

NTCIP 1210 v01

National Transportation
Communications for ITS Protocol

Field Management Stations (FMS) - Part 1: Object Definitions for Signal System Masters (SSM)

A Joint Standard of AASHTO, ITE, and NEMA



NTCIP Standards Publication

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American Association of State Highway and Transportation Officials (AASHTO)
Institute of Transportation Engineers (ITE)
National Electrical Manufacturers Association (NEMA)

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NTCIP 1210 v01 was prepared by the NTCIP Field Master Stations Working Group (FMS WG), which is a subdivision of the Joint Committee on the NTCIP. The Joint Committee on the NTCIP 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.

When NTCIP 1210 v01 was prepared, the following individuals were active members of the NTCIP FMS WG:

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Transportation |

INTRODUCTION

NTCIP 1210 v01 defines the management information related to a Signal System Master (SSM). SSM management information includes individual parameters that represent the configuration, status, and control information that is unique to SSMs. NTCIP 1210 v01 also includes pre-defined message sets of these parameters and others from other standards to address operational and informational exchanges in a baseline system configuration. The parameters and message sets are collectively referred to as objects. Specific groupings of these parameters and others to address operational configuration, monitoring, and control in a baseline system configuration are defined. The objects are defined using several ASN.1 Macros that were initially developed for use with Internet information management. The macros have been modified to include additional information specific to NTCIP and ITS Data Dictionaries and Message Sets.

NTCIP 1210 v01 defines requirements that are applicable to an NTCIP environment that involves the control of traffic signal controllers. While the term SSM implies some type of physical device, many of the data concepts are applicable to any logical implementation. By definition, an SSM operates in the context of a "system" that includes traffic signal controllers and office, computer-based traffic management center software. NTCIP 1210 v01, therefore, imposes requirements on both of these "system" components, as well.

NTCIP 1210 v01 defines requirements that are applicable to all NTCIP environments and also contains optional and conditional elements that are applicable to specific environments for which they are intended. NTCIP 1210 v01 is an NTCIP Device Data Dictionary Standard and an Information Profile standards publication. Device Data Dictionaries Standards express management information in terms of objects (data elements, data frames, and messages) for use within NTCIP systems. Information Profiles reference one or more object definition, data dictionary, and/or message set standards to fully describe the information level requirements.

The following keywords apply to NTCIP 1210 v01: AASHTO, ITE, NEMA, NTCIP, FMS, and SSM.

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began development of the NTCIP. The NEMA Transportation Section's purpose was in response to user needs to include standardized systems communications in NEMA TS 2, *Traffic Controller Assemblies*. 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 Intelligent Transportation Systems (ITS) network.

In September 1996, an agreement was executed among AASHTO, ITE, and NEMA to jointly develop, approve, and maintain the NTCIP standards. The Joint Committee on the NTCIP formed the Field Master Working Group to define a common set of management information related to roadside devices that act in a supervisory capacity. The first meeting of the working group was in February 2000. The WG name was subsequently revised to Field Management Stations WG (FMS WG).

After considering all functionality that could be considered appropriate to a field master, the FMS WG developed a work plan based upon a two-part standard. The initial part, *Object Definitions for Signal System Masters*, addresses the information and operational requirements of traditional "closed-loop" systems. A second part was envisioned to address requirements of an advanced "field management station" that go beyond signal controllers to include such devices as dynamic message signs, environmental system sensors, CCTV camera controllers, and ramp metering controllers.

For more information about NTCIP standards, visit the NTCIP website at www.ntcip.org.

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All User Comments are referred to the committee responsible for developing and/or maintaining this NTCIP 1210 v01. 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 is 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 NTCIP 1210 v01. Previous User Comments and their disposition may be available for reference and information at www.ntcip.org.

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Approvals

NTCIP 1210 v01 was separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization has approved NTCIP 1210 v01 as the following standard type, as of the date:

AASHTO—Standard Specification; May 2011
ITE—Software Standard; June 2011
NEMA—Standard; December 2010

History

The following is the development history of NTCIP 1210 v01:

NTCIP 1210 v01—the User Comment Drafts (UCDs). The FMS WG started drafting NTCIP 1210 v01 in the year 2000. Two UCDs were accepted by the NTCIP Joint Committee—the first UCD, version v01.14, was accepted in December 2001, and the second UCD, version v01.46, was accepted in August 2007. Because of the number of user comments on the first UCD, significant revisions included addition of Systems Engineering content. The additional content included a Signal System Master Concept of

Operations, user needs, and requirements. With the minor version numbering reaching v01.40, the FMS WG added dialogs and objects to the draft, which satisfied the ConOps and fulfilled the requirements. Traceability was provided by the PRL and RTM.

