

STN	Intelligentné dopravné systémy (ITS) Funkcia vrstvy zariadení Časť 2: Riadenie polohy a času (PoTi) Vydanie 2	STN EN 302 890-2 V2.1.1 87 2890
------------	--	---

Intelligent Transport Systems (ITS); Facilities Layer function; Part 2: Position and Time management (PoTi); Release 2

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/21

Obsahuje: EN 302 890-2 V2.1.1:2020

132330

ETSI EN 302 890-2 V2.1.1 (2020-10)



**Intelligent Transport Systems (ITS);
Facilities Layer function;
Part 2: Position and Time management (PoTi);
Release 2**

Reference

DEN/ITS-00182

Keywords

facility, ITS, time-stamping

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommitteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2020.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	5
Foreword.....	5
Modal verbs terminology	5
Introduction	6
1 Scope	7
2 References	7
2.1 Normative references	7
2.2 Informative references	8
3 Definition of terms, symbols and abbreviations.....	9
3.1 Terms	9
3.2 Symbols	9
3.3 Abbreviations.....	10
4 Position and Time entity introduction	11
4.1 Introduction.....	11
4.2 Service provided by the PoTi entity.....	12
5 PoTi functional description	12
5.1 PoTi in the ITS Domain.....	12
5.2 ITS Constellation	12
5.3 PoTi in the ITS Station (ITS-S) architecture	13
5.4 PoTi entity functional architecture.....	14
5.4.1 General	14
5.4.2 Position information Management	14
5.4.3 Position Augmentation.....	15
5.4.4 Reference coordinate System Conversion	15
5.4.5 Time information Management	15
5.4.6 Time synchronization	15
5.4.7 Time reference system conversion Service	15
5.5 PoTi Interfaces.....	16
5.5.1 Interface to ITS applications (FA-SAP).....	16
5.5.2 Interfaces to the Networking and Transport Layer (NF-SAP)	17
5.5.3 Interfaces to the Management entity (MF-SAP)	17
5.5.4 Interfaces to the Security entity (SF-SAP)	17
5.5.5 Interfaces to other Facility layer entities	18
6 Position and time requirements	18
6.1 Requirements related to PoTi functions.....	18
6.2 ITS-S reference position	20
6.2.1 Introduction	20
6.2.2 ITS-S reference position for passenger cars	20
6.2.3 ITS-S reference position for Trucks	22
6.2.4 ITS-S reference position for Busses	28
6.2.5 ITS-S reference position for Motorcycles, mopeds and bicycles	29
6.2.6 ITS-S reference position for Pedestrians.....	31
6.2.7 ITS-S reference position for Special Vehicles	31
6.2.8 ITS-S reference position for City-Tram	31
6.2.9 ITS-S reference position for Roadside ITS Stations (R-ITS-Ss).....	32
6.3 Position and time confidence	32
6.3.1 General requirements related to confidence	32
6.3.2 Confidences related to Position Information Management	33
6.3.2.1 Horizontal Position confidence.....	33
6.3.2.2 Vertical Position confidence.....	33
6.3.2.3 Horizontal Speed confidence	33
6.3.2.4 Heading confidence	33

6.3.2.5	Confidence of other quantities	34
6.3.2.6	Other accuracy estimations.....	34
6.3.3	Confidences related to Reference Coordinate System Conversion Management	34
6.3.3.1	Relative Position confidence	34
6.3.4	Confidences related to Time Information Management.....	34
7	Augmentation services	35
7.1	Introductions	35
7.2	GNSS Positioning Correction (GPC) Augmentation Service	35
7.2.1	Introduction	35
7.2.2	GPC requirements	36
7.2.3	GPC Data processing by the V-ITS-S during transition between R-ITS-S service areas.....	36
7.3	R-ITS-S ranging augmentation Service	37
7.3.1	Introduction	37
7.3.2	Ranging service announcements	38
7.3.2.1	Introduction	38
7.3.2.2	Ranging Service Application Data	39
7.3.3	Measurement	40
7.3.4	Ranging Rate	40
7.3.5	Security	40
Annex A (normative):	ASN.1 specification of messages	41
A.1	ASN.1 specification of ranging service application data	41
History		42

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Intelligent Transport Systems (ITS).

The present document is part 2 of a multi-part deliverable covering Facilities Layer function, as identified below:

Part 1: "Services Announcement (SA) specification";

Part 2: "Position and Time management (PoTi); Release 2".

The present document is based on inputs provided by various European projects including AutoNet, Concordia, Ensemble, Hights, PRoPART, Dutch-Germany-Austria Corridor, Scope@F, A58 (NL), PRE-DRIVE C2X, DRIVE C2X, SafeSpot, CVIS, CoVeL, SCOR@F, simTD, etc.

