
**Intelligent transport systems —
Roadside modules SNMP data
interface —**

**Part 6:
Commands**

*Systèmes de transport intelligents — Interface de données SNMP pour
les modules en bord de route —*

Partie 6: Commandes



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

A list of all parts in the ISO 20684 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

0.1 Background

The need for standardized communication with ITS field devices is growing around the world. Several countries have adopted Simple Network Management Protocol (SNMP) based field device communication standards.

There is a growing view and empirical evidence that standardizing this activity will result in improved ITS performance, reduced cost, reduced deployment time, and improved maintainability. The ISO 20684 series extends ISO 15784-2 by defining the management information necessary to monitor, configure and control features of field devices. The data elements defined in all parts of ISO 20684 series may be used with any protocol but were designed with an expectation that they would be used with one of the ISO 15784-2 protocols.

By using this approach, agencies can specify open procurements and systems can be expanded geographically in an open and non-proprietary manner, which reduces costs, speeds up deployment, and simplifies integration.

0.2 Overview

SNMP is a collection of well-thought-out and well-proven concepts and principles. SNMP employs the sound principles of abstraction and standardization. This has led to SNMP being widely accepted as the prime choice for communication between management systems and devices on the internet and other communications networks.

The original implementation of SNMP was used to manage network devices such as routers and switches. Since then, the use of SNMP has grown into many areas of application on the internet and has also been used successfully over various serial communications networks.

This document defines management information for ITS field devices following the SNMP conventions.

0.3 Document approach and layout

This document defines:

- a) the conformance requirements for this document ([Clause 4](#));
- b) a set of user needs for user-defined trigger conditions that can “fire” to initiate actions ([Clause 5](#));
- c) a set of detailed requirements for the identified user needs ([Clause 6](#));
- d) security considerations for the information defined in this document ([Clause 7](#));
- e) the management information bases that define the data for the defined requirements ([Annex A](#));
- f) the requirements traceability matrix (RTM) that traces the requirements to the design elements ([Annex B](#)).

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Intelligent transport systems — Roadside modules SNMP data interface —

Part 6: Commands

1 Scope

Field devices are a key component in intelligent transport systems (ITS). Field devices include traffic signals, message signs, weather stations, traffic sensors, roadside equipment for connected ITS (C-ITS) environments, etc.

Field devices often need to exchange information with other external entities (managers). Field devices can be quite complex, necessitating the standardization of many data concepts for exchange. As such, the ISO 20684 series is divided several individual parts.

This document specifies the user needs, requirements and design elements that are used to issue an SNMP set-request in response to a trigger firing. This allows a manager to configure the field device to implement simple responses to conditions in the field.

NOTE 1 There are similarities between certain portions of the Event MIB defined in IETF RFC 2981 and this document.

NOTE 2 ISO 20684-1 provides additional details about how the ISO 20684 series relates to the overall ITS architecture.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 20684-1:2021, *Intelligent transport systems — Roadside modules SNMP data interface — Part 1: Overview*

IETF RFC 2578, *Structure of Management Information Version 2 (SMIv2)*, April 1999.

IETF RFC 2579, *Textual Conventions for SMIv2*, April 1999.

IETF RFC 2580, *Conformance Statements for SMIv2*, April 1999.

IETF RFC 3411, *An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks*, December 2002.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20684-1 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Conformance

This clause follows the rules defined in ISO 20684-1. [Table 1](#) traces each user need to a set of software features. [Table 2](#) traces each feature to a set of requirements. For a full understanding of these tables and codes, see ISO 20684-1.

Table 1 — User need and feature conformance

Need	Requirement	Conformance
5.1: Issue trigger-based commands		M
	6.1 : Command factory	M
	20684-7 6.5: SNMP target	M
	20684-7 6.6: SNMP target parameters	M

Table 2 — Requirement conformance

Feature	Requirement	Conformance
6.1: Command factory		
	6.1.2.1 : Determine command factory capabilities	M
	6.1.2.2 : Configure a command factory	M
	6.1.2.3 : Verify command factory configuration	M
	6.1.2.4 : Retrieve command factory statistics	M
	6.1.2.5 : Retrieve command factory status	M
	6.1.2.6 : Toggle a command factory	M
	6.1.2.7 : Delete command factory	M
	6.1.3.1 : Size of variable bindings list	M
	6.1.3.2 : Issue a command	M

5 User needs

5.1 Issue trigger-based commands

5.1.1 Automatically respond to user-defined exceptions user need

A manager needs to be able to configure a field device ("field manager") to send a command to a remote field device ("target") when user-defined conditions are detected by the field manager. This will allow the field manager to alter the state of other devices (targets) in response to exceptional conditions in a timely manner without burdening the communications channel between the centre and field location.

