
Dfca YtbY]b'dclcj UbY]bZfa UWY'fHHK!'Gdcfc]'UHH=dfY_'cX]fUb] \ 'dfca Ytb] gdcfc]'É%'XY.'?cX]fb]dfclc_c`nUfUX]g_]dcXUh_cj b]g]ghYa 'fF8GLÉ'Dfca Ytb] gdcfc]b]_UbU'fF8G!HA7čž_]i dcfUV'Ug]ghYa '5 @FH'7'fGC'%, %!%&\$'\$' Ł

Traffic and Travel Information (TTI) - TTI Messages via traffic message coding - Part 1: Coding protocol for Radio Data System - Traffic Message Channel (RDS-TMC) using ALERT-C (ISO 14819-1:2003)

Verkehrs- und Reiseinformationen (TTI) - TTI-Meldungen über Verkehrsmeldungscodierung - Teil 1: Meldungsschlüssel für den digitalen Radio-Verkehrsnachrichtenkanal (RDS-TMC) unter Verwendung von ALERT C (ISO 14819-1:2003)

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Information aux voyageurs sur la circulation (TTI) - Messages d'information diffusés aux voyageurs par codage des messages de circulation - Partie 1: Protocole de codage pour la radiodiffusion de données - Canal de messages d'informations routieres (RDS-TMC) avec ALERT-C (ISO 14819-1:2003)

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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**Traffic and Travel Information (TTI) - TTI Messages via traffic
message coding - Part 1: Coding protocol for Radio Data
System - Traffic Message Channel (RDS-TMC) using ALERT-C
(ISO 14819-1:2003)**

Information aux voyageurs sur la circulation (TTI) -
Messages d'information diffusés aux voyageurs par codage
des messages de circulation - Partie 1: Protocole de
codage pour la radiodiffusion de données - Canal de
messages d'informations routières (RDS-TMC) avec
ALERT-C (ISO 14819-1:2003)

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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 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 Management Centre has the same status as the official versions.

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Foreword

The text of the International Standard from Technical Committee ISO/TC 204 "Transport information and control systems" of the International Organization for Standardization (ISO) a European Standard by Technical Committee CEN/TC 278, "Road transport and traffic telematics", 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 December 2003, and conflicting national standards shall be withdrawn at the latest by December 2003.

This document supersedes ENV 12313-1:1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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EN ISO 14819-1:2003 (E)

INTRODUCTION

Traffic and traveller information may be disseminated through a number of services or means of communication, covering static displays, inter-active terminals and in-vehicle equipment.

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 standard focuses on the data specification for TTI messages, their network layer and their service layer, to be conveyed by the RDS-TMC feature, specified in IEC 62106:2000. Other standards are being developed by CEN/TC 278 Working Group 4 to cover TTI messages that may be conveyed by other carriers.

The following terms should be noted, to enable the TTI information chain to be more fully understood.

Data Service Provider: An organisation that manages any data service, by gathering data, processing data and selling the data service. A Data Service Provider then negotiates for the use of the necessary data bandwidth with a Broadcaster and/or Transmission Operator. A Data Service Provider is responsible for the "quality" of data to his customers and must provide suitable customer support. Editorial control over the data may be part of a "data bit-rate contract" agreement (for example an RDS-TMC service may require the Broadcaster to apply some editorial control, so that both RDS-TMC messages and other broadcast services, such as spoken or teletext traffic and travel information, possibly derived from more than one source, are not contradictory).

Programme Service Provider: An organisation that manages and originates programming and associated data for broadcast. This will often be carried out by a Broadcaster but allows for the subtle distinction, where a separate company is commissioned to produce a programme, together with associated data, e.g. text of teachers' notes for an educational series.

Broadcaster: A traditionally incorporated organisation responsible for a continuous strand of programmes, their quality and programme associated data, as well as responsible for overall co-ordination of "broadcast transmissions" (often a Broadcaster is the licensee of a national regulator). A Broadcaster may also be a Programme Service Provider and sometimes be a Data Service Provider.

Network Operator: An organisation contracted to supply both programme and data circuits interconnecting Data Service Provider, Programme Service Provider, Broadcaster and Transmission Operator. According to the connections, various protocols may be used, e.g. ALERT-C, EBU Universal Encoder Communications Protocol.

Transmission Operator: Organisation responsible for the actual transmission of the full broadcast signal including the audio programme, programme associated data and data services. Normally a Transmission Operator is contracted to perform the transmission task by a Broadcaster.

Broadcasters already provide valuable TTI services to motorists, in countries throughout Europe, using spoken reports and teletext information. Due to the widespread adoption of the Radio Data System, there is now the possibility of transmitting coded TTI messages digitally and "silently" using the RDS-TMC feature, which avoids the interruption of planned programmes. Potentially this has two advantages: messages can be decoded into the "language" of the user, regardless of location and many more messages can be made available.

The ALERT-C protocol defined in this specification supports a digital, silent broadcasting 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 or urban roads.

