3	1-3
[cctvSwitchAssignmentMonitorPortNumber]	[cctvSwitchAssignmentMonitorPortLabelNumber]	[cctvSwitchAssignmentMonitorMode]	[cctvSwitchAssignmentCameraPortNumber]	[cctvSwitchAssignmentCameraPortLabelNumber]	[cctvSwitchAssignmentTimeDateOverlay]	[cctvSwitchAssignmentSequenceNumber]	[cctvSwitchAssignmentStatus]	[cctvSwitchAssignmentGroupStatus]	[cctvSwitchAssignmentGroupSequenceStatus]

The sequence label number [cctvSwitchSequenceLabelNumber] parameter identifies the label from the label table that is associated with the sequence.

Sequence Table [cctvSwitchSequenceTable]		
Sequence Number	Sequence Definition	Sequence Label Number
1-65535	String	0-65535

[cctvSwitchSequenceNumber]	[cctvSwitchSequenceDefinition]	[cctvSwitchSequenceLabelNumber]

The group label number [cctvSwitchGroupLabelNumber] parameter identifies the label from the label table that is associated with the group.

Group Table [cctvSwitchGroupTable]		
Group Number	Group Definition	Group Label Number
1-65535	String	0-65535
[cctvSwitchGroupNumber]	[cctvSwitchGroupDefinition]	[cctvSwitchGroupLabelNumber]

The group sequence label [cctvSwitchGroupSequenceLabelNumber] number parameter identifies the label from the label table that is associated with the group sequence.

Group Sequence Table [cctvSwitchGroupSequenceTable]		
Group Sequence Number	Group Sequence Definition	Group Sequence Label Number
1-65535	String	0-65535

[cctvSwitchGroupSequenceNumber]	[cctvSwitchGroupSequenceDefinition]	[cctvSwitchGroupSequenceLabelNumber]

The input label number [inputLabelNumber] parameter identifies the label from the label table that is associated with the input.

Input Table [inputTable]			
Input Number	Input Camera Port Number	Input Monitor Port Number	Input Label Number
1-8	0-65535	0-65535	0-65535
[inputNumber]	[inputCameraPortNumber]	[inputMonitorPortNumber]	[inputLabelNumber]

The output label number [outputLabelNumber] parameter identifies the label from the label table that is associated with the output.

Output Table [outputTable]			
Output Number	Output Camera Port Number	Output Monitor Port Number	Output Label Number
1-8	0-65535	0-65535	0-65535

[outputNumber]	[outputCameraPortNumber]	[outputMonitorPortNumber]	[outputLabelNumber]

The video loss label number [cctvSwitchVideoLossLabelNumber] parameter identifies the label from the label table that is associated with the loss of video on the associated camera port.

Camera Status Table [cctvSwitchCameraStatusTable]		
Camera Port Number	Video Loss	Video Loss Label
1-65535	String	0-65535
[cctvSwitchCameraPortNumber]	[cctvSwitchVideoLoss]	[cctvSwitchVideoLossLabelNumber]

The label active [labelActivate] parameter, from the switch label table, is used to enable and disable the label display. It should be noted that the standard is silent on the issue of overlapping labels. As such, the standard does not preclude overlapping labels.

Switch Label Table [labelSwitchTable]							
Label Number	Text	Font Number	Height	Color	Start Row	Start Column	Active

1-65535	String	1-2	0-255	1-16	0-255	0-255	String
[labelNumber]	[labelText]	[labelFontNumber]	[labelHeight]	[labelColor]	[labelStartRow]	[labelStartColumn]	[labelActivate]

Example: A user wants to display the previously created label number 5 of MAPP RD each time that Camera 6 is displayed on Monitor 2, using the previously created camera to monitor assignment. In order to do this, the following operations would need to occur:

SET [cctvSwitchAssignmentCameraPortLabelNumber] to 5 in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to indicate that label number 5 is to be displayed when the camera is displayed on the monitor. Please note that the camera to monitor assignment is made using the switch assignment table and the label is created using the switch label table.

SET [labelActive] to 1 in Row 5 [labelNumber] of the [labelSwitchTable] to indicate that the label is enabled for display.

2.4.3.2.3 Display a time and date overlay

Similar to the parameters defining the attributes of labels, font, height, color and display position are defined for both time and date overlays. The time format [timeFormat] parameter defines whether or not the function is supported and, if it is supported, the display of time in either a 12 hour or 24 hour format. The date format [dateFormat] parameter defines whether or not the function is supported and sets forth a variety of display formats for the date. The standard defines the default font in the time date overlay font number [timeDateOverlayFontNumber] parameter for use in displaying time and/or date overlays as ASCII encoded text characters [0-9, A-Z, colon (:), period (.), slash (/), apostrophe (‘), and space ( )]. The time date overlay height [timeDateOverlayHeight] parameter controls the height of the time and/or date overlay text and is represented as the percent of screen filled and scaled from 0-255 to fit the height of the screen. Sixteen (16) colors are allowed by the time date overlay color [timeDateOverlayColor] parameter and these colors are: blue, green, cyan, red, magenta, brown, white, grey, light blue, light green, light cyan, light red, light magenta, yellow, bright white and black. The time date overlay start row [timeDateOverlayStartRow] parameter identifies the vertical position, designated from the upper left corner of the screen, where the time and/or date overlay is to be displayed. The time date overlay start column [timeDateOverlayStartColumn] parameter identifies the horizontal position, designated from the upper left corner of the screen, where the time and/or date overlay is to be displayed. Both of these text position parameters are scaled to a range of 0-255 to fit the size of the screen.

The display time date overlay [cctvSwitchAssignmentTimeDateOverlay] parameter in the switch assignment table is the mechanism for displaying the time and/or date overlays.

Switch Assignment Table [cctvSwitchAssignmentTable]									
Monitor Port Number	Monitor Port Label Number	Monitor Mode	Camera Port Number	Camera Port Label Number	Display Time Date Overlay	Sequence Number	Assignment Status	Group Status	Group Sequence Status
1-65535	0-65535	1-7	1-65535	0-65535	1-5	1-65535	1-6	1-3	1-3

[cctvSwitchAssignmentMonitorPortNumber]	[cctvSwitchAssignmentMonitorPortLabelNumber]	[cctvSwitchAssignmentMonitorMode]	[cctvSwitchAssignmentCameraPortNumber]	[cctvSwitchAssignmentCameraPortLabelNumber]	[cctvSwitchAssignmentTimeDateOverlay]	[cctvSwitchAssignmentSequenceNumber]	[cctvSwitchAssignmentStatus]	[cctvSwitchAssignmentGroupStatus]	[cctvSwitchAssignmentGroupSequenceStatus]

Example: A user wants to display a time and date overlay on Monitor 2. The time and date overlay is intended to be displayed using the default font type, with a height of about 10% of the screen, with a white color, near the lower left corner of screen (assume about a 5% screen width and screen height separation between the edge of the screen and the beginning of the label). The time should be displayed using the 24 hour format and the date should be displayed using a numeric month/day/year format. In order to do this, the following operations would need to occur:
SET [timeDateOverlayFontNumber] to 2 (the enumerated value for the ASCII encoded text characters) to designate the time and date overlay font type.
SET [timeDateOverlayHeight] to 26 to indicate the height of the time and date overlay as being about 10% of the 0-255 range allowed for this value.
SET [timeDateOverlayColor] to 7 (the enumerated value for white) to define the time and date overlay color.
SET [timeDateOverlayStartRow] to 216 to indicate the starting row of the time and date overlay as being about 5% of the 0-255 range allowed for this value. Please note that this value assumes a beginning point as being the upper left corner of the time and date overlay.
SET [timeDateOverlayStartColumn] to 13 to indicate the starting column of the label as being about 5% of the 0-255 range allowed for this value.
SET [cctvSwitchAssignmentTimeDateOverlay] to 5 (the enumerated value for the display of both time and date in the overlay) in Row 2 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] to indicate that label number 5 is to be displayed on the monitor.

2.4.3.2.4 Blanking all labels from a monitor

The global label disable parameter [cctvSwitchGlobalLabelDisable] is used to enable and disable the global display of labels. This global label disable [cctvSwitchGlobalLabelDisable] parameter does not turn off the time and date overlays.

Example: A user wants to eliminate all text labels being displayed on all monitors, while leaving the display of the time and date overlay. In order to do this, the following operations would need to occur:
SET [cctvSwitchGlobalLabelDisable] to 1 to indicate that the display of all labels on all monitors is DISABLED.

2.4.3.3 Discrete Inputs/Outputs

2.4.3.3.1 Using Input Functions

Eight (8) discrete inputs are allowed by the NTCIP Video Switching standard. The input table establishes the associations between the discrete inputs and/or the camera ports and the monitor ports. The table is

indexed by the input number [inputNumber] parameter and the input camera port [inputCameraPortNumber] and input monitor [inputMonitorPortNumber] port parameters identify the port associated with the discrete input.

Input Table [inputTable]			
Input Number	Input Camera Port Number	Input Monitor Port Number	Input Label Number
1-8	0-65535	0-65535	0-65535
[inputNumber]	[inputCameraPortNumber]	[inputMonitorPortNumber]	[inputLabelNumber]

The discrete inputs are cleared by the input latch clear [inputLatchClear] parameter.

Example: A user wants to display Camera 6 on Monitor 2 when Discrete Intput.1 is ON. In order to do this, the following operations would need to occur:
SET [inputCameraPortNumber] to 6 in Row 1 [inputNumber] of the [inputTable] to indicate that Camera 6 is to be displayed on a monitor when the discrete input is ON.
SET [inputMonitorPortNumber] to 2 in Row 1 [inputNumber] of the [inputTable] to indicate that the camera is to be displayed on Monitor 2 when the discrete input is ON.

The Discrete Input 1 latch can be cleared by using the following operation:
SET [inputLatchClear] to Bit0=0 to clear the latching state of the discrete input by turning it OFF.

2.4.3.3.2 Using Output Functions

Eight (8) discrete outputs are allowed by the NTCIP Video Switching standard. The output table establishes the associations between the discrete outputs and/or the camera ports and the monitor ports. The table is indexed by the output number [outputNumber] parameter and the output camera port [outputCameraPortNumber] and output monitor port [outputMonitorPortNumber] parameters identify the port associated with the discrete output.

Output Table [outputTable]			
Output Number	Output Camera Port Number	Output Monitor Port Number	Output Label Number
1-8	0-65535	0-65535	0-65535

[outputNumber]	[outputCameraPortNumber]	[outputMonitorPortNumber]	[outputLabelNumber]

The discrete outputs are activated and deactivated by the output control [outputControl] parameter. The output control [outputControl] parameter also specifies the desired active state for the discrete output.

Example: A user wants to display Camera 6 on Monitor 2 when Discrete Output.1 is turned ON. In order to do this, the following operations would need to occur:
SET [outputCameraPortNumber] to 6 in Row 1 [outputNumber] of the [outputTable] to indicate that Camera 6 is to be displayed on a monitor when the discrete output is ON.
SET [outputMonitorPortNumber] to 2 in Row 1 [outputNumber] of the [ioutputTable] to indicate that the camera is to be displayed on Monitor 2 when the discrete output is ON.
SET [outputControl] to (Bit0=1,Bit0=1) to SELECT the output and turn it ON.

2.4.4 Status Functions

The NTCIP CCTV Switching standard establishes a standardized mechanism for identifying the status of camera to monitor assignments, along with the status of the discrete inputs and outputs. A standardized mechanism is also provided for identifying the loss of video on a camera port.

2.4.4.1 Determining current monitor use

The assignment status [cctvSwitchAssignmentStatus] parameter in the switch assignment table is used for identifying the camera to monitor assignment, along with the status of a camera sequence, for each monitor port. The assignment status [cctvSwitchAssignmentStatus] parameter denotes the following status conditions: no camera port assigned to the monitor, camera port out of range, monitor port out of range, dwell time out of range, or no sequence defined.

The switch assignment table also provides the status for groups and group sequences on a per monitor port basis. The group status [cctvSwitchAssignmentGroupStatus] parameter indicates the status for a group assignment as being failed or not identified for the monitor. Similarly, the group sequence status [cctvSwitchAssignmentGroupSequenceStatus] parameter indicates the status for a group sequence assignment as being failed or not identified for the monitor.

Switch Assignment Table [cctvSwitchAssignmentTable]									
Monitor Port Number	Monitor Port Label Number	Monitor Mode	Camera Port Number	Camera Port Label Number	Display Time Date Overlay	Sequence Number	Assignment Status	Group Status	Group Sequence Status
1-65535	0-65535	1-7	1-65535	0-65535	1-5	1-65535	1-6	1-3	1-3

[cctvSwitchAssignmentMonitorPortNumber]	[cctvSwitchAssignmentMonitorPortLabelNumber]	[cctvSwitchAssignmentMonitorMode]	[cctvSwitchAssignmentCameraPortNumber]	[cctvSwitchAssignmentCameraPortLabelNumber]	[cctvSwitchAssignmentTimeDateOverlay]	[cctvSwitchAssignmentSequenceNumber]	[cctvSwitchAssignmentStatus]	[cctvSwitchAssignmentGroupStatus]	[cctvSwitchAssignmentGroupSequenceStatus]

Example: A user requests the status of Monitor 1 for which no camera has been assigned. In order to do this, the following operations would need to occur:
GET [cctvSwitchAssignmentStatus] in Row 1 [cctvSwitchAssignmentMonitorPortNumber] of the [cctvSwitchAssignmentTable] and the value returned is 2 (the enumerated value of no camera port assigned to the monitor) for the assignment status. Other possible status indications include camera port out of range, monitor port out of range, dwell time out of range, and no sequence defined.

Similarly, the status for groups and group sequences can be read on a per monitor port basis.

2.4.4.2 Reading input and output status

The input status [inputStatus] parameter provides the current state, ON or OFF, for each of the eight (8) discrete inputs. Inputs are designed to be latching, in that once received that input latch status is turned from OFF to ON. The input latch status [inpuLatchtStatus] parameter indicates that an input on any of the eight (8) discrete inputs has occurred since the previous input latch was cleared.

The output status [outputStatus] parameter provides the current state, ON or OFF, for each of the eight (8) discrete outputs.

Example: A user requests the status of Discrete Input. The current status of Discrete Input 1 can be determined by using the following operation:
GET [inputStatus], an individual parameter that provides the status of all eight (8) inputs, looking specifically at Bit0 and the value returned is 0=OFF or 1=ON to read the active status of the discrete input.

Please note that the status of inputs is latching, in order for the user to determine if a discrete input has occurred since the most recent previous latch was cleared. The latch status of Discrete Input 1 can be determined by using the following operation:
GET [inputLatchStatus], an individual parameter that provides the status of all eight (8) latched inputs, looking specifically at Bit0 and the value returned is 0=OFF or 1=ON to read the latched status of the discrete input.

Example: A user requests the status of Discrete Output. The current status of Discrete Output 1 can be determined by using the following operation:
GET [outputStatus], an individual parameter that provides the status of all eight (8) outputs, looking specifically at Bit0 and the value returned is 0=OFF or 1=ON to read the current active status of the discrete output.

