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Global Object Definitions

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This publication was prepared by the NTCIP Global Object Working Group, 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.

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- Eagle Traffic Control Systems
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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

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

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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:

NTCIP Coordinator
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1847
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*

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14200 Park Meadow Drive
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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.

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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.

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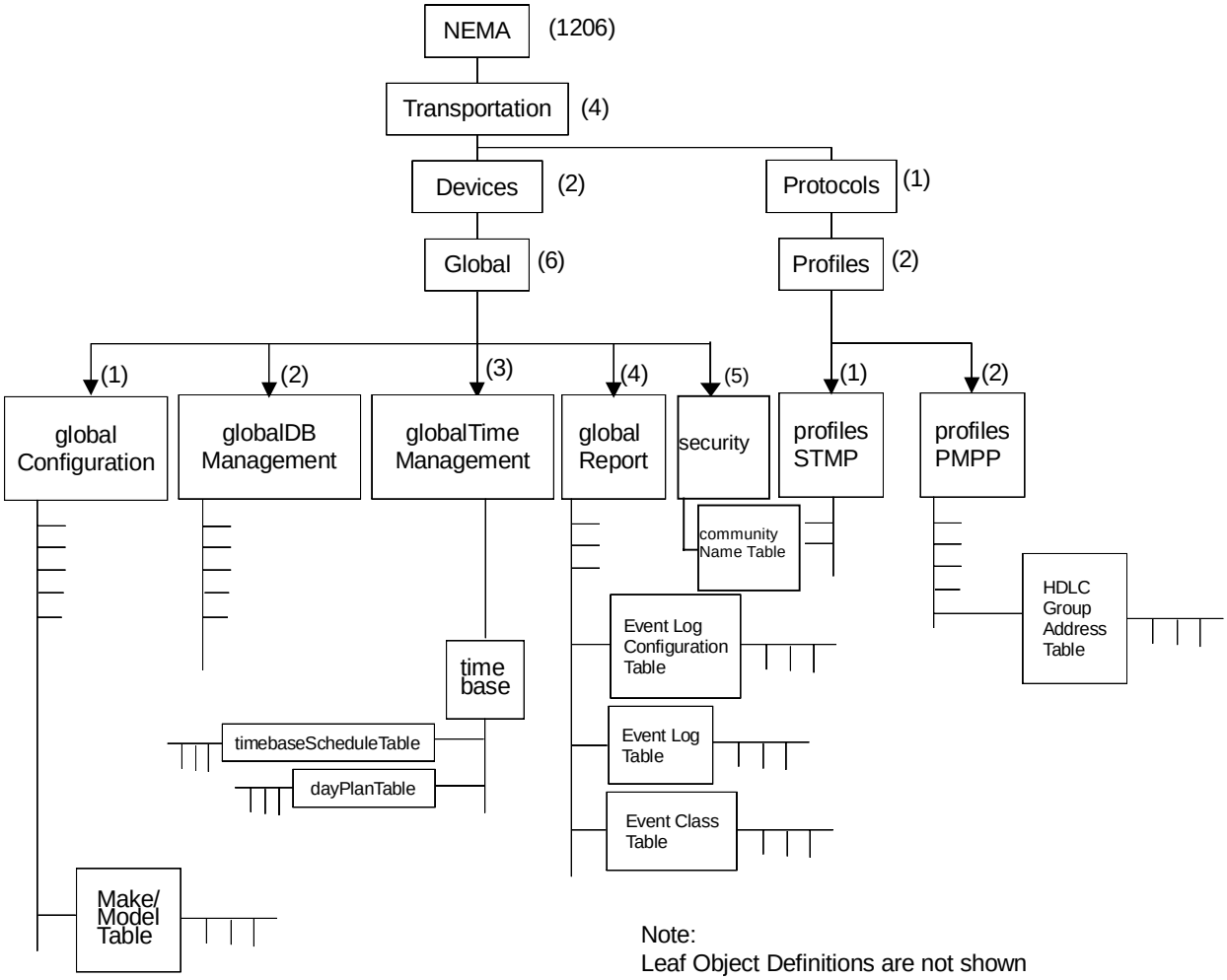
1.5 OBJECT TREE



Note:
Leaf Object Definitions are not shown

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Section 2
OBJECT DEFINITIONS

This section defines those objects which are expected to be used by different device types such as actuated traffic signal controllers, variable message signs, ramp meter controllers. The objects are defined in OJBECT-TYPE macro defined in RFC 1212, laid out in ASN.1 format as defined in ISO/IEC 8824-1, ISO/IEC 8824-2, ISO/IEC 8824-3, and ISO/IEC 8824-4. The OBJECT-TYPE macro used in this document is defined in RFC 1212. The text provided from Clause 2.1 through the end of the section (except the clause headings) constitutes the NEMA Standard Global MIB.

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

Nodes should not be confused with conformance groups, which are defined in Section 3. A conformance group is a logical grouping of objects which is used for conformance statements. While conformance groups will frequently correspond to the nodal structure, a conformance group may contain objects which are not lexigraphically ordered. For example, a schedule conformance group may contain both "global" and "asc" specific objects.

Text preceded by a double hyphen in the MIB definitions represent normative text for this standard.

2.1 NTCIP OBJECTS

```
--NTCIP OBJECTS
GLOBAL DEFINITIONS ::= BEGIN

--For the purpose of this section, the following OBJECT IDENTIFIERS are used:
IMPORTS
    OBJECT-TYPE
    FROM RFC-1212
    transportation
    FROM NEMA_SMI
    devices, protocols, profiles
    FROM TMIB
    Opaque, Counter
    FROM RFC1155-SMI

    global OBJECT IDENTIFIER ::= { devices 6 }
```

2.2 GLOBAL CONFIGURATION NODE

```
globalConfiguration OBJECT IDENTIFIER
::= { global 1 }
--This node is an identifier used to group all objects for support of configuration functions
-- that are common to most device types.
```

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2.2.1 Global Set ID Parameter

```
globalSetIDParameter OBJECT-TYPE
    SYNTAX    INTEGER (0..65535)
    ACCESS    read-only
    STATUS    optional
    DESCRIPTION "Specifies a relatively unique ID for all user-changeable parameters of the particular
    device-type currently implemented in the device.  Often this ID is calculated using a CRC algorithm."
    ::= { globalConfiguration 1 }
```

2.2.2 Maximum Modules Parameter

```
globalMaxModules   OBJECT-TYPE
    SYNTAX    INTEGER (0..255)
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
    "The number of rows that are listed in the Global Module Table."
    ::= { globalConfiguration 2 }
```