NTCIP 1210 v01—the Recommended Standard. In April 2008, v01.47 disposed of the second round of User Comments. In May 2008, the v01.48 proposed Recommended Standard was submitted to the NTCIP Joint Committee for acceptance. In May 2008, the NTCIP Joint Committee accepted v01.48 as the Recommended Standard. However, in August 2008, the JC had extended discussion on the approach to resolve quality issues. Planning for a quality audit ensued.

NTCIP 1210 v01—the substitute Recommended Standard. In December 2008, a Walkthrough Exercise of NTCIP 1210 v01.49 was conducted for logical consistency and traceability. In January through March 2009, the decisions from the Walkthrough Exercise were posted, the MIB was checked, and tracing was quality checked in several minor versions ~v01.51. In March 2009, the 1210 MIB was reported to compile with no errors. Also in March 2009, the NTCIP Joint Committee approved the substitution of v01.52 as the Recommended Standard.

NTCIP 1210 v01—ballot and Joint Approval. In 2009, the normative reference dependency of “same or higher status” delayed issuance of NTCIP 1210 v01 until after NTCIP 1201 v03, *Global Object (GO) Definitions*, was sent for balloting and approval. In May 2010, the normative reference hold was removed, and NTCIP 1210 v01.53 was edited for SDO balloting and approval. Following editing, NTCIP 1210 v01.55 was published.

Compatibility of Versions

To distinguish NTCIP 1210 v01 (as published) from previous drafts, NTCIP 1210 v01 also includes NTCIP 1210 v01.55 on each page header. 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.

NTCIP 1210 v01 is designated, and should be cited as, NTCIP 1210 v01. Anyone using NTCIP 1210 v01 should seek information about the version number that is of interest to them in any given circumstance. The MIB, the PRL, and the PICS should all reference the version number of the standards publication that was the source of the excerpted material.

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 NTCIP 1210 v01 should also consult NTCIP 8004 v02 for specific guidelines on compatibility.

CONTENTS

	Page
SECTION 1 GENERAL [INFORMATIVE]	1
1.1 Scope	1
1.1 References.....	1
1.1.1 Normative References	1
1.1.2 Other References.....	2
1.1.3 Contact Information.....	2
1.2 Terms	2
1.3 SSM Object Tree.....	7
SECTION 2 CONCEPT OF OPERATIONS [NORMATIVE]	8
2.1 Tutorial [Informative]	8
2.2 Current Situation and Problem Statement [Informative]	11
2.3 Reference Physical Architecture.....	12
2.3.1 Remote Signal System	13
2.3.2 Hierarchical Distributed Signal System.....	14
2.3.3 Operational Policies and Assumptions	14
2.4 Architectural Needs.....	14
2.4.1 Provide Live Data.....	15
2.4.2 Provide Off-Line Logged Data	15
2.4.3 Connect Communications Networks.....	15
2.4.4 Support Legacy Communications Networks.....	15
2.5 Features	15
2.5.1 Manage SSM	16
2.5.2 Manage SSLs.....	21
2.6 Security	21
2.7 Relationship of User Needs to National ITS Architecture Flows [Informative].....	21
2.8 Operational Scenarios [Informative].....	22
2.8.1 Remote Signal System, Low-Speed Communications	22
2.8.2 Hierarchical Distributed Signal System on Low-Speed Infrastructure	23
2.8.3 Hierarchical Distributed Signal System with High-Speed Communications	24
SECTION 3 FUNCTIONAL REQUIREMENTS [NORMATIVE]	25
3.1 Tutorial	25
3.2 Protocol Requirements List (PRL)	25
3.2.1 User Needs Column.....	26
3.2.2 Requirements Column	26
3.2.3 Conformance Column	26
3.2.4 Support Column	27
3.2.5 Instructions for Completing the PRL	27
3.2.6 Protocol Requirements List (PRL)	28
3.3 Operational Environment Requirements.....	35
3.3.1 Support Basic Communications.....	35
3.3.2 Support Logged Event Data.....	36