2.4.4.3 Determining camera video loss at the switch

The camera status table is used to monitor for the loss of video on camera ports. The table is indexed by

the camera port number [cctvSwitchCameraPortNumber] parameter. The video loss [cctvSwitchVideoLoss] parameter indicates the ABSENCE or PRESENCE of video picture signals on the associated camera port.

Camera Status Table [cctvSwitchCameraStatusTable]		
Camera Port Number	Video Loss	Video Loss Label
1-65535	String	0-65535
[cctvSwitchCameraPortNumber]	[cctvSwitchVideoLoss]	[cctvSwitchVideoLossLabelNumber]

Example: While not being displayed, a user wants to determine the presence of a video signal on Camera 7. The presence of a video signal can be determined by using the following operation:
GET [cctvSwitchVideoLoss] from Row 7 [cctvSwitchCameraPortNumber] of the [cctvSwitchCameraStatusTable] and the value returned is 0=ABSENCE or 1=PRESENCE to read the current status of video picture signals.

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Section 3
CCTV SWITCH MIB

This section defines those objects that are expected to be used by closed circuit television (CCTV) video switching devices. The objects are described in terms of the ASN.1 (defined in ISO/IEC 8824-1, ISO/IEC 8824-2, ISO/IEC 8824-3, and ISO/IEC 8824-4) macro OBJECT-TYPE. The OBJECT-TYPE macro is defined in RFC 1212. The text provided from Clause 3.1 through the end of the section (except the clause headings) constitutes the NTCIP Standard CCTV Switch MIB.

The clauses below present the objects in lexigraphical order of their OBJECT IDENTIFIERS that correspond to their physical location within the global naming tree. The objects defined in this document reside under the "cctvswitch" node of the global naming tree. To aid in object management, the "cctvswitch" node has been subdivided into logical categories, each defined by a node under the "cctvswitch" node. The individual objects are then located under the appropriate node.

Nodes should not be confused with conformance groups, which are defined in Section 4. A conformance group is a logical grouping of objects that is used for conformance statements. While conformance groups will frequently correspond to the nodal structure, a conformance group may contain objects that are not lexigraphically ordered.

3.1 CLOSED CIRCUIT TELEVISION (CCTV) SWITCH OBJECTS

```
SWITCH-MIB1 DEFINITIONS ::= BEGIN

--the following OBJECT IDENTIFIERS are used in the CCTV Switch MIB:

IMPORTS
     OBJECT-TYPE
          FROM RFC-1212
     devices
          FROM TMIB-II;

-- For the purpose of this section, the following OBJECT IDENTIFIERS are used:
cctvSwitch  OBJECT IDENTIFIER ::= {devices 8}
```

3.2 CCTV SWITCH DISCRETE INPUT OBJECTS

```
cctvSwitchInput OBJECT IDENTIFIER ::= { cctvSwitch 1 }
```

3.2.1 Discrete Input Status Parameter

```
inputStatus OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> Input status denotes a bit-mapped value that indicates the
current state of eight (8) user defined discrete inputs, as outlined below:
Bit7  0 = OFF, 1 = ON for the active status of discrete Input 8 (MSB),
Bit6  0 = OFF, 1 = ON for the active status of discrete Input 7,
```

```
Bit5  0 = OFF, 1 = ON for the active status of discrete Input 6,
Bit4  0 = OFF, 1 = ON for the active status of discrete Input 5,
Bit3  0 = OFF, 1 = ON for the active status of discrete Input 4,
Bit2        0 = OFF, 1 = ON for the active status of discrete Input 3,
Bit1  0 = OFF, 1 = ON for the active status of discrete Input 2,
Bit0        0 = OFF, 1 = ON for the active status of discrete Input 1 (LSB).
Please note that user defined discrete inputs may reduce interoperability of
the device.
<DescriptiveName> CctvSwitch.inputStatus:text
<DataConceptType> Data Element”
::= {cctvSwitchInput 1}
```

3.2.2 Discrete Input Latch Status Parameter

```
inputLatchStatus OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE (1))
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> Latch status denotes a bit-mapped value that indicates the
presence of a latched input for eight (8) user defined discrete inputs,
indicating that an input has occurred since the previous latch was cleared, as
outlined below:
Bit7        0 = OFF, 1 = ON for the latch status of the discrete Input 8
(MSB),
Bit6        0 = OFF, 1 = ON for the latch status of the discrete Input 7,
Bit5        0 = OFF, 1 = ON for the latch status of the discrete Input 6,
Bit4        0 = OFF, 1 = ON for the latch status of the discrete Input 5,
Bit3        0 = OFF, 1 = ON for the latch status of the discrete Input 4,
Bit2        0 = OFF, 1 = ON for the latch status of the discrete Input 3,
Bit1        0 = OFF, 1 = ON for the latch status of the discrete Input 2,
Bit0        0 = OFF, 1 = ON for the latch status of the discrete Input 1
(LSB).
Please note that user defined discrete inputs may reduce interoperability of
the device.
<DescriptiveName> CctvSwitch.inputLatchStatus:text
<DataConceptType> Data Element”
::= {cctvSwitchInput 2}
```

3.2.3 Discrete Input Latch Clear Parameter

```
inputLatchClear OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> Latch clear denotes a bit-mapped value that clears the presence
of a latched input for eight (8) user defined discrete inputs, as outlined
below:
Bit7        0 = OFF, 1 = ON for clearing the input latch for discrete Input 8
(MSB),
Bit6        0 = OFF, 1 = ON for clearing the input latch for discrete Input 7,
Bit5        0 = OFF, 1 = ON for clearing the input latch for discrete Input 6,
Bit4        0 = OFF, 1 = ON for clearing the input latch for discrete Input 5,
Bit3        0 = OFF, 1 = ON for clearing the input latch for discrete Input 4,
Bit2        0 = OFF, 1 = ON for clearing the input latch for discrete Input 3,
Bit1        0 = OFF, 1 = ON for clearing the input latch for discrete Input 2,
```



```
Bit0        0 = OFF, 1 = ON for clearing the input latch for discrete Input 1
(LSB).
Please note that user defined discrete inputs may reduce interoperability of
the device.
<DescriptiveName> CctvSwitch.inputLatchClear:text
<DataConceptType> Data Element”
::= {cctvSwitchInput 3}
```

3.2.4 Discrete Input Table

```
inputTable OBJECT-TYPE
SYNTAX      SEQUENCE OF InputTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> This table contains data specific to each input assignment.
Each row in the table identifies a single input assignment.  Table rows are
set by the manufacturer, and row creation/deletion is not supported.
<DescriptiveName> CctvSwitch.inputTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchInput 4}

inputTableEntry OBJECT-TYPE
SYNTAX      InputTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters of the input table.
<DescriptiveName> CctvSwitch.inputTableEntry
<DataConceptType> Entity Type”
INDEX {inputNumber}
::= {inputTable 1}

InputTableEntry ::= SEQUENCE {
      inputNumber             INTEGER,
      inputCameraPortNumber   INTEGER,
      inputMonitorPortNumber  INTEGER,
      inputLabelNumber        INTEGER
      }
```

3.2.4.1 Discrete Input Number Parameter

```
inputNumber OBJECT-TYPE
SYNTAX      INTEGER (1..255)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of the discrete input (1 through
8).  Values of 9..255 are reserved.
<DescriptiveName> CctvSwitch.inputNumber:identifier
<DataConceptType> Data Element”
::= {inputTableEntry 1}
```

3.2.4.2 Discrete Input Camera Port Number Parameter

```
inputCameraPortNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical camera port that is
associated with the discrete input.  A value of zero (0) indicates that no
camera port number is associated with the discrete input.  When read, this
object returns the last value written.
<DescriptiveName> CctvSwitch.inputCameraPortNumber:identifier
<DataConceptType> Data Element”
::= {inputTableEntry 2}
```

3.2.4.3 Discrete Input Monitor Port Number Parameter

```
inputMonitorPortNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical monitor port that is
associated with the discrete input.  A value of zero (0) indicates that no
monitor port number is associated with the input.  When read, this object
returns the last value written.
<DescriptiveName> CctvSwitch.inputMonitorPortNumber:identifier
<DataConceptType> Data Element”
::= {inputTableEntry 3}
```

3.2.4.4 Discrete Input Label Number Parameter

```
inputLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this discrete input for this monitor port.
Writing a value to this object changes the label assignment.  When read, this
object returns last value written.  A value of zero (0) indicates that no
input label is displayed.
<DescriptiveName> CctvSwitch.inputLabelNumber:identifier
<DataConceptType> Data Element”
::= {inputTableEntry 4}
```

3.3 CCTV SWITCH DISCRETE OUTPUT OBJECTS

```
cctvSwitchOutput OBJECT IDENTIFIER ::= { cctvSwitch 2 }
```

3.3.1 Discrete Output Status Parameter

```
outputStatus OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
```



```
"<Definition> Output status denotes a bit-mapped value that indicates the
current state of eight (8) user defined discrete outputs, as outlined below:
Bit7  0 = OFF, 1 = ON for the active status of discrete Output 8 (MSB),
Bit6  0 = OFF, 1 = ON for the active status of discrete Output 7,
Bit5  0 = OFF, 1 = ON for the active status of discrete Output 6,
Bit4  0 = OFF, 1 = ON for the active status of discrete Output 5,
Bit3  0 = OFF, 1 = ON for the active status of discrete Output 4,
Bit2        0 = OFF, 1 = ON for the active status of discrete Output 3,
Bit1  0 = OFF, 1 = ON for the active status of discrete Output 2,
Bit0        0 = OFF, 1 = ON for the active status of discrete Output 1 (LSB).
Please note that user defined discrete inputs may reduce interoperability of
the device.
<DescriptiveName> CctvSwitch.outputStatus:text
<DataConceptType> Data Element”
::= {cctvSwitchOutput 1}
```

3.3.2 Discrete Output Control Parameter

```
outputControl OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(2))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> Output control activates and deactivates individual discrete
outputs as outlined below:
Byte1
      Bit7        0 = NOT SELECT, 1 = SELECT designates the control of Output
8 (MSB),
      Bit6        0 = NOT SELECT, 1 = SELECT designates the control of Output
7,
      Bit5        0 = NOT SELECT, 1 = SELECT designates the control of Output
6,
      Bit4        0 = NOT SELECT, 1 = SELECT designates the control of Output
5,
      Bit3        0 = NOT SELECT, 1 = SELECT designates the control of Output
4,
      Bit2        0 = NOT SELECT, 1 = SELECT designates the control of Output
3,
      Bit1        0 = NOT SELECT, 1 = SELECT designates the control of Output
2,
      Bit0        0 = NOT SELECT, 1 = SELECT designates the control of Output
1(LSB),
Byte2
Bit7  0 = OFF, 1 = ON for the desired active state of discrete Output 8(MSB),
Bit6  0 = OFF, 1 = ON for the desired active state of discrete Output 7,
Bit5  0 = OFF, 1 = ON for the desired active state of discrete Output 6,
Bit4  0 = OFF, 1 = ON for the desired active state of discrete Output 5,
Bit3  0 = OFF, 1 = ON for the desired active state of discrete Output 4,
Bit2  0 = OFF, 1 = ON for the desired active state of discrete Output 3,
Bit1  0 = OFF, 1 = ON for the desired active state of discrete Output 2,
Bit0  0 = OFF, 1 = ON for the desired active state of discrete Output 1(LSB).
Please note that user defined discrete inputs may reduce interoperability of
the device.  When read, this object returns last value written.
<DescriptiveName> CctvSwitch.outputControl:text
<DataConceptType> Data Element”
::= {cctvSwitchOutput 2}
```

3.3.3 Discrete Output Table

```
outputTable OBJECT-TYPE
SYNTAX      SEQUENCE OF OutputTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
"<Definition> This table contains data specific to each output assignment.
Each row in the table identifies a single output assignment.  Table rows are
set by the manufacturer, and row creation/deletion is not supported.
<DescriptiveName> CctvSwitch.outputTable
<DataConceptType> Entity Type
<Table Type> static"
::= {cctvSwitchOutput 3}

outputTableEntry OBJECT-TYPE
SYNTAX      OutputTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
"<Definition> Parameters of the output table.
<DescriptiveName> CctvSwitch.outputTableEntry
<DataConceptType> Entity Type"
INDEX {outputNumber}
::= {outputTable 1}

OutputTableEntry ::= SEQUENCE {
      outputNumber                  INTEGER,
      outputCameraPortNumber  INTEGER,
      outputMonitorPortNumber     INTEGER,
      outputLabelNumber       INTEGER
      }
```

3.3.3.1 Discrete Output Number Parameter

```
outputNumber OBJECT-TYPE
SYNTAX      INTEGER (1..255)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of the discrete output (1
through 8). Values of 9..255 are reserved.
<DescriptiveName> CctvSwitch.outputNumber:identifier
<DataConceptType> Data Element"
::= {outputTableEntry 1}
```

3.3.3.2 Discrete Output Camera Port Number Parameter

```
outputCameraPortNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical camera port that is
associated with the discrete output.  A value of zero (0) indicates that no
camera port number is associated with the discrete output.  When read, this
object returns the last value written.
```



```
<DescriptiveName> CctvSwitch.outputCameraPortNumber:identifier
<DataConceptType> Data Element”
::= {outputTableEntry 2}
```

3.3.3.3 Discrete Output Monitor Port Number Parameter

```
outputMonitorPortNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical monitor port
associated with the discrete output.  A value of zero (0) indicates that no
monitor port number is associated with the output.  When read, this object
returns the last value written.
<DescriptiveName> CctvSwitch.outputMonitorPortNumber:identifier
<DataConceptType> Data Element”
::= {outputTableEntry 3}
```

3.3.3.4 Discrete Output Label Number Parameter

```
outputLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this discrete output for this monitor port.
Writing a value to this object changes the label assignment.  When read, this
object returns last value written.  A value of zero (0) indicates that no
output label is displayed.
<DescriptiveName> CctvSwitch.outputLabelNumber:identifier
<DataConceptType> Data Element”
::= {outputTableEntry 4}
```

3.4 CCTV SWITCH LABEL OBJECTS

```
cctvSwitchLabel   OBJECT IDENTIFIER ::= { cctvSwitch 3 }
```

3.4.1 Maximum Number of Labels Parameter

```
labelMaximum OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> Defines the maximum number of labels in the label table.  A
label is defined as text with position, font, and color information.
<DescriptiveName> CctvSwitch.labelMaximum:quantity
<DataConceptType> Data Element
<Unit> labels"
::= {cctvSwitchLabel 1}
```

3.4.2 Switch Label Table

```
labelSwitchTable OBJECT-TYPE
SYNTAX      SEQUENCE OF LabelSwitchEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
"<Definition> This table contains data specific to each label.  A label is
defined as text with position, font, and color information. Each row in the
table identifies a single label.  Table rows are set by the manufacturer, and
row creation/deletion is not supported.
<DescriptiveName> CctvSwitch.labelSwitchTable
<DataConceptType> Entity Type
<TableType> static "
::= {cctvSwitchLabel 2}

labelSwitchEntry OBJECT-TYPE
SYNTAX      LabelSwitchEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
"<Definition> Parameters of the label table.
<DescriptiveName> CctvSwitch.labelSwitchEntry
<DataConceptType> Entity Type "
INDEX {labelNumber}
::= {labelSwitchTable 1}

LabelSwitchEntry ::= SEQUENCE {
      labelNumber             INTEGER,
labelText               OCTET STRING,
labelFontNumber         INTEGER,
labelHeight             INTEGER,
labelColor              INTEGER,
      labelStartRow                 INTEGER,
      labelStartColumn        INTEGER,
      labelActive             OCTET STRING
      }
```

