
**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**

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*Systèmes intelligents de transport — Informations sur le trafic et le
tourisme via le codage de messages sur le trafic —*

*Partie 1: Protocole de codage pour le système de radiodiffusion de
données (RDS) — Canal de messages d'informations sur le trafic
(RDS-TMC) avec ALERT-C*



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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. 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. www.iso.org/patents

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This second edition cancels and replaces the first edition (ISO 14819-1:2003), which has been technically revised.

ISO 14819 consists of the following parts, under the general title *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*
- *Part 2: Event and information codes for Radio Data System — Traffic Message Channel (RDS-TMC) using ALERT-C*
- *Part 3: Location referencing for Radio Data System — Traffic Message Channel (RDS-TMC) using ALERT-C*
- *Part 6: Encryption and conditional access for the Radio Data System — Traffic Message Channel ALERT C coding*

Compared to previous releases, this version includes the following additions:

- Precise location referencing
- Tendencies of Traffic Queue Lengths (TTQL)
- Coding of parking POIs
- Coding of interrupted roads

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- Coding of other isolated POIs (except parking POIs)
- Coding of parallel roads
- Version identification of TMC location tables
- Location Table Exchange Format
- North American Safety Events in TMC
- Explicit Location Table Country Code transmission in TMC
- Guidelines for Service Providers and Terminal Manufacturers for Implementation of explicit Location Table Country Code transmission
- Coding of link roads
- GB-English - List of Quantifiers
- Additional Event Codes identified by Germany
- Additional TMC Events from Danish proposal
- Additional TMC Supplementary Information: Unconfirmed Report
- RDS-TMC delivery of IVR Telephone Number
- Coding of link roads

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Introduction

Traffic and traveller information (TTI) may 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 system) 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 part of ISO 14819 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 IEC 62106 (Second edition - 2009).

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



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Figure 1 — The Traveller Information Services Association TTI value chain

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A number of entities (e.g. companies, businesses) take part in one or more activities to complete the activities shown in the value chain. Two, in particular are described, for improved understanding:

Service Provider: An organisation that constructs a data service, by gathering data, processing data and supplying the data service. A Service Provider then 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 content to his customers and must provide suitable customer support.

Broadcaster: A traditionally incorporated organisation responsible for a continuous strand of audio programmes and their quality. A broadcaster may also be responsible for 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 a number of 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, so make delivery of TTI messages more timely and topical.

The ALERT-C protocol defined in this part of ISO 14819 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.

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This part of ISO 14819 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 international standard has been implemented in many countries worldwide and, as a result of very extensive implementation experience, it has matured with many changes from the earliest version of the ALERT-C proposal of 1990. At that time CEN TC 278 Sub-working group (SWG) 4.1 developed the coding protocol, herein and the event list described in ISO 14819-2; meanwhile CEN TC 278 SWG 7.3 developed the location referencing method which is described in ISO 14819-3. Subsequently the TMC Forum was responsible for collecting specific additions and improvements intended for inclusion in this part of ISO 14819. Latterly, the Traveller Information Services Association (TISA) took over all responsibility (including TMC Forum legacy) for maintenance of this part of ISO 14819, which now includes an up to date set of industry supported enhancements to RDS-TMC.

The RDS system is fully described in IEC 62106 (Second edition, 2009) and it contains the 'hooks' to RDS-TMC, detailed in this part of ISO 14819. It employs a group structured data protocol. It uses type 3A groups defined to carry Open Data Application (ODA) identification and service and network layer information. This enables signalling of the TMC feature in other data groups. It uses type 8A groups defined to carry RDS-TMC messages and location information, together with TMC service tuning information.

Broadly, two types of RDS-TMC services are required: one that is, in effect, free of charge at the point of use by an end user and thus uses un-encrypted data, and one that is paid-for using encrypted data. The conditional access capability was developed by the TMC Forum and is described in ISO 14819-6.

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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

1.1 General scope

The ALERT-C protocol is designed to provide mostly event-oriented road end-user information messages. Many "hooks" have been left for future development and a few status-orientated road end-user information messages were included.

1.2 Content

The presentation section of the ALERT-C protocol specifies messages that may be presented to the user in accordance with the general requirements set out above. It defines the message structure and content, and its presentation to the end-user.

