

DIN EN ISO 14819-1



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Ersatz für
DIN EN ISO 14819-1:2014-03

**Intelligente Transportsysteme –
Verkehrs- und Reiseinformationen über Verkehrsmeldungskodierung –
Teil 1: Kodierungsprotokoll für den digitalen Radiokanal für
Verkehrsmeldungen (RDS-TMC) unter Nutzung von ALERT-C
(ISO 14819-1:2021);
Englische Fassung EN ISO 14819-1:2021**

Intelligent transport systems –
Traffic and travel information messages via traffic message coding –
Part 1: Coding protocol for Radio Data System – Traffic Message Channel (RDS-TMC) using
ALERT-C (ISO 14819-1:2021);
English version EN ISO 14819-1:2021

Systèmes de transport intelligents –
Informations sur le trafic et les déplacements via le codage de messages sur le trafic –
Partie 1: Protocole de codage pour le système de radiodiffusion de données – canal de
messages d'informations sur le trafic (RDS-TMC) avec Alert-C (ISO 14819-1:2021);
Version anglaise EN ISO 14819-1:2021

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DIN-Normenausschuss Automobiltechnik (NAAutomobil)

Nationales Vorwort

Dieses Dokument (EN ISO 14819-1:2021) wurde vom Technischen Komitee ISO/TC 204 „Intelligent Transport Systems“ in Zusammenarbeit mit dem Technischen Komitee CEN/TC 278 „Intelligente Verkehrssysteme“, dessen Sekretariat von NEN (Niederlande) gehalten wird, erarbeitet.

Das zuständige deutsche Normungsgremium ist der Gemeinschaftsarbeitsausschuss NA 052-02-71 GA „Intelligente Verkehrssysteme“ des DIN-Normenausschusses Automobiltechnik (NAAutomobil).

Das Präsidium des DIN hat mit seinem Beschluss 1/2004 festgelegt, dass von dem in den Regeln der europäischen Normungsarbeit von CEN/CENELEC verankerten Grundsatz, wonach Europäische Normen in den drei offiziellen Sprachen Deutsch, Englisch und Französisch veröffentlicht werden, in begründeten Ausnahmefällen abgewichen und auf die deutsche Sprachfassung verzichtet werden kann.

Die Genehmigung dafür hat die DIN-Geschäftsleitung entsprechend ihren in Anlage 1 zu dem DIN-Rundschreiben A 5/2004 festgelegten Kriterien für die vorliegende Norm auf Antrag des NA 052 NAAutomobil als Ergebnis einer Einzelfallentscheidung erteilt, zumal bereits dieser Norm zugrunde liegende Papiere überwiegend in englischer Sprache auch von den deutschen Marktteilnehmern angewendet werden.

Verkehrs- und Reiseinformationen (en: traffic and traveller information, TTI) können über verschiedene Dienste und Kommunikationsmöglichkeiten, wie statische Anzeigen (z. B. Wechselverkehrszeichen), Audioübertragungen an Autoradios, Datendienstübertragungen an fahrzeuginterne Einrichtungen (z. B. installierte Navigationssysteme) sowie mobile Geräte (z. B. portable Navigationsgeräte) an den Endnutzer verteilt werden.

Für all diese Anwendungsmöglichkeiten von Diensten wird eine klare Definition und Standardformate der verbreiteten Daten und der Meldungsstruktur benötigt. Dies erlaubt die Funktionsfähigkeit konkurrenzfähiger Produkte mit den empfangenen Daten.

Dieses Dokument beschreibt die Datenspezifikation von TTI-Botschaften zusammen mit deren notwendigen Netzwerk- und Dienste Schichten, über die RDS-TMC abgewickelt werden.

Aktuelle Informationen zu diesem Dokument können über die Internetseiten von DIN (www.din.de) durch eine Suche nach der Dokumentennummer aufgerufen werden.