3.4.2.1 Label Number Parameter

```
labelNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition>The number associated with each individual label.
<DescriptiveName> CctvSwitch.labelNumber:identifier
<DataConceptType> Data Element"
::= { labelSwitchEntry 1}
```

3.4.2.2 Text Label String Parameter

```
labelText OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(0..255))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> Text for the label.  The label text must fit within the frame-
size available for the application.
```



```
<DescriptiveName> CctvSwitch.labelText:text
<DataConceptType> Data Element”
::= { labelSwitchEntry 2}
```

3.4.2.3 Label Font Number Parameter

```
labelFontNumber OBJECT-TYPE
SYNTAX      INTEGER (1..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Designates the font number to be displayed.  Only one font style
may be supported and that font style is taken to be the default style.  When
read, this object returns last value written.
Value       Meaning
1           other,
designates the default ASCII encoded text characters [0-9, A-Z , colon (:),
period (.), slash (/), apostrophe (‘) and space ( )] to be displayed,
3..255            reserved.
<DescriptiveName> CctvSwitch.labelFontNumber:code
<DataConceptType> Data Element”
DEFVAL { 2 }
::= { labelSwitchEntry 3}
```

3.4.2.4 Label Height Parameter

```
labelHeight OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Height of this label text represented as a percent of screen
filled by the text and scaled to a range of zero (0) and 255 to fit height of
screen.  A height of zero (0) indicates that a label is not displayed and a
height of 255 indicates that the label is presented at a maximum height.  When
read, this object returns last value written.
<DescriptiveName> CctvSwitch.labelHeight:quantity
<DataConceptType> Data Element
<Unit> scalar 0 to 255”
::= { labelSwitchEntry 4}
```

3.4.2.5 Label Color Parameter

```
labelColor OBJECT-TYPE
SYNTAX      INTEGER {
blue(1),
green(2),
cyan(3),
red(4),
magenta(5),
brown(6),
white(7),
grey(8),
lightBlue(9),
lightGreen(10),
lightCyan(11),
lightRed(12),
```

```
lightMagenta(13),
yellow(14),
brightWhite(15),
black(16)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Color of the label characters.  The default color must always be
supported.  The color is defined as follows:
Value       Meaning
1           blue,
2           green,
3           cyan,
4           red,
5           magenta,
6           brown,
7           white,
8           grey,
9           lightBlue,
10          lightGreen,
11          lightCyan,
12          lightRed,
13          lightMagenta,
14          yellow,
15          brightWhite,
black.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.labelColor:code
<DataConceptType> Data Element”
DEFVAL { white }
::= { labelSwitchEntry 5}
```

3.4.2.6 Label Start Row Parameter

```
labelStartRow OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Start of text row number representing the vertical position on
the screen where the text is to be displayed and scaled to a range of zero (0)
to 255.  Zero (0) – zero (0) is designated as the upper left corner of the
display.  When read, this object returns last value written.
<DescriptiveName> CctvSwitch.labelStartRow:identifier
<DataConceptType> Data Element”
::= { labelSwitchEntry 6}
```

3.4.2.7 Label Start Column Parameter

```
labelStartColumn OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Start of text column number representing the horizontal position
on the screen where the text is to be displayed and scaled to a range of zero
```



```
(0) to 255.  Zero (0) – zero (0) is designated as the upper left corner of the
display.  When read, this object returns last value written.
<DescriptiveName> CctvSwitch.labelStartColumn:identifier
<DataConceptType> Data Element”
::= { labelSwitchEntry 7}
```

3.4.2.8 Label Active Control Parameter

```
labelActive OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> The object denotes whether or not the label is enabled for
display.
Bit 7       0 = DISABLED, 1 = ENABLED for display of the label (MSB),
Bits6..0    Reserved (Bit0 = LSB).
<DescriptiveName> CctvSwitch.labelActive:text
<DataConceptType> Data Element”
::= { labelSwitchEntry 8}
```

3.5 CCTV SWITCH TIME DATE OVERLAY OBJECTS

```
switchTimeDateOverlay   OBJECT IDENTIFIER ::= { cctvSwitch 4 }
```

3.5.1 Assignment Time Format Parameter

```
timeFormat OBJECT-TYPE
SYNTAX      INTEGER {
other(1),
noTime(2),
timeType1(3),
timeType2(4)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the display format for time, as described
below:
Value       Meaning
other time format,
no time function is supported by this device,
time is displayed in 12 hour format (HH:MM:SS pm),
time is displayed in 24 hour format (HH:MM:SS).
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentTimeFormat:code
<DataConceptType> Data Element”
::= { switchTimeDateOverlay 1}
```

3.5.2 Assignment Date Format Parameter

```
dateFormat OBJECT-TYPE
SYNTAX      INTEGER {
other(1),
noDate(2),
dateType1(3),
dateType2(4),
```

```
dateType3(5),
dateType4(6),
dateType5(7),
dateType6(8)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the display format for time, as described
below:
Value       Meaning
other date format,
no date function is supported by this device,
date is displayed as (MM/DD/YYYY) with month being a numeric designation,
date is displayed (YYYY/MM/DD) with month being a numeric designation,
date is displayed (Month/DD/YYYY) with month being a 3-letter abbreviation of
the month,
date is displayed as (MM/DD/YYYY) with month being a numeric designation,
date is displayed (YYYY/MM/DD) with month being a numeric designation,
date is displayed (Month/DD/YYYY) with month being a 3-letter abbreviation of
the month.
<DescriptiveName> CctvSwitch.cctvSwitch AssignmentDateFormat:code
<DataConceptType> Data Element”
::= { switchTimeDateOverlay 2}
```

3.5.3 Time Date Overlay Font Number Parameter

```
timeDateOverlayFontNumber OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
                        ascii(2) }
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Designates the time date overlay font number to be displayed.
Only one font style may be supported and that font style is taken to be the
default style.  When read, this object returns last value written.
Value       Meaning
other,
designates the default ASCII encoded text characters [0-9, A-Z , colon (:),
period (.), slash (/), apostrophe (‘) and space ( )] to be displayed.
<DescriptiveName> CctvSwitch.timeDateOverlayFontNumber:code
<DataConceptType> Data Element”
DEFVAL { 2 }
::= { switchTimeDateOverlay 3}
```

3.5.4 Time Date Overlay Height Parameter

```
timeDateOverlayHeight OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Height of the time date overlay text represented as a percent of
screen filled by the text and scaled to a range of zero (0) and 255 to fit
height of screen.  A height of zero (0) indicates that a time date overlay is
not displayed and a height of 255 indicates that the time date overlay is
```



```
presented at a maximum height.  When read, this object returns last value
written.
<DescriptiveName> CctvSwitch.timeDateOverlayHeight:quantity
<DataConceptType> Data Element
<Unit> scalar 0 to 255”
::= { switchTimeDateOverlay 4}
```

3.5.5 Time Date Overlay Color Parameter

```
timeDateOverlayColor OBJECT-TYPE
SYNTAX      INTEGER {
blue(1),
green(2),
cyan(3),
red(4),
magenta(5),
brown(6),
white(7),
grey(8),
lightBlue(9),
lightGreen(10),
lightCyan(11),
lightRed(12),
lightMagenta(13),
yellow(14),
brightWhite(15),
black(16)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Color of the time date overlay characters.  The default color
must always be supported.  The color is defined as follows:
Value       Meaning
1           blue,
2           green,
3           cyan,
4           red,
5           magenta,
6           brown,
7           white,
8           grey,
9           lightBlue,
10          lightGreen,
11          lightCyan,
12          lightRed,
13          lightMagenta,
14          yellow,
15          brightWhite,
black.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.timeDateOverlayColor:code
<DataConceptType> Data Element”
DEFVAL { white }
::= { switchTimeDateOverlay 5}
```

3.5.6 Time Date Overlay Start Row Parameter

```
timeDateOverlayStartRow OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Start of text row number representing the vertical position on
the screen where the time date overlay text is to be displayed and scaled to a
range of zero (0) to 255.  Zero (0) – zero (0) is designated as the upper left
corner of the display.  When read, this object returns last value written.
<DescriptiveName> CctvSwitch.timeDateOveralyStartRow:identifier
<DataConceptType> Data Element”
::= { switchTimeDateOverlay 6}
```

3.5.7 Time Date Overlay Start Column Parameter

```
timeDateOverlayStartColumn OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> Start of text column number representing the horizontal position
on the screen where the time date overlay text is to be displayed and scaled
to a range of zero (0) to 255.  Zero (0) – zero (0) is designated as the upper
left corner of the display.  When read, this object returns last value
written.
<DescriptiveName> CctvSwitch.timeDateOverlayStartColumn:identifier
<DataConceptType> Data Element”
::= { switchTimeDateOverlay 7}
```

3.6 CCTV SWITCH ASSIGNMENT OBJECTS

```
cctvSwitchAssignment    OBJECT IDENTIFIER ::= { cctvSwitch 5 }
```

3.6.1 Maximum Number of Assignable Camera Ports Parameter

```
cctvSwitchAssignmentMaximumCameraPorts OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the maximum number of physical camera
ports.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentMaximumCameraPorts:quantity
<DataConceptType> Data Element
<Unit> camera ports”
::= {cctvSwitchAssignment 1}
```

3.6.2 Maximum Number of Assignable Monitor Ports Parameter

```
cctvSwitchAssignmentMaximumMonitorPorts OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
```



```
"<Definition> A value representing the maximum number of physical monitor
ports.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentMaximumMonitorPorts:quantity
<DataConceptType> Data Element
<Unit> monitor ports”
::= {cctvSwitchAssignment 2}
```

3.6.3 Switch Assignment Table

```
cctvSwitchAssignmentTable  OBJECT-TYPE
SYNTAX      SEQUENCE OF CctvSwitchAssignmentTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> A table containing data specific to the CCTV switch assignments,
text overlays and assignment status.  Table rows are set by the manufacturer,
and row creation/deletion is not supported.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchAssignment 3}

cctvSwitchAssignmentTableEntry OBJECT-TYPE
SYNTAX      CctvSwitchAssignmentTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters within the CCTV switch table that address switch
assignments and format of the time and date stamp.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentTableEntry
<DataConceptType> Entity Type”
INDEX {cctvSwitchAssignmentMonitorPortNumber}
::= {cctvSwitchAssignmentTable 1}

CctvSwitchAssignmentTableEntry ::= SEQUENCE {
      cctvSwitchAssignmentMonitorPortNumber           INTEGER,
      cctvSwitchAssignmentMonitorPortLabelNumber            INTEGER,
cctvSwitchAssignmentMonitorMode                 INTEGER,
cctvSwitchAssignmentCameraPortNumber            INTEGER,
      cctvSwitchAssignmentCameraPortLabelNumber       INTEGER,
cctvSwitchAssignmentTimeDateOverlay             INTEGER,
cctvSwitchAssignmentSequenceNumber        INTEGER,
cctvSwitchAssignmentStatus                      INTEGER,
cctvSwitchAssignmentGroupStatus                 INTEGER,
      cctvSwitchAssignmentGroupSequenceStatus         INTEGER
}
```

3.6.3.1 Assignment Monitor Port Number Parameter

```
cctvSwitchAssignmentMonitorPortNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical monitor port.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentMonitorPortNumber:identifier
<DataConceptType> Data Element”
```

```
::= {cctvSwitchAssignmentTableEntry 1}
```

3.6.3.2 Assignment Monitor Label Number Parameter

```
cctvSwitchAssignmentMonitorPortLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this monitor port.  When read, this object
returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchMonitorPortLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 2}
```

3.6.3.3 Assignment Monitor Mode Parameter

```
cctvSwitchAssignmentMonitorMode OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
                        displayCamera(2),
                        displaySequence(3),
                        holdSequence(4),
                        nextSequentialCamera(5),
                        previousSequentialCamera(6),
                        restartSequence(7)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> An assignment command, as follows:
Value       Meaning
1           other monitor mode command,
2     display      the      camera      port      identified      by      the
cctvSwitchAssignmentCameraPortNumber on this monitor port,
3     display        the        sequence        identified        by        the
cctvSwitchAssignmentSequenceNumber on this monitor port,
4           hold the sequence,
5           hold the sequence and then go to the next sequential camera in the
sequence,
6     hold the sequence and then go to the previous sequential camera in the
sequence,
restart the currently displayed sequence.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentMonitorMode:code
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 3}
```

3.6.3.4 Assignment Camera Port Number Parameter

```
cctvSwitchAssignmentCameraPortNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
```



```
"<Definition> A value representing the number of physical camera port to be
displayed on the monitor port.  When read, this object returns last value
written.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentCameraPortNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 4}
```

3.6.3.5 Assignment Camera Label Number Parameter

```
cctvSwitchAssignmentCameraPortLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with the camera port assignment.  A value of zero (0)
indicates that there is no label associated with this camera port assignment.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchCameraPortLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 5}
```

3.6.3.6 Assignment Time Date Overlay Parameter

```
cctvSwitchAssignmentTimeDateOverlay OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
timeNotDisplayed(2),
                        timeDisplayed(3),
                        dateDisplayed(4),
                        bothTimeDateDisplayed(5)}
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the state of the time display for this
monitor port, as defined below:
Value       Meaning
1           other time date overlay command on this monitor port,
2           time overlay is not displayed on this monitor port,
3           time overlay is displayed on this monitor port,
4           date overlay is displayed on this monitor port,
5           both time and date overlays are displayed on this monitor port.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentTimeDateOverlay:code
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 6}
```

3.6.3.7 Assignment Sequence Number Parameter

```
cctvSwitchAssignmentSequenceNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of the sequence to be displayed
on the monitor port.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentSequenceNumber:identifier
```

```
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 7}
```

3.6.3.8 Assignment Status Parameter

```
cctvSwitchAssignmentStatus OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
                        noCameraPortAssignment(2),
cameraPortOutOfRange(3),
                        monitorPortOutOfRange(4),
                        dwellTimeOutOfRange(5),
                        noSequenceDefined(6)}
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
“<Definition>  A  value  representing  the  camera  to  monitor  and  sequence
assignment status, as described below:
      Value       Meaning
other assignment status,
no camera port assigned to this monitor,
camera port number is out of range,
monitor port number is out of range,
dwell time is out of range,
no sequence is defined for this assignment.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentStatus:code
<DataConceptType> Data Element”
DEFVAL { noCameraPortAssignment }
::={cctvSwitchAssignmentTableEntry 8}
```

3.6.3.9 Assignment Group Status Parameter

```
cctvSwitchAssignmentGroupStatus OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
                        groupAssignmentFailed(2),
                        groupUnidentified(3)}
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> Status of the group assignment, as follows:
Value       Meaning
1           other group status,
2     the group assignment failed on this monitor port,
no group is identified for this monitor port.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentGroupStatus:code
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 9}
```