3.3.3	Manage Access	36
3.4	Data Exchange Requirements	36
3.4.1	Collect System Detector Data	36
3.4.2	Manage the SSM Configuration	37
3.4.3	Manage System Timing Plans	38
3.4.4	Monitor the SSM Operation	40
SECTION 4	DIALOG SPECIFICATIONS [NORMATIVE]	43
4.1	Simple Network Management Protocol (SNMP)	43
4.1.1	Generic SNMP Get Interface	43
4.1.2	Generic SNMP Get Next Interface	44
4.1.3	Generic SNMP Set Interface	45
4.1.4	Variable Binding List Structure	45
4.1.5	Additional Requirements	46
4.2	Dialogs	46
4.2.1	Configure Sensor Source and Volume/Occupancy Period	48
4.2.2	Configure Section and Intersection Information in SSM	48
4.2.3	Timing Plans	49
4.2.4	Configure SSM Timekeeping	49
4.2.5	Configure Schedule Plan Selection	49
4.2.6	Configure Traffic-Responsive Plan Selection	50
4.2.7	Engage Plan Selection	53
4.2.8	Synchronize the SSL Time-of-Day Clocks	53
4.2.9	Synchronize the SSL Coordination by SSM Direct Command	53
4.2.10	Set Block Data	54
4.2.11	Get Block Data	54
4.2.12	Monitor the SSM Operation	54
4.2.13	Pass-Through Interface Dialog	56
4.2.14	Configure SSM to SSL Command and Polling Interface	56
4.2.15	Determine Current Configuration and Capabilities of Event Logging Service	57
4.2.16	Configure Event Logging Service	57
4.2.17	Retrieve Event Logged Data	58
4.2.18	Clear Event Log	58
4.2.19	Determine Security Configuration	58
4.2.20	Security Configuration	58
4.2.21	Engage Timing Plan in the SSL by SSM Direct Command	59
4.2.22	TMS Plan Selection Override for Each Section	59
SECTION 5	SIGNAL SYSTEM MASTER OBJECT DEFINITIONS [NORMATIVE]	60
5.1	Section Setup	62
5.1.1	Maximum Sections	62
5.1.2	Section Setup Table	62
5.2	Intersection Setup	64
5.2.1	Maximum Number of Intersections	64
5.2.2	Intersection Setup Table	65
5.3	Command Setup	66

5.3.1	Maximum Commands	66
5.3.2	Command Table.....	67
5.4	Message Object Identifiers	70
5.4.1	Max Message OID Pairs	71
5.4.2	SSM Message OID Table	71
5.5	TMP Message Setup.....	74
5.5.1	TMP Maximum Messages	75
5.5.2	TMP Maximum Message Variables	75
5.5.3	TMP Message Setup Table	76
5.6	TMP Message Configuration	83
5.6.1	TMP Message Configuration Table	83
5.7	PMPP Routing.....	84
5.7.1	Maximum Messages Routed	85
5.7.2	SSL Message Routed Table	85
5.8	Intersection Status	89
5.8.1	Intersection Status Table	89
5.9	Control Mode.....	94
5.9.1	Control Mode Table.....	94
5.10	System Re-Sync	105
5.10.1	System Re-Sync Control.....	105
5.10.2	Max SSM Patterns	105
5.10.3	Pattern Cycle Length Table	105
5.11	SSM TimeBase	106
5.11.1	Maximum Timebase SSM Actions	107
5.11.2	Maximum Timebase SSM Action Tasks	107
5.11.3	Timebase SSM Action Table	107
5.12	Sensor Source	110
5.12.1	Maximum Sensor Sources.....	111
5.12.2	Sensor Data Table	111
5.13	SSM Volume Occupancy Configuration.....	117
5.13.1	SSM Volume Occupancy Table	117
5.14	Detector Group Configuration	118
5.14.1	Detector Group Configuration Table	118
5.14.2	Detector Group Output Table.....	122
5.15	Detector Configuration	123
5.15.1	Maximum Detectors Per Group	123
5.15.2	Detector Configuration Table	123
5.16	Computational Channel Detector Group.....	124
5.16.1	Computational Channel Detector Group Configuration Table	124
5.16.2	Threshold Comparator Channel Input Output Table.....	126
5.17	Threshold COS Matrix.....	130
5.17.1	Maximum Levels Cycle	130
5.17.2	Maximum Levels Split	131
5.17.3	Maximum Levels Offset	131