Änderungen

Gegenüber DIN EN ISO 14819-1:2014-03 wurden folgende Änderungen vorgenommen:

- a) zusätzliche Tuningvarianten wurden ergänzt, um eine Referenz von TMC-Diensten im Band von 64 MHz bis 88 MHz zu ermöglichen;
- b) die Methode zur Verschlüsselung eines RDS-TMC-Dienstes, die ursprünglich im Teil 6 beschrieben wurde, ist nun in diesem Normenteil zusammengefasst (neuer Abschnitt 8);
- c) redaktionelle und formale Korrekturen.

Frühere Ausgaben

DIN EN ISO 14819-1: 2005-06, 2014-03

Nationaler Anhang NA (informativ)

Begriffe

Die Benummerung der folgenden Begriffe und Abkürzungen ist identisch mit der Benummerung in der Englischen Fassung.

3.1 Begriffe

Für die Anwendung dieses Dokuments gelten die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Verwendung in der Normung unter den folgenden Adressen bereit:

- ISO Online Browsing Platform: verfügbar unter <http://www.iso.org/obp>
- IEC Electropedia: verfügbar unter <http://www.electropedia.org/>

3.1.1

Zugriffsprofil

ACP, en: access profile

eindeutige Beschreibung eines RDS-TMC-Dienstes und eine Indizierungsperiode

3.1.2

alternative Frequenz

AF, en: alternatively frequency

Frequenz, die von einem Sender in einem unmittelbar angrenzenden Gebiet verwendet wird, die denselben Audioprogrammdienst wie das eingestellte Programm überträgt

Anmerkung 1 zum Begriff: Verschiedene AFs werden zusammen in einer Liste übertragen. Wenn der TMC-Dienst dasselbe Netzwerk wie ein Audiodienst verwendet, wird diese AF-Liste auch zur Verfolgung des TMC-Dienstes verwendet.

3.1.3

Anwendungsbezeichnung

AID, en: application identification

Bezeichnung, die den spezifischen Gruppentyp signalisiert, welcher von der *offenen Datenanwendung* (3.1.23) verwendet wird

3.1.4

Kontinuitätsindexfeld

(en: continuity index field)

Feld, welches zur Unterscheidung von unterschiedlichen Multigruppenmeldungen dient

Anmerkung 1 zum Begriff: Alle Gruppen innerhalb einer bestimmten Multigruppenmeldung beinhalten denselben Wert dieses Kontinuitätsindex.

3.1.5

Ländercode

CC, en: country code

Ganzzahl ungleich Null, die als *Positionstabellenländercode* (en: location table country code, *LTCC*) (3.1.21) übertragen wird, oder, wenn dieser Wert Null ist, der *Programmbezeichnungsländercode* (en: programme identification country code, *PICC*) (3.1.27) ist

3.1.6

Richtung und Ausmaß

(en: direction and extent)

Bezeichner für benachbarte Segmente oder spezifische *Punktorte* (3.1.17), die ebenfalls vom Ereignis betroffen sind, und, wo angemessen, die Richtung des betroffenen Verkehrs

3.1.7

Umleitungsempfehlung

(en: diversion advice)

Empfehlung die anzeigt, ob Endnutzern das Finden und Folgen von alternativen Streckenführungen empfohlen wird

3.1.8

Dauer

(en: duration)

Hinweis, für wie lange das Andauern eines Problems erwartet wird

3.1.9

Verschlüsselungsbezeichner

ENCID, en: encryption identifier

Wert der anzeigt, welche Zeile in der *Dienstschlüsseltabelle* (3.1.30) von Parametern der Dienstanbieter im Verschlüsselungsprozess an diesem Tag verwendet wird

Anmerkung 1 zum Begriff: Der Verschlüsselungsbezeichner wird in der Typ-8A-Gruppe, Variante 0 übertragen.