NOTE The field manager and target can be the same field device.

EXAMPLE A manager wants to configure a field manager to automatically display a message whenever ice is detected on the roadway.

5.1.2 Automatically respond to user-defined exceptions overview

5.1.2.1 Required features

In the simplest case, the "automatically respond to user-defined exceptions" user need shall support the following features.

- A mechanism to trigger the command factory to generate a command. For example, this functionality can be provided by the trigger, as specified by ISO/TS 20684-3.

- b) A command factory, as defined by this document, which defines details about the command(s) to be generated when the event occurs.
- c) An SNMP target, as specified by ISO/TS 20684-7 and RFC 3413, which defines the SNMP agent to which the command should be sent. It may also be used to identify a remote device from which to obtain data used in the trigger logic.
- d) SNMP target parameters, as specified by ISO/TS 20684-7 and RFC 3413, which defines the parameters used to communicate with the SNMP target.

5.1.3 Graphical relationships

The relationships among these features are depicted in [Figure 1](#).

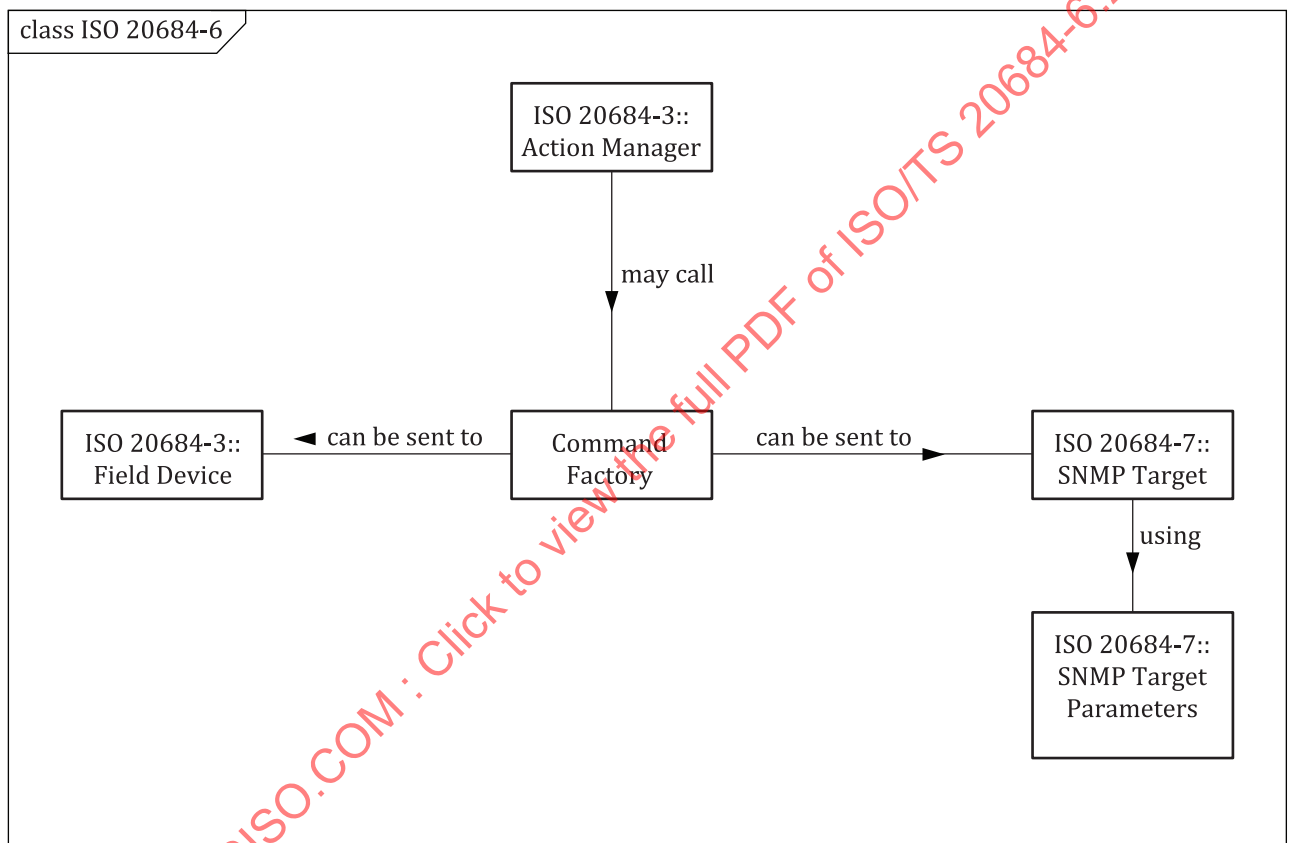


Figure 1 — Conceptual overview of commands

The mechanism by which the command factory is called is outside the scope of this document, but it is possible for it to be called by an entry in the fdActionTable, as specified in ISO/TS 20684-3.

When the command factory is called, the field manager sends the configured SNMP set request to the identified SNMP target using the configured SNMP target parameters.

6 Requirements

6.1 Command factory

6.1.1 Command factory definition

The command factory generates a SET request for a target when activated. The target may be the host field device or a remote field device.

6.1.2 Command factory data exchange requirements

6.1.2.1 Determine command factory capabilities

The field device shall allow a manager to determine the maximum size (number of octets) allowed for the variable binding list associated with any fdCommandFactoryEntry.

6.1.2.2 Configure a command factory