5.17.4	Levels to Output Table	131
5.18	Auxiliary Channels Output	133
5.18.1	Auxiliary Queue, Occupancy, and Non-Arterial Levels.....	133
5.18.2	Auxiliary Queue Output Matrix Table	134
5.18.3	Auxiliary Occupancy Output Matrix Table	135
5.18.4	Auxiliary Non-Arterial Output Matrix Table	137
5.19	Transfer Threshold Levels	139
5.19.1	Transfer Thresholds Table	139
5.20	Signature Configuration	146
5.20.1	Maximum Signatures	146
5.20.2	Maximum Signature Detectors.....	146
5.20.3	Signature Configuration Table	146
5.21	Signature Historical Data	149
5.21.1	Signature Historical Data Table	150
5.22	Signature Sample.....	151
5.22.1	Signature Sample Configuration Table	151
5.22.2	Signature Match Table	152
5.22.3	Signature Weighting Configuration Table	153
5.23	Unit Parameters	154
5.23.1	Algorithm Support	154
5.23.2	Backup Time Parameter	155
5.24	Algorithm Update and Control.....	155
5.24.1	Algorithm Update and Control Table.....	155
5.25	SSM Block Objects	157
5.25.1	SSM Block Get Control	157
5.25.2	SSM Block Data	158
5.25.3	SSM Block Error Status	159
SECTION 6 SSM BLOCK OBJECT DEFINITIONS [NORMATIVE].....		160
6.1	Block Data Type & ID.....	160
6.2	SSM Section Setup Block	161
6.2.1	SSM Section Setup Block Example	162
6.3	SSM Intersection Setup Block	162
6.3.1	SSM Intersection Setup Block Example	163
6.4	SSM Command Sequence Block.....	163
6.4.1	SSM Command Sequence Block Example	164
6.5	SSM Message Object Identifier Block.....	164
6.5.1	SSM Message Object Identifier Block Example	165
6.6	SSM TMP Message Setup Block.....	165
6.6.1	TMP Message Setup Block Example.....	166
6.7	TMP Message Configuration Block.....	166
6.7.1	TMP Message Configuration Block Example	167
6.8	TMP Message Configuration Status Block	167
6.8.1	TMP Message Configuration Status Block Example	168
6.9	SSM Control Mode Block.....	168

6.9.1	SSM Control Mode Block Example	168
6.10	SSM Pattern Cycle Length Block	169
6.10.1	SSM Pattern Cycle Length Block Example	169
6.11	SSM Timebase Schedule Block	170
6.11.1	SSM Timebase Schedule Block Example	170
6.12	SSM Timebase Day Plan Block	171
6.12.1	Day Plan Block Example	171
6.13	SSM Timebase Action Block	172
6.13.1	SSM Timebase Action Block Example	173
6.14	SSM Sensor Source Block	173
6.14.1	SSM Sensor Source Block Example	174
6.15	SSM Volume Occupancy Configuration Block	174
6.15.1	SSM Volume Occupancy Configuration Block Example	175
6.16	SSM Detector Group Configuration Block	175
6.16.1	SSM Detector Group Configuration Block Example	176
6.17	SSM Detector Configuration Block	177
6.17.1	SSM Detector Configuration Block Example	177
6.18	SSM Comp Chan Detector Group Configuration Block	178
6.18.1	SSM Comp Chan Detector Group Configuration Block Example	179
6.19	SSM Threshold COS Matrix Block	179
6.19.1	SSM Threshold COS Matrix Block Example	180
6.20	SSM Aux Queue Channel Override Block	181
6.20.1	SSM Aux Queue Channel Override Block Example	182
6.21	SSM Aux Occup Channel Override Block	182
6.21.1	SSM Aux Occup Channel Override Block Example	183
6.22	SSM Aux Non-Arterial Channel Override Block	183
6.22.1	SSM Aux Non-Arterial Channel Override Block Example	184
6.23	SSM Transfer Thresholds Block	185
6.23.1	SSM Transfer Thresholds Block Example	185
6.24	SSM Algorithm Control Block	186
6.24.1	SSM Algorithm Control Block Example	187
6.25	SSM Signature Configuration Block	187
6.25.1	SSM Signature Configuration Block Example	187
6.26	SSM Signature Historical Block	188
6.26.1	SSM Signature Historical Block Example	189
6.27	SSM Signature Sample Block	190
6.27.1	SSM Signature Sample Block Example	190
6.28	SSM Signature Weighting Block	191
6.28.1	SSM Signature Weighting Block Example	191
6.29	SSM Miscellaneous Data Block	192
6.29.1	SSM Miscellaneous Data Block Example	192
6.30	SSM Event Class Block	193
6.30.1	SSM Event Class Block Example	193
6.31	SSM Event Config Block	194