3.1.10

Endnutzer

(en: end-user)

alle möglichen *Endgerätekunden* (3.1.33)

BEISPIEL Ein Fahrer eines Fahrzeuges, der Benutzer eines mobilen oder festen TMC-Empfängers oder ein intelligenter Kunde, der Informationen wie z. B. für ein Navigationssystem weiterleitet.

3.1.11

Ereignisbeschreibung

(en: event description)

Beschreibung, welche Details zu einem Verkehrsproblem (z. B. durch einen Unfall verursachten Stau) und, wenn angemessen, dessen Schwere (z. B. resultierende Staulänge) oder zur Wettersituation gibt

3.1.12

Ereignisliste

(en: Event List)

abgestimmte Tabelle von *Ereignisbeschreibungen* (3.1.11) und Parametern mit dazu festgelegtem Ereigniscode, welche Details zum Verkehrsproblem (z. B. durch einen Unfall verursachten Stau) und, wenn angemessen, dessen Schwere (z. B. resultierende Staulänge) oder zur Wettersituation gibt

Anmerkung 1 zum Begriff: Die Ereignisliste kann in ISO 14819-2 gefunden werden.

3.1.13

Ablaufdatum

(en: expiry date)

Datum, welches vom Dienstanbieter festgelegt wird, an dem die Fähigkeit eines bestimmten *Endgerätes* (3.1.33), einen verschlüsselten Dienst zu entschlüsseln, enden sollte (d.h. das Ende der bezahlten Abonnementperiode)

3.1.14**erweiterter Ländercode****ECC**, en: extended country code

8-Bit-Code ungleich Null, der als erweiterter Positionstabellen-Ländercode (LTECC) übertragen wird, oder, wenn dieser Wert Null sein sollte oder nicht übertragen wurde, der erweiterte Ländercode ECC, der in der RDS-Typ-1A-Gruppe übertragen wurde

3.1.15**fremde Positionstabelle**

(en: foreign location table)

Positionstabelle (3.1.18), welche unterschiedlich zur Standard-Positionstabelle ist und vom Sender genutzt wird

3.1.16**INTER-ROAD**

Botschaftssystem zur Referenzierung von *Orten* (3.1.17) aus anderen *Positionstabellen* (3.1.18) über spezielle Multigruppenmeldungen

Anmerkung 1 zum Begriff: Diese Meldungen können zur Information von *Endnutzern* (3.1.10) über Probleme in anderen Gebieten, speziell in Nachbarländern oder -regionen verwendet werden.

3.1.17**Ort**

(en: location)

zeigt ein Gebiet, Straßenabschnitt oder Positionspunkt der Problemquelle an

3.1.18**Positionstabelle**

(en: location table)

für jeden Dienst abgestimmte Positionstabelle, welche Informationen zur Anzeige eines Gebiets, eines Straßenabschnitts oder *Orts* (3.1.17) der Problemquelle beinhaltet

3.1.19**Positionstabellennummer****LTN**, en: location table number

Ganzzahlnummer 1...63, die zur Identifizierung der *Positionstabelle* (3.1.18) verwendet wird

Anmerkung 1 zum Begriff: LTN wird in Typ-3A-Gruppen übertragen.

3.1.20**Positionstabellennummer vor der Verschlüsselung****LTNBE**, en: location table number before encryption

Ganzzahlnummer 1...63, die zur Identifizierung der *Positionstabelle* (3.1.18) vom Dienstanbieter verwendet wird, bevor die Codes in der Tabelle zur Übertragung verschlüsselt werden.

Anmerkung 1 zum Begriff: LTNBE wird in Typ-8A-Gruppen übertragen.

3.1.21**Positionstabellen-Ländercode****LTCC**, en: location table country code

Code (im Bereich 1..F [hex]), der jeder *Ortsdatenbank* (3.1.17), basierend auf dem Land/der Länder mit TMC-Dienst Abdeckung, zugeordnet ist

3.1.22

erweiterter Positionstabellen-Ländercode

LTECC, en: location table extended country code

Code (im Bereich 10..F [hex]), der jeder *Ortsdatenbank* (3.1.17), basierend auf dem Land/der Länder mit TMC-Dienst Abdeckung, zugeordnet ist

Anmerkung 1 zum Begriff: Zusammen identifizieren LTECC, LTCC und LTN eindeutig eine Ortsdatenbank.