The field device shall allow a manager to configure the command and the target(s) to which the command should be sent along with a description for the entry.

6.1.2.3 Verify command factory configuration

The field device shall allow a manager to verify the configuration of a command factory.

6.1.2.4 Retrieve command factory statistics

The field device shall allow a manager to retrieve statistics about the issuance of commands by the command factory.

6.1.2.5 Retrieve command factory status

The field device shall allow a manager to retrieve the status of the command factory.

6.1.2.6 Toggle a command factory

The field device shall allow a manager to toggle the enabled status of a command factory.

6.1.2.7 Delete command factory

The field device shall allow a manager to delete a command factory configuration.

6.1.3 Command factory capability requirements

6.1.3.1 Size of variable bindings list

The field device shall support a variable binding list of at least 64 octets for each supported command.

6.1.3.2 Issue a command

The field device shall transmit a Set Request to the associated target, using the associated SNMP target parameters, each time the command factory is called (e.g. due to logic defined in ISO/TS 20684-3).

7 Security vulnerabilities

There are data elements defined in this document with a MAX-ACCESS clause of read-write and/or read-create. These and other data elements are sensitive and need to be protected from malicious and inadvertent manipulation and/or disclosure. The support for requests in a non-secure environment without proper protection can have a negative effect on network operations. A sampling of the vulnerabilities includes:

- a) the ability to change when commands are sent;
- b) the ability to delete commands;
- c) the ability to create additional commands; and

d) the ability to monitor current configurations.

To overcome these vulnerabilities, it is highly recommended that SNMPv3 with TLS support, as defined in RFC 6353, is used to exchange the data.

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Annex A (normative)

Management information base (MIB)

This annex provides definitions which it is useful to import into other management information base (MIB) modules of this document.