The present standard is based on the ALERT-C traffic message coding protocol, which was a major 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 throughout Europe, working in conjunction with the European Broadcasting Union (EBU) and the European Conference of Ministers of Transport (ECMT).

Changes that have been made in the present document in comparison with earlier versions and the original ALERT-C proposal of 1990 are based on comments that have been received from many parties, and have been thoroughly discussed in CEN TC278 Sub-working group 4.1.

All aspects referring to location referencing were dealt with separately by CEN TC278 SWG7.3 in EN ISO 14819-3 and are not included in this document.

The RDS system is fully described in IEC 62106:2000 and it contains the 'hooks' to RDS-TMC, which is detailed in this standard. RDS type 3A groups are defined to carry the ODA identification and service and network layer information, while type 8A groups are defined to carry RDS-TMC message and location information.

Two methodologies are generally distinguished in the "RDS-TMC world":

The first approach is based on the idea of a universal ALERT-C service. This is possible if a continuous and interoperable network of ALERT-C free-access services is in place in a country or around a continent.

The second approach allows a Data Service Provider to offer a value added service, generally a paid-for service, which will contain status-oriented messages according to the ALERT-Plus protocol and must also contain event-oriented messages according to the ALERT-C protocol. For historical reasons, two RDS-TMC Open Data Applications (ODA) have been defined. The first ODA only allows the implementation of the ALERT-C service. The second ODA takes into account both possible services (ALERT-C with ALERT-Plus), allowing operation of a universal service as well as an added value RDS-TMC service on the same transmitter. A service provider is thus able to offer the universal service, and to propose in parallel to his clients a more sophisticated information such as travel times. This additional service may be paid-for and encrypted while the basic ALERT-C service may remain free-access.

Message management issues were also felt to be an area where further discussion was required prior to 'fixing'. Concern has also been expressed about the desirability of fixing items where the wording had been deliberately left open pending field trial results. As a result of this, the term 'cycle' referred to in the fixed parts of the text, should not be considered as prescribing a rigid structure of cycles at this stage.

1 SCOPE

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1.1 General Scope

The ALERT-C protocol is designed to provide mostly **event-orientated road end-user information** messages. Many "hooks" have been left for future development and indeed a **few status-orientated road end-user information** messages were included. This protocol is designed to be closely linked to the ALERT-Plus protocol, which is specifically designed for **status-orientated road end-user information**; both protocols may be available in the same RDS transmission. The ALERT-Plus protocol is specified in ENV 12313-4.

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 (EN 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 situation, 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.

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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.

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1.5 Event List

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

2 NORMATIVE REFERENCES

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (Including amendments).

EN ISO 14819-2	Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 2: Event and information codes for Radio Data System – Traffic Message Channel (RDS-TMC) (ISO/FDIS 14819-2:2002)
EN ISO 14819-3	Traffic and Traveller Information (TTI) - TTI Messages via traffic message coding - Part 3: Location Referencing for ALERT-C (ISO/TS 14819-3:2000)
ENV 12313-4	Traffic and Traveller Information (TTI) - TTI Messages via Traffic Message Coding - Part 4: Coding Protocol for Radio Data System - Traffic Message Channel (RDS-TMC) – RDS-TMC using ALERT-Plus with ALERT-C
ENV 13106:2000	Road transport and traffic telematics - DATEX traffic and travel data dictionary (version 3.1.a)

EN 28601	Data elements and interchange formats - Information interchange - Representation of dates and times (ISO 8601:1988 and its technical corrigendum 1:1991)
IEC 62106:2000	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 and definitions and abbreviated terms

3.1 Terms and definitions

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

3.1.1

Continuity Index Field

the purpose of the Continuity Index Field is to help distinguish between different multi-group messages. All groups within any particular multi-group message contain the same value of this continuity index.

3.1.2

Country Code

The Country Code is defined in the RDS specification IEC 62106:2000 and assigns a code to each country. Country codes are not unique to one country and can be repeated in non-neighbouring countries.

3.1.3

Direction and Extent

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

3.1.4

Diversion Advice

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

3.1.5

Duration

Giving an indication of how long the problem is expected to last.

3.1.6

End-user

In this specification, end-user is used to cover the meaning for all possible terminal clients. 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.

3.1.7

Event Description

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

3.1.8

Event List

An agreed table of event descriptions 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. The Event List is defined in EN ISO 14819-2: 2002.

3.1.9

Foreign Location Table

A location table different from the default location table used by the transmitter.

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EN ISO 14819-1:2003 (E)**3.1.10****INTER-ROAD**

A way of referencing locations from other location tables via special multi-group messages. These messages can be used to inform end-users about problems in other areas, in particular in neighbouring countries.

3.1.11**Extended Country Code**

The Extended Country Code is defined in the RDS specification IEC 62106:2000 and assigns a unique code to each country.

3.1.12**Location**

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

3.1.13**Location Table**

An agreed location table for each service which contains information to indicate the area, road segment or point location where the source of the problem is situated. Each service has a Location Table defined by the Location Table Number (LTN).

