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National Transportation Communications for ITS Protocol Global Object Definitions

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In addition to the many volunteer efforts, recognition is also given to those organizations who supported the efforts of the working groups by providing comments and funding for the standard, including:

- Eagle Traffic Control Systems
- Econolite Control Products, Inc.
- Gardner Systems
- Iteris, Inc.
- PB Farradyne Inc
- Peek Traffic Systems, Inc.

FOREWORD

This document uses only metric units.

The purpose of this publication is to identify and define the common object definitions that may be supported by devices that are NTCIP-compliant. This document is an NTCIP Data Dictionary Standard. Data Dictionary Standards provide formal definitions of data elements for use within NTCIP systems.

For more information about NTCIP standards, visit the NTCIP Web Site at <http://www.ntcip.org>. For a hardcopy summary of NTCIP information, contact the NTCIP Coordinator at the address below.

In preparation of this NTCIP document, input of users and other interested parties was sought and evaluated. Inquires, comments, and proposed or recommended revisions should be submitted to:

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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; 1997
ITE – Software Standard; December 1997
NEMA – Standard; October 1996

History

From 1996 to 1999, this document was referenced as NEMA TS 3.4. However, to provide an organized numbering scheme for the NTCIP documents, this document is now referenced as NTCIP 1201. The technical specifications of NTCIP 1201 are identical to the former reference, except as noted in the development history below:

NEMA TS 3.4-1996 v96.01.7, April 7, 1997. October 1996 – Version 1.5 approved by NEMA. April 1997 – Version 1.7 published by NEMA with editorial corrections. October 1996 – Accepted as a Recommended Standard by the Joint Committee on the NTCIP. Approved by AASHTO in 1997 and approved by ITE in December 1997.

NEMA TS 3.4 Amendment 1 v98.01.07. October 1998 – Version 98.01.05 accepted as a Recommended Amendment by the Joint Committee on the NTCIP, and edited v01.07 referred for balloting and approval by NTCIP Standards Bulletin B0032 in May 1999. Approved by AASHTO in October 1999, approved by ITE in January 2001, and approved by NEMA in December 1999.

NTCIP 1201:1996 [assigned version 01.08]. August 1999 – Assigned NTCIP 1201 document number in NTCIP Standards Bulletin B0038. August 2000 – Joint NTCIP Standards Publication cover used over TS 3.4 contents.

NTCIP 1201:1996 v01.10, December 2001. January 2002 – Formatted for printing: incorporated Amendment 1 v07 into text; updated title page date and version number; modified and

reorganized front matter to conform to NTCIP 8002. Most references to TS 3 standard designations were changed to equivalent NTCIP standard numbers.

INTRODUCTION

This publication provides definitions of data elements for use with various transportation devices. The data is defined using the Simple Network Management Protocol (SNMP) object-type format as defined in RFC 1212 and the defined NTCIP format defined in NTCIP 8004. This data would typically be exchanged using one of the NTCIP 1103 recognized Application Layers (e.g., SNMP).

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, global, data, data dictionary, object.

In 1992, the NEMA 3-TS Transportation Management Systems and Associated Control Devices Section began the effort to develop the NTCIP. The Transportation Section's purpose was to respond 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 reached among NEMA, ITE, and AASHTO to jointly develop, approve, and maintain NTCIP Standards. In late 1998, the Global Object Working Group was tasked with the effort to update the Global Object Definitions document. The first meeting of this working group was held in January 1999.

The first version of this document was published as NEMA TS 3.4-1996; however, in 1997, both AASHTO and ITE adopted the standard. Thus, in order to provide an organized numbering scheme and to reflect the joint approval of AASHTO, ITE, and NEMA, the updated document is now numbered NTCIP 1201. The reformatted version was developed to reflect lessons learned and to add new features from the approved amendment.