2.2.3 Module Table

```
globalModuleTable   OBJECT-TYPE
    SYNTAX    SEQUENCE OF ModuleEntry
    ACCESS    not-accessible
    STATUS    mandatory
    DESCRIPTION
    " A table containing information regarding manufacturer of software and hardware and the associated
    module models and version numbers as well as an indicator if the module is hardware or software
    related. The number of rows in this table shall equal the value of the globalMaxModule object."
    ::= { globalConfiguration 3 }

moduleEntry OBJECT-TYPE
    SYNTAX    ModuleTableEntry
    ACCESS    not-accessible
    STATUS    mandatory
    DESCRIPTION
    "This object defines an entry in the module table"
    INDEX { moduleNumber }
    ::= { globalmoduleTable 1 }

ModuleTableEntry ::= SEQUENCE {
    moduleNumber            INTEGER,
    moduleDeviceNode        OBJECT IDENTIFIER,
    moduleMake              OCTET STRING,
    moduleModel             OCTET STRING,
    moduleVersion           OCTET STRING,
    moduleType              INTEGER }
```

2.2.3.1 Module Number Parameter

```
moduleNumber OBJECT-TYPE
    SYNTAX    INTEGER (1..255)
    ACCESS    read-only
    STATUS    mandatory
    DESCRIPTION
```


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"This object contains the row number (1..255) within this table for the associated module."
::= { moduleTableEntry 1 }

2.2.3.2 Module Device Node Parameter

moduleDeviceNode OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This object contains the device node number of the device-type."
::= { moduleTableEntry 2 }

2.2.3.3 Module Make Parameter

moduleMake OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This object specifies the manufacturer of the associated module. A null-string shall be transmitted if this object has no entry."
::= { moduleTableEntry 3)

2.2.3.4 Module Model Parameter

moduleModel OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This object specifies the model number (hardware) or firmware reference (software) of the associated module. A null-string shall be transmitted if this object has no entry."
::= { moduleTableEntry 4 }

2.2.3.5 Module Version Parameter

moduleVersion OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This object specifies the version of the associated module. A null-string shall be transmitted if this object has no entry."
::= { moduleTableEntry 5)

2.2.3.6 Module Type Parameter

moduleType OBJECT-TYPE
SYNTAX INTEGER {
other (1),
hardware (2),
software (3) }
ACCESS read-only
STATUS mandatory
DESCRIPTION

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"This object specifies if the associated module is a hardware or software module."
::= { moduleTableEntry 6 }

2.3 GLOBAL DATABASE MANAGEMENT NODE

globalDBManagement OBJECT IDENTIFIER
::= { global 2 }

-- This node is an identifier used to group all objects for support of database
-- functions that are common to most device types.

2.3.1 Database Creation Transaction

dbCreateTransaction OBJECT-TYPE
SYNTAX INTEGER { normal (1),
transaction (2),
verify (3),
done (6)
}
ACCESS read-write
STATUS mandatory

DESCRIPTION:
"This object provides transaction control for device configuration. The transaction mode changes the behavior of the agent to force buffering of database objects until all related database objects have been modified. In the normal mode, SET operations to database objects may be stored in a device's database immediately with no regard to whether other changes will be made. In the transaction mode, SET operations to database objects are buffered until a verify state performs a consistency check. When the consistency check completes, the device automatically transitions to the done state where a normal or transaction command can be issued.

A database object is a user provided piece of setup information that is necessary for the proper operation of a device. It is static in nature in that the agent would never change it without direction from the management station. For example, a parameter that defines a default mode of operation would be a database object. A parameter that indicates the current state of the device would not be a database object.

The states and commands are defined as:

NORMAL: SET operations behave as normal SNMP SETs and can have an immediate effect on the value of any database objects used by the device. This is the default state of this object.

The only command that may be written to dbCreateTransaction while in this state is TRANSACTION. Any other values written to this object in this state shall result in an error response of 'badValue'.

TRANSACTION: SET operations of database objects are buffered by the agent device for later consistency checks. Standard SYNTAX checking takes place at the time of the SET operation. A transaction may consist of multiple SET operations over multiple frames.

The only commands that can be written to dbCreateTransaction while in this state are VERIFY and NORMAL. A VERIFY command will change the state to VERIFY. If a NORMAL command is received, all buffered data is discarded and the state is returned to NORMAL. Any other values written to this object when in this state shall result in an error response of 'badValue'.

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VERIFY: Specific database objects are checked for consistency. When consistency checks are complete the device will automatically advance to the DONE state.

The state of dbCreateTransaction cannot be changed when in the VERIFY state. Any other values written to this object in this state shall result in an error response of 'badValue'.

The consistency check analyzes certain critical objects 'in context' and treats them as an interrelated whole rather than separate non-related data items. The consistency check rules are not defined in this standard. They are device and implementation specific. Where applicable, the consistency check rules are defined in application specific object definition standards. A specific implementation may add additional checks beyond those defined in the standards. As a simplified example of a consistency check, consider the following. Two objects are defined to specify the month and the day-of-month of an event. Valid values for day-of-month would normally be 1 to 31, but in the context of month 9 (September), only the values 1 to 30 are correct.

DONE: This state is entered automatically once consistency checks have completed in the VERIFY mode. The value of dbVerifyStatus and dbVerifyError indicate whether the consistency check found any errors.

Only two valid values can be written to dbCreateTransaction in this state: NORMAL and TRANSACTION. Any other values written to this object in this state shall result in an error response of 'badValue'.

If a NORMAL command is issued and dbVerifyStatus indicates doneWithNoError, the buffered data is transferred to the device memory and the state is returned to NORMAL. If a NORMAL command is issued and dbVerifyStatus indicates something other than doneWithError then the buffered data is discarded and the state is returned to NORMAL.

If a TRANSACTION command is issued, regardless of dbVerifyStatus, no action takes place (the buffered data is not changed) and the TRANSACTION state is re-entered.

		COMMANDED STATE			
		transaction	*verify*	*normal*	*done*
CURRENT STATE	normal	transaction (1)	normal (2)	normal (2)	normal (2)
	transaction	transaction (2)	verify (3)	normal (4)	transaction (2)
	verify (7)	verify (2)	verify(2)	verify (2)	verify (2)
	done (8)	transaction (5)	done(2)	normal (6)	done (2)

Operational procedures and error responses:

(1) Once a copy of all database objects is placed in a buffer the state is changed to transaction and error response indicates noError. If the operation fails, the state remains the same and error response indicates genErr.

(2) No action takes place, the state remains the same, but response indicates badValue.

(3) The state is changed to verify, a consistency check is started, and response indicates noError.

(4). The buffered copy of all database objects is discarded, the state is changed to normal, and response indicates noError.