3.6.3.10 Assignment Group Status Parameter

```
cctvSwitchAssignmentGroupSequenceStatus OBJECT-TYPE
SYNTAX      INTEGER {
                        other(1),
                        groupSequenceAssignmentFailed(2),
                        groupSequenceUnidentified(3)}
ACCESS      read-only
```



```
STATUS      mandatory
DESCRIPTION
"<Definition> Status of the sequence of groups assignment, as follows:
Value       Meaning
1           other group sequence status,
the sequence of groups assignment failed on this monitor port,
no sequence of groups is identified for this monitor port.
<DescriptiveName> CctvSwitch.cctvSwitchAssignmentGroupSequenceStatus:code
<DataConceptType> Data Element”
::= {cctvSwitchAssignmentTableEntry 10}
```

3.6.4 Global Label Disable Parameter

```
cctvSwitchGlobalLabelDisable OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
“<Definition> The object turns off all labels on the CCTV switch, but does not
turn off the time and date overlays.  A value of 0 denotes that labels are
active.  A value of 1 denotes that all labels, except for the time and date
overlays are globally disabled on the CCTV switch and not displayed.
Bit 7       0 =  ENABLED, 1 = DISABLED for the global display of labels (MSB),

Bits6..0    Reserved (Bit0 = LSB).
<DescriptiveName> CctvSwitch.cctvSwitchGlobalLabelDisable:text
<DataConceptType> Data Element”
::= {cctvSwitchAssignment 4}
```

3.7 CCTV SWITCH SEQUENCE OBJECTS

```
cctvSwitchSequence      OBJECT IDENTIFIER ::= { cctvSwitch 6 }
```

3.7.1 Maximum Number of Sequences Parameter

```
cctvSwitchMaximumSequences OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the maximum number of allowable sequences.
<DescriptiveName> CctvSwitch.cctvSwitchMaximumSequences:quantity
<DataConceptType> Data Element
<Unit> sequences”
::= {cctvSwitchSequence 1}
```

3.7.2 Sequence Table

```
cctvSwitchSequenceTable OBJECT-TYPE
SYNTAX      SEQUENCE OF CctvSwitchSequenceTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
```

```
“<Definition> A table containing data specific to the CCTV switch sequence
definition.  Table rows are set by the manufacturer, and row creation/deletion
is not supported.
<DescriptiveName> CctvSwitch.cctvSwitchSequenceTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchSequence 3}

cctvSwitchSequenceTableEntry OBJECT-TYPE
SYNTAX      CctvSwitchSequenceTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters within the CCTV sequence table that address the
definition and labeling of a sequence.
<DescriptiveName> CctvSwitch.cctvSwitchSequenceTableEntry
<DataConceptType> Entity Type”
INDEX {cctvSwitchSequenceNumber}
::= {cctvSwitchSequenceTable 1}

CctvSwitchSequenceTableEntry ::= SEQUENCE {
      cctvSwitchSequenceNumber                        INTEGER,
      cctvSwitchSequenceDefinition                    OCTET STRING,
cctvSwitchSequenceLabelNumber             INTEGER
}
```

3.7.2.1 Sequence Number Parameter

```
cctvSwitchSequenceNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> The number used as an identifier for each individual sequence.
<DescriptiveName> CctvSwitch.cctvSwitchSequenceNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchSequenceTableEntry 1}
```

3.7.2.2 Sequence Definition Parameter

```
cctvSwitchSequenceDefinition OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(3..255))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A string defining the camera ports, and dwell times, for the
sequence to be displayed on the specified monitor port, as described below:
      Bytes1,2    camera  port  number  associated  with  the  monitor  port
displayed in the sequence,
      Byte3       dwell time in seconds for the camera port displayed in the
sequence.
 A sequence can support up to 85 camera port displays on a single monitor
port.
<DescriptiveName> CctvSwitch.cctvSwitchSequenceDefinition:text
<DataConceptType> Data Element”
::= {cctvSwitchSequenceTableEntry 2}
```


3.7.2.3 Sequence Label Number Parameter

```
cctvSwitchSequenceLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this sequence.  A value of zero (0) indicates
that there is no label associated with this sequence.  When read, this object
returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchSequenceLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchSequenceTableEntry 3}
```

3.8 CCTV SWITCH GROUP OBJECTS

```
cctvSwitchGroup   OBJECT IDENTIFIER ::= { cctvSwitch 7 }
```

3.8.1 Maximum Number of Groups Parameter

```
cctvSwitchMaximumGroups OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the maximum number of allowable groups.
<DescriptiveName> CctvSwitch.cctvSwitchMaximumGroups:quantity
<DataConceptType> Data Element
<Unit> groups”
::= {cctvSwitchGroup 1}
```

3.8.2 Group Table

```
cctvSwitchGroupTable OBJECT-TYPE
SYNTAX      SEQUENCE OF CctvSwitchGroupTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> A table containing data specific to the CCTV switch group
definition.  Table rows are set by the manufacturer, and row creation/deletion
is not supported.
<DescriptiveName> CctvSwitch.cctvSwitchGroupTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchGroup 2}

cctvSwitchGroupTableEntry OBJECT-TYPE
SYNTAX      CctvSwitchGroupTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters within the CCTV group table that address the
definition and labeling of a group.
<DescriptiveName> CctvSwitch.cctvSwitchGroupTableEntry
```

```
<DataConceptType> Entity Type”
INDEX {cctvSwitchGroupNumber}
::= {cctvSwitchGroupTable 1}

CctvSwitchGroupTableEntry ::= SEQUENCE {
      cctvSwitchGroupNumber                    INTEGER,
      cctvSwitchGroupDefinition                      OCTET STRING,
cctvSwitchGroupLabelNumber                     INTEGER
}
```

3.8.2.1 Group Number Parameter

```
cctvSwitchGroupNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> The number used as an identifier for each individual group.
<DescriptiveName> CctvSwitch.cctvSwitchGroupNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchGroupTableEntry 1}
```

3.8.2.2 Group Definition Parameter

```
cctvSwitchGroupDefinition OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(4..255))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A string defining the camera ports, and monitor ports, for the
group to be displayed, as described below:
      Bytes1,2    camera  port  number  associated  with  the  monitor  port
displayed in the group,
Bytes3,4    monitor  port  number  on  which  the  associated  camera  port  is
displayed in the group.
 A group can support up to 63 camera port displays on their associated monitor
ports.
<DescriptiveName> CctvSwitch.cctvSwitchGroupDefinition:text
<DataConceptType> Data Element”
::= {cctvSwitchGroupTableEntry 2}
```

3.8.2.3 Group Label Number Parameter

```
cctvSwitchGroupLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this group.  A value of zero (0) indicates that
there is no label associated with this group.  When read, this object returns
last value written.
<DescriptiveName> CctvSwitch.cctvSwitchGroupLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchGroupTableEntry 3}
```


3.8.3 Activate Group Parameter

```
cctvSwitchActivateGroup OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> A command to display the group identified by this parameter.  A
value of 0 means that no group is displayed.  When read, this object returns
last value written.
<DescriptiveName> CctvSwitch.cctvSwitchGoToGroup:identifier
<DataConceptType> Data Element”
DEFVAL { 0 }
::={cctvSwitchGroup 3}
```

3.9 CCTV SWITCH GROUP SEQUENCE OBJECTS

```
cctvSwitchGroupSequence OBJECT IDENTIFIER ::= { cctvSwitch 8 }
```

3.9.1 Maximum Number of Group Sequences Parameter

```
cctvSwitchMaximumGroupSequences OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the maximum number of allowable sequences
of groups.
<DescriptiveName> CctvSwitch.cctvSwitchMaximumGroupSequences:quantity
<DataConceptType> Data Element
<Unit> sequences of groups”
::= {cctvSwitchGroupSequence 1}
```

3.9.2 Group Sequence Table

```
cctvSwitchGroupSequenceTable OBJECT-TYPE
SYNTAX      SEQUENCE OF CctvSwitchGroupSequenceTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> A table containing data specific to the CCTV switch sequence of
groups definition.    Table rows are set by the manufacturer, and row
creation/deletion is not supported.
<DescriptiveName> CctvSwitch.cctvSwitchGroupSequenceTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchGroupSequence 2}

cctvSwitchGroupSequenceTableEntry OBJECT-TYPE
SYNTAX      CctvSwitchGroupSequenceTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters within the CCTV group sequence table that address the
definition and labeling of a sequence of groups.
```

```
<DescriptiveName> CctvSwitch.cctvSwitchGroupSequenceTableEntry
<DataConceptType> Entity Type”
INDEX {cctvSwitchGroupSequenceNumber}
::= {cctvSwitchGroupSequenceTable 1}

CctvSwitchGroupSequenceTableEntry ::= SEQUENCE {
      cctvSwitchGroupSequenceNumber             INTEGER,
      cctvSwitchGroupSequenceDefinition               OCTET STRING,
cctvSwitchGroupSequenceLabelNumber        INTEGER
}
```

3.9.2.1 Group Number Parameter

```
cctvSwitchGroupSequenceNumber OBJECT-TYPE
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> The number used as an identifier for each individual sequence of
groups.
<DescriptiveName> CctvSwitch.cctvSwitchGroupSequenceNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchGroupSequenceTableEntry 1}
```

3.9.2.2 Group Sequence Definition Parameter

```
cctvSwitchGroupSequenceDefinition OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(5..255))
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A string defining the group number and dwell times for the
sequence of groups to be displayed, as described below:
Bytes1,2    group number parameter from the group table that identifies the
individual group to be displayed,
Byte3 dwell time in seconds for the group displayed in the sequence of groups.
 A group sequence can support up to 85 group displays.
<DescriptiveName> CctvSwitch.cctvSwitchGroupSequenceDefinition:text
<DataConceptType> Data Element”
::= {cctvSwitchGroupSequenceTableEntry 2}
```

3.9.2.3 Group Sequence Label Number Parameter

```
cctvSwitchGroupSequenceLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with this sequence of groups.  A value of zero (0)
indicates that there is no label associated with this sequence of groups.
When read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchGroupSequenceLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchGroupSequenceTableEntry 3}
```


3.9.3 Activate Group Sequence Parameter

```
cctvSwitchActivateGroupSequence OBJECT-TYPE
SYNTAX      INTEGER (0..255)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
“<Definition> A command to display the sequence of groups identified by this
parameter.  A value of 0 means that no sequence of groups is displayed.  When
read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchActivateGroupSequence:identifier
<DataConceptType> Data Element”
DEFVAL { 0 }
::={cctvSwitchGroupSequence 3}
```

3.10 CCTV SWITCH CAMERA STATUS OBJECTS

```
cctvSwitchCameraStatus  OBJECT IDENTIFIER ::= { cctvSwitch 10 }
```

3.10.1 Camera Status Table

```
cctvSwitchCameraStatusTable OBJECT-TYPE
SYNTAX      SEQUENCE OF CctvSwitchCameraStatusTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> A table containing data specific to the camera status on CCTV
camera ports.    Table rows are set by the manufacturer, and row
creation/deletion is not supported.
<DescriptiveName> CctvSwitch.cctvSwitchCameraStatusTable
<DataConceptType> Entity Type
<TableType> static”
::= {cctvSwitchCameraStatus 1}

cctvSwitchCameraStatusTableEntry OBJECT-TYPE
SYNTAX      CctvSwitchCameraStatusTableEntry
ACCESS      not-accessible
STATUS      mandatory
DESCRIPTION
“<Definition> Parameters within the CCTV camera status table that address the
loss of video and label displayed upon video loss.
<DescriptiveName> CctvSwitch.cctvSwitchCameraStatusTableEntry
<DataConceptType> Entity Type”
INDEX {cctvSwitchCameraPortNumber}
::= {cctvSwitchCameraStatusTable 1}

CctvSwitchCameraStatusTableEntry ::= SEQUENCE {
      cctvSwitchCameraPortNumber                    INTEGER,
      cctvSwitchVideoLoss                           OCTET STRING,
cctvSwitchVideoLossLabelNumber                INTEGER
}
```

3.10.1.1 Camera Port Number Parameter

```
cctvSwitchCameraPortNumber OBJECT-TYPE
```

```
SYNTAX      INTEGER (1..65535)
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the number of physical camera port.
<DescriptiveName> CctvSwitch.cctvSwitchCameraPortNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchCameraStatusTableEntry 1}
```

3.10.1.2 Video Loss Parameter

```
cctvSwitchVideoLoss OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE(1))
ACCESS      read-only
STATUS      mandatory
DESCRIPTION
“<Definition> The object denotes the presence or absence of video on this
camera port.
Bit 7       0 = ABSENCE, 1 = PRESENCE of video picture signals (MSB),
Bits6..0    Reserved (Bit0 = LSB).
<DescriptiveName> CctvSwitch.cctvSwitchVideoLoss:text
<DataConceptType> Data Element”
::= {cctvSwitchCameraStatusTableEntry 2}
```

3.10.1.3 Video Loss Label Number Parameter

```
cctvSwitchVideoLossLabelNumber OBJECT-TYPE
SYNTAX      INTEGER (0..65535)
ACCESS      read-write
STATUS      mandatory
DESCRIPTION
"<Definition> A value representing the label number from the switch label
table that is associated with the loss of video on this camera port.  A value
of zero (0) indicates that there is no label associated with the loss of video
on this camera port.  When read, this object returns last value written.
<DescriptiveName> CctvSwitch.cctvSwitchVideoLossLabelNumber:identifier
<DataConceptType> Data Element”
::= {cctvSwitchCameraStatusTableEntry 3}


END
```


Section 4
CONFORMANCE

4.1 CONFORMANCE GROUPS

A conformance group is defined in NTCIP 1103 Simple Transportation Management Framework (STMF), clause 3.3.5, as a basic unit of conformance.

Conformance groups are defined as either mandatory or optional. If a conformance group is mandatory, all of the objects and subgroups with STATUS "mandatory" that are part of the conformance group shall be present for a device to claim conformance to the MIB defining the Conformance group. If a Conformance group is optional, all of the objects and subgroups with the STATUS "mandatory" that are part of the conformance group shall be present if the device supports the Conformance group. Optional objects with the STATUS "optional" may be supported.

When a table is included in a conformance group, all objects contained in the table are included by reference. This is because a table is defined as a SEQUENCE OF {SEQUENCE}. Thus, all objects listed in the sequence are defined as an integral part of the table. Tables are defined as either mandatory or optional. If a table is mandatory, all of the objects with STATUS "mandatory" shall be present. If a table is optional, all of the objects with the STATUS "mandatory" shall be present if the device supports the table. Optional objects within a table with the STATUS "optional" may be supported.

Support for objects within a Subgroup are handled in the same fashion as tables. This is summarized in Table 4-1.