RDS-TMC messages are language-independent, and can be presented in the language of the user's choice. The ALERT-C protocol utilises a standardised Event List (ISO 14819-2) of event messages with their code values, which also includes general traffic problems and weather situations.

ALERT-C defines two categories of information within messages: basic and optional items. In principle, basic information is present in all messages. Optional information can be 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 situations, general traffic problems and weather situations (e.g. congestion caused by 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 or not end-users are recommended to find and follow an alternative route.

Optional information can be added to any message using one or more additional RDS data groups. This optional addition can give greater detail or can 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.

1.3 Message management

The message management component deals with 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 the presentation section. System messages are of use only to the RDS-TMC terminal, for message management purposes.

1.4 Transmission

The transmission component conveys the messages over-air. The ALERT-C protocol, which RDS-TMC uses, retains the fundamental approach of earlier work, which aims to code most messages entirely within a single RDS group.

RDS-TMC information comprises both 'system information' and 'user messages'. System information relates to the particular 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.

1.5 Event list

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

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2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4217:2008, *Codes for the representation of currencies and funds*

ISO 8601:2004, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 14819-2, *Intelligent transport systems — Traffic and travel information messages via traffic message coding — Part 2: Event and information codes for Radio Data System — Traffic Message Channel (RDS-TMC) using ALERT-C*

ISO 14819-3, *Intelligent transport systems — Traffic and travel information messages via traffic message coding — Part 3: Location referencing for Radio Data System — Traffic message Channel (RDS-TMC) using ALERT-C*

IEC 62106:2009, *Specification of the radio data system (RDS) for VHF/FM sound broadcasting in the frequency range from 87.5 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.

3.1.1**Application Identifier**

signals the specific group type used by the Open Data Application

Note 1 to entry: Defined in the RDS specification IEC 62106.

3.1.2**Continuity Index Field**

helps 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.

3.1.3**Country Code**

assigns a code to each country

Note 1 to entry: Country codes are not unique to one country and can be repeated in non-neighbouring countries.

Note 2 to entry: In RDS, The Country Code is transmitted in the first 4-bits of the PI code to signal the origin of the audio programme, which may be different to the country where the transmitter is located.

Note 3 to entry: Defined in the RDS specification IEC 62106.

3.1.4**Direction and Extent**

identifies the adjacent segments or specific point locations also affected by the incident, and where appropriate the direction of traffic affected

3.1.5**Diversion Advice**

shows whether or not end-users are recommended to find and follow an alternative route

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3.1.6**Duration**

gives an indication of how long the problem is expected to last

3.1.7**End-user**

covers the meaning for all possible terminal clients

Note 1 to entry: This could be 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.

3.1.8**Event Description**

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

3.1.9**Event List**

agreed table of event descriptions and parameters, assigning an event code value and giving the 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: Defined in ISO 4217:2008.

3.1.10**Foreign Location Table**

location table which is different from the default location table used by the transmitter

3.1.11

INTER-ROAD

way of referencing locations from other location tables via special multi-group messages

Note 1 to entry: These messages can be used to inform end-users about problems in other areas, in particular in neighbouring countries.

3.1.12

Extended Country Code

assigns a unique code to each country

Note 1 to entry: The combination of ECC and CC altogether assigns a unique code for each country.

Note 2 to entry: Defined in the RDS specification IEC 62106.

3.1.13

Location

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

3.1.14

Location Table

agreed table which contains for each service information the area, road segment or point location where the source of the problem is situated

Note 1 to entry: Each location table is identified by three elements: a Number – Location Table Number, a Location Table Country Code, and a Location Table Extended Country Code. The combination of these three elements identifies a Location Table uniquely. Each service has a Location Table defined by Location Table Number, a Location Table Country Code and Location Table Extended Country Code.

3.1.15

Location Table Country Code

assigns a code to each location table, based on the country of origin of the locations referenced in this table

3.1.16

Location Table Extended Country Code

assigns a code to each location table, based on the country of origin of the locations referenced in this table

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

3.1.17

Open Data Application

provides the means for adding applications to an RDS transmission

Note 1 to entry: Defined in the RDS specification IEC 62106.

3.1.18

Programme Identifier

assigns a unique value to each audio programme source

Note 1 to entry: Defined in the RDS specification IEC 62106.