6.31.1 SSM Event Config Block Example	194
6.32 SSM Dynamic Object Config Block.....	195
6.32.1 SSM Dynamic Object Config Block Example	196
6.33 SSM Dynamic Object Owner Block	196
6.33.1 SSM Dynamic Object Owner Block Example	196
6.34 SSM Dynamic Object Status Block.....	197
6.34.1 SSM Dynamic Object Status Block Example.....	197
6.35 SSM Watch Object Definition Block.....	198
6.36 SSM Watch Object Status Block.....	198
6.37 SSM Watch Block Definition Block	198
6.38 SSM Watch Block Status Block	198
6.39 SSM Report Object Configuration Block.....	198
6.40 SSM Report Object Status Block	198
6.41 SSM Report Block Definition Block.....	198
6.42 SSM Report Block Status Block.....	198
6.43 SSM Trap Management Block	199
6.44 SSM Trap Management Status Block.....	199
6.45 SSM Daylight Saving Block	199
6.45.1 SSM Daylight Saving Block Example	200
ANNEX A REQUIREMENTS TRACEABILITY MATRIX (RTM), SSM DEVICE, AND INFORMATION PROFILE REQUIREMENTS LIST	201
ANNEX B SSM DEVICE AND INFORMATION PROFILE [NORMATIVE]	216
B.1 Introduction	216
B.2 Notation.....	216
B.2.1 Type Symbols	216
B.3 Section Setup Group.....	216
B.4 Intersection Setup Group	217
B.5 Command Setup Group	217
B.6 Message Group.....	218
B.6.1 Message Object Identifier Group	218
B.6.2 TMP Message Setup Group	218
B.6.3 TMP Message Configuration Group	218
B.7 PMPP Routing Group.....	219
B.8 Intersection Status Group	219
B.9 Control Mode Group.....	220
B.10 System Resync Group	221
B.11 Timebase Group	221
B.11.1 Global Timebase Group.....	221
B.11.2 SSM Timebase Group.....	222
B.12 Threshold Algorithm Group	223
B.12.1 Sensor Source Group	223
B.12.2 Volume Occupancy Configuration Group	223
B.12.3 Detector Group Configuration Group	223
B.12.4 Detector Configuration Group	224

B.12.5 Computational Channel Detector Group	224
B.12.6 Threshold COS Matrix Group	225
B.12.7 Auxiliary Channels Output Group	225
B.12.8 Transfer Threshold Levels Group	226
B.12.9 Algorithm Update and Control Group	226
B.13 Signature Algorithm Group	227
B.13.1 Signature Configuration Group	227
B.13.2 Signature Historical Data Group	227
B.13.3 Signature Sample Group	227
B.14 Unit Parameters Group	228
B.15 Block Object Group	228
B.16 Global Configuration Group	229
B.17 Database Management Group	229
B.18 Report Group	230
B.19 PMPP Group	231
B.20 SNMP Group	231
B.21 System Group	231
B.22 SFMP Group	232
B.23 STMP Group	232
B.24 Logical Name Group	233
B.25 Security Group	233
B.26 RS232 Group	233
B.27 HDLC Group	234
B.28 Interfaces Group	235
B.29 IP Group	236
B.30 ICMP Group	237
B.31 TCP Group	237
B.32 UDP Group	238
B.33 Ethernet Group	238
B.34 PPP Table	239
B.35 Dialog Table	239
ANNEX C SSM CONTROL HIERARCHY [NORMATIVE]	241
C.1 SSM Section Pattern Control Hierarchy	241
C.2 SSM Section Special Function Control Hierarchy	241

FIGURES

	Page
Figure 1 Naming Tree	7
Figure 2 Sample Activity Diagram	10
Figure 3 Sample Activity Diagram—Alternate	13
Figure 4 Architectural Needs	15
Figure 5 Features	16
Figure 6 Manage SSM	16
Figure 7 Manage System Timing Plans	17
Figure 8 Monitor System Operation	20
Figure 9 SNMP Get Interface	44

Figure 10 SNMP GetNext Interface	44
Figure 11 SNMP Set Interface	45
Figure 12 SNMP Interface—View of Participating Classes	46
Figure 13 SSM Section Pattern Control Hierarchy	242
Figure 14 SSM Section Special Function Control Hierarchy	243