National transposition dates	
Date of adoption of this EN:	19 October 2020
Date of latest announcement of this EN (doa):	31 January 2021
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 July 2021
Date of withdrawal of any conflicting National Standard (dow):	31 July 2021

Modal verbs terminology

In the present document **"shall"**, **"shall not"**, **"should"**, **"should not"**, **"may"**, **"need not"**, **"will"**, **"will not"**, **"can"** and **"cannot"** are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"must" and **"must not"** are **NOT** allowed in ETSI deliverables except when used in direct citation.

Introduction

Intelligent Transportation Systems Cooperative, Connected and Automated Mobility (CCAM) related use cases in the ITS environment as specified in the ETSI ITS architecture (ETSI EN 302 665 [i.1]) can be distributed over multiple ITS stations (ITS-Ss). ITS-Ss interact in the ITS system to exchange sensor data and traffic related information to make each other aware of traffic safety or traffic efficiency circumstances and situations by which each ITS-S equipped road user, whether automated or not, can improve their safety and efficiency related decisions.

1 Scope

The present document provides the specification of the Position and Time (PoTi) services. It includes functional and operational requirements for the position and time data to support ITS Applications. In addition, it includes the definition of syntax and semantics of messages exchanged between ITS Stations (ITS-Ss) to augment the position and time accuracy. Finally, it specifies the facilities layer protocol in support of such message exchanges.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 103 301: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Facilities layer protocols and communication requirements for infrastructure services".
- [2] RTCM 10402.3: "Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service".
- [3] RTCM 10403.3: "Differential GNSS (Global Navigation Satellite Systems) Services - Version 3".
- [4] ETSI EN 302 663 (V1.3.1) (01-2020): "Intelligent Transport Systems (ITS); ITS-G5 Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band".
- [5] ETSI EN 302 890-1 (V1.2.1) (07-2019): "Intelligent Transport Systems (ITS); Facilities layer function; Part 1: Services Announcement (SA) specification".
- [6] World Geodetic System 1984 (WGS84).

NOTE: Available at http://earth-info.nga.mil/GandG/update/index.php?dir=wgs84&action=wgs84#tab_wgs84-res.

- [7] ISO 8855 (2011): "Road Vehicles -- Vehicle dynamics and road-holding ability -- Vocabulary".
- [8] ETSI TS 103 248: "Intelligent Transport Systems (ITS); GeoNetworking; Port Numbers for the Basic Transport Protocol (BTP)".
- [9] ISO 5725-1 (1994): "Accuracy (trueness and precision) of measurement methods and results -- Part 1: General principles and definitions".
- [10] ETSI TS 102 894-2: "Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary".
- [11] ETSI EN 302 931 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; Geographical Area Definition".
- [12] ISO/TS 16460:2016: "Intelligent transport systems -- Communications access for land mobiles (CALM) -- Communication protocol messages for global usage".

- [13] Recommendation ITU-T X.691/ISO/IEC 8825-2:2015: "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI EN 302 665: "Intelligent Transport Systems (ITS); Communications Architecture".
- [i.2] ETSI TR 102 638 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Definitions".
- [i.3] ETSI EN 302 637-2: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service".
- [i.4] ETSI EN 302 637-3: "Intelligent Transport Systems (ITS); Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service".
- [i.5] ETSI TS 102 894-1 (V1.1.1): "Intelligent Transport Systems (ITS); Users and applications requirements; Part 1: Facility layer structure, functional requirements and specifications".
- [i.6] ETSI TR 103 299: "Intelligent Transport System (ITS); Cooperative Adaptive Cruise Control (CACC); Pre-standardization study".
- [i.7] ETSI TS 103 324: "Intelligent Transport Systems (ITS); Cooperative Perception Services".
- [i.8] ETSI TS 103 246-1 (V1.2.1) (03-2017): "Satellite Earth Stations and Systems (SES); GNSS based location systems; Part 1: Functional requirements".
- [i.9] EUREF: "European Terrestrial Reference System 89 (ETRS89)".

NOTE: Available at <http://etrs89.ensg.ign.fr>.

- [i.10] ETSI TR 101 607 (V1.1.1) (05-2013): "Intelligent Transport Systems (ITS); Cooperative ITS (C-ITS); Release 1".
- [i.11] ISO 3534-1 (10-2009): "Statistics - Vocabulary and symbols - Part 1: General statistical terms and terms".
- [i.12] ETSI TS 136 305 (V11.2.0): "LTE; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Stage 2 functional specification of User Equipment (UE) positioning in E-UTRAN (3GPP TS 36.305 version 11.2.0 Release 11)".
- [i.13] IETF RFC 5905 (June 2