3.1.23

offene Datenanwendung

ODA, en: open data application

Anwendung, welche die Mittel zur Ergänzung von Anwendungen an eine RDS-Übertragung bereitstellt

3.1.24

anderes Netzwerk

ON, en: other network

RDS-Eigenschaft

3.1.25

PIN-Code

(en: PIN code)

numerischer oder alphanumerischer Code, der in ein *Endgerät* (3.1.33) eingegeben werden muss, bevor es diesem Endgerät erlaubt ist, entschlüsselte RDS-TMC-Botschaften darzustellen

Anmerkung 1 zum Begriff: Der Wert des PIN-Codes wird vom Endgerätehersteller mit einem Algorithmus unter Verwendung der Endgeräte-*Seriennummer* (3.1.28) und einem oder mehreren *Zugriffsprofil(en)* (3.1.1) als Faktoren, berechnet.

3.1.26

Programmidentifizierung

PI, en: programme identification

Identifizierung, die einen Code für jede Rundfunkprogramm-Quelle festlegt

3.1.27

Programmidentifizierungsländercode

PICC, en: programme identification country code)

erste vier Bits des 16-Bit-*Programmidentifizierungscodes* (3.1.26).

Anmerkung 1 zum Begriff: Normalerweise, aber nicht immer oder notwendigerweise, haben der Programmidentifizierungsländercode und der *Positionstabellen-Ländercode* (3.1.21) an einer RDS-TMC-Übertragung denselben Wert.

3.1.28

Seriennummer

(en: serial number)

alphanumerischer Bezeichner, der eindeutig für ein *Endgerät* (3.1.33) (oder Gruppe von Endgeräten) ist und vom Hersteller bestimmt wird

3.1.29

Dienstbezeichner

SID, en: service-ID

Bezeichner, der zur eindeutigen Identifizierung eines TMC-Dienstes vom Dienstanbieter verwendet wird

3.1.30**Dienstschlüssel****SVK**, en: service key

Nummer, die im Vertrauen von einem Dienstanbieter an einen *Endgerätehersteller* (3.1.33) gegeben wird und die angibt, welche der acht möglichen Verschlüsselungstabellen der Dienst zur Verschlüsselung verwendet

Anmerkung 1 zum Begriff: Der Dienstschlüssel wird nicht übertragen.

3.1.31**stille Aufhebungsmeldung**

(en: silent cancellation message)

Beschreibung, die dazu verwendet wird, Botschaften vom *Endgerät* (3.1.33) des *Endnutzers* (3.1.10) zu löschen

3.1.32**Systeminformationen**

(en: system information)

Information, die ein RDS-TMC-*Endgerät* (3.1.33) befähigt, notwendige Daten zu dekodieren und auszuwerten, welche die empfangene Übertragung beschreiben,

Anmerkung 1 zum Begriff: Die Systeminformation zeigt einen RDS-TMC-Dienst an und umfasst einige Diensteigenschaften, welche zur Auswahl des RDS-TMC-Dienstes benötigt werden.

3.1.33**Endgerät**

(en: terminal)

Gerät, welches die Nutzerschnittstelle mit dem TMC-Dienst bereitstellt

Anmerkung 1 zum Begriff: Die Funktionalität des Endgerätes deckt einen Bereich von Funktionen ab, angefangen mit einfachen Geräten mit limitieren Meldungsrepertoire und beschränkten *Ortsdatenbanken* (3.1.17), bis zu höherentwickelten Geräten, die den vollen TMC-Leistungsumfang und/oder einen weiten Bereich von strategischen und taktischen *Ortsdatenbanken* bieten.