Table 4-1
Object Support Requirements

OBJECT STATUS	TABLE STATUS	CONFORMANCE GROUP STATUS (IF ANY)	OBJECT SUPPORT
mandatory	Mandatory	mandatory	mandatory
mandatory	Mandatory	optional	mandatory, if conformance group is supported
mandatory	Optional	mandatory	mandatory, if table is supported
mandatory	Optional	optional	mandatory, if both the conformance group and table are supported
optional	Mandatory	mandatory	optional
optional	Mandatory	optional	optional
optional	Optional	mandatory	optional
optional	Optional	optional	optional

The Conformance Group definitions for Closed Circuit Television (CCTV) are defined in the following Clauses. A CCTV Switch may have multiple capabilities; thus, Conformance Groups are defined for each capability.

4.1.1 CCTV Switch Assignment Conformance Group

The Assignment Conformance Group consists of objects that specify the configuration parameters of a

CCTV Switch. The conformance requirement for each object within the group is shown. Please refer to the Conformance Statement Table 4-2 for the conformance requirement for the group. The Assignment Conformance Group shall consist of the following objects:

Object or Table Name	Reference	Conformance Requirement within the Group
labelMaximum	NTCIP 1208 v01.12	mandatory
labelSwitchTable	NTCIP 1208 v01.12	mandatory
labelNumber	NTCIP 1208 v01.12	mandatory
labelText	NTCIP 1208 v01.12	mandatory
labelFontNumber	NTCIP 1208 v01.12	mandatory
labelHeight	NTCIP 1208 v01.12	mandatory
labelColor	NTCIP 1208 v01.12	mandatory
labelStartRow	NTCIP 1208 v01.12	mandatory
labelStartColumn	NTCIP 1208 v01.12	mandatory
labelActive	NTCIP 1208 v01.12	mandatory
timeFormat	NTCIP 1208 v01.12	mandatory
dateFormat	NTCIP 1208 v01.12	mandatory
timeDateOverlayFontNumber	NTCIP 1208 v01.12	mandatory
timeDateOverlayHeight	NTCIP 1208 v01.12	mandatory
timeDateOverlayColor	NTCIP 1208 v01.12	mandatory
timeDateOverlayStartRow	NTCIP 1208 v01.12	mandatory
timeDateOverlayStartColumn	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentMaximumCameraPorts	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentMaximumMonitorPorts	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentTable	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentMonitorPortNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentMonitorPortLabelNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentMonitorMode	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentCameraPortNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentCameraPortLabelNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentTimeDateOverlay	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentSequenceNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentStatus	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentGroupStatus	NTCIP 1208 v01.12	mandatory
cctvSwitchAssignmentGroupSequenceStatus	NTCIP 1208 v01.12	mandatory
cctvSwitchGlobalLabelDisable	NTCIP 1208 v01.12	mandatory
cctvSwitchMaximumSequences	NTCIP 1208 v01.12	mandatory
cctvSwitchSequenceTable	NTCIP 1208 v01.12	mandatory
cctvSwitchSequenceNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchSequenceDefinition	NTCIP 1208 v01.12	mandatory
cctvSwitchSequenceLabelNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchMaximumGroups	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupTable	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupDefinition	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupLabelNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchActivateGroup	NTCIP 1208 v01.12	mandatory
cctvSwitchMaximumGroupSequences	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupSequenceTable	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupSequenceNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupSequenceDefinition	NTCIP 1208 v01.12	mandatory
cctvSwitchGroupSequenceLabelNumber	NTCIP 1208 v01.12	mandatory

Object or Table Name	Reference	Conformance Requirement within the Group
cctvSwitchActivateGroupSequence	NTCIP 1208 v01.12	mandatory

4.1.2 CCTV Switch Discrete I/O Conformance Group

The CCTV Switch Discrete I/O Conformance Group consists of objects that specify discrete input/output functions within a CCTV Switch. The conformance requirement for each object within the group is shown. Please refer to the Conformance Statement Table 4-2 for the conformance requirement for the group. The Discrete I/O Conformance Group shall consist of the following objects:

Object or Table Name	Reference	Conformance Requirement within the Group
inputStatus	NTCIP 1208 v01.12	mandatory
inputLatchStatus	NTCIP 1208 v01.12	mandatory
inputLatchClear	NTCIP 1208 v01.12	mandatory
inputTable	NTCIP 1208 v01.12	mandatory
inputNumber	NTCIP 1208 v01.12	mandatory
inputCameraPortNumber	NTCIP 1208 v01.12	mandatory
inputMonitorPortNumber	NTCIP 1208 v01.12	mandatory
inputLabelNumber	NTCIP 1208 v01.12	mandatory
outputStatus	NTCIP 1208 v01.12	mandatory
outputControl	NTCIP 1208 v01.12	mandatory
outputTable	NTCIP 1208 v01.12	mandatory
outputNumber	NTCIP 1208 v01.12	mandatory
outputCameraPortNumber	NTCIP 1208 v01.12	mandatory
outputMonitorPortNumber	NTCIP 1208 v01.12	mandatory
outputLabelNumber	NTCIP 1208 v01.12	mandatory

4.1.3 CCTV Switch Camera Status Conformance Group

The CCTV Switch Camera Status Conformance Group consists of objects that specify camera status functions within a CCTV Switch. The conformance requirement for each object within the group is shown. Please refer to the Conformance Statement Table 4-2 for the conformance requirement for the group. The Camera Status Conformance Group shall consist of the following objects:

Object or Table Name	Reference	Conformance Requirement within the Group
cctvSwitchCameraStatusTable	NTCIP 1208 v01.12	mandatory
cctvSwitchCameraPortNumber	NTCIP 1208 v01.12	mandatory
cctvSwitchVideoLoss	NTCIP 1208 v01.12	mandatory
cctvSwitchVideoLossLabelNumber	NTCIP 1208 v01.12	mandatory

4.2 CONFORMANCE STATEMENTS

CCTV switch devices shall adhere to the conformance requirements specified in Table 4-2 as a minimum to claim compliance to this standard. Additional objects or groups may be supported without being non-compliant with CCTV Switch objects or NTCIP.

Minimum and maximum ranges of objects that differ from the values of the object's SYNTAX field may be enforced by an application running on a device.

A device that enforces range limits within the bounds specified by the values of the object's SYNTAX field shall not be categorized as being non-compliant with CCTV Switch objects or NTCIP.

A device that supports a subset of enumerated values for a given object shall not be categorized as being non-compliant with CCTV Switch objects or NTCIP.

Table 4-2
Conformance Statement Table

Conformance Group	Reference	Conformance Requirement
Configuration	NTCIP 1201 v02	mandatory
Time Management	NTCIP 1201 v02	optional
Security	NTCIP 1103 and NTCIP 2301 v02	mandatory
CCTV Switch Assignment	NTCIP 1208 v01.12	mandatory
CCTV Switch Discrete I/O	NTCIP 1208 v01.12	optional
CCTV Switch Camera Status Parameters	NTCIP 1208 v01.12	optional

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Annex A
EXTENDED GLOSSARY
(Informative)

Aberrations	Certain aberrations degrade the image formed by a lens.
A/B Editing	Video editing using two source recorders.
A/B Roll Editing	A technique by which selected odd (A-roll) and even (B-roll) audio/video sequences from two VCRs are then dubbed onto a third tape, usually a composite master.
A/B Split Screen	A useful means for comparing two sources simultaneously. Permits a fast visual check of the phase and sync timing between two inputs.
Ablation	Optical memory data writing technique in which laser burns pits onto a metal film.
Absolute	A measure of pan, tilt, or zoom movement specified as the number of degrees relative to home position.
Achromatic	Completely colorless white light.
Active Line	The horizontal scan lines which produce a television picture. In the NTSC system in the US, there are 525 active lines.
Active Program	The length of audio and video program material on the master videotape not to exceed the one-side capacity of a videodisc.
Active Video Lines	All video not occurring in the horizontal and vertical blanking intervals.
ACTV1	A channel/receiver compatible system with increased resolution.
ACTV2	Similar to ACTV1 but with improved audio and still more advanced resolution.
Advanced Compatible Television (ACTV)	Advanced television transmission system; currently two such systems exist.
Advanced Interactive Video (AIV)	A format for storing analog and digital video images, digital sound and data on a single laser disc.
Advanced Television (ATV)	Including several versions of improved or higher quality television, including HDTV, IDTV, EDTV, and several other television systems considered better than the currently available and used systems.
Aliasing	Undersirable "beating" effects caused by sampling frequencies being too low to faithfully reproduce image detail.
Alpha Channel	A portion of each display pixel representing the combined video and graphic image data for a video digitizer component.
Alphageometric	A videotex graphics format in which shapes are defined by geometric elements such as points and lines.
Alphamosaic Graphics	A videotex graphics format in which pictures are composed of small character sized blocks.
Analog Video	A video signal that represents an infinite number of gradations between given video levels.

Anamorphic	A type of lens adapter designed to produce a wide screen image from an equally condensed image on the film.
Aperture	The opening of a lens which controls the amount of light reaching the surface of the pickup device. The size of the aperture is controlled by the iris adjustment. By increasing the f stop number (f/1.4, f/1.8, f/2.8, etc.) less light is permitted to pass to the pickup device.
Aspect Ratio	The proportions of a projected picture area in terms of relative height and width values. In the U.S., standard video aspect ratio is four units wide by three units high, usually shown as 4:3.
Astigmatism	The uneven foreground and background blur that is in the image.
Asymmetrical Compression	An image compression system which takes more processing to compress the image than it does to extract or decompress it.
Auto Brightness Control	The electronic circuit which controls the brightness of the display device as a function of ambient light.
Auto Focus	The process of automatically adjusting the lens focus to provide a sharp image on the faceplate of the camera pickup device.
Auto Iris Lens	A lens where the aperture automatically opens or closes to maintain proper light levels on the faceplate of the camera pickup device.
Automatic Frequency Control (AFC)	An electronic circuit used whereby the frequency of an oscillator is automatically maintained within specified limits.
Automatic Gain Control (AGC)	An electronic circuit used by which the gain of a signal is automatically adjusted as a function of its input or other specified parameter.
Automatic Light Control (ALC)	The process by which the illumination incident upon the face of the pickup device is automatically adjusted as a function of the brightness of the scene.
Automatic Pan (Scan)	Continuous, automatic horizontal back and forth motion of a camera.
Automatic Sensitivity Control (ASC)	(A) Electronic circuit which varies the sensitivity of the system as a function of automatic target control, automatic light controls, other specified control parameters, or any combination thereof. (B) Detects light intensity and keeps camera in optimum working condition as it applies to light input.
Automatic Iris Lens	A lens in which the aperture automatically opens or closes to maintain proper light levels on the faceplate of the camera pickup device.
Automatic Light Control (ALC)	A circuit used in audio and video recorders to control the level of the recorded signal automatically to provide uniform level without distortion due to overloading. Also called Automatic Gain Control (AGC). An ALC Defeat control permits manual level control for wide ranges or special recording purposes.
Back Light	A fixture that is often not properly applied or overlooked completely. The main function of the back light is to separate the individual subjects from the background and give them depth and dimension.
Barrel Distortion	The distortion of a scene which occurs when a wide-angle lens is used; edges appear rounded and out of proportion with the center of

	the image.
Base and Fill Lights	Commonly referred to as "scoops" provide a soft-edged field of light which is used to provide basic illumination of the subject. to fill in the areas not highlighted by the key light, to illuminate the background and to soften shadowed caused by key lights.
Blackburst	A composite color video signal. This signal has composite sync, reference burst, and a black video signal which is usually at a level of 7.5 IRE 1 .05V) above the blanking level. (B) Fade-to-Black between scenes.
Black Level	The level of the video signal that corresponds to the maximum limits of the black areas of the picture.
Blanking	Related to composite sync. This signal has both horizontal and vertical components and is at its negative level whenever video is to be blanked or turned off.
Blanking Level	It is the level of a video signal which separates the range that contains the picture information from the range that contains the synchronizing information.
Bloom	Unacceptable TV picture caused by too much light.
Brightness	Achromatic intensity, relative lighting without regard to color; light emitted from a surface such as a screen measured in foot-lamberts, foot-candles, or lux.
Brightness Ratio	The difference between the brightest and darkest object in a scene. Too extreme a difference can lead to an unacceptable contrast ratio.
Brightness Signal	Same as the luminance signal (Y); the signal which carries information about the amount of light at each point in the image.
Burst	In color TV reception, the signal that serves as the reference for the 3.58 MHz oscillator; it occurs during video blanking.
Camera Power	The power supply delivered to the camera necessary for proper operation.
Character Generator	Reproduces recognized font styles from a computer type keyboard-usually provides multiple screen storage and is capable of background colorization from video display.
Charge-Coupled Device (CCD)	Semiconductor devices arrayed so that the electric charge at the output of one provides the input stimulus to the next. More compact and efficient than cathode ray tubes.
Chroma	The color information contained in a video signal, consisting of hue (phase angle) and saturation (amplitude) of the color subcarrier.
Chroma Keying	The process of overlaying one video signal over another, the areas of overlay being defined by a specific range of color, or chrominance, one of the signals. For this process to work, the chrominance must have sufficient resolution, or bandwidth. Coded (composite) video systems do not have sufficient bandwidth for acceptable quality chroma keying, hence analog chroma keyers typically use RGB sources.
Chrominance	The color part of a signal, relating to the hue and saturation but not to the brightness or luminance of the signal, e.g. black, gray and white,

	have no chrominance, but any colored signal has both chrominance and luminance. U,V: Cr,Cb: 1,Q:(R-Y), (B-Y) represent the chrominance information of a signal.
Clipping	The process of shearing off the peaks of either the white or the black excursions of the video signal.
Closed Circuit Television (CCTV)	A distribution system which limits reception of an image to those receivers or monitors which are directly connected to the origination point by coaxial cable or microwave link.
Closed Loop	A continuous loop of film or tape for repetitive playing, often in a cartridge.
Coder-Decoder (CODEC)	A device for encoding a signal for transmission and decoding it upon receipt of transmitted signals.
Color Lookup Table (CLUT)	A selection of colors assigned a digital value and held in a table. A program then decodes a color image for display by matching the code stored for each pixel with the associated color value in the look-up table.
Color Bars	SMPTE standard test bars used to match playback with original recording levels. Often accompanied by a 1000 Hz audio tone.
Color Burst	A few (8 to 10) cycles of 3.58MHz color subcarrier which occur during the back porch interval. Color burst amplitude is 40 IEEE units and phase is 1800. The color oscillator of a color television receiver is phase locked to the color burst.
Color Correction	A process in which the coloring in a television image is altered or corrected by electronic means. Care must be taken to insure that the modified video does not exceed the limits of subsequent processing or transmission systems.
Color Cycling Animation	The color of individual pixels are changed to give the effect of movement.
Colorization	Adding color to an originally black-and-white image.
Color Map	A table which stores the values of the red, green, and blue (RGB) components of colors in a computer graphics system to be displayed on the monitor.
Color Phase	The correct timing relationship within a color display-color is considered to be in-phase when the hue is reproduced correctly.
Colorplexer	An encoder which combines the separate red, green, and blue signals into one composite video signal.
Color Subcarrier	The 3.58MHz signal which carries color information. This signal is superimposed on the luminance level. Amplitude of the color sub-carrier represents saturation and phase angle represents hue.
Color Temperature	The color tint expressed in degrees Kelvin (K) of the light source. The higher the color temperature, the bluer the light; the lower the temperature, the redder the light.
Community Antenna Television (CATV)	Usually referred to as cable television.