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(5) The buffered copy of all database objects is not changed or reloaded, the state is changed to transaction, and response indicates noError.
(6) If dbVerifyStatus indicates doneWithNoError, then the copy of all database objects is transferred to memory, the state is changed to normal and response indicates noError. If dbVerifyStatus indicates doneWithError then the buffered data is discarded, the state is changed to NORMAL, and response indicates noError.
(7) The state will automatically change to done when the consistency check completes.
(8) dbVerifyStatus and dbVerifyError are only valid in this state."

::= { globalDBManagement 1 }

2.3.2 Database Error Type Parameter

```
dbErrorType OBJECT-TYPE
SYNTAXINTEGER { tooBig (1),
                noSuchName (2),
                badValue (3),
                readOnly (4),
                genError (5),
                updateError (6),
                noError (7) }
ACCESS          read-only
STATUS          deprecated
DESCRIPTION:
"This object returns the current error status of the transaction.  The value of this
object is only valid when the dbCreateTransaction object is in the Done or Error state."
::= { globalDBManagement 2 }
```

2.3.3 Database Error ID Parameter

```
dbErrorID  OBJECT-TYPE
SYNTAX          OBJECT IDENTIFIER
ACCESS          read-only
STATUS          deprecated
DESCRIPTION
"This object contains the object identifier of the first object in the transaction buffer that caused an error
while dbCreateTransaction object was in the Verifying or Updating state.  The value of this object is only
valid when the dbCreateTransaction object is in the Error state.  It is undefined when the
dbCreateTransaction object is in other states."
::= { globalDBManagement 3 }
```

2.3.4 Database Transaction ID Parameter

```
dbTransactionID  OBJECT-TYPE
SYNTAX          INTEGER (0..255)
ACCESS          read-write
STATUS          deprecated
DESCRIPTION
"This object contains the transaction ID value that is to be contained in all SET operation writes while the
dbCreateTransaction object is not in the Normal state.  During transaction operations every SET
command shall begin with a write to this object with the current value of this object.  If a SET operation is
performed without writing to this object, or with a value that does not match the current value, then an
error response of 'genError' shall be returned.  This mechanism is used to determine that the same
management station that started the transaction is performing the SET operations that are being buffered
or modifying the state of dbCreateTransaction."
```


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::= { globalDBManagement 4 }

2.3.5 Database Make ID Parameter

```
dbMakeID OBJECT-TYPE
SYNTAX        INTEGER (0..255)
ACCESS        read-only
STATUS        deprecated
DESCRIPTION
"This object is used to create unique transaction ID's for management stations to use when starting transactions using the dbCreateTransaction object. This object will be incremented by one every time it is read, so that different values will be returned for each read. Management stations wishing to start a transaction should first read the dbCreateTransaction object to verify that it is in the Normal state. If so then the management shall GET dbMakeID to obtain a transaction ID to use, then SET dbCreateTransaction to startCmd and dbTransactionID to the value just received. If the response to the SET operation is 'noError' then the management station has started a transaction. If the response to the SET operation is 'genError' then the management station should read the dbCreateTransaction and dbTransactionID objects to ensure that the error was not due to a communications retry. If the dbCreateTransaction is in the Transaction state, and the dbTransactionID is the same value returned by the read of this object, then the management station is the owner of the transaction. If the dbTransactionID does not match the value originally returned by this object, then the management station is not the owner of the transaction and must wait until the dbCreateTransaction object returns to the Normal state before attempting to start the transaction."
::= { globalDBManagement  5 }
```

2.3.6 Database Verify Status Parameter

```
dbVerifyStatus   OBJECT-TYPE
SYNTAX        INTEGER {      notDone (0),
                             doneWithError (1),
                             doneWithNoError  (2) }
ACCESS        read-only
STATUS        mandatory
DESCRIPTION
"This object indicates the current status of verify (consistency checking) processing. The value of this object is only valid when the dbCreateTransaction object is in the Verify or Done state. If read during any other state, the value of this object is not valid but no error will be indicated."
::= { globalDBManagement 6 }
```

2.3.7 Database Verify Error Parameter

```
dbVerifyError   OBJECT-TYPE
SYNTAX        OCTET STRING (SIZE (0..255))
ACCESS        read-only
STATUS        mandatory
DESCRIPTION
"This object contains a textual description of or a reference to an error that was found by the verify (consistency checking) processing. The value of this object is only valid when the dbCreateTransaction object is in the Done state and the dbVerifyStatus object is in the doneWithError state. If read during any other state, the value of this object is not valid but no error will be indicated."
::= { globalDBManagement 7 }
```

2.4 GLOBAL TIME MANAGEMENT NODE

```
globalTimeManagement   OBJECT IDENTIFIER
::= { global 3 }
```


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-- This node is an identifier used to organize all objects for support of time-related
-- functions that are common to most device types.

2.4.1 Global Time Parameter

globalTime OBJECT-TYPE
SYNTAX Counter
ACCESS read-write
STATUS mandatory
DESCRIPTION: "The current time in seconds since the epoch of 00:00:00 (midnight) January 1, 1970 UTC (a.k.a. Zulu)."
::= { globalTimeManagement 1 }

2.4.2 Global Daylight Savings Parameter

globalDaylightSaving OBJECT-TYPE
SYNTAX INTEGER { other (1),
disableDST (2),
enableUSDST (3) }
ACCESS read-write
STATUS mandatory
DESCRIPTION: "This object specifies if the Daylight Savings Time (DST) is enabled, disabled or some other form of daylight savings time is active.
disableDST - DST clock adjustments shall NOT occur.
enableUSDST - DST clock adjustments shall occur. In accordance with USA practice, DST shall begin the first Sunday in April and shall end the last Sunday on October. All changes of time occur at 2:00AM."
REFERENCE
"NEMA TS 2 Clause 3.8.2"
::= { globalTimeManagement 2 }

2.4.3 TimeBase Event Scheduler Node

timebase OBJECT IDENTIFIER
::= { globalTimeManagement 3 }

-- This node is an identifier used to organize the main objects for event scheduling.
-- Device type-specific objects (tables) pointed to are defined within the appropriate MIB.