TABLES

	Page
Table 1 Main User Needs and National ITS Architecture	22
Table 2 Status Symbols	26
Table 3 Predicate Notations.....	27
Table 4 Project Requirement Column Options	27
Table 5 Protocol Requirements List (PRL)	28
Table 6 DataType and Description	160
Table 7 NTCIP Standard Data Block ssmBlockData-dataID Definitions	160
Table 8 Requirements Traceability Matrix (RTM)	201
Table 9 Type Symbols	216
Table 10 SSM Section Setup Group Objects.....	217
Table 11 SSM Intersection Setup Group Objects	217
Table 12 SSM Command Setup Group Objects	217
Table 13 SSM Message Group Objects	218
Table 14 SSM Message Object Identifier Group Objects	218
Table 15 TMP Message Setup Group Objects	218
Table 16 TMP Message Configuration Group Objects	219
Table 17 PMPP Routing Group	219
Table 18 Intersection Status Group	219
Table 19 Control Mode Group	220
Table 20 System Resync Group	221
Table 21 Timebase Group	221
Table 22 Global Timebase Group.....	221
Table 23 Timebase Group	222
Table 24 Threshold Algorithm Group.....	223
Table 25 Sensor Source Group	223
Table 26 Volume Occupancy Configuration Group	223
Table 27 Detector Group Configuration Group	223
Table 28 Detector Configuration Group	224
Table 29 Computational Channel Detector Group.....	224
Table 30 Threshold COS Matrix Group	225
Table 31 Auxiliary Channels Output Group	226
Table 32 Transfer Threshold Levels Group	226
Table 33 Algorithm Update and Control Group	226
Table 34 Signature Algorithm Group	227
Table 35 Signature Configuration Group	227
Table 36 Signature Historical Data Group	227
Table 37 Signature Sample Group	228
Table 38 Unit Parameters Group	228
Table 39 Block Object Group	228
Table 40 Global Configuration Group	229
Table 41 Database Management Group.....	230
Table 42 Report Group Objects	230
Table 43 PMPP Group Objects.....	231
Table 44 SNMP Group Objects	231
Table 45 System Group	231
Table 46 SFMP Group	232
Table 47 STMP Group	232
Table 48 Logical Name Group	233

Table 49 Security Group	233
Table 50 RS232 Group	233
Table 51 HDLC Group	234
Table 52 Interfaces Group	235
Table 53 IP Group.....	236
Table 54 ICMP Group	237
Table 55 TCP Group	237
Table 56 UDP Group.....	238
Table 57 Ethernet Group.....	238
Table 58 PPP Objects.....	239
Table 59 Dialog Table	239

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Section 1 GENERAL [INFORMATIVE]

1.1 SCOPE

NTCIP 1210 v01 defines requirements related to the Information Level communications interface between a management station and a signal system master (SSM). This is achieved through the presentation of user needs for such an interface in Section 2 with detailed functional requirements presented in Section 3.

NTCIP 1210 v01 includes references to the communications interface between the SSM and a Signal System Local (SSL). However, the standardized definition of that interface is provided in other standards, such as NTCIP 1202 v02.

NTCIP 1210 v01 only addresses a subset of agency specification (procurement) requirements. NTCIP 1210 v01 does not address requirements related to the accuracy of readings, hardware components, mounting details, etc.

NTCIP 1210 v01 standardizes the communications interface by identifying the various operational needs of users and subsequently identifying the requirements that supported each need. A summary of the conformance requirements are provided in Annex A through a Requirements Traceability Matrix (RTM).

1.1 REFERENCES

Normative references contain provisions that, through reference in this text, constitute provisions of NTCIP 1210 v01. Other references in NTCIP 1210 v01 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 NTCIP 1210 v01 are encouraged to investigate the possibility of applying the most recent editions of the standard listed.

1.1.1 Normative References

AASHTO / ITE / NEMA NTCIP 1103 v02	<i>Transportation Management Protocols</i> published July 2010
AASHTO / ITE / NEMA NTCIP 1201 v03	<i>Global Object (GO) Definitions</i> published March 2011
AASHTO / ITE / NEMA NTCIP 1202:2005	<i>Object Definitions for Actuated Traffic Signal Controller (ASC) Units</i> published November 2005
	NOTE—NTCIP 1202:2005 is referenced as NTCIP 1202 v02.
AASHTO / ITE / NEMA NTCIP 8004 v02	<i>Structure and Identification of Management Information (SMI)</i> published June 2010
IAB STD 17	<i>(RFC 1213) Management Information Base for Network Management of TCP/IP-based Internets: MIB-II</i> . K. McCloghrie; M. Rose; March 1991