Compact Disc (CD)	A 4.75" (12 cm) laser-encoded optical disc that contains information encoded digitally in the constant linear velocity (CLV) spiral format.
Compact Disc+Graphics (CD+G)	A CD format which includes extended graphics capabilities.
Compact Disc-Interactive (CD-I)	A CD format which provides audio, digital data, still graphics, and limited motion video. The standard for this format is known as the Green Book.
Compact Disc-Interactive Video (CD-IV)	A CD format which provides audio, digital data, still graphics, and full-screen, full-motion video.
Compact Disc-Music Instrument Digital Interface (CD+MIDI)	A CD format which provides digital audio, graphics information, and the musical instrument digital interface (MIDI) specifications and capabilities.
Compact Disc-Read Only Memory	A 4.75" (12 cm) laser-encoded optical memory storage medium that contains information encoded digitally in the constant linear velocity (CLV) spiral format. The standards for this format are known as the Yellow Book.
Component Analog Video (CAV)	Unencoded video signals which can provide greater color resolution. An NTSC encoder must be used to read the signals so they may be recognized by a standard NTSC receiver.
Compatible Color	A video broadcast system which separates the luminance and chrominance signals so that the signal may be received by either a color or black and white receiver.
Component	The normal interpretation of a component video signal is one in which the luminance and chrominance are sent as separate components.
Component Video	The separation of chrominance and luminance parts of the video signal. These two component signals are recorded separately.
Composite	A composite video signal is one in which the luminance and chrominance information have been combined using one of the coding standards: NTSC, PAL, SECAM.
Composite Sync	A signal consisting of horizontal sync pulses, vertical syncpulses, and equalizing pulses only, with a no-signal reference level.
Composite Video Signals	The complete visual wave form of the color video signal composed of chromatic and luminance picture information; blanking pedestal; field, line, and color sync pulses; and field equalizing pulses.
Compressed Video	A video image or segment that has been digitally processed using a variety of algorithms and other techniques to reduce the amount of space required to store the digital information.
Contrast	(A) The range of light and dark values in a picture or the ratio between the maximum and the minimum brightness values. Low contrast is shown mainly as shades of gray, while high contrast is shown as blacks and whites with very little gray. (B) A TV monitor adjustment which increases or decreases the level of contrast of a televised picture.

Contrast Range	The range of grays in a video image, usually a ratio of light to dark.
Contrast Ratio	The ratio of brightness of the brightest possible area to the darkest possible area of an image.
Convergence	Proper alignment of the vertical and horizontal lines, as in video projection.
Cross Color	This defect manifests itself as spurious rainbow patterns on highly textured objects like the one found on a striped shirt or tweed jacket. Cross-color defect is attributed to the make-up of the NTSC signal which mixes the high luminance and chrominance information in the same composite baseband spectrum.
Cross Luminance	More generally referred to as "Dot Crawl," this defect appears as a dot pattern crawling up or hanging on the edges of color areas. This is also a result of the NTSC signal structure where the color information leaks into the luminance signal.
Delta	A measurement in degrees of pan, tilt, zoom movement specified as the difference between an initial and final position.
Definition	The sharpness/resolution of a picture.
Depth of Field	The front to back zone in a field of view which is in focus in the televised scene. With a greater depth of field, more of the scene, near to far, is in focus.
Encoded	The encoded video signal is formed by starting with an RGB signal from the color television camera. This RGB signal is then processed through an I and 0 encoder which converts the RGB into a composite NTSC signal. The encoded signal has all of the elements of the composite video signal: sync, burst, chroma, and luminance.
Encoder Video	Devices that change individual component signals into composite signals. For example, an encoder combines Y (luminance or light) and C (chrominance or color) signals to provide a video image.
Enhanced Definition Television also Extended Definition Television (EDTV)	An advanced television system with advanced encoding and transmission methods but not as sophisticated as HDTV.
Equalizer	(A) Equipment designed to compensate for loss and delay frequency effects within a system. (B) A component, or circuit, which allows for the adjustment of a signal across a given band.
f /number	In lenses with adjustable irises, the maximum iris opening is expressed as a ratio, (focal length of the lens)/(maximum diameter of aperture). This maximum iris will be engraved on the front ring of the lens.
Field	One-half of a television picture. One complete vertical scan of the picture, containing 262.5 lines. Two fields make up a complete television picture (frame). The lines of Field 1 are vertically interlaced with Field 2 for 525 lines of resolution.
Field Frequency	The number of fields per second is the field frequency; NTSC field frequency is 60 per second; PAL and SECAM frequencies are 50.
Flicker	A video effect on a still or frozen frame caused when the two fields that make one video picture frame are not identically matched, thus

	creating two different pictures alternating every 1/60 of a second.
Flutter	Rapid change in frequency of an audio or video signal due to variations in tape or disk speed. Wow is usually considered a lower frequency speed variation.
Focal Length	The distance from the center of the lens to a plane at which point a sharp image of an object viewed at an infinite distance from the camera is produced. The focal length determines the size of the image and the angle of the field of view seen by the camera through the lens. That is the distance from the center of the lens to the pickup device.
Focus	The process of sharpening a blurred image on a screen, monitor, or any display; adjusting picture to achieve the greatest possible resolution.
Focus, Automatic	A device on slide projectors whereby after focusing the first image, remaining similarly-mounted slides are automatically focused.
Foot Candle	The amount of light reflected by a surface one foot from a lighted candle. Metric equivalent is lux.
Foot Lambert	One lumen or one foot candle of light over a one square foot surface.
Format, Video	Current formats include C, U-Matic, Betacam, M, Betacam SP, M-11, DI, D2, Beta, VHS, Hi8, 8mm and S-VHS.
Frame	(A) The total area of the picture which is scanned while the picture signal is not blanked. (B) A complete TV picture consisting of two fields; a total scanning of all 525 lines of the raster area; occurs every 1/30 of a second. (625 lines, 1/25 sec. in Europe and many other countries).
Frame Rate	The speed at which video frames are scanned or displayed; 30 frames a second for NTSC; 25 frames a second for PAL/SECAM.
Genlock	Genlock is a process of sync generator locking. This is usually performed by introducing a composite video signal from a master source to the subject sync generator. The generator to be locked has circuits to isolate vertical drive, horizontal drive and subcarrier. The process then involves locking the subject sync generator to the master subcarrier, horizontal, and vertical drives so that the result is that both sync generators are running at the same frequency and phase.
Ghost	A shadowy or weak image in the received picture, offset either to the right or to the left of the primary image. It is the result of transmission conditions where secondary signals are created and received earlier or later than the primary signal caused by a reflected RF signal.
Gray Scale	A series of tones which range from true black to true white, it is usually expressed in 10 steps.
Heater	A device used to maintain a constant camera enclosure temperature. A heater is typically thermostatically controlled and is used in harsh viewing environments.
High-Definition Television (HDTV)	A variety of video formats offering greater visual accuracy (or resolution) than current NTSC, PAL, or SECAM broadcast standards. Current formats generally range in resolution from 655 scanning lines to 2,125 scanning lines, having an aspect ratio of 5:3 (or 1.67:1), and a video bandwidth of 30 MHz to 50 MHz which is 5+ times greater than

	NTSC standard. Digital HDTV has a bandwidth of 300+ MHz.
High Resolution	Camera or monitor with a great number of scanning lines (1000-2000) which produces a very sharp, detailed image.
Home Position	An arbitrary pan, tilt, and zoom position defined by the camera vendor. The home position represents a mechanical reference point from which camera and lens position parameters are measured.

Horizontal Blanking Interval	The time required for the picture-forming beam of a CRT to return from the start of one line to the start of the next line.
Horizontal Blanking Signal	The blanking signal that is produced at the end of each scanning line.
Horizontal Drive	This signal is derived by dividing sub-carrier by 227.5 and then doing some pulse shaping.
Horizontal Resolution	Smallest increment of a television picture that can be discerned in the horizontal plane.
Horizontal Sync	This signal is derived by dividing sub-carrier by 227.5 and then doing some pulse shaping. The signal is used by monitors and cameras to determine the start of each horizontal line.
Hue	A) Distinction between colors. Red, blue, green, yellow, etc., are hues. White, black, and gray are not considered hues. (B) The dimension of color that is referred to a scale of perceptions ranging from red through yellow, green, blue back to red.
Interlace	The pattern described by the two separate field scans when they join to form a complete video frame.
Interlaced	The process of scanning whereby the alternate lines of both scanned fields fall evenly between each other.
Interlacing	Increasing video resolution by doubling the number of horizontal scan lines. NTSC video is interlaced.
Interleaving	A method of storing information sequences in an alternating series of frames and playing the sequences using a computers capabilities to achieve continuous play of a segment.
Intraframe Coding	A method to compress a video signal for transmission in which half the picture information is eliminated by dropping every other frame as it comes from the camera. At playback, each frame remains on the screen twice the normal duration to simulate the standard 30 frame/second video rate.
Interfield Flicker	A video effect that occurs when field dominance is incorrectly specified or if field dominance changes at one or more points on the master tape from having been edited on equipment that is incapable of frame-accurate editing.
Iris	A device used to control the amount of light that reaches the imaging sensor. The amount of light transmitted through a lens is controlled by an adjustable diaphram, or iris, located in the lens barrel. The opening is referred to as the aperture, and the size of the aperture is controlled by rotating the aperture control ring on the lens barrel. The graduations on the lens barrel are expressed in terms of the focal length for the lens divided by the diameter of the aperture at that setting. This ratio is called the f-number.
Lens	An assembly of optical components, usually made from glass, used to focus light on an imaging device.
Lens Speed	Refers to the ability of a lens to pass light expressed as a ratio: the focal length of the lens divided by the (effective) diameter. A fast lens which passes more light might be rated f / 1.1 or 1.2; a much slower

	lens which passes less light might be designated f / 3.5 The f / number = focal length / aperture.
Line-Lock	Synchronizes camera to power line zero crossing for roll-free vertical interval switching. Vertical phase delay can be externally adjusted (continuously) to allow vertical synchronization in multiphase power installations.
Looping	A term indicating that a high impedance device has been permanently connected in parallel to a video source.
Lumen	A measurement of quantity of light taken at the source of the light. Lumens per square foot are foot candles.
Luminance	Brightness; one of the three image characteristics coded in composite television represented by the letter Y.
Lux	The metric measurement of light quantity. The measurement is taken from the reflection off the object illuminated. One foot-candle equals 10.76 lux. A lux equals one lumen per square meter.
Macro	A series of commands batched together and executable through one or a few keystrokes.
Manual Focus	The process of manually adjusting the lens focus to provide a sharp image on the faceplate of the camera pickup device.
Manual Iris Lens	A lens in which the aperture is manually opened or closed to maintain proper light levels on the faceplate of the camera pickup device.
M, M Format	Portable camera/recorder system developed by Panasonic; also used for just the recorder or the interconnect format. "M" actually refers to the manner in which the video tape is wrapped around the head drum. M format systems employ the (V, I, 0) component set.
MII (M2). MII Format	Second generation camera/recorder system developed by Panasonic; also used for just the recorder or the interconnect format. MII uses a version of the (V, R-Y, B-Y) component set.
Moiré	(A) A wavy or satiny effect produced by the convergence of lines. It usually appears as a curving of the lines in the horizontal wedges of a test pattern. It is a natural optical effect when converging lines in a television picture are nearly parallel to the scanning lines. (B) Optical disturbance caused by interference of similar frequencies.
Multi-standard Decoder	A device that converts NTSC, PAL, SECAM or NTSC 4.43 video to RGB video.
National Television System Committee (NTSC)	The organization which formulated the "NTSC" system; Usually taken to mean the NTSC color television system itself, or its interconnect standards. The US standard 525 line 60 field system.
Neutral Colors	The range of gray levels, from black to white, but without color. For neutral areas in the image the RGB signals will all be equal, in color difference formats the color difference signals will be zero.
Non-Interlace	A scanning system that repeats the exact vertical retrace period for every field, resulting in every other scan line in a 525 line system being refreshed 60 times a second. This results in a flicker-free image with half the vertical resolution.
Non-Interlaced	A video scanning system where the horizontal lines are scanned from

	top to bottom in order, as opposed to interlaced, where the lines are scanned in two passes, odd lines on one pass and even lines on another.
NTSC Color Bars	A pattern generated by the NTSC Generator, consisting of eight equal width color bars. Colors are white (75%), black (7.5% set-up level), 75% saturated pure colors red, green, and blue, and 75% saturated hues of yellow, cyan, and magenta. Mixtures of two colors in 1:1 ratio without third color.
NTSC Format	A color television format having 525 scan lines; a field frequency of 60 Hz.; a broadcast bandwidth of 4 MHz., line frequency of 15.75 kHz.; frame frequency of 1/30 of a second; and a color subcarrier frequency of 3.58 MHz.
NTSC Video 4.43	This term refers to the video output of video tape or disk players used mainly in Middle East countries.
Overscan	Deliberate scanning in a television set or monitor in which the active display area of the CRT is filled with slightly less than the complete video image. This enables the physical edges of the display device to become the picture's borders rather than the blanking portions of the signal.
PAL-M	Phase Alternation by Line, Brazilian broadcast standard which consists of 525 lines and 60 fields per second.
Pan	Movement of the camera in a horizontal direction.
Persistence	The rate of decay of the visible glow from a CRT's phosphor, when the scanning electron beam is no longer applied. Monitors with a long persistence phosphor will have less visible flicker, but may show smearing when images are moved on the screen.
Phase Alternate by Line (PAL)	Broadcast standard which consists of a 625 line 50 field composite color transmission system, used in Great Britain, Ireland, Western Europe, Scandinavia, South Africa and Australia. The phase alternation makes the signal relatively immune to certain distortions compared to NTSC.
Preset	A pre-specified position where a camera is pointed to a fixed point in space. A preset includes pan, tilt, and zoom parameters. Presets are typically programmed by manually adjusting the camera position and lens zoom setting followed by initiating a save command from the camera control system.
Raster	The rectangular pattern of scanning lines upon which the picture is produced. The illuminated face of the TV monitor without the video information present.
Resolution	(A) A measure of the ability of a camera or television system to reproduce detail. That is the number of picture elements that can be reproduced with good definition, It is a factor of the pickup device or the TV CRT characteristics and the video signal bandwidth. (B) Generally called horizontal resolution. It can be evaluated by establishing the limit to which lines can be distinguished on a test pattern. A larger resolution value means a broader frequency band of the video signal. (C) A measure of the greatest amount of detail that can be seen, or resolved, in an image.