2.4.3.1 Maximum Number of Time Base Schedule Entries Parameter

maxTimeBaseScheduleEntries OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The value of this object specifies the maximum number of different entries supported by the device as shown by the number of rows in the timeBaseScheduleTable."
::= { timebase 1 }

2.4.3.2 Time Base Schedule Table

timeBaseScheduleTable OBJECT-TYPE
SYNTAX SEQUENCE OF TimeBaseScheduleEntry
ACCESS not-accessible

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STATUS mandatory
DESCRIPTION
"A table containing the time base schedule parameters for the device. The number of rows in this table might be equal but is not allowed to exceed the value of the maxTimeBaseScheduleEntries object. The table references the appropriate day plan for the device. The plan is determined by comparing the current month (MONTH), day of week (DOW) and date of month (DOM) to the appropriate fields. The settings for MONTH, DOW and DOM are connected with a logical AND. In order to determine which timebased event to select, determine the event which has the most specific date specified. Select the more specific event based on their MONTH settings; if the same, select the most specific DOM; if that is still the same, select the most specific DOW; if that's still the same, the first occurrence within the time base event table shall be selected. "More specific" means the least number of bits set within an object. All entries in Time Base Schedule Table are expressed in local time and date."
::= { timebase 2 }

timeBaseScheduleEntry OBJECT-TYPE
SYNTAX TimeBaseScheduleEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"Event Parameters for the time based schedule programming of the device."
INDEX { timeBaseScheduleNumber }
::= { timeBaseScheduleTable 1 }

TimeBaseScheduleEntry ::= SEQUENCE {
timeBaseScheduleNumber INTEGER,
timeBaseScheduleMonth INTEGER,
timeBaseScheduleDay INTEGER,
timeBaseScheduleDate INTEGER,
timeBaseScheduleDayPlan INTEGER

2.4.3.2.1 Time Base Schedule Number Parameter

timeBaseScheduleNumber OBJECT-TYPE
SYNTAX INTEGER (1..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The time base schedule number for objects in this row. The value of this object shall not exceed the value of the maxTimeBaseScheduleEntries object. The activation of a scheduled entry shall occur whenever allowed by all other objects within this table."
::= { timeBaseScheduleEntry 1 }

2.4.3.2.2 Time Base Schedule Month of Year Parameter

timeBaseScheduleMonth OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The Month(s) of the Year that the schedule entry shall be allowed. Each bit represents a specific month. If the bit is set to one (1), then the scheduled entry shall be allowed during the associated month. If the bit is zero (0), then the scheduled entry shall not be allowed during the associated month. The bits are defined as:

Bit	Month of Year
0	Reserved
1	January

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2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November
12	December
13 - 15	Reserved"

::= { timeBaseScheduleEntry 2 }

2.4.3.2.3 Time Base Schedule Day of Week Parameter

timeBaseScheduleDay OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The Day(s) of Week that the schedule entry shall be allowed. Each bit represents a specific day of the week. If the bit is set to one (1), then the scheduled entry shall be allowed during the associated DOW. If the bit is set to zero (0), then the scheduled entry shall not be allowed during the associated DOW. The bits are defined as:

Bit	Day of Week
0	Reserved
1	Sunday
2	Monday
3	Tuesday
4	Wednesday
5	Thursday
6	Friday
7	Saturday"

::= { timeBaseScheduleEntry 3 }

2.4.3.2.4 Time Base Schedule Date Parameter

timeBaseScheduleDate OBJECT-TYPE
SYNTAX INTEGER (0..4294967295)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The Day(s) of a month that the schedule entry shall be allowed. Each bit represents a specific date of the month. If the bit is set to one (1), then the scheduled entry shall be allowed during the associated date. If the bit is set to zero (0), then the scheduled entry shall not be allowed during the associated date. The bits are defined as:

Bit	Day Number
0	Reserved
1	Day 1
2	Day 2
||	
31	Day 31"

::= { timeBaseScheduleEntry 4 }

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2.4.3.2.5 Time Base Schedule Day Plan Parameter

timeBaseScheduleDayPlan OBJECT-TYPE
SYNTAX INTEGER (1..255)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object specifies what Plan number shall be associated with this timeBaseScheduleDayPlan -object."
::= { timeBaseScheduleEntry 5 }

2.4.4 Day Plan Parameters

2.4.4.1 Maximum Number of Day Plans - Parameter

maxDayPlans OBJECT-TYPE
SYNTAX INTEGER (1..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The value of this object specifies the maximum, fixed number of different timebased Day Plans supported by the device. The value of this object represents the number of day plans (primary key into the table) available in the timeBaseDayPlanTable."
::= { timebase 3 }

2.4.4.2 Maximum Number of Day Plan Events - Parameter

maxDayPlanEvents OBJECT-TYPE
SYNTAX INTEGER (1..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The value of this object specifies the maximum, fixed number of different timebased Day Plan Events within each Day Plan supported by the device. The value of this object represents the number of rows (secondary key into the table) available within each of the day plans that are available in the timeBaseDayPlanTable."
::= { timebase 4 }

2.4.4.3 Day Plan Table

timeBaseDayPlanTable OBJECT-TYPE
SYNTAX SEQUENCE OF TimeBaseDayPlanEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A table containing day plan numbers, the times when to implement them and the associated actions. The number of rows in this table shall not exceed the value of the maxDayPlans object. This table is always used in association with device-type specific objects specifying device-type specific actions such as activating a message on a VMS sign or initiating a pattern for a signal controller. The device-type specific action will only be initiated when the specific DayPlan has been activated and at the indicated time."
::= { timebase 5 }

timeBaseDayPlanEntry OBJECT-TYPE
SYNTAX TimeBaseDayPlanEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A table containing the timebased day plan parameters of a device."

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```
INDEX { dayPlanNumber, dayPlanEventNumber }
::= { timeBaseDayPlanTable 1 }

TimeBaseDayPlanEntry ::= SEQUENCE {
        dayPlanNumber           INTEGER,
        dayPlanEventNumber      INTEGER,
        dayPlanHour             INTEGER,
        dayPlanMinute           INTEGER,
        dayPlanActionNumberOID  OBJECT IDENTIFIER }
```

2.4.4.3.1 Day Plan Number

```
dayPlanNumber   OBJECT-TYPE
SYNTAX          INTEGER (1..255)
ACCESS          read-only
STATUS          mandatory
DESCRIPTION
"This object specifies the day plan number for objects in this row. The value shall not exceed the value of the maxDayPlans object.  Day plan numbers are used in the TimeBase Event Table to specify day plan numbers to be implemented on specific days of the year or as part of the week plans."
::= { timeBaseDayPlanEntry 1 }
```

2.4.4.3.2 Day Plan Event Number

```
dayPlanEventNumber   OBJECT-TYPE
SYNTAX          INTEGER (1..255)
ACCESS          read-only
STATUS          mandatory
DESCRIPTION
"This object identifies day plan event number(s) to be scheduled on a specific day plan number.  Several different events can be scheduled to take place during a day, and each of these events is one entry or row within a specified day plan number.  The total number of events for one day plan shall not exceed the value of the maxDayPlanEvents-object."
::= { timeBaseDayPlanEntry 2 }
```

2.4.4.3.3 Day Plan Hour Parameter