3.1.34**Abstimmungsinformationen**

(en: tuning information)

Information, die einem RDS-TMC-*Endgerät* (3.1.33) ermöglicht, an den Grenzen eines Senderversorgungsgebietes, von einem Sender zu einem anderen zu wechseln

3.1.35**Nutzermeldung**

(en: user message)

Meldung, die möglicherweise dem *Endnutzer* (3.1.10) bekannt gemacht wird

Anmerkung 1 zum Begriff: Nutzermeldungen beinhalten Beschreibungen für Ereignisse, Orte (3.1.17), *Richtung und Ausmaß* (3.1.6), *Dauer* (3.1.8) usw.

3.1.36**Verband für Reiseinformationsdienste****TISA**, en. Traveller Information Services Association

gemeinnützige Mitgliederorganisation, die unter der belgischen Gesetzgebung gegründet wurde und zum Ziel hat, weltweite Normen für Verkehrs- und Reiseinformationen wie TMC oder TPEG zu entwickeln und zu pflegen

— Leerseite —

English Version

**Intelligent transport systems - Traffic and travel
information messages via traffic message coding - Part 1:
Coding protocol for Radio Data System - Traffic Message
Channel (RDS-TMC) using ALERT-C (ISO 14819-1:2021)**

Systèmes de transport intelligents - Informations sur le
trafic et les déplacements via le codage de messages
sur le trafic - Partie 1: Protocole de codage pour le
système de radiodiffusion de données - canal de
messages d'informations sur le trafic (RDS-TMC) avec
Alert-C (ISO 14819-1:2021)

Intelligente Transportsysteme - Verkehrs- und
Reiseinformationen über Verkehrsmeldungskodierung
- Teil 1: Kodierungsprotokoll für den digitalen
Radiokanal für Verkehrsmeldungen (RDS-TMC) unter
Nutzung von ALERT-C (ISO 14819-1:2021)

This European Standard was approved by CEN on 30 July 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 14819-1:2021) has been prepared by Technical Committee ISO/TC 204 "Intelligent transport systems" in collaboration with Technical Committee CEN/TC 278 "Intelligent transport systems" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 14819-1:2013.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 14819-1:2021 has been approved by CEN as EN ISO 14819-1:2021 without any modification.

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Foreword

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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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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 14819-1:2013), which has been technically revised. The main changes compared to the previous edition are as follows:

- Additional tuning variants have been added to allow referencing of TMC services using the 64 MHz to 88 MHz band.
- The method of encrypting an RDS-TMC service, previously separately specified in ISO 14819-6, has been merged into this document as Clause 8. Consequently, some renumbering of sections has occurred and encryption-specific terms, definitions and abbreviated terms have been added in Clause 3.
- In some places the text has been improved and/or rearranged for greater clarity. Several typographical and grammatical errors have been corrected.

A list of all parts in the ISO 14819 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 General

Traffic and traveller information (TTI) can be disseminated through a number of services and means of communication to the end user, including static displays (e.g. variable message signs), broadcast audio to car radios, broadcast data services to in-vehicle equipment (e.g. installed navigation systems) and to nomadic device terminals (e.g. portable navigation device).

For all such services, the data to be disseminated and the message structure involved in the various interfaces require clear definition and standard formats, in order to allow competitive products to operate with any received data.

This document describes the data specification for TTI messages, together with their network layer and their service layer, which shall be conveyed by the RDS-TMC feature, specified in the IEC 62106 series.

The TTI information chain, from event to end-user, is quite complex and the Traveller Information Services Association (TISA) value chain shown in Figure 1 helps to explain the key components.



Figure 1 — Traveller Information Services Association TTI value chain

Several entities (e.g. companies, businesses) take part in one or more activities to complete the activities shown in the value chain. These are described below for improved understanding:

Service provider: An organization that constructs a data service, by gathering data, processing data and supplying the data service. A service provider negotiates for the use of the necessary data bandwidth with a Broadcaster and/or Transmission Operator. A service provider is responsible for the "quality" of the data to its customers and should provide suitable customer support.