Retrace	The blank portion of the video signal, while the electron beam moves without producing an image.
Red, Green, Blue (RGB)	The chrominance information in a video signal.
RGB, RGB Format, RGB System	Red, Green, and Blue: The basic parallel component set, in which a signal is used for each primary color; or the related equipment or interconnect formats or standards.
RGB Sync	Red, green, blue and sync, same as RGB but with additional sync channel.
RGB Video	Computer video output which can be analog or digital. Analog RGB video has 3,4, or 5 wires; one for the red, one for the green, one for the blue video and one or two for the sync.
Saturation	Quantity of pure color, which is diluted when mixed with white.
SEquential Couleur A Memoire (SECAM)	or sequential color and memory. A color W system with 625 lines and 50 fields developed in France different from NTSC and PAL systems. Used in France, Russia and Eastern Europe.
Sequential Switcher	A video control device that switches multiple video inputs to multiple video outputs in a predetermined timed sequence.
Switcher	Term often used to describe a special effects generator; a unit which allows the operator to switch between video camera signals. Switchers are often used in industrial applications to switch between video cameras monitoring certain areas for display on one monitor.
Sync	This signal is derived from a composite or combination of horizontal and vertical drives, with some slightly narrowed and delayed pulses as well as the addition of equalizing pulses.
Sync generator	A device which generates a signal which can be read by several types of equipment. The signal is used to keep all equipment running together.
Tilt	The movement of a camera in a vertical direction.
Underscan	Decreases raster size H and V so that all four edges of the picture are visible on the monitor. Allows viewing of skew and tracking which would not be visible in normal (overscanned) mode. Also helpful when aligning test charts to be certain they touch all four corners of the raster. Likewise, when checking the alignment of multiplexer images from a film chain, underscan allows proper framing of the projected image going into the video camera.
Vertical Interval Time Code (VITC)	(Vertical Interval Time Code): This is the same information as the SMPTE time code. It is superimposed onto the vertical blanking interval, so that the correct time code can be read even when a helical scanning VCR is in the Pause or Slow mode.
Vertical Retrace	The return of the electron beam to the top of a television picture tube screen or a camera pickup device target at the completion of the field scan.
Vertical Sync Pulse	A portion of the vertical blanking interval which is made up of blanking level and six pulses (92% duty cycle at -40 IEEE units) at twice the horizontal sync pulse repetition rate. Synchronizes vertical scan of television receiver to composite video signal. Starts each frame at

	same vertical position (sequential fields are offset 1/2 line to achieve interlaced scan).
Video	Pertaining to picture signals in a television system. (A): any production using videotape or television technology. (B): Television and the technical equipment and events involved in creating television. (C): The picture portion of a television broadcast. (D): Non-broadcast or private television.
Video Distribution Amplifier	A special amplifier for strengthening the video signal so that it can be supplied to a number of video monitors at the same time.
Video Tape Recorder (VTR)	The term "VTR" includes reel-to-reel and cassette type.
White Balance	(A) White balance is considered the reference color with which all other colors in an image are compared against. Auto white balance detects white colors in an image as a reference for other colors in the field of view. (B) A method of resetting the balance on a video camera by shooting a white card which adjusts the camera to the color temperature of the card.
White Level Set	White set; a camera control which establishes the luminance level for a color camera.
Y Signal	The luminance signal transmitted in standard color video.
Y/C	A set of video signals that contain a separate Y, which is luminance, and C, which is chroma. Usually the chroma is at 3.58MHz, as in the S-Video signal. but it can also be at 688kHz in the 3/4" dub format.
Y, Cl, C2	A generalized set of CAV signals: Y is the luminance signal. C1 is the 1st color difference signal and C2 is the 2nd color difference signal.
Y, I, Q	The set of CAV signals specified for the NTSC system: Y is the luminance signal. I is the 1St color difference signal and 0 is the 2nd color difference signal.
Y, Pb, P,	A version of Y, R-Y, B-Y specified for the SMPTE analog component standard.
Y, R-Y, B-Y	The general set of CAV signals used in the PAL system as well as for some encoder and most decoder applications in NTSC systems; Y is the luminance signal. R-Y is the 1st color difference signal and B-Y is the 2nd color difference signal.
Y, U, V,	Luminance and color difference components for PAL systems; Y, BV, R-Y with new names; the derivation from RGB is identical.
Zone	A region in space defined by pan and tilt limits. A zone is typically identified by a pre-programmed text message that is displayed to the user when the center of the camera's field of view is within the zone.
Zoom	The process of mechanically or electronically adjusting the focal length of a lens from wide angle through telephoto.
Zoom Ratio	A mathematical expression of the two extremes of focal length available on a particular zoom lens.

Annex B
INFORMATION PROFILE

(Informative)

A Conformance Group is a basic unit of conformance and is used to specify a collection of related managed objects. The Conformance Group designation applied to a set of objects provides a systematic means for determining which objects are required to support a function. If a device has multiple functions, a Conformance Group will be defined for each function. Conformance Group definitions will be found in the NTCIP Object Definition Standard documents. The Object Definition Standard may define a Conformance Group with objects that are not in lexicographic order and only apply to devices of that type.

The related managed objects of a Conformance Group may include mandatory and/or optional objects. Mandatory objects within a Conformance Group shall be implemented. Optional objects shall be implemented only if a defined function of the device requires that particular object.

For example, assume a device implements an asynchronous RS-232 interface. It must implement all the mandatory objects in the Asynchronous Conformance Group of the RS-232 MIB. It would not have to implement the Synchronous Conformance Group of objects unless it also provided a synchronous interface.

Assume also that the Asynchronous Conformance Group has a *CRC error counter* object that is optional. The *CRC error counter* object would not have to be implemented unless the device used CRC checking on the asynchronous interface.

Conformance Groups are defined as either mandatory or optional. If a Conformance Group is mandatory, all of the objects with STATUS "mandatory" that are part of the Conformance Group shall be present for a device to claim conformance to the Conformance Group. If a Conformance Group is optional, all of the objects that are part of the Conformance Group with the STATUS "mandatory" shall be present if the device supports the Conformance Group. Objects with the STATUS "optional" may be supported.

When a table is included in a Conformance Group, all objects contained in the table are included by reference. This is because a table is defined as a SEQUENCE OF {SEQUENCE}. Thus, all objects listed in the sequence are defined as an integral part of the table. Tables are defined as either mandatory or optional. If a table is mandatory, all of the objects with STATUS "mandatory" shall be present. If a table is optional, all of the objects with the STATUS "mandatory" shall be present if the device supports the table. Objects in the table with the STATUS "optional" may be supported.

B.1 NOTATION

The following notations and symbols are used to indicate status and conditional status within this standard.

B.1.1 TYPE Symbols

The following symbols are used to indicate type:

Symbol	Type
C	Control Object - use of 'dbCreateTransaction' in NTCIP 1201 Clause 2.3.1 shall NOT delay a SET to this object.
P	Parameter Object - use of 'dbCreateTransaction' in NTCIP 1201 Clause 2.3.1 to SET this object is optional.
P2	Parameter Object - use of 'dbCreateTransaction' in NTCIP 1201 Clause 2.3.1 to SET this object is mandatory.
S	Status / Information Object - this object is read only therefore a SET is not permitted.

B.1.2 Status Symbols

The following symbols are used to indicate status:

Symbol	Status
M	Mandatory
M.<n>	Support of every item of the group labeled by the same numeral <n> required, but only one is active at time.
O	Optional
O.<n>	Optional, but support of at least one of the group of options labeled by the same numeral <n> is required
C	Conditional
N/A	Non-applicable (i.e., logically impossible in the scope of the profile)
X	Excluded or prohibited

B.1.3 Conditional Status Notation

The following predicate notation is used:

Notation	Status
"<predicate>: M	Item is conditional on the <predicate>.

The <predicate>: notation means that the Status following it applies only when the feature or features identified by the predicate are supported. In the simplest case, <predicate> is the identifying tag of a single item.

B.1.4 Support Column

This section is in the form of a PICS and, therefore, includes a support column. An implementer claims

support of an item by circling the appropriate answer (Yes or No) in the support column:

B.2 CCTV SWITCH REQUIREMENTS

The Conformance Group definitions for CCTV Switch devices are defined in this clause. A CCTV Switch has multiple functions; thus, Conformance Groups are defined for each function.

The following table lists functional requirements for a CCTV Switch, and asks if the listed features have been implemented.

Ref	Areas	Clause of Profile	Status	Support
A.3	CCTV Switch Assignment Conformance Group	NTCIP 1208 – 3.2	M	Yes
A.4	CCTV Switch Discrete I/O Conformance Group	NTCIP 1208 – 3.3	O	Yes / No
A.5	CCTV Switch Camera Status Conformance Group	NTCIP 1208 – 3.4	O	Yes / No
A.6	Configuration Conformance Group	NTCIP 1201 v02 – 2.2	M	Yes
A.7	Time Management Conformance Group	NTCIP 1201 v02 – 2.4	O	Yes / No
A.8	NTCIP Security Conformance Group	NTCIP 1103 – A.10 and 2301 v02	M	Yes

CCTV Switch devices shall adhere to the conformance requirements specified in the above table as a minimum to claim compliance to this standard. Additional objects or groups may be supported without being non-compliant with CCTV Switch objects or NTCIP.

Minimum and maximum ranges of objects that differ from the values of the object's SYNTAX field may be enforced by an application running on a device.

A device which enforces range limits within the bounds specified by the values of the object's SYNTAX field shall not be categorized as being non-compliant with CCTV Switch objects or NTCIP.

A device which supports a subset of objects with enumerated values shall not be categorized as being non-compliant with CCTV Switch objects or NTCIP.

B.3 CCTV SWITCH ASSIGNMENT CONFORMANCE GROUP

The CCTV Switch Assignment Conformance Group consists of the following objects:

CCTV Switch Assignment CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
3.4, 3.5, 3.6, 3.7, 3.8, 3.9	**CCTV Switch Assignment Conformance Group**	---	M	Yes	----	-----
3.4	**CCTV Switch Label Objects**	---	---	---	---	---
3.4.1	labelMaximum	S	3.4 : M	Yes	1-65535	
3.4.2	labelSwitchTable	---	3.4 : M	Yes	---	---
	labelSwitchEntry	---	3.4 : M	Yes	---	---
3.4.2.1	labelNumber	S	3.4 : M	Yes	1-65535	
3.4.2.2	labelText	P	3.4 : M	Yes	String	
3.4.2.3	labelFontNumber	P	3.4 : M	Yes	1-2	
3.4.2.4	labelHeight	P	3.4 : M	Yes	0-255	
3.4.2.5	labelColor	P	3.4 : M	Yes	1-16	
	blue(1)	---	---	Yes / No	---	---
	green(2)	---	---	Yes / No	---	---
	cyan(3)	---	---	Yes / No	---	---
	red(4)	---	---	Yes / No	---	---
	magenta(5)	---	---	Yes / No	---	---
	brown(6)	---	---	Yes / No	---	---
	white(7)	---	---	Yes / No	---	---
	grey(8)	---	---	Yes / No	---	---
	lightBlue(9)	---	---	Yes / No	---	---
	lightGreen(10)	---	---	Yes / No	---	---
	lightCyan(11)	---	---	Yes / No	---	---
	lightRed(12)	---	---	Yes / No	---	---
	lightMagenta(13)	---	---	Yes / No	---	---
	yellow(14)	---	---	Yes / No	---	---
	brightWhite(15)	---	---	Yes / No	---	---
	black(16)	---	---	Yes / No	---	---
3.4.2.6	labelStartRow	P	3.4 : M	Yes	0-255	
3.4.2.7	labelStartColumn	P	3.4 : M	Yes	0-255	
3.4.2.8	labelActive	P	3.4 : M	Yes	String	
	bit 7 – Display Label	---	---	Yes	---	---
	bit 6 – Reserved	---	---	---	---	---
	bit 5 – Reserved	---	---	---	---	---
	bit 4 – Reserved	---	---	---	---	---
	bit 3 – Reserved	---	---	---	---	---
	bit 2 – Reserved	---	---	---	---	---
	bit 1 – Reserved	---	---	---	---	---
	bit 0 – Reserved	---	---	---	---	---
3.5	**CCTV Switch Time Date Overlay Objects**	---	---	---	---	---
3.5.1	timeFormat	P	3.5 : M	Yes	1-4	
	other(1)	---	---	Yes / No	---	---
	noTime(2)	---	---	Yes / No	---	---
	timeType1(3)	---	---	Yes / No	---	---
	timeType2(4)	---	---	Yes / No	---	---
3.5.2	dateFormat	P	3.5 : M	Yes	1-8	
	other(1)	---	---	Yes / No	---	---
	noDate(2)	---	---	Yes / No	---	---
	dateType1(3)	---	---	Yes / No	---	---
	dateType2(4)	---	---	Yes / No	---	---
	dateType3(5)	---	---	Yes / No	---	---
	dateType4(6)	---	---	Yes / No	---	---
	dateType5(7)	---	---	Yes / No	---	---
	dateType6(8)	---	---	Yes / No	---	---
3.5.3	timeDateOverlayFontNumber	P	3.5 : M	Yes	1-2	
	other(1)	---	---	Yes / No	---	---
	ascii(2)	---	---	Yes / No	---	---

CCTV Switch Assignment CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
3.5.4	timeDateOverlayHeight	P	3.5 : M	Yes	0-255	
3.5.5	timeDateOverlayColor	P	3.5 : M	Yes	1-16	
	blue(1)	---	---	Yes / No	---	---
	green(2)	---	---	Yes / No	---	---
	cyan(3)	---	---	Yes / No	---	---
	red(4)	---	---	Yes / No	---	---
	magenta(5)	---	---	Yes / No	---	---
	brown(6)	---	---	Yes / No	---	---
	white(7)	---	---	Yes / No	---	---
	grey(8)	---	---	Yes / No	---	---
	lightBlue(9)	---	---	Yes / No	---	---
	lightGreen(10)	---	---	Yes / No	---	---
	lightCyan(11)	---	---	Yes / No	---	---
	lightRed(12)	---	---	Yes / No	---	---
	lightMagenta(13)	---	---	Yes / No	---	---
	yellow(14)	---	---	Yes / No	---	---
	brightWhite(15)	---	---	Yes / No	---	---
	black(16)	---	---	Yes / No	---	---
3.5.6	timeDateOverlayStartRow	P	3.5 : M	Yes	0-255	
3.5.7	timeDateOverlayStartColumn	P	3.5 : M	Yes	0-255	
3.6	**CCTV Switch Assignment Objects**	---	---	---	---	---
3.6.1	cctvSwitchAssignmentMaximumCameraPorts	S	3.6 : M	Yes	1-65535	
3.6.2	cctvSwitchAssignmentMaximumMonitorPorts	S	3.6 : M	Yes	1-65535	
3.6.3	cctvSwitchAssignmentTable	---	3.6 : M	Yes	---	---
	cctvSwitchAssignmentEntry	---	3.6 : M	Yes	---	---
3.6.3.1	cctvSwitchAssignmentMonitorPortNumber	S	3.6 : M	Yes	1-65535	
3.6.3.2	cctvSwitchAssignmentMonitorPortLabelNumber	P	3.6 : M	Yes	0-65535	
3.6.3.3	cctvSwitchAssignmentMonitorMode	C	3.6 : M	Yes	1-7	
	other(1)	---	---	Yes / No	---	---
	displayCamera(2)	---	---	Yes / No	---	---
	displaySequence(3)	---	---	Yes / No	---	---
	holdSequence(4)	---	---	Yes / No	---	---
	nextSequentialCamera(5)	---	---	Yes / No	---	---
	previousSequentialCamera(6)	---	---	Yes / No	---	---
	restartSequence(7)	---	---	Yes / No	---	---
3.6.3.4	cctvSwitchAssignmentCameraPortNumber	P	3.6 : M	Yes	1-65535	
3.6.3.5	cctvSwitchAssignmentCameraPortLabelNumber	P	3.6 : M	Yes	0-65535	
3.6.3.6	cctvSwitchAssignmentTimeDateOverlay	P	3.6 : M	Yes	1-5	
	other(1)	---	---	Yes / No	---	---
	timeNotDisplayed(2)	---	---	Yes / No	---	---
	timeDispayed(3)	---	---	Yes / No	---	---
	dateDisplayed(4)	---	---	Yes / No	---	---
	bothTimeDateDisplayed(5)	---	---	Yes / No	---	---
3.6.3.7	cctvSwitchAssignmentSequenceNumber	P	3.6 : M	Yes	1-65535	
3.6.3.8	cctvSwitchAssignmentStatus	S	3.6 : M	Yes	1-6	
	other(1)	---	---	Yes / No	---	---
	noCameraPortAssignment(2)	---	---	Yes / No	---	---
	cameraPortOutOfRange(3)	---	---	Yes / No	---	---
	monitorPortOutOfRange(4)	---	---	Yes / No	---	---
	dwellTimeOutOfRange(5)	---	---	Yes / No	---	---
	noSequenceDefined(6)	---	---	Yes / No	---	---
3.6.3.9	cctvSwitchAssignmentGroupStatus	S	3.6 : M	Yes	1-3	
	other(1)	---	---	Yes / No	---	---
	groupAssignmentFailed(2)	---	---	Yes / No	---	---
	groupUnidentified(3)	---	---	Yes / No	---	---
3.6.3.10	cctvSwitchAssignmentGroupSequenceStatus	S	3.6 : M	Yes	1-3	
	other(1)	---	---	Yes / No	---	---
	groupSequenceAssignmentFailed(2)	---	---	Yes / No	---	---
	groupSequenceUnidentified(3)	---	---	Yes / No	---	---
3.6.4	cctvSwitchGlobalLabelDisable	C	3.6 : M	Yes	String	
	bit 7 – Global Label Display	---	---	Yes	---	---