```
dayPlanHour   OBJECT-TYPE
SYNTAX          INTEGER (0..23)
ACCESS          read-write
STATUS          mandatory
DESCRIPTION
"The Hour of day that the associated event shall become active.  Valid values for this object are 0 - 23 as the time shall be transmitted in military time."
::= { timeBaseDayPlanEntry 3 }
```

2.4.4.3.4 Day Plan Minute Parameter

```
dayPlanMinute   OBJECT-TYPE
SYNTAX          INTEGER (0..59)
ACCESS          read-write
STATUS          mandatory
DESCRIPTION
"The Minute of the hour (defined in the dayPlanHour) object that the associated event shall become active. Valid values for this object are 0 - 59 since there are only 0 - 59 minutes in an hour."
::= { timeBaseDayPlanEntry 4 }
```


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2.4.4.3.5 Day Plan Action Number OID Parameter

dayPlanActionNumberOID OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object specifies the first index-column (if multi indexed tables are pointed to, all indices have to be specified within the OID) within a device-type specific action table that contains the actions (specified in the associated columns within the table) that shall be executed if the time indicated within the dayPlanTable and the timeBaseEventSchedule Table is the current time."
::= { timeBaseDayPlanEntry 5 }

2.4.4.4 Day Plan Status Parameter

dayPlanStatus OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This object indicates the current value of the active day PlanNumber-object. A value of zero (0) indicates that there is no dayPlanNumber that is currently active."
::= { timebase 6 }

2.4.5 Global Local Time Differential Parameter

globalLocalTimeDifferential OBJECT-TYPE
SYNTAX INTEGER (-43200..43200)
ACCESS read-write
STATUS mandatory
DESCRIPTION
“Indicates the number of seconds offset between local time and GMT. Positive values indicate local times in the Eastern Hemisphere up to the International Date Line and negative values indicate local times in the Western Hemisphere back to the International Date Line. If one of the daylight savings times is activated, this value will change automatically at the referenced time. For example, Central Standard Time (CST) is -21600 and Central Daylight Time (CDT) is -18000.”
::= { globalTimeManagement 4 }

2.5 REPORT PARAMETER NODE

globalReport OBJECT IDENTIFIER
::= { global 4 }

-- This node is an identifier used to organize all objects for support of report functions
-- that are common to most device types.

2.5.1 Maximum Event Log Configurations Parameter

maxEventLogConfigs OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The number of rows that exist in the static eventLogConfig table for this device."
::= { globalReport 1 }

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2.5.2 Event Log Configuration Table

```
eventLogConfigTable   OBJECT-TYPE
SYNTAX        SEQUENCE OF EventLogConfigEntry
ACCESS        not-accessible
STATUS        mandatory
DESCRIPTION
"A table containing Event Log Configuration information. The number of rows in this table is equal to the
maxEventLogConfigs object."
::= { globalReport 2 }

eventLogConfigEntry OBJECT-TYPE
SYNTAX        EventLogConfigEntry
ACCESS        not-accessible
STATUS        mandatory
DESCRIPTION
"This object defines an entry in the event log configuration table."
INDEX { eventConfigID }
::= { EventLogConfigTable 1 }

EventLogConfigEntry ::= SEQUENCE {
        eventConfigID                   INTEGER,
        eventConfigClass                INTEGER,
        eventConfigMode                 INTEGER,
        eventConfigCompareValue         INTEGER,
        eventConfigCompareValue2        INTEGER,
        eventConfigCompareOID           OBJECT IDENTIFIER,
        eventConfigLogOID               OBJECT IDENTIFIER,
        eventConfigAction               INTEGER }
```

2.5.2.1 Event Log Configuration ID Parameter

```
eventConfigID  OBJECT-TYPE
SYNTAX        INTEGER (1..65535)
ACCESS        read-only
STATUS        mandatory
DESCRIPTION
"This object contains the row number which is used to identify the event associated with this row in the
eventLogConfigTable.  The number of event IDs shall not exceed the value indicated in the
maxEventLogConfigs object.  The value zero (0) is not allowed."
::= { eventLogConfigEntry 1 }
```

2.5.2.2 Event Log Configuration Class Parameter

```
eventConfigClass OBJECT-TYPE
SYNTAX        INTEGER (1..255)
ACCESS        read-write
STATUS        mandatory
DESCRIPTION
"This object contains the class value to assign to the event associated with this row in the event
configuration table.  This value is used in the event log table to organize various events defined in this
table into logical groupings."
::= { eventLogConfigEntry 2 }
```


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2.5.2.3 Event Log Configuration Mode Parameter

eventConfigMode OBJECT-TYPE
SYNTAX INTEGER { other (1),
onChange (2),
greaterThanValue (3),
smallerThanValue (4),
hysteresisBound (5),
periodic (6) }
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object specifies the mode of operation for this event. All checks and entries to the table must occur within one second of the condition becoming true. The modes are defined as follows:

VALUE	DESCRIPTION
onChange	create a log entry when value referenced by the eventTypeOID changes
greaterThanValue	create a log entry when the object value becomes greater than the value referenced to by the eventCompareValue object, if this value is exceeded for the amount of time specified in the eventConfigCompareValue2 object (in tenth of seconds) and this value is greater than zero (0). A value of zero (0) for eventConfigCompareValue2 indicates immediate logging.
smallerThanValue	create a log entry when the object value becomes less than the value referenced to by the eventCompareValue object, if this value is exceeded for the amount of time specified in the eventConfigCompareValue2 object (in tenth of seconds) and this value is greater than zero (0). A value of zero (0) for eventConfigCompareValue2 indicates immediate logging.
hysteresisBound	creates a log entry when the object value becomes either less than the lowerbound value or greater than the upperbound value. The lowerbound value is the lower value of the eventConfigCompareValue- and the eventConfigCompareValue2-objects, the upperbound is the other value.
periodic	create a log entry every x seconds, where x is defined by the value stored in eventConfigCompareValue. The values stored in eventConfigCompareValue2 and eventConfigCompareOID are ignored in this mode. "

::= { eventLogConfigEntry 3 }

2.5.2.4 Event Log Configuration Compare Value Parameter

eventConfigCompareValue OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object contains the comparison value to use with eventConfigMode values (greaterThanValue, smallerThanValue, hysteresisBound). No value within this object is necessary when the eventConfigMode-object has the “value onChange (2)."
::= { eventLogConfigEntry 4 }

2.5.2.5 Event Log Configuration Compare Value 2 Parameter

eventConfigCompareValue2 OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION

--`,,`,,`-`-`,,`,,`,`,,`---

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"If the eventConfigMode is set to hysteresisBound, this object specifies the second comparison value for the hysteresis. If the eventConfigMode is set to greaterThanValue or smallerThanValue, this object specifies the time (in tenth of seconds) for which the comparison must be true prior to the event condition becoming true. If the eventConfigMode is set to onChange or periodic, the value of this object shall be ignored."
::= { eventLogConfigEntry 5 }

2.5.2.6 Event Log Configuration Compare Object Identifier Parameter

eventConfigCompareOID OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object contains the object identifier which references the value against which the comparison is made. If the eventConfigMode is set to periodic, the value of this object shall be ignored."
::= { eventLogConfigEntry 6 }

2.5.2.7 Event Log Configuration Object Identifier Parameter

eventConfigLogOID OBJECT-TYPE
SYNTAX OBJECT IDENTIFIER
ACCESS read-write
STATUS optional
DESCRIPTION
"This object contains the object identifier which indicates what value to log when a condition or event occurs (e.g., log the phase display when the watchdog alarm status changes)."
::= { eventLogConfigEntry 7 }

2.5.2.8 Event Log Configuration Action Parameter

eventConfigAction OBJECT-TYPE
SYNTAX INTEGER { other (1),
disabled (2),
log (3) }
ACCESS read-write
STATUS optional
DESCRIPTION
"This value of this object indicates the action that will take place when the event described in this row of the event configuration table occurs.
disabled - no entry will be recorded due to this event.
log - an entry will be recorded in the event log table when this event occurs."
::= { eventLogConfigEntry 8 }

2.5.3 Maximum Event Log Size Parameter

maxEventLogSize OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The maximum, fixed number of rows that can be utilized within the Event Log Table."
::= { globalReport 3 }

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2.5.4 Event Log Table