A.1 Command MIB

```
-- *****
-- A.1.1 Command Header
-- *****

-- ASN1START
COMMAND-MIB DEFINITIONS ::= BEGIN
IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, OBJECT-IDENTITY, Integer32, Unsigned32,
Counter32

                                FROM SNMPv2-SMI
                                -- RFC 2578

StorageType, RowStatus

                                FROM SNMPv2-TC
                                -- RFC 2579

MODULE-COMPLIANCE, OBJECT-GROUP

                                FROM SNMPv2-CONF
                                -- RFC 2580

SnmpAdminString

                                FROM SNMP-FRAMEWORK-MIB
                                -- RFC 3411

SnmpTagValue

                                FROM SNMP-TARGET-MIB
                                -- RFC 3413

ITSDailyTimeStamp, ITSDateStamp, ITSPduErrorStatus, fieldDevice, iso20684p6
                                FROM FIELD-DEVICE-TC-MIB
                                -- ISO 20684-1 Annex A

;
fdCommandMIB MODULE-IDENTITY
    LAST-UPDATED "202002122127Z"
    ORGANIZATION "ISO TC 204 WG 9"
    CONTACT-INFO
        "name: Kenneth Vaughn
        phone: +1-571-331-5670
        email: kvaughn@trevilon.com
        postal: 6606 FM 1488 RD STE 148-503
              Magnolia, TX 77354
              USA"
    DESCRIPTION
        "This MIB defines a mechanism by which a manager can configure a device to
        issue SNMP SET requests to another SNMP Agent when called."

    REVISION "202002122127Z"
    DESCRIPTION
        "Initial revision of the document as proposed for CD ballot."
::= {iso20684p6 1}
```

```

-- *****
-- A.1.2 Node Definitions
-- *****

fdCommandConformance OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "A node containing conformance statements related to the fdCommandMIB, as
        defined in ISO/TS 20684-6."
    ::= {fdCommandMIB 2}

fdCommandCompliances OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "A node for compliance statements for the fdCommandMIB."
    ::= {fdCommandConformance 1}

fdCommandGroups OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "A node for group definitions related to fdCommandMIB."
    ::= {fdCommandConformance 2}

fdCommand OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "A node for management information related to the fdCommandMIB."
    ::= {fieldDevice}

-- *****
-- A.1.3 Objects
-- *****

fdCommandMaxVbSize OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The maximum size, in octets, of a value of fdCommandVariableBindings."
    ::= {fdCommand 1}

fdCommandTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF FdCommandEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A dynamic table where each entry defines a set request that can be sent
        to either the local or a remote device."
    ::= {fdCommand 2}

fdCommandEntry OBJECT-TYPE
    SYNTAX      FdCommandEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry in the fdCommandTable."
    INDEX       {fdCommandOwner, fdCommandName}
    ::= {fdCommandTable 1}

fdCommandEntry ::= SEQUENCE {
    fdCommandOwner          SnmpAdminString,
    fdCommandName           SnmpAdminString,
    fdCommandDescription    SnmpAdminString,
    fdCommandVariableBindings OCTET STRING,
    fdCommandTargetTag      SnmpTagValue,
    fdCommandContextName    SnmpAdminString,
    fdCommandState          INTEGER,
    fdCommandCalls          Counter32,
    fdCommandAttempts       Counter32,
    fdCommandResponses      Counter32,

```

fdCommandErrors	Counter32,
fdCommandLastAttemptSource	OBJECT IDENTIFIER,
fdCommandLastAttemptTime	ITSDailyTimeStamp,
fdCommandLastAttemptDate	ITSDateStamp,
fdCommandLastAttemptStatus	INTEGER,
fdCommandLastResponseID	Integer32,
fdCommandLastResponseErrorStatus	ITSPduErrorStatus,
fdCommandLastResponseErrorIndex	Unsigned32,
fdCommandLastResponseDate	ITSDateStamp,
fdCommandLastResponseTime	ITSDailyTimeStamp,
fdCommandStorageType	StorageType,
fdCommandRowStatus	RowStatus }

```
fdCommandOwner OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE (1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "The owner of the command entry."
 ::= {fdCommandEntry 1}
```

```
fdCommandName OBJECT-TYPE
SYNTAX      SnmpAdminString (SIZE (1..32))
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A secondary index that identifies the specific command defined by an
    owner."
 ::= {fdCommandEntry 2}
```

```
fdCommandDescription OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "A textual description of the command."
 ::= {fdCommandEntry 3}
```

```
fdCommandVariableBindings OBJECT-TYPE
SYNTAX      OCTET STRING (SIZE (0..65535))
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The variableBindings field of the SNMP SetRequest-PDU to be sent to the
    target. An implementation shall restrict the size of this of this object
    to the fdCommandMaxVBSIZE."
 ::= {fdCommandEntry 4}
```

