TECHNICAL SPECIFICATION

ISO/TS 18234-1

Second edition
2013-10-15

Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format —

Part 1: Introduction, numbering and versions (TPEG1-INV)

Systèmes intelligents de transport — Informations sur le trafic et le tourisme via les données de format binaire du groupe d'experts du protocole de transport, génération 1 (TPEG1) —

Partie 1: Introduction, numérotage et versions (TPEG1-INV)

Reference number
ISO/TS 18234-1:2013(E)

© ISO 2013

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

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Contents

Page

Foreword ..... **iv**
Introduction ..... **vi**
1 Scope **1**
2 Normative references **1**
3 Abbreviated terms **2**
4 Application identification **2**
Annex A (normative) **Overview of parts, naming and versions** **4**
Annex B (informative) **Applications and bearers** **5**
Bibliography **6**

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

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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.

ISO/TS 18234-1 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Road transport and traffic telematics,* in collaboration with ISO Technical Committee ISO/TC 204, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (18234-1:2006), which has been technically revised.

ISO/TS 18234 consists of the following parts, under the general title *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format*:

— *Part 1: Introduction, numbering and versions (TPEG1-INV)*

— *Part 2: Syntax, semantics and framing structure (TPEG1-SSF)*

— *Part 3: Service and network information (TPEG1-SNI)*

— *Part 4: Road Traffic Message (RTM) application*

— *Part 5: Public Transport Information (PTI) application*

— *Part 6: Location referencing applications*

— *Part 7: Parking information (TPEG1-PKI)*

— *Part 8: Congestion and Travel Time application (TPEG1-CTT)*

© ISO 2013 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

— *Part 9: Traffic event compact (TPEG1-TEC)*

— *Part 10: Conditional access information (TPEG1-CAI)*

— *Part 11: Location Referencing Container (TPEG1-LRC)*

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

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Introduction

TPEG technology uses a byte-oriented data stream format, which may be carried on almost any digital bearer with an appropriate adaptation layer. TPEG messages are delivered from service providers to end-users and used to transfer information from the database of a service provider to an end-user's equipment.

The brief history of TPEG technology development dates back to the European Broadcasting Union (EBU) Broadcast Management Committee establishing the B/TPEG project group in autumn 1997 with the mandate to develop, as soon as possible, a new protocol for broadcasting traffic and travel-related information in the multimedia environment. TPEG technology, its applications and service features are designed to enable travel-related messages to be coded, decoded, filtered and understood by humans (visually and/or audibly in the user's language) and by agent systems.

One year later in December 1998, the B/TPEG group produced its first EBU specifications. Two Technical Specifications were released. ISO/TS 18234-2 (TPEG-SSF) described the Syntax, Semantics and Framing Structure, which is used for all TPEG applications. ISO/TS 18234-4 (TPEG-RTM), described the first application, for Road Traffic Messages.

Subsequently, CEN/TC 278/WG 4, in conjunction with ISO/TC 204, established a project group comprising the members of B/TPEG and they have continued the work concurrently since March 1999. Since then two further parts were developed to make the initial complete set of four parts, enabling the implementation of a consistent service. ISO/TS 18234-3 (TPEG-SNI) describes the Service and Network Information Application, which should be used by all service implementations to ensure appropriate referencing from one service source to another. ISO/TS 18234-1 (TPEG-INV), completes the series, by describing the other parts and their relationship; it also contains the application IDs used within the other parts. Additionally, ISO/TS 18234-5, the Public Transport Information Application (TPEG-PTI), was developed.

But a major step forward was to develop the so-called TPEG-Loc location referencing method, which enabled both map-based TPEG-decoders and non map-based ones to deliver either map-based location referencing or human readable text information. The original issue of ISO/TS 18234-6 described the TPEG-Loc application in detail and was used in association with the other parts of ISO/TS 18234 series to provide location referencing.

TPEG-Loc was designed to offer service providers and end-users several large and significant advantages over previous location based services. TPEG-Loc formed the basis of location referencing for any TPEG application that may be specified. However, as time progressed and new TPEG applications were being developed, it became clear that two new requirements would need to be satisfied. Firstly, detailed segment descriptions would be needed for applications such as TPEG-Congestion and Travel Time where for example dynamic segments and sub-segments are required. Secondly, new requirements for the use of existing pre-coded location formats such as the Korean Node Link Location and the VICS Link Location methods and the most recent Dynamic Location Referencing method developed by ISO/TC 204.

The TPEG-Location Referencing Container (TPEG-LRC) is designed remembering the original TPEG objectives, to ensure that it meets all needs of both service providers and potential client devices. It is thus flexible in use, from both a service provision and end-user viewpoint. It will be issued as soon as possible.

TPEG applications are now developed using UML modelling and a software tool is used to automatically select content which then populates a TS. Diagrammatic extracts from the model are used to show the capability of the binary coding in place of lengthy text descriptions; the diagrams do not necessarily include all relevant content possible.