```
eventLogTable   OBJECT-TYPE
SYNTAX          SEQUENCE OF EventLogEntry
ACCESS          not-accessible
STATUS          mandatory
DESCRIPTION
"A table containing Event History data collected."
::= { globalReport 4 }

eventLogEntry OBJECT-TYPE
SYNTAX          EventLogEntry
ACCESS          not-accessible
STATUS          mandatory
DESCRIPTION
"This object defines an entry in the event log table"
INDEX { eventLogClass, eventLogNumber }
::= { eventLogTable 1 }

EventLogEntry ::= SEQUENCE {
        eventLogClass       INTEGER,
        eventLogNumber      INTEGER,
        eventLogID          INTEGER,
        eventLogTime        Counter,
        eventLogValue       Opaque }
```

2.5.4.1 Event Log Class Parameter

```
eventLogClass OBJECT-TYPE
SYNTAX          INTEGER (0..255)
ACCESS          read-only
STATUS          mandatory
DESCRIPTION
"This object contains the class of the associated event as defined in the eventLogConfig Table."
::= { eventLogEntry 1 }
```

2.5.4.2 Event Log Number Parameter

```
eventLogNumber OBJECT-TYPE
SYNTAX          INTEGER (1..255)
ACCESS          read-only
STATUS          mandatory
DESCRIPTION
"The event number within this class for this event.  Event numbers shall be assigned starting at 1 and
shall increase to the value specified by the associated eventClassLimit for the class associated with the
rows.  Events shall maintain a chronological ordering in the table with the oldest event of a class
occupying the row with eventNumber = 1, and subsequent events filling subsequent rows. This ordering
shall be maintained when events are cleared."
::= { eventLogEntry 2 }
```

2.5.4.3 Event Log ID Parameter

```
eventLogID  OBJECT-TYPE
SYNTAX          INTEGER (0..65535)
ACCESS          read-only
STATUS          mandatory
```


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DESCRIPTION
"This object contains the event configuration ID (from the eventLogConfigTable) that caused this table entry. It indicates the row in the eventLogConfig table responsible for this event entry. If this object is set to zero (0) then the associated row (in the eventLogTable) is cleared and the following rows shall be renumbered to maintain a sequential eventNumber sequence."
::= { EventLogEntry 3 }

2.5.4.4 Event Log Time Parameter

eventLogTime OBJECT-TYPE
SYNTAX Counter
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The time that the event occurred in seconds since the epoch of 00:00:00 (midnight) January 1, 1970 per the device's globalTime object. If the device does not have valid date and time information, then this shall be the time in seconds since the device powered up."
::= { eventLogEntry 4 }

2.5.4.5 Event Log Value Parameter

eventLogValue OBJECT-TYPE
SYNTAX Opaque
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The value of this object is set to the value referenced by the eventConfigLogOID of the associated eventLogID when the event was logged. Its length is variable."
::= { eventLogEntry 5 }

2.5.5 Maximum Event Classes Parameter

maxEventClasses OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object defines the maximum, fixed number of rows in the eventClassTable that this device supports. This places an upper limit on the number of classes that may be defined for events in this device."
::= { globalReport 5 }

2.5.6 Event Class Table

eventClassTable OBJECT-TYPE
SYNTAX SEQUENCE OF EventClassEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This table is used to configure event logging limits and log table maintenance."
::= { globalReport 6 }

eventClassEntry OBJECT-TYPE
SYNTAX EventClassEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION

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"This defines a row in the Event Class Table"
INDEX { eventClassNumber }
::= { eventClassTable 1 }