Broadcaster: A traditionally incorporated organization responsible for a continuous strand of audio programmes and their quality. A broadcaster may also be responsible for the overall co-ordination of "broadcast transmissions" (often a Broadcaster is the licensee of a national regulator). A Broadcaster may also be a service provider.

TTI services for travellers, using spoken radio reports and in-vision reports, occupy broadcast air-time and whilst valuable to some, they are considered less useful by others. Furthermore, only some are useful for travellers on the move. Due to the widespread adoption of the Radio Data System, in VHF/FM broadcasting on Band II there is the possibility of transmitting coded TTI messages digitally and "silently" using the RDS-TMC feature, which avoids the interruption of planned programmes. This TTI delivery method has several advantages: TTI messages can be decoded into the language of the end user, regardless of location, more messages can be made available and planned broadcast programme interruption is avoided. Thus, using RDS-TMC makes the delivery of TTI messages more timely and topical.

0.2 ALERT-C protocol

The ALERT-C protocol defined in this document supports a data broadcasting service for travellers, providing information about many kinds of traffic and travel events. Messages include traffic incident information relating to national and regional routes and some urban roads and other information required by a traveller, such as roadworks and weather information.

The ALERT-C protocol utilizes a standardized Event List of event messages with their code values, which also includes general traffic problems and weather situations. Being transmitted as a series of codes, RDS-TMC messages are language-independent and are presented in the language of the user's choice.

ALERT-C defines two categories of information within messages: basic and optional items. In principle, basic information is present in all messages. Optional information is added to messages where necessary.

Standard RDS-TMC user messages provide the following five basic items of explicit, broadcast information:

1. **Event description**, giving details of road event situation, general traffic problems and weather situations (e.g. congestion caused by an accident) and where appropriate its severity (e.g. resulting queue length).
2. **Location**, indicating the area, road segment or point location where the source of the problem is situated.
3. **Direction and extent**, identifying the adjacent segments or specific point locations also affected by the incident, and where appropriate the direction of traffic affected.
4. **Duration**, giving an indication of how long the problem is expected to last.
5. **Diversion advice**, showing whether end-users are recommended to find and follow an alternative route.

Optional information may be added to any message using one or more additional RDS data groups. This optional addition may give greater detail or deal with unusual situations. Any number of additional fields can in principle be added to each basic message, subject only to a maximum message length of five RDS data groups.

0.3 Document development and RDS groups

This document is based on the ALERT-C traffic message coding protocol, which was a product of DRIVE Project V1029, "RDS Advice and Problem Location for European Road Traffic". The RDS-ALERT project aimed to define standards for RDS-TMC, working in conjunction with the European Broadcasting Union (EBU) and the European Conference of Ministers of Transport (ECMT).

The document has been implemented in many countries worldwide and, after very extensive implementation experience, it has matured with many changes compared to the earliest version of the ALERT-C proposal of 1990. At that time, CEN TC 278 Working Groups developed the coding protocol described in this document, the Event List described in ISO 14819-2 and the location referencing method described in ISO 14819-3. Subsequently the TMC Forum was responsible for collecting specific additions and improvements intended for inclusion in this document. In 2008, TISA took over all responsibility (including TMC Forum legacy) for maintenance of this document, which now includes an up to date set of industry supported enhancements to RDS-TMC.

The RDS is fully described in IEC 62106 and it contains the 'hooks' to RDS-TMC detailed in this document¹⁾; it employs a group-structured data protocol. Terminal Device manufacturers should be aware that service providers broadcast the following RDS groups:

- a) type 3A groups, which carry the TMC Open Data Application (ODA) identification and service and network layer information, identifying TMC services uniquely worldwide;
- b) type 8A groups, which carry RDS-TMC messages and location information, together with TMC service tuning information; and
- c) type 4A groups, which contain the Clock Time (CT) information that is used as the time reference within TMC.