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Section 1 GENERAL

1.1 SCOPE

The messaging between Transportation Management and field devices is accomplished by using the NTCIP Application Layer services to convey requests to access or modify values stored in a given device; these values are referred to as objects. The purpose of this publication is to identify and define these objects definitions that may be supported by multiple device types (e.g., actuated signal controllers and variable message signs). The grouping of objects for a given device type is performed in the device-type-specific object definition standard.

1.2 REFERENCES

For approved revisions, contact:

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National Electrical Manufacturers Association
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Rosslyn, VA 22209-3801

For proposed revisions, which are under discussion by the relevant NTCIP Working Group, and recommended revisions of the Joint Committee on the NTCIP, visit the web at <http://www.ntcip.org>.

The following standards (normative references) contain provisions which, 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 the standard listed below.

1.2.1 Normative References

ANSI
11 West 42nd Street, 13th Floor
New York, NY 10036

ISO/IEC 8824-1:1995 *Information Technology—Abstract Syntax Notation One (ASN.1): Specification of Basic Notation*

ISO/IEC 8824-2:1995 *Information Technology—Abstract Syntax Notation One (ASN.1): Information Object Specification*

DDN Network Information Center
14200 Park Meadow Drive
Suite 200
Chantilly, VA 22021

Electronic copies of RFC documents may be obtained using "anonymous FTP" to the host <nic.ddn.mil> or <ds.internic.net>. Printed copies are available from: (800) 365-3642 or (703) 802-4535.

RFC 1155 *Structure and Identification of Management Information for TCP/IP-based Internets.*
K. McCloghrie; M. Rose; 05/10/1990

RFC 1212 *Concise MIB Definitions.* K. McCloghrie; M. Rose; 03/26/1991

1.2.2 Other References

National Electrical Manufacturers Association

1300 North 17th Street, Suite 1847
Rosslyn, VA 22209

NEMA TS 2-1992 *Traffic Controller Assemblies*

NTCIP 1101:1996 *National Transportation Communications for ITS Protocol – Simple
Transportation Management Framework*

NTCIP 2001:1996 *National Transportation Communications for ITS Protocol - Class B Profile*

ANSI

11 West 42nd Street, 13th Floor
New York, New York 10036
(212) 642-4900

ISO/IEC 8824-3:1995 *Information Technology—Abstract Syntax Notation One (ASN.1): Constraint
Specification*

ISO/IEC 8824-4:1995 *Information Technology—Abstract Syntax Notation One (ASN.1):
Parameterization of ASN.1 Specifications*

ISO/IEC 8825-1:1995 *Information Technology—ASN.1 Encoding Rules: Specification of Basic Encoding
Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding
Rules (DER).*

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RFC 1213 *Management Information Base for Network Management of TCP/IP-based
Internets: MIB-II.* K. McCloghrie; M. Rose; CP/IP-base

RFC 1157 *A Simple Network Management Protocol (SNMP).* M. Schoffstall; M. Feder; J.
Davin; J. Case; 05/10/1990

1.3 TERMS

Conformance level: Each of the defined Profiles have one or more layers specifying the protocols that must be implemented in a device to correspond to a particular level of NTCIP support.

Profile: Refers to a set of protocols, each of which operates independently on one of the seven (7) OSI Layers, if this layer is utilized. Different protocols are utilized at the same layer within different profiles.

1.4 ABBREVIATIONS

The abbreviations used in this standard publication are defined as follows:

CRC—Cyclic Redundancy Check; polynomial algorithm performed on a specified range of data resulting in a 16 or 32 bit value.

MIB—Management Information Base; a collection of objects defined using Abstract Syntax Notation One (ASN.1) that can be accessed via a network management protocol.

NVT-ASCII—Network Virtual Terminal – American Standard Code for Information Interchange as defined in RFC 854.

PMPP—Point-to-MultiPoint Protocol, a new protocol under development that will enable the standardized, simultaneous communications between multiple devices on the same communications line/channel.

STMP—Simple Transportation Management Protocol, part of the newly developed NEMA standard called Simple Transportation Management Framework (STMF) that used the well known Simple Network Management Protocol (SNMP) besides the STMP.

1.5 OBJECT TREE