```
EventClassEntry ::= SEQUENCE {
        eventClassNumber            INTEGER,
        eventClassLimit             INTEGER,
        eventClassClearTime         Counter,
        eventClassDescription       OCTET STRING,
        eventClassNumRowsInLog      INTEGER }
```

2.5.6.1 Event Class Number Parameter

eventClassNumber OBJECT-TYPE
SYNTAX INTEGER (1..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"This is a class value that is to be configured."
::= { eventClassEntry 1 }

2.5.6.2 Event Class Limit Parameter

eventClassLimit OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object specifies the maximum number of events of the associated class to store in the log. Once the limit is reached, the oldest entry of the matching class will be overwritten by any new entry of the same class. If the value of this object is set to a number smaller than the current number of rows within this class in the eventLogTable, then the oldest entries shall be lost/deleted."
::= { eventClassEntry 2 }

2.5.6.3 Event Class Clear Time Parameter

eventClassClearTime OBJECT-TYPE
SYNTAX Counter
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object is used to clear multiple event log entries from the event log table. Setting this value shall cause all events of this class that have an eventTime equal to or less than this object to be cleared from the eventLog table. The time is the number of seconds since the epoch of 00:00:00 (midnight) January 1, 1970."
::= { eventClassEntry 3 }

2.5.6.4 Event Class Description Parameter

eventClassDescription OBJECT-TYPE
SYNTAX OCTET STRING
ACCESS read-write
STATUS optional
DESCRIPTION
"This object specifies a description of the class in ASCII characters."
::= { eventClassEntry 4 }

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2.5.6.5 Event Class Number of Rows in Event Log Table Parameter

eventClassNumRowsInLog OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The number of rows for this class that currently exist in the eventLogTable."
::= { eventClassEntry 5 }

2.6 STMP OBJECT NODE

profilesSTMP OBJECT IDENTIFIER
::= { profiles 2 }

--This node is an identifier used to group all objects for support of configuration functions
-- that are common to device types that support the STMP protocol. The objects under this node are
-- placed under the Protocols\Profiles\STMP subtree within the NEMA node, but they have been listed
-- here due to the lack of a separate document that lists these objects.

2.6.1 Dynamic Object Persistence Parameter

dynamicObjectPersistence OBJECT-TYPE
SYNTAX INTEGER (0..65535)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"The maximum power outage time in minutes that may occur before all STMP dynamic object definitions in a device shall be invalidated.
If this object is set to zero then existing dynamic object definitions shall be invalidated on device power up.
If this object is set to its maximum value (65535) the existing dynamic object definitions shall not be invalidated due to power outages of any duration.

A device that supports STMP dynamic objects shall support this object."
REFERENCE
"NEMA TS 3.2 Clause 4.2.1.1"
::= { profilesSTMP 1 }

2.7 PMPP OBJECT NODE

profilesPMPP OBJECT IDENTIFIER
::= { profiles 3 }

-- This node is an identifier used to group all objects for support of the PMPP function that
-- are common to all device types. The objects under this node are placed under the
-- Protocols\Profiles\PMPP subtree within the NEMA node, but they have been listed here due to the lack
-- of a separate document that lists these objects.

2.7.1 Maximum HDLC Group Address Parameter

maxGroupAddresses OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-only
STATUS mandatory

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DESCRIPTION
"The maximum number of group addresses this device supports. This object indicates the maximum number of rows in the Data Link Layer group address table."
::= { profilesPMPP 1 }

2.7.2 HDLC Group Address Table

hdlcGroupAddressTable OBJECT-TYPE
SYNTAX SEQUENCE OF HdlcGroupAddressEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"A table containing group addresses at which a device may receive frames."
::= { profilesPMPP 2 }

hdlcGroupAddressEntry OBJECT-TYPE
SYNTAX HdlcGroupAddressEntry
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"An entry in the group address table that contains a device's data link layer group address at which it will accept frames."
INDEX { hdlcGroupAddressIndex }
::= { hdlcGroupAddressTable 1 }

HdlcGroupAddressEntry ::= SEQUENCE {
    hdlcGroupAddressIndex INTEGER,
    hdlcGroupAddress INTEGER }

2.7.2.1 HDLC Group Address Index Parameter

hdlcGroupAddressIndex OBJECT-TYPE
SYNTAX INTEGER (0..255)
ACCESS read-only
STATUS mandatory
DESCRIPTION
"The index number for the group address in this row."
::= { hdlcGroupAddressEntry 1 }

2.7.2.2 HDLC Group Address Parameter

hdlcGroupAddress OBJECT-TYPE
SYNTAX INTEGER
ACCESS read-write
STATUS mandatory
DESCRIPTION
"A group address for the data link layer. For PMPP, the syntax is an 8- or 16-bit entry with the second low order bit set to a one indicating that this is a group address."
REFERENCE
"NEMA TS 3.3 Clause 3.3.3.1"
::= { hdlcGroupAddressEntry 2 }

2.8 SECURITY NODE

security OBJECT IDENTIFIER ::= global 5
-- This node is an identifier used to group all objects related to the

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-- assignment of community names and the access rights they provide.

2.8.1 Community Name Administrator Parameter

```
communityNameAdmin OBJECT-TYPE
SYNTAX    OCTET STRING (SIZE(8..16))
ACCESS    read-write
STATUS    mandatory
DESCRIPTION
"This object is the community name that must be used to specifically gain access to information under the
security node.  A message with this value in the community name field of an SNMP message has user
read-write access to the security node objects and all other objects implemented in the device.  The
syntax is defined as an OCTET STRING and therefore any character can have a value of 0..255."
DEFVAL { "administrator" }
::= { security 1 }
```

2.8.2 Maximum Community Names Parameter

```
communityNamesMax   OBJECT-TYPE
SYNTAX    INTEGER (1..255)
ACCESS    read-only
STATUS    mandatory
DESCRIPTION
"This object specifies the maximum number of rows that are implemented in the community name table."
::= { security 2 }
```

2.8.3 Community Names Table

```
communityNameTable  OBJECT-TYPE
SYNTAX    SEQUENCE OF CommunityNameTableEntry
ACCESS    not-accessible
STATUS    mandatory
DESCRIPTION
"This table defines the community names that can appear in the community name field of the SNMP
message and access privileges associated with that community name."
::= { security 3 }



communityNameTableEntry  OBJECT-TYPE
SYNTAX    CommunityNameTableEntry
ACCESS    not-accessible
STATUS    mandatory
DESCRIPTION
"This is the row index of information in the community name table."
INDEX     { communityNameIndex }
::= { communityNameTable 1 }

