INTERNATIONAL STANDARD

ISO 20684-1

First edition
2021-04

Intelligent transport systems — Roadside modules SNMP data interface —

Part 1: **Overview**

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

Partie 1: Vue d'ensemble

Reference number
ISO 20684-1:2021(E)

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Published in Switzerland

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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).

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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.

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Introduction

0.1 Background

The need for standardized communication with ITS field devices is growing around the world. Several countries have adopted 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 the ISO 20684 series may be used with any relevant 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) How conformance is defined in subsequent parts of the ISO 20684 series (Clause 5);

b) Terminology and symbols used throughout the various parts of the ISO 20684 series (Clause 3 and Clause 4);

c) Conventions used throughout the various parts of the ISO 20684 series (Clause 6);

d) The ITS architectural services defined in ISO 14813-1 that are addressed by the ISO 20684 series (Clause 7);

e) The rules used by other parts of the ISO 20684 series in defining the user needs that drive the definition of requirements (Clause 8);

f) The rules used by other parts of the ISO 20684 series in defining requirements and constraints (Clause 9);

g) A set of generic dialogues that are referenced by other parts of the ISO 20684 series (Clause 10);

h) A discussion of security that applies to all devices conforming to the ISO 20684 series (Clause 11);

i) The management information base (MIB) for the features defined by this document (Annex A);

j) A description of the requirements traceability matrix that is provided in each subsequent part of the ISO 20684 series that traces defined requirements to the required design elements (Annex B).

In addition, the MIBs are available electronically at https://standards.iso.org/iso/20684/-1/ed-1/en.

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Intelligent transport systems — Roadside modules SNMP data interface —

Part 1: Overview

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.

The ISO 20684 series defines data that can be used when field devices need to exchange information with other external entities (called "managers" in this document, even if they are other field devices). Field devices can be quite complex, necessitating the standardization of many data concepts for exchange. As such, the ISO 20684 series is divided into several individual parts. This document (Part 1) introduces the ISO 20684 series and provides normative content that applies to all subsequent parts.

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.

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
agent
entity (3.2) that can respond to `get` and `set` requests

3.2
entity
device or "thing" that becomes part of an intelligent transport system

3.3
event
information captured when a *trigger* (3.13) *fires* (3.6) within an *agent* (3.1)

Note 1 to entry: Events are often transmitted in notifications or stored in logs.

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3.4
exception
condition that creates an *event* (3.3) that a user can want to store in a *log* (3.7) or transmit in a *notification* (3.9)

3.5
field device
fixed or portable roadside module that includes an *agent* (3.1)

3.6
fire
to start a process when a *trigger* (3.13) value transitions from false to true

3.7
log
registry of *events* (3.3) within an *agent* (3.1) that can be retrieved by a *manager* (3.8)

3.8
manager
entity (3.2) that can generate `get` and `set` requests and/or can receive `report`, `trap`, and/or other `inform` messages

[SOURCE: ISO 15784-2:2015, 4.9 — modified.]

3.9
notification
listing of one or more *events* (3.3) that the *agent* (3.1) can send to one or more *managers* (3.8)

3.10
response time
time from the receipt of the last byte of a Confirmed Class `pduType` to the start of the transmission of the first byte of the response message (when access is allowed by lower layers)

3.11
target
entity (3.1) to which the *field device* (3.5) can need to send `request`s or `notification`s

Note 1 to entry: Field devices often need to send notifications to managers when triggers fire.

Note 2 to entry: Field devices can be configured to request data from other field devices to use in their expression or trigger logic.

Note 3 to entry: Field devices can be configured to control other field devices in response to a trigger firing.

3.12
trap
notification (3.9) sent from an SNMP *agent* (3.1) to a SNMP *manager* (3.8) without an immediately preceding request from the manager or any expectation of an acknowledgement

3.13
trigger
condition that evaluates to a Boolean value

4 Symbols and abbreviated terms

ASN.1 abstract syntax notation one

BER basic encoding rules

IAB Internet Architecture Board

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