NTCIP 8004 v02

National Transportation Communications for ITS Protocol

Structure and Identification of Management Information (SMI)

A Joint Standard of AASHTO, ITE, and NEMA

version 02.17

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NTCIP 8004 v02 was prepared by the NTCIP Base Standards and Profiles 2 (BSP2) Working Group (WG), which is a subdivision of the Joint Committee on the NTCIP. 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 NTCIP 8004 v02 was prepared, the following individuals were members of the NTCIP BSP2 WG:

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- Blake Christie
- Kenneth Vaughn

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- URS Greiner
- Washington State Department of Transportation

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FOREWORD

NTCIP 8004 v02 specifies a set of rules and protocols for organizing, describing, and defining transportation management information to be exchanged between transportation management applications and transportation equipment. NTCIP 8004 v02 defines requirements that are applicable to all NTCIP devices that exchange data in that transportation environment.

In addition, NTCIP 8004 v02 contains mandatory requirements that are applicable to all devices claiming conformance to NTCIP 8004 v02. NTCIP 8004 v02 also contains optional and conditional requirements, which may be applicable to a specific environment in which a device is used. NTCIP 8004 v02 has five annexes, but only Annex A is normative. NTCIP 8004 v02 uses only metric units.

NTCIP 8004 v02 is also an NTCIP Process, Control, and Information Management document that defines the practices and policies used by the NTCIP Joint Committee in developing and maintaining NTCIP standards publications. Specifically, NTCIP 8004 v02 is applicable to the NTCIP 1200 series and other NTCIP standards that deal with device data dictionaries.

The following keywords apply to NTCIP 8004 v02: AASHTO, Dynamic Objects, ITE, NEMA, NTCIP, SMI, SNMP, STMP, process and control standard.

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Approvals

NTCIP 8004 v02 was separately balloted and approved by AASHTO, ITE, and NEMA after recommendation by the Joint Committee on the NTCIP. Each organization has approved NTCIP 8004 v02 as the following standard type, as of the date:

AASHTO—Standard Specification; May 2010
ITE—Software Standard; June 2010
NEMA—Standard; December 2009

History

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began development of the NTCIP. The Transportation Section's purpose was in response to user needs to include standardized systems communication in the NEMA TS 2 standard, *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 NTCIP has sponsored the development of a number of standards that define device data dictionaries. After the NTCIP Class B Profile was published, the Joint Committee on the NTCIP determined that the communications profiles should be modular to meet the varied needs of different communication environments. The Joint Committee on the NTCIP formed both the Base Standards and Protocols Working Group (BSP WG) and the Profiles WG. After reorganization, the two WGs merged to form the Base Standards and Profiles (BSP2) WG. The first meeting of the working group was in January 1999.

During early stages of development, portions of NTCIP 8004 v02 were part of NTCIP 1101:1996, which was also numbered and referenced as NEMA TS 3.2-1996. However, to provide a more systematic approach to an organized numbering scheme, and to reflect the joint copyright of AASHTO, ITE, and NEMA, the current designation is NTCIP 8004 v02.

NTCIP 8004 v02 was originally part of NTCIP 1101:1996, *Simple Transportation Management Framework*. In July 1999, the Joint Committee on the NTCIP approved a work item to separate a predecessor of NTCIP 8004 v02 into a stand-alone document. In January 2000, the BSP WG submitted a work plan and initiated development of NTCIP 8004 SMI.

NTCIP 8004 v02.04, May 2006—NTCIP Joint Committee accepted the User Comment Draft, which included changes harmonized to NTCIP 8005 v01.18. The references to the <DescriptiveName> and <DataType> subfields were deleted, and a new <Object identifier> subfield was added to reflect the full Object identifier value from the root node.

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NTCIP 8004 v02.07, January 2007—NTCIP Joint Committee further accepted the addition of a new Section 2.6 in the User Comment Draft, in accordance with Technical Coordination Forum (TCF) recommendations on backward compatibility. In January 2007, Standards Bulletin B0118 issued v02.07 for review and comment.

NTCIP 8004 v02.12, October 2007—NTCIP Joint Committee accepted v02.12 as a Recommended Standard, with instructions for two revisions. January 2008—Revised definition of 'deprecated' per Joint Committee, and updated figures to reflect new nodes.

NTCIP 8004 v02.15, September 2009—NTCIP Standards Bulletin B0134 issued for ballot and approval, after v02.13 to v02.14 edited during March 2008 to July 2009 for object STATUS definitions and related content.

NTCIP 8004 v02.16, March 2010—Edited prior to publication.

Compatibility of Versions

To distinguish NTCIP 8004 v02 (as published) from previous drafts, NTCIP 8004 v02 also includes NTCIP 8004 v02.17 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 8004 v02 is designated, and should be cited as, NTCIP 8004 v02. Anyone using NTCIP 8004 v02 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 8004 v02 should also consult NTCIP 8004 v02 for specific guidelines on compatibility.

NOTE—The reference to NTCIP 8004 v02 is template information. The circular nature of the reference is recognized.

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Section 1
GENERAL

1.1 SCOPE

NTCIP 8004 v02 specifies a set of rules and protocols for organizing, describing, and defining transportation management information to be exchanged between transportation management applications and transportation equipment. NTCIP 8004 v02 defines the Structure and Identification of Management Information (SMI) used in transportation-related devices. NTCIP 8004 v02 is applicable to the NTCIP 1200 series and other NTCIP standards that deal with device data dictionaries.

NOTE—NTCIP 8004 v02 relies on widely accepted conventions, generally designated as “SMIv1” and defined in IAB STD 16, as well as some elements of SMIv2, as defined in IAB STD 58.

1.2 REFERENCES

Normative references contain provisions that, through reference in this text, constitute provisions of NTCIP 8004 v02. Other references in NTCIP 8004 v02 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 the standard listed.

1.2.1 Normative References

IAB STD 16	(RFC 1155: 1990, *Structure and Identification of Management Information for TCP/IP-based Internets*; RFC 1212: 1991, *Concise MIB Definitions*)
IAB STD 58	(RFC 2578:1999, *Structure of Management Information Version 2 (SMIv2))*
ISO/IEC 8824-1:2002	*Information technology—Abstract Syntax Notation One (ASN.1): Specification of basic notation*
ISO/IEC 8824-2:2002	*Information technology—Abstract Syntax Notation One (ASN.1): Information object specification*
ISO/IEC 8824-3:2002	*Information technology—Abstract Syntax Notation One (ASN.1): Constraint specification*
ISO/IEC 8824-4:2002	*Information technology—Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications*
ISO 1000:1992	*SI Units and recommendations for use of their multiples and of certain other units*

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