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

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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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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

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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.

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

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