CCTV Switch Assignment CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
	bit 6 – Reserved	---	---	---	---	---
	bit 5 – Reserved	---	---	---	---	---
	bit 4 – Reserved	---	---	---	---	---
	bit 3 – Reserved	---	---	---	---	---
	bit 2 – Reserved	---	---	---	---	---
	bit 1 – Reserved	---	---	---	---	---
	bit 0 – Reserved	---	---	---	---	---
3.7	**CCTV Switch Sequence Objects**	---	---	---	---	---
3.7.1	cctvSwitchMaximumSequences	S	3.7 : M	Yes	1-65535	
3.7.2	cctvSwitchSequenceTable	---	3.7 : M	Yes	---	---
	cctvSwitchSequenceEntry	---	3.7 : M	Yes	---	---
3.7.2.1	cctvSwitchSequenceNumber	S	3.7 : M	Yes	1-65535	
3.7.2.2	cctvSwitchSequenceDefinition	P	3.7 : M	Yes	String	
	Bytes 1 and 2 – Camera Port Number	---	---	Yes	---	---
	Byte 3 – Dwell Time	---	---	Yes	---	---
3.7.2.3	cctvSwitchSequenceLabelNumber	P	3.7 : M	Yes	0-65535	
3.8	**CCTV Switch Group Objects**	---	---	---	---	---
3.8.1	cctvSwitchMaximumGroups	S	3.8 : M	Yes	1-65535	
3.8.2	cctvSwitchGroupTable	---	3.8 : M	Yes	---	---
	cctvSwitchGroupEntry	---	3.8 : M	Yes	---	---
3.8.2.1	cctvSwitchGroupNumber	S	3.8 : M	Yes	1-65535	
3.8.2.2	cctvSwitchGroupDefinition	P	3.8 : M	Yes	String	
	Bytes 1 and 2 – Camera Port Number	---	---	Yes	---	---
	Bytes 3 and 4 – Monitor Port Number	---	---	Yes	---	---
3.8.2.3	cctvSwitchGroupLabelNumber	P	3.8 : M	Yes	0-65535	
3.8.3	cctvSwitchActivateGroup	C	3.8 : M	Yes	0-255	
3.9	**CCTV Switch Group Sequence Objects**	---	---	---	---	---
3.9.1	cctvSwitchMaximumGroupSequences	S	3.9 : M	Yes	1-65535	
3.9.2	cctvSwitchGroupSequenceTable	---	3.9 : M	Yes	---	---
	cctvSwitchGroupSequenceEntry	---	3.9 : M	Yes	---	---
3.9.2.1	cctvSwitchGroupSequenceNumber	S	3.9 : M	Yes	1-65535	
3.9.2.2	cctvSwitchGroupSequenceDefinition	P	3.9 : M	Yes	String	
	Bytes 1 and 2 – Camera Port Number	---	---	Yes	---	---
	Bytes 3 and 4 – Monitor Port Number	---	---	Yes	---	---
	Byte 5 – Dwell Time	---	---	Yes	---	---
3.9.2.3	cctvSwitchGroupSequenceLabelNumber	P	3.9 : M	Yes	0-65535	
3.9.3	cctvSwitchActivateGroupSequence	C	3.9 : M	Yes	0-255	

B.4 CCTV SWITCH DISCRETE I/O CONFORMANCE GROUP

The CCTV Switch Discrete I/O Conformance Group consists of the following objects:

CCTV Switch Discrete I/O CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
3.2 and 3.3	**CCTV Switch Discrete I/O Conformance Group**	---	O	Yes / No	---	---
3.2	**CCTV Switch Discrete Input Objects**	---	---	---	---	---
3.2.1	inputStatus	S	3.2 : M	Yes	String	
	bit 7 – Discrete Input 8 Active Status	---	---	Yes	---	---
	bit 6 – Discrete Input 7 Active Status	---	---	Yes	---	---
	bit 5 – Discrete Input 6 Active Status	---	---	Yes	---	---
	bit 4 – Discrete Input 5 Active Status	---	---	Yes	---	---
	bit 3 – Discrete Input 4 Active Status	---	---	Yes	---	---
	bit 2 – Discrete Input 3 Active Status	---	---	Yes	---	---
	bit 1 – Discrete Input 2 Active Status	---	---	Yes	---	---
	bit 0 – Discrete Input 1 Active Status	---	---	Yes	---	---
3.2.2	inputLatchStatus	S	3.2 : M	Yes	String	
	bit 7 – Discrete Input 8 Latch Status	---	---	Yes	---	---
	bit 6 – Discrete Input 7 Latch Status	---	---	Yes	---	---
	bit 5 – Discrete Input 6 Latch Status	---	---	Yes	---	---
	bit 4 – Discrete Input 5 Latch Status	---	---	Yes	---	---
	bit 3 – Discrete Input 4 Latch Status	---	---	Yes	---	---
	bit 2 – Discrete Input 3 Latch Status	---	---	Yes	---	---
	bit 1 – Discrete Input 2 Latch Status	---	---	Yes	---	---
	bit 0 – Discrete Input 1 Latch Status	---	---	Yes	---	---
3.2.3	inputLatchClear	C	3.2 : M	Yes	String	
	bit 7 – Discrete Input 8 Latch Clear	---	---	Yes	---	---
	bit 6 – Discrete Input 7 Latch Clear	---	---	Yes	---	---
	bit 5 – Discrete Input 6 Latch Clear	---	---	Yes	---	---
	bit 4 – Discrete Input 5 Latch Clear	---	---	Yes	---	---
	bit 3 – Discrete Input 4 Latch Clear	---	---	Yes	---	---
	bit 2 – Discrete Input 3 Latch Clear	---	---	Yes	---	---
	bit 1 – Discrete Input 2 Latch Clear	---	---	Yes	---	---
	bit 0 – Discrete Input 1 Latch Clear	---	---	Yes	---	---
3.2.4	inputTable	---	3.2 : M	Yes	---	---
	inputTableEntry	---	3.2 : M	Yes	---	---
3.2.4.1	inputNumber	S	3.2 : M	Yes	1-8	
3.2.4.2	inputCameraPortNumber	P	3.2 : M	Yes	0-65535	
3.2.4.3	inputMonitorPortNumber	P	3.2 : M	Yes	0-65535	
3.2.4.4	inputLabelNumber	P	3.2 : M	Yes	0-65535	
3.3	**CCTV Switch Discrete Output Objects**	---	---	---	---	---
3.3.1	outputStatus	S	3.3 : M	Yes	String	
	bit 7 – Discrete Output 8 Active Status	---	---	Yes	---	---
	bit 6 – Discrete Output 7 Active Status	---	---	Yes	---	---
	bit 5 – Discrete Output 6 Active Status	---	---	Yes	---	---
	bit 4 – Discrete Output 5 Active Status	---	---	Yes	---	---
	bit 3 – Discrete Output 4 Active Status	---	---	Yes	---	---
	bit 2 – Discrete Output 3 Active Status	---	---	Yes	---	---
	bit 1 – Discrete Output 2 Active Status	---	---	Yes	---	---
	bit 0 – Discrete Output 1 Active Status	---	---	Yes	---	---
3.3.2	outputControl	C	3.3 : M	Yes	String	
	Byte 1, bit 7 – Discrete Output 8 Control	---	---	Yes	---	---
	Byte 1, bit 6 – Discrete Output 7 Control	---	---	Yes	---	---
	Byte 1, bit 5 – Discrete Output 6 Control	---	---	Yes	---	---
	Byte 1, bit 4 – Discrete Output 5 Control	---	---	Yes	---	---
	Byte 1, bit 3 – Discrete Output 4 Control	---	---	Yes	---	---
	Byte 1, bit 2 – Discrete Output 3	---	---	Yes	---	---

CCTV Switch Discrete I/O CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
	Control Byte 1, bit 1 – Discrete Output 2 Control Byte 1, bit 0 – Discrete Output 1 Control	--- ---	--- ---	Yes Yes	--- ---	--- ---
	Byte 2, bit 7 – Discrete Output 8 Active Byte 2, bit 6 – Discrete Output 7 Active Byte 2, bit 5 – Discrete Output 6 Active	--- --- ---	--- --- ---	Yes Yes Yes	--- --- ---	--- --- ---
	Byte 2, bit 4 – Discrete Output 5 Active Byte 2, bit 3 – Discrete Output 4 Active Byte 2, bit 2 – Discrete Output 3 Active	--- --- ---	--- --- ---	Yes Yes Yes	--- --- ---	--- --- ---
	Byte 2, bit 1 – Discrete Output 2 Active Byte 2, bit 0 – Discrete Output 1 Active	--- ---	--- ---	Yes Yes	--- ---	--- ---
3.3.3	outputTable	---	3.3 : M	Yes	---	---
3.3.3.1	outputTableEntry outputNumber	--- S	3.3 : M 3.3 : M	Yes Yes	--- 1-8	---
3.3.3.2	outputCameraPortNumber	P	3.3 : M	Yes	0-65535	
3.3.3.3	outputMonitorPortNumber	P	3.3 : M	Yes	0-65535	
3.3.3.4	outputLabelNumber	P	3.3 : M	Yes	0-65535	

B.5 CCTV SWITCH CAMERA STATUS CONFORMANCE GROUP

The CCTV Switch Camera Status Conformance Group shall consist of the following objects:

CCTV Switch Camera Status CONFORMANCE GROUP						
NTCIP 1208 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
3.10	**CCTV Switch Camera Status Objects**	---	O	Yes / No	---	---
3.10.1	cctvSwitchCameraStatusTable cctvSwitchCameraStatusEntry	--- ---	3.10 : M 3.10 : M	Yes Yes	--- ---	--- ---
3.10.1.1	cctvSwitchCameraPortNumber	S	3.10 : M	Yes	1-65535	
3.10.1.2	cctvSwitchVideoLoss bit 7 – Video Picture Signals bit 6 – Reserved	S --- ---	3.10 : M --- ---	Yes Yes ---	String --- ---	 --- ---
	bit 5 – Reserved bit 4 – Reserved bit 3 – Reserved	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---
	bit 2 – Reserved bit 1 – Reserved bit 0 – Reserved	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---
3.10.1.3	cctvSwitchVideoLossLabelNumber	P	3.10 : M	Yes	0-65535	

B.6 GLOBAL CONFIGURATION CONFORMANCE GROUP

The Global Configuration Conformance Group shall consist of the following objects:

Global Configuration CONFORMANCE GROUP						
NTCIP 1201 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
2.2	**Global Config Objects**	---	M	Yes	---	---
2.2.1	globalSetIDParmeter	S	2.2 : O	Yes / No	0-65535	
2.2.2	globalMaxModules	S	2.2 : M	Yes	0-255	
2.2.3	globalModuleTable	---	2.2 : M	Yes	---	---
	moduleTableEntry	---	2.2 : M	Yes	---	---
2.2.3.1	moduleNumber	S	2.2 : M	Yes	1-255	
2.2.3.2	moduleDeviceNode	S	2.2 : M	Yes	OID	
2.2.3.3	moduleMake	S	2.2 : M	Yes	String	
2.2.3.4	moduleModel	S	2.2 : M	Yes	String	
2.2.3.5	moduleVersion	S	2.2 : M	Yes	String	
2.2.3.6	moduleType	S	2.2 : M	Yes	1-3	
	other(1)	---	---	Yes / No	---	---
	hardware(2)	---	---	Yes / No	---	---
	software(3)	---	---	Yes / No	---	---
2.2.4	controller-baseStandards	S	2.2 :O	Yes / No	String	

B.7 TIME MANAGEMENT CONFORMANCE GROUP

The Time Management Conformance Group shall consist of the following objects:

Time Management CONFORMANCE GROUP						
NTCIP 1201v2 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
2.4	**Time Management Conformance Group**	---	O	Yes / No	---	---
2.4.1	globalTme	C	2.4 : M	Yes	Counter	
2.4.2	globalDaylightSavings	P	2.4 : M	Yes	1-3	
2.4.6	controller-standardTimeZone	P	2.4 : M	Yes	-43200 - 43200	
2.4.7	controller-localTime	S	2.4 : M	Yes	Counter	

B.8 NTCIP SECURITY CONFORMANCE GROUP

The NTCIP Security Conformance Group shall consist of the following objects:

Security CONFORMANCE GROUP						
NTCIP 1103 Clause	**Object Name**	**Object Type**	**Object Status**	**Object Support**	**Allowed Values**	**Supported Values**
A.10	**Security Conformance Group**	--	M	Yes	----	---
A.10.1	adminCommunityName	C	A.10 : M	Yes	String	
A.10.2	maxCommunityNames	C	A.10 : M	Yes	1..255	
A.10.3	communityNameTable	--	A.10 : M	Yes	---	
	communityNameTableEntry	--	A.10 : M	Yes	---	
A.10.3.1	communityNameIndex	S	A.10 : M	Yes	1..255	
A.10.3.2	communityNameString	S	A.10 : M	Yes	String	
A.10.3.3	communityNameAccessMask	S	A.10 : M	Yes	Gauge	

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