3.1.14**Programme Identifier**

The Programme Identification code is defined in the RDS specification IEC 62106:2000 and assigns a unique value to each audio programme source.

3.1.15**Silent Cancellation Message**

The Event List contains many silent cancellation messages descriptions which are used to delete messages from the end-user terminal.

3.1.16**Service-ID**

The Service ID is used to uniquely identify a particular TMC service from a service provider.

3.1.17**System Information**

System Information enables an RDS-TMC terminal to decode and evaluate essential data, which describes the transmission being received. System Information indicates an RDS-TMC service and comprises some service characteristics needed to select the RDS-TMC service.

3.1.18**Terminal**

RDS-TMC terminals provide the user interfaces with the TMC service. 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.

3.1.19**Tuning Information**

Tuning Information enables a RDS-TMC terminal to change from one transmitter to another at boundaries of a particular transmitter's coverage. Each transmitter should direct the RDS-TMC terminal to specific frequencies or TMC services in adjacent areas.

3.1.20**User Message**

user messages are those potentially made known to the end-user. They contain event, location, direction and extent, duration etc. descriptions.

3.2 Abbreviated terms

For the purposes of this standard, 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

ALERT-C

Advice and Problem Location for European Road Traffic, Version C.

3.2.4

CC

Country Code -an RDS feature.

3.2.5

CT

Clock Time -an RDS feature.

3.2.6

EBU

European Broadcasting Union.

3.2.7

ECC

Extended Country Code -an RDS feature.

3.2.8

ECMT

European Conference of Ministers of Transport.

3.2.9

LTN

Location Table Number.

3.2.10

MGS

Message Geographical Scope.

3.2.11

ODA

Open Data Application –an RDS feature.

3.2.12

ON

Other Network -an RDS feature.

3.2.13

PI

Programme Identifier -an RDS feature.

3.2.14

RDS

Radio Data System.

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EN ISO 14819-1:2003 (E)**3.2.15****rfu**

Reserved for future use.

3.2.16**SID**

Service-ID.

3.2.17**TMC**

Traffic Message Channel.

3.2.18**TN**

Tuned Network.

3.2.19**UTC**

Universal Co-ordinated Time.

4 APPLICATION**4.1 General**

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-orientated 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;
- details of local traffic incidents which may be avoidable through the use of minor diversions;
- status-orientated information on traffic conditions which can help to support intelligent on-vehicle route guidance equipment; and
- additional data on roadside amenities and tourism information which can in future complement and update on-vehicle mobile databases.

4.3 TMC virtual terminal

Information broadcast digitally and silently can only be interpreted by suitable RDS-TMC terminals. These RDS-TMC terminals provide the user interfaces with the TMC service. Their functionality may vary substantially according to technical developments and market requirements, which cannot be wholly predicted in advance. Instead, a **virtual terminal** model is defined which covers a range of terminal functions, including:

- simple terminals with a limited message repertoire and restricted location database;
- more sophisticated terminals offering full TMC message features and/or a wide range of strategic and tactical location databases;
- terminals which monitor only a single, selected TMC service, and others which employ more sophisticated search strategies of several or many channels;
- terminals which are active before the start of a journey, and others which must acquire their TMC data after the journey begins; and
- terminals which provide output via speech synthesis and/or visual displays, and others which interface to more sophisticated on-vehicle route guidance equipment.

4.4 Event-orientated end-user information messages

The ALERT-C protocol defines only **event-orientated end-user information** messages. Provision is also made for the subsequent definition of other types of message, such as **status-orientated route guidance** information, or such other applications as may be desired in future.

End-user information messages are those designed primarily to service an in-vehicle terminal, offering information directly to end-users via speech synthesis and/or displays. Terminals can also be used in home and office terminals or public access terminals, to assist in pre-trip journey planning.

Event-oriented messages describe deviations from the normal traffic equilibrium state, and include problems such as congestion, roadworks, adverse weather conditions, accidents, ferry delays or cancellations, etc..

4.5 Strategic and tactical information

ALERT-C follows EBU Guidelines on Broadcasts for Motorists, revised June 1990, in distinguishing between strategic information, of value for trip planning and route selection in the medium term, and tactical information likely to be of relevance for immediate local diversions around current traffic problems.

In more detail, broadcast traffic information comprises:

- a) immediate "tactical" information, for transmission as soon as possible, with frequent repeats;
- b) medium-term "strategic" information, for transmission at intervals, according to available channel capacity;
- c) long-term "background" information, for transmission from time to time;
- d) forecasts such as weather and expected road conditions, traffic density, coming events, etc.; and
- e) tourist and other messages, including public transport information, which may be relevant for motorists.

The ALERT-C protocol follows these guidelines, aiming to allow as many as possible of the existing spoken messages to be carried in similar forms using the digital TMC medium.

4.6 Geographic relevance

ALERT-C utilises location coding strategies prepared in guidelines developed within the DRIVE Project. These guidelines adopt hierarchical principles of structuring the location database in accordance with EBU Broadcast for Motorists group functional recommendations for strategic and tactical messages. This is dealt with in EN ISO 14819-3.