1) In this document, many "hooks" have been left for future development and indeed a few status-orientated road end-user information messages are included.

Additionally, where necessary, the following group may also be transmitted:

- d) type 0A groups, which contain Alternative Frequency (AF) information, that is used as an alternative to, or in addition to, tuning information carried in the type 8A group.

It is noted that although the 'message' information carried within the 8A group will be transmitted once with either one or two 'immediate' repeats (see 7.3), the encryption administration information and the tuning information, both also transmitted in type 8A groups, usually will not be transmitted with an 'immediate' repeat: this information is largely 'static' and repeated periodically only every several seconds or minutes. Terminal Devices therefore process every RDS group received that passes their CRC and use the data contained within once it has been verified by the reception of a second identical group, regardless of whether received 'immediately' or after several seconds or minutes.

Broadly speaking, two types of RDS-TMC services are in use: one that is broadcast without access control, and one that is broadcast with access control. The method of 'access control' was designed in 2000 and was published separately in ISO 14819-6. It described how a service provider encrypted their service and the complementary process to be adopted by terminals to decrypt the service by arrangement with the service provider. It also indicated a strategy to be followed to introduce encrypted services between 2001 and 2003, when encryption was expected to become widespread. As encrypted RDS-TMC services are now widespread, the details in ISO 14819-6 have now been merged within this document and consequently ISO 14819-6 has been withdrawn.

Intelligent transport systems — Traffic and travel information messages via traffic message coding —

Part 1:

Coding protocol for Radio Data System-Traffic Message Channel (RDS-TMC) using ALERT-C

1 Scope

The ALERT-C protocol is designed to provide mostly event-oriented road end-user information messages.

This document specifies the messages which are presented to the user in accordance with a set of general requirements. It defines the message structure and content and its presentation to the end-user.

The message management component of this document describes the message management functions of RDS-TMC. The ALERT-C protocol distinguishes between user messages and system messages. User messages are those potentially made known to the end-user, as defined in Clause 5. System messages are of use only to the RDS-TMC terminal, for message management purposes.

RDS-TMC information comprises both 'system information' and 'user messages'. System information relates to the TMC service and details the parameters that the terminal needs to be able to find, identify and decode the TMC information. System information is transmitted in type 3A groups and in type 8A groups.

User messages contain the details of the traffic events; these may use one or more type 8A groups. Most messages may be transmitted using a single type 8A group, however messages with more detail (e.g. diversion advice) may use up to a total of five, type 8A groups.

The transmission component of this document conveys the messages over-air. The ALERT-C protocol, used by RDS-TMC, has the fundamental approach of aiming to code most messages entirely within a single RDS group.

The ALERT-C Event List, which contains all event descriptions, is described in ISO 14819-2.

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 4217, *Codes for the representation of currencies*

IEC 62106 (all parts), *Radio data system (RDS) — VHF/FM sound broadcasting in the frequency range from 64,0 MHz to 108,0 MHz*

3 Terms, definitions and abbreviated terms

3.1 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/>

3.1.1

access profile

ACP

unique description of a particular RDS-TMC service and subscription period

3.1.2

alternative frequency

AF

frequency used by a transmitter in an immediately adjacent area that carries the same audio programme service as the tuned programme

Note 1 to entry: Several AFs are transmitted together in a list. Where the TMC service uses the same Network as an audio service, this AF list is also used for following the TMC service.

3.1.3

application identification

AID

identification that signals the specific group type used by the *open data application* (3.1.23)

3.1.4

continuity index field

field that helps to distinguish between different multi-group messages

Note 1 to entry: All groups within any particular multi-group message contain the same value of this continuity index.