This Technical Specification provides an index to the other parts of ISO/TS 18234 and describes the AID for TPEG (See Clause 4).

During the development of the TPEG technology a number of versions have been documented and various trials implemented using various versions of the specifications. At the time of the publication of this Technical Specification, the original parts are fully inter-workable and no specific dependencies exist. Now

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

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

however, at least for TPEG1-TEC, profiles are used to define which applications should be used together. For example, TPEG1-TEC is used only with TPEG1-LRC containing DLR1 and never with TPEG1-LOC.

This Technical Specification has the technical version number TPEG-INV/004 (See Annex A).

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

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format —

Part 1:
Introduction, numbering and versions (TPEG1-INV)

1 Scope

This Technical Specification provides an introduction and index to the complete set of TPEG Generation 1 toolkit components and applications. It allows the indexing of new applications as they are added to the TPEG applications family, by defining their Application Identification (AID).

This Technical Specification will be updated when such developments occur, to indicate the latest status and the inter-working of the various TPEG specifications. It will be issued as a new editorial version *every* time a new issue of *any* other specification is issued.

2 Normative references

The following referenced documents are indispensable for the application of this Technical Specification. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 17572 (all parts), *Intelligent transport systems (ITS) — Location referencing for geographic databases*

ISO/TS 18234-2, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 2: Syntax, semantics and framing Structure (TPEG1-SSF)*

ISO/TS 18234-3, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 3: Service and network information (TPEG1-SNI)*

ISO/TS 18234-4, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 4: Road Traffic Message (RTM) application*

ISO/TS 18234-5, *Traffic and Travel Information (TTI) — TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 5: Public Transport Information (PTI) application*

ISO/TS 18234-6, *Traffic and Travel Information (TTI) - TTI via Transport Protocol Expert Group (TPEG) data-streams — Part 6: Location referencing applications*

ISO/TS 18234-7, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 7: Parking information (TPEG-PKI)*

ISO/TS 18234-8, *Intelligent transport systems — Traffic and travel information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 8: Congestion and Travel Time application (TPEG1-CTT)*

ISO/TS 18234-9, *Intelligent transport systems — Traffic and Travel Information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 9: Traffic event compact (TPEG1-TEC)*

ISO/TS 18234-10, *Intelligent transport systems — Traffic and Travel Information via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 10: Conditional access information (TPEG1-CAI)*

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

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

ISO/TS 18234-11, *Intelligent transport systems — Traffic and Travel Information (TTI) via transport protocol experts group, generation 1 (TPEG1) binary data format — Part 11: Location Referencing Container (TPEG1-LRC)*

3 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

AID Application Identification

ARIB Association of Radio Industries and Businesses (Japan)

ATSC Advanced Television Systems Committee, Inc. (USA)

B/TPEG Broadcast/TPEG (the EBU project group name for the TPEG specification drafting group)

CEN Comité Européen de Normalisation

CTT Congestion and Travel Time (See ISO/TS 18234-8)

DAB Digital Audio Broadcasting

DVB Digital Video Broadcasting

EBU European Broadcasting Union

INV Introduction, numbering and versions (this Technical Specification)

ISO International Organization for Standardization

PTI Public Transport Information (See ISO/TS 18234-5)

RDS-TMC Radio Data System – Traffic Message Channel

RFU Reserved for Future Use

RTM Road Traffic Message (See ISO/TS 18234-4)

SNI Service and Network Information (See ISO/TS 18234-3)

SSF Syntax, Semantics and Framing Structure (See ISO/TS 18234-2)

Tba to be announced

TPEG1 Transport Protocol Expert Group – Generation 1

TPEG-LOC Location Referencing for applications – the “native” TPEG method (See ISO/TS 18234-6)

TPEG-LRC Location Referencing Container – Toolkit for various location referencing methodologies to be used (See ISO/TS 18234-11 and ISO 17572 series)

TTI Traffic and Travel Information

4 Application identification

Each TPEG application is assigned a unique number, called the Application Identification (AID). An AID is defined whenever a new application is developed.

The AID number is used within the TPEG-SNI Application[2] to indicate how to process TPEG content and to facilitate the routing of information in a client device to the appropriate Application decoder.

© ISO 2013 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

In order to allow service providers to test new Applications within an existing service multiplex, a Test AID is allocated for every application. All client devices shall ignore content flagged by a Test AID.

Table 1 shows AID numbers currently allocated.