-- This defines the specific object instances and values to be set.

```
fdCommandTargetTag OBJECT-TYPE
SYNTAX      SnmpTagValue
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The tag for the target(s) to which the SNMP SetRequest shall be sent.
    Systems limited to self-management may subrange this value to a zero length
    field. A value of zero (0) length shall indicate the local system. In
    this case, the command shall be under the security credentials of the
    requester that set fdTrigger-rowStatus to 'active'. Those credentials are
    the input parameters for isAccessAllowed from the Architecture for
    Describing SNMP Management Frameworks. Otherwise access rights are
    checked according to the security parameters resulting from the tag."
 ::= {fdCommandEntry 5}
```

```
fdCommandContextName OBJECT-TYPE
SYNTAX      SnmpAdminString
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The management context to use with the variableBindings value."
 ::= {fdCommandEntry 6}
```

fdCommandState OBJECT-TYPE

SYNTAX INTEGER { ready (1), notReady (2), pending (3), call (4) }

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object provides control and status information for the command. The values 'notReady', 'ready', and 'pending' are status values; the value 'call' is a command value. Setting this object to any value other than 'call' shall result in a 'wrongValue' error. Setting this object to 'call' when it is in the 'ready' state shall result in a '. The field device shall then attempt to send the command to the identified targets. This object shall automatically transition back to the 'ready' state once the command has been sent to all identified targets and responses have been received, timeouts have occurred, or transmission errors have been detected for each target. Setting this object to 'call' when it is in the 'notReady' or 'pending' state shall result in an 'inconsistentValue' error. In addition, the fdCommandLastAttempt objects shall be updated. This mechanism allows identification of why the attempt failed. The status shall indicate 'notReady' whenever this table entry is not 'active'. When this table entry is 'active', the value of this object shall be 'pending' if the field device is still processing a previous call for this command; otherwise, it shall be 'ready'."

::= {fdCommandEntry 7}

fdCommandCalls OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times this command entry has been called from all sources (e.g., through an SNMP set request, by the scheduler, by the trigger, etc.). This counter will increment by one each time the table entry is called, even if the command is sent to zero or multiple targets."

::= {fdCommandEntry 8}

fdCommandAttempts OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of times the field device has attempted to send this command to a target since the last reboot. If the command is not in the 'active' state or if no targets are identified to receive the command, this counter will not increment."

::= {fdCommandEntry 9}

fdCommandResponses OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The total number of responses received for this row of the table since the last reboot."

::= {fdCommandEntry 10}

fdCommandErrors OBJECT-TYPE

SYNTAX Counter32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of error responses received to commands sent for this row of the table since the last reboot. The value of this object should always be less than or equal to fdCommandResponses."

::= {fdCommandEntry 11}

fdCommandLastAttemptSource OBJECT-TYPE

SYNTAX OBJECT IDENTIFIER

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The OBJECT IDENTIFIER indicating the source that requested the last command to be sent. If the command was called by the action table, this object shall indicate the OBJECT IDENTIFIER of the fdActionIndex object instance. If the command was called by setting the fdCommandIssue object to 'true', this object shall indicate the OBJECT IDENTIFIER of the fdCommandIssue object instance."

::= {fdCommandEntry 12}

fdCommandLastAttemptTime OBJECT-TYPE

SYNTAX ITSDailyTimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The UTC time at which the last command was sent for this row."

::= {fdCommandEntry 13}

fdCommandLastAttemptDate OBJECT-TYPE

SYNTAX ITSDateStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The UTC date on which this last command was sent for this row."

::= {fdCommandEntry 14}

fdCommandLastAttemptStatus OBJECT-TYPE

SYNTAX INTEGER {
 other (1),
 pending (2),
 success (3),
 errorNotActive (4),
 errorPending (5),
 errorTransmit (6),
 errorResponse (7),
 timeout (8) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The status of the last attempt, defined as:

other: a status other than those shown (e.g., no command has been sent yet)

pending: a command has been sent for which a response has not been received and the timeout has not yet expired

success: a 'noError' response was received in response to the last request

errorNotActive: a request was made to send the command when the table entry was not in the 'active' state

errorPending: a request was made to send the command when it was in the 'pending' state

errorTransmit: an error occurred in attempting to transmit the command (e.g., a sockets error)

errorResponse: a response was received to the command, but it indicated an error-status other than 'noError'

timeout: no response was received for the last request and the timeout has expired. If a response is received after the timeout, the value of this object shall be updated to reflect the response."

::= {fdCommandEntry 15}

fdCommandLastResponseID OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The value of the request-id field of the last Response-PDU received in response to a command generated by this row."