3.1.19

Programme Identifier Country Code

first four bits of the Programme Identifier are identical with Country Code if the RDS specification IEC 62106 is implemented

Note 1 to entry: The CC is signalled in the RDS PI Code for purposes of identifying the country of origin of the audio programme.

Note 2 to entry: Usually the Programme Identifier Country Code and the Location Table Country Code on an RDS-TMC transmission have the same value, but not always nor necessarily.

3.1.20**Silent Cancellation Message**

used to delete messages from the end-user terminal

3.1.21**Service-ID**

used to uniquely identify a particular TMC service from a service provider

3.1.22**System Information**

enables an RDS-TMC terminal to decode and evaluate essential data, which describes the transmission being received

Note 1 to entry: System Information indicates an RDS-TMC service and comprises some service characteristics needed to select the RDS-TMC service.

3.1.23**Terminal**

provides the user interfaces with the TMC service

Note 1 to entry: Their functionality may cover a range of terminal functions from simple terminals with a limited message repertoire and restricted location database to more sophisticated terminals offering full TMC message features and/or a wide range of strategic and tactical location databases.

3.1.24**Tuning Information**

enables a RDS-TMC terminal to change from one transmitter to another at boundaries of a particular transmitter's coverage

Note 1 to entry: Each transmitter should direct the RDS-TMC terminal to specific frequencies or TMC services in adjacent areas.

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3.1.25**User Message**

describes the messages which are potentially made known to the end-user

Note 1 to entry: They contain event, location, direction and extent, duration etc. descriptions.

3.1.26**TISA**

not-for-profit membership organisation established under Belgian law aiming at developing and maintaining worldwide traffic and traveller information standards such TMC and TPEG

3.2 Abbreviated terms

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

3.2.1**AF**

Alternative Frequency - an RDS feature

3.2.2**AFI**

Alternative Frequency Information - an RDS-TMC feature

3.2.3**AID**

Application Identifier - an RDS feature

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3.2.4

ALERT-C

Advice and Problem Location for European Road Traffic, Version C

3.2.5

CC

Country Code - an RDS feature

3.2.6

CT

Clock Time - an RDS feature

3.2.7

EBU

European Broadcasting Union

3.2.8

ECC

Extended Country Code -an RDS feature

3.2.9

ECMT

European Conference of Ministers of Transport

3.2.10

IVR

Interactive Voice Response – an information telephone call, typically automated

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3.2.11

LTCC

Location Table Country Code

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3.2.12

LTECC

Location Table Extended Country Code

3.2.13

LTN

Location Table Number

3.2.14

MGS

Message Geographical Scope

3.2.15

ODA

Open Data Application –an RDS feature

3.2.16

ON

Other Network - an RDS feature

3.2.17

PI

Programme Identifier - an RDS feature

3.2.18

PICC

Programme Identifier Country Code

3.2.19**RDS**

Radio Data System

3.2.20**rfu**

Reserved for future use

3.2.21**SID**

Service-ID

3.2.22**TISA**

Traveller Information Services Association

3.2.23**TMC**

Traffic Message Channel

3.2.24**TN**

Tuned Network

3.2.25**UTC**

Universal Co-ordinated Time

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4 Application

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4.1 General

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Spoken broadcast traffic messages already provide a valuable information service to motorists in countries throughout Europe. Digital broadcasting techniques have now become available due to the widespread adoption of the Radio Data System (RDS). RDS enables traffic messages to be carried digitally and silently by a Traffic Message Channel (TMC), without necessarily interrupting the audio programme.

The ALERT-C protocol defined in this specification supports a digital, silent broadcast service for motorists, providing information about many kinds of traffic events. This includes roadworks, weather and traffic incident information relating to major national and international routes, regional routes and local roads.

Some basic information about public transport is included within the scope of the current protocol for the special case of ferries and short rail links designed to carry road vehicles, such as Alpine tunnels or the Channel Tunnel.

4.2 Definition of the TMC "travel service"

ALERT-C defines the Traffic Message Channel (TMC) as a travel service digitally and silently broadcast using RDS, which can provide an end-user with:

- event-oriented end-user information on the nature, severity and probable evolution of both urban and interurban traffic problems;
- reduced frustration and uncertainty due to this provision of timely and helpful information;
- assistance with journey planning, including rerouting and rescheduling of trips to avoid current or projected strategic traffic situations;