3.1.5

country code

CC

non-zero integer transmitted as the *location table country code (LTCC)* (3.1.21), or if that value is zero, the *programme identification country code (PICC)* (3.1.27)

3.1.6

direction and extent

identifier for adjacent segments or specific point *locations* (3.1.17) also affected by the incident, and where appropriate the direction of traffic affected

3.1.7

diversion advice

advice showing whether end-users are recommended to find and follow an alternative route

3.1.8

duration

indication of how long the problem is expected to last

3.1.9

encryption identifier

ENCID

value indicating which line in the *service key* (3.1.30) table of parameters the service provider is using in the encryption process that day

Note 1 to entry: The encryption identifier is transmitted in type 8A group variant 0.

3.1.10

end-user

all possible *terminal* (3.1.33) clients

EXAMPLE a vehicle driver, a user of a portable or fixed TMC receiver or an intelligent client that processes the information such as in a navigation system.

3.1.11

event description

description giving details of the traffic problem (e.g. congestion caused by an accident) and where appropriate its severity (e.g. resulting queue length) or weather situation

3.1.12

Event List

agreed table of *event descriptions* (3.1.11) and parameters, assigned an event code value giving details of traffic problem (e.g. congestion caused by accident) and where appropriate its severity (e.g. resulting queue length) or the weather situation

Note 1 to entry: The Event List is found in ISO 14918-2.

3.1.13

expiry date

date determined by the service provider on which a particular *terminal's* (3.1.33) ability to decrypt an encrypted service should cease (i.e. the end of the paid subscription period)

3.1.14

extended country code

ECC

non-zero 8-bit code transmitted as the location extended table country code (LTECC), or if that value is zero, or not transmitted, the extended country code (ECC), transmitted in RDS type 1A group

3.1.15

foreign location table

location table (3.1.18) which is different from the default location table used by the transmitter

3.1.16

INTER-ROAD

messaging system for referencing *locations* (3.1.17) from other *location tables* (3.1.18) via special multi-group messages

Note 1 to entry: These messages are used to inform *end-users* (3.1.10) about problems in other areas, particularly in neighbouring countries or regions.

3.1.17

location

indication of the area, road segment or point location where the source of the problem is situated

3.1.18

location table

agreed location table for each service which contains information to indicate the area, road segment or point *location* (3.1.17) where the source of the problem is situated

3.1.19

location table number

LTN

integer number 1...63 used to identify the *location table* (3.1.18)

Note 1 to entry: The LTN is transmitted in type 3A groups.

3.1.20

location table number before encryption

LTNBE

integer number 1...63 used to identify the *location table* (3.1.18) used by the service provider prior to the codes within the table being encrypted for transmission

Note 1 to entry: The LTNBE is transmitted in type 8A groups.

3.1.21

location table country code

LTCC

code (in the range 1..F [hex]) assigned to each *location* (3.1.17) database, based on the country/countries the TMC service covers

3.1.22

location table extended country code

LTECC

code (in the range 10..F [hex]) assigned to each *location* (3.1.17) database, based on the country/countries the TMC service covers

Note 1 to entry: Together the LTECC, LTCC and LTN identify a location database uniquely.

3.1.23

open data application

ODA

application which provides the means for adding applications to an RDS transmission

3.1.24

other network

ON

RDS feature

3.1.25

PIN code

numeric or alphanumeric code required to be entered into a *terminal* (3.1.33) before that terminal is permitted to present decrypted RDS-TMC messages

Note 1 to entry: The value of the PIN code is calculated by the terminal manufacturer from an algorithm using terminal *serial number* (3.1.28) and one or more *access profiles* (3.1.1) as factors.

3.1.26

programme identification

PI

identification which assigns a code to each audio programme source

3.1.27

programme identification country code

PICC

first four bits of the 16-bit *programme identification* (3.1.26) code

Note 1 to entry: Usually the programme identification country code and the *location table country code* (3.1.21) on an RDS-TMC transmission have the same value, but not always nor necessarily.

3.1.28

serial number

alphanumeric identifier, unique to a *terminal* (3.1.33) (or group of terminals), determined by the manufacturer