REFERENCE "RFC 3416"

DEFVAL {0}

::= {fdCommandEntry 16}

fdCommandLastResponseErrorStatus OBJECT-TYPE

SYNTAX ITSPduErrorStatus

MAX-ACCESS read-only

STATUS current

DESCRIPTION


```

    "The value of the error-status field of the last Response-PDU received in
    response to a command generated by this row."
    DEFVAL      {noError}
    ::= {fdCommandEntry 17}

fdCommandLastResponseErrorIndex OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of the error-index field of the last Response-PDU received in
        response to a command generated by this row."
    REFERENCE   "RFC 3416"
    DEFVAL      {0}
    ::= {fdCommandEntry 18}

fdCommandLastResponseDate OBJECT-TYPE
    SYNTAX      ITSDateStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of fdClockUtcDate when the field device last received a
        response to a command generated by this row."
    ::= {fdCommandEntry 19}

fdCommandLastResponseTime OBJECT-TYPE
    SYNTAX      ITSDailyTimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of fdClockUtcTime when the field device last received a
        response to a command generated by this row."
    ::= {fdCommandEntry 20}

fdCommandStorageType OBJECT-TYPE
    SYNTAX      StorageType
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The storageType for this conceptual row."
    ::= {fdCommandEntry 21}

fdCommandRowStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status of this conceptual row. To create a row in this table, a manager
        must set this object to either createAndGo (4) or createAndWait(5). The
        value of this object shall be 'notReady' whenever the variableBindings for
        this row is set to a zero-length string (''). Objects in this row may be
        modified while the value of this object is active."
    DEFVAL      {notReady}
    ::= {fdCommandEntry 22}

-- *****
-- A.1.4 Conformance Information
-- *****

fdCommandMIBCompliance MODULE-COMPLIANCE
    STATUS      current
    DESCRIPTION
        "The conformance statement for the field device log MIB."
    MODULE     -- this module
        MANDATORY-GROUPS {
            fdCommandCapabilitiesGroup,
            fdCommandManagementGroup,
            fdCommandConfigurationGroup,
            fdCommandStatisticsGroup,
            fdCommandStatusGroup
        }

```

```

::= {fdCommandCompliances 1}

fdCommandCapabilitiesGroup OBJECT-GROUP
OBJECTS
    {
        fdCommandMaxVBSIZE
    }
STATUS
    current
DESCRIPTION
    "Management information that identifies the capabilities of each
    fdNotifyFactoryEntry."
REFERENCE "Clause 6.1.2.1"
::= {fdCommandGroups 1}

fdCommandManagementGroup OBJECT-GROUP
OBJECTS
    {
        fdCommandRowStatus
    }
STATUS
    current
DESCRIPTION
    "Management information that provides for creation, deletion, and management
    of an fdNotifyFactoryEntry."
REFERENCE "Clause 6.1.2.2, Clause 6.1.2.3, Clause 6.1.2.6, Clause 6.1.2.7"
::= {fdCommandGroups 2}

fdCommandConfigurationGroup OBJECT-GROUP
OBJECTS
    {
        fdCommandDescription,
        fdCommandVariableBindings,
        fdCommandTargetTag,
        fdCommandContextName,
        fdCommandStorageType
    }
STATUS
    current
DESCRIPTION
    ""
REFERENCE "Clause 6.1.2.2, Clause 6.1.2.3"
::= {fdCommandGroups 3}

fdCommandStatisticsGroup OBJECT-GROUP
OBJECTS
    {
        fdCommandCalls,
        fdCommandAttempts,
        fdCommandResponses,
        fdCommandErrors,
        fdCommandLastAttemptSource,
        fdCommandLastAttemptTime,
        fdCommandLastAttemptDate,
        fdCommandLastAttemptStatus,
        fdCommandLastResponseID,
        fdCommandLastResponseErrorStatus,
        fdCommandLastResponseErrorIndex,
        fdCommandLastResponseDate,
        fdCommandLastResponseTime
    }
STATUS
    current
DESCRIPTION
    ""
REFERENCE "Clause 6.1.2.4"
::= {fdCommandGroups 4}

fdCommandStatusGroup OBJECT-GROUP
OBJECTS
    {
        fdCommandState
    }
STATUS
    current
DESCRIPTION
    ""
REFERENCE "Clause 6.1.2.5"
::= {fdCommandGroups 5}

```

END

-- ASN1END

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