CommunityNameTableEntry::=SEQUENCE
                                  { communityNameIndex       INTEGER,
                                    communityNameUser        OCTET STRING,
                                    communityNameAccessMask  GAUGE
                                  }
```


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2.8.3.1 Community Name Index Parameter

communityNameIndex OBJECT-TYPE
SYNTAX INTEGER (1..255)
ACCESS not-accessible
STATUS mandatory
DESCRIPTION
"This object defines the row index into the communityNameTable. This value shall not exceed the communityNamesMax object value."
::= { communityNameTableEntry 1 }

2.8.3.2 User Community Name Parameter

communityNameUser OBJECT-TYPE
SYNTAX OCTET STRING (SIZE(6..16))
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object defines a community name value that a security administrator can assign user read-write access to information (other than security) in a device A message with this value in the community name field of an SNMP message has user access rights as defined in the communityNameAccessMask. The syntax is defined as an OCTET STRING and therefore any character can have a value of 0..255."
DEFVAL { "public" }
::= { communityNameTableEntry 2 }

2.8.3.3 User Community Name Mask Parameter

communityNameAccessMask OBJECT-TYPE
SYNTAX GAUGE (0..4294967295)
ACCESS read-write
STATUS mandatory
DESCRIPTION
"This object defines a 32-bit mask that can be used to associate 'write access' with a community name. A value of 0x00000000 grants the community name user read-only access and overrides any individual object's read-write access clause. A value of OxFFFFFFFF grants the community name user read-write access and an individual object's read-write access clause applies. Values other 0x00000000 and 0xFFFFFFFF are implementation specific and may limit viewing and/or accessing the information in a device."
DEFVAL { 4294967295 }
::= { communityNameTableEntry 3 }

END

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Section 3
GROUP DEFINITIONS

A conformance group is defined in [NTCIP 1101] TS 3.2 – Simple Transportation Management Network (STMF), Clause 3.3.5.

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. Objects within a table with the STATUS "optional" may be supported.

Table 3–1
OBJECT SUPPORT REQUIREMENTS

Object Status	Table Status	Conformance Group Status	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 specific device-types such as signal controllers or VMS signs are usually defined in this section but since the Global Object Definitions define the setup of objects (or functions) common to multiple device-types, it cannot and should not be prohibited that a special device-type uses these objects in different logical groupings then defined within this document.

Each conformance group defines a certain function, which has been seen as a logical grouping. The following conformance group definitions are guidelines.

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3.1 CONFIGURATION CONFORMANCE GROUP

The Global Configuration Conformance group consists of a variety of global objects related to general configuration information. The Global Configuration Conformance group shall consist of the following objects and tables:

Object or Table Name	Reference
globalSetIDParameter	NTCIP 1201
globalMaxModules	NTCIP 1201
globalModuleTable	NTCIP 1201
moduleNumber	NTCIP 1201
moduleDeviceNode	NTCIP 1201
moduleMake	NTCIP 1201
moduleModel	NTCIP 1201
moduleVersion	NTCIP 1201
moduleType	NTCIP 1201

3.2 DATABASE MANAGEMENT CONFORMANCE GROUP

The Global Database Management Conformance group consists of global objects related to database management functions. The Global Database Management Conformance group shall consist of the following objects:

Object or Group Name	Reference
dBCreationTransaction	NTCIP 1201
dbVerifyStatus	NTCIP 1201:1996 Amendment 1
dbVerifyError	NTCIP 1201:1996 Amendment 1

3.3 TIME MANAGEMENT CONFORMANCE GROUP

The Global Time Management Conformance group consists of global objects related to time management functions. The Time Database Management Conformance group shall consist of the following objects:

Object or Group Name	Reference
globalTime	NTCIP 1201
globalDaylightSaving	NTCIP 1201
globalLocalTimeDifferential	NTCIP 1201:1996 Amendment 1

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3.4 TIME BASE EVENT SCHEDULE CONFORMANCE GROUP

The Time Base Conformance group consists of the global schedule table objects related to time base operation. Other device-type specific objects are defined in the appropriate device-type specific documents. The Time Base Conformance group shall consist of the following objects:

Object or Conformance group Name	Reference
maxTimeBaseScheduleEntries	NTCIP 1201
timebaseScheduleTable	NTCIP 1201
timebaseScheduleNumber	NTCIP 1201
timebaseScheduleMonth	NTCIP 1201
timebaseScheduleDay	NTCIP 1201
timebaseScheduleDate	NTCIP 1201
timebaseScheduleDayPlan	NTCIP 1201
maxDayPlans	
maxDayPlanEvents	NTCIP 1201
timeBaseDayPlanTable	NTCIP 1201
dayPlanNumber	NTCIP 1201
dayPlanEventNumber	NTCIP 1201
dayPlanHour	NTCIP 1201
dayPlanMinute	NTCIP 1201
dayPlanActionNumberOID	NTCIP 1201
dayPlanStatus	NTCIP 1201

3.5 REPORT CONFORMANCE GROUP

The Report Conformance group consists of those global objects related to event logging. The Report Conformance group shall consist of the following objects:

Object or Group Name	Reference
maxEventLogConfigs	NTCIP 1201
eventLogConfigTable	NTCIP 1201
eventConfigID	NTCIP 1201
eventConfigClass	NTCIP 1201
eventConfigMode	NTCIP 1201
eventConfigCompareValue	NTCIP 1201
eventConfigCompareValue2	NTCIP 1201
eventConfigCompareOID	NTCIP 1201
eventConfigLogOID	NTCIP 1201
eventConfigAction	NTCIP 1201
maxEventLogSize	NTCIP 1201
eventLogTable	NTCIP 1201
eventLogClass	NTCIP 1201
eventLogNumber	NTCIP 1201
eventLogID	NTCIP 1201
eventLogTime	NTCIP 1201
eventLogValue	NTCIP 1201
maxEventClasses	NTCIP 1201
eventClassTable	NTCIP 1201
eventClassNumber	NTCIP 1201
eventClassLimit	NTCIP 1201
eventClassClearTime	NTCIP 1201
eventClassDescription	NTCIP 1201
eventClassNumRowsInLog	NTCIP 1201

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3.6 STMP CONFORMANCE GROUP

The STMP Group consists of those objects related to STMP parameters. The STMP Group shall consist of the following objects:

Object or Group Name	Reference
dynamicObjectPersistence	NTCIP 1201

3.7 PMPP CONFORMANCE GROUP

The PMPP Group consists of those optional global objects related to PMPP parameters. The PMPP Group shall consist of the following objects:

Object or Group Name	Reference
maxGroupAddresses	NTCIP 1201
hdlcGroupAddressTable	NTCIP 1201
hdlcGroupAddressIndex	NTCIP 1201
hdlcGroupAddress	NTCIP 1201

3.8 SECURITY CONFORMANCE GROUP

The Security Group consists of those mandatory global objects related to community name parameters. The Security Group shall consist of the following objects:

Object or Group Name	Reference
communityNameAdmin	NTCIP 1201
communityNamesMax	NTCIP 1201
communityNameTable	NTCIP 1201
communityNameIndex	NTCIP 1201
communityNameUser	NTCIP 1201
communityNameMask	NTCIP 1201

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Section 4
CONFORMANCE STATEMENTS

In addition to the device-type specific conformance requirements stated in the appropriate documents, all transportation related device types shall adhere to the conformance requirements specified in Table 4-1 as a minimum to claim compliance to this standard. Additional objects or groups may be supported without being non-compliant with 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 NTCIP.

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

Table 4–1
CONFORMANCE TABLE

Conformance Group	Reference	Conformance Requirement
Configuration	NTCIP 1201	mandatory
Security	NTCIP 1201	mandatory
Database Management	NTCIP 1201	optional
Time Management	NTCIP 1201	optional
Timebase Event Schedule	NTCIP 1201	optional
Report	NTCIP 1201	optional
STMP	NTCIP 1201	optional
PMPP	NTCIP 1201	optional

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