Table 1 — Currently allocated Application Identification (AID) numbers

AID Number (hex)	Application	Abbreviation
0000	Service and Network Information application	SNI
0001	Road Traffic Message application	RTM
0002	Public Transport Information application	PTI
0003	Parking Information application	PKI
0004	Congestion and Travel Time application	CTT
0005	Traffic Event Compact application	TEC
0006	Conditional Access Information application	CAI
0007	Traffic Flow and Prediction	TFP

AID Number (hex)	Test Application	Not used
xxxx	TEST: RTM application	Not used
xxxx	TEST: PTI application	Not used
xxxx	TEST: PKI application	Not used
xxxx	TEST: CTT application	Not used
xxxx	TEST: TEC application	Not used
xxxx	TEST: CAI application	Not used

NOTE Test AIDs use randomly allocated numbers from within the upper half range available (e.g. 01FF to FFFF).

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Annex A
(normative)

Overview of parts, naming and versions

A.1 General

The ISO/TS 18234 series is partitioned into a number of parts to allow the development, over time, of a wide range of Applications. These parts are given descriptive titles appropriate to their Application and reduced to a three-letter acronym.

EXAMPLE 1 The TPEG Road Traffic Message application would be abbreviated to TPEG-RTM (ISO/TS 18234-4).

Each part has a technical-version number that is allocated to published Technical Specifications, to allow full management of versions as they are developed and validated. This is indicated by "_v.v", following the technical-version acronym.

Each technical version is allocated an editorial-version number, which is allocated to published Technical Specifications to allow full management of versions as they are issued. This is indicated by "/nnn", following the title, comprising the title acronym and technical-version number; it is incremented from 001 upwards.

EXAMPLE 2 The second editorial version of the first Road Traffic Message Application was published as: TPEG-RTM_1.0/002.

In the above context, a new technical version is issued when a technology change is made (e.g. a new feature is added), whereas a new editorial version is issued *only* when simple typing, word or diagram formatting or text descriptions are changed.

The following table details the complete set of *current* technical-versions and editorial-versions of ISO/TS 18234.

Table A.1 — Specification parts, titles and versions

ISO designation	Technical Specification	Technical version
TS 18234-1	Introduction, numbering and versions	TPEG1-INV/004
TS 18234-2	Syntax, Semantics and Framing Structure	TPEG1-SSF_1.0/002
TS 18234-3	Service and network information application	TPEG1-SNI_3.1/001
TS 18234-4	TPEG - Road Traffic Message application	TPEG1-RTM_3.0/003
TS 18234-5	TPEG - Public Transport Information application	TPEG1-PTI_3.0/001
TS 18234-6	TPEG - Location referencing applications	TPEG1-LOC_3.0/001
TS 18234-7	TPEG - Parking Information application	TPEG1-PKI_1.0/001
TS 18234-8	TPEG - Congestion and Travel Time application	KR-TPEG1-CTT_n.n/00n
TS 18234-9	TPEG - Traffic event compact application	TPEG1-TEC_3.0/001
TS 18234-10	TPEG-Conditional access information application	TPEG1-CAI_1.0/001
TS 18234-11	TPEG - Location Referencing Container	TPEG1-LRC_1.0/001

© ISO 2013 – All rights reserved
Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Annex B
(informative)

Applications and bearers

B.1 General

The work item for the development of TPEG technology reflected the knowledge at that time about data bearer potential. As a result, the term "high data rate bearers" was used, but no specific definition was placed upon the words: "high data rate". Although by comparison with RDS-TMC running at approximately 80 bits/sec, TPEG technology was indeed aimed at much higher data rate bearers (around 8 kbits/s or higher). The 'position' of TPEG technology in relation to data bearers is now better understood. 'Adaptation Layer' requirements for both Digital Radio (DAB) and the Internet were described and successfully implemented for technical tests during the TPEG Project (See IST-1999-12201, TPEG Project Deliverable 6, Section 8).

The current development of TPEG technology will be very well matched *both* technically and economically to Digital Radio (DAB/DAB+), Digital Multimedia Broadcasting (DMB), HD Radio and Internet bearers.

Other bearers such as ARIB, ATSC and DVB may be able to offer much higher data rates with economic and technical utility. However, these bearers are highly structured (layered) in their ability to handle transparent data services and they include mechanisms suitable for carousel delivery, which may require a different TPEG data structure before real transparency can be achieved. For example, tpegML files may be considered suitable (See ISO/TS 24530 series and see IST-1999-12201, TPEG Project Deliverable 6, Section 9).

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

Bibliography

[1] ISO/IEC 7498-1, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model — Part 1*

[2] ISO/IEC/TR 10000-1, *Information technology — Framework and taxonomy of International Standardized Profiles — Part 1: General principles and documentation framework*

[3] ISO/TS 24530 (all parts), *Traffic and Travel Information (TTI) — TTI via Transport Protocol Experts Group (TPEG) Extensible Markup Language (XML)*

[4] IST-1999-12201, *TPEG Project Deliverable 6*

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

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

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST

ICS 35.240.60;03.220.01

Price based on 6 pages

© ISO 2013 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Licensee=University of Alberta/5966844001, User=sharabiani, shahramfs
Not for Resale, 12/17/2013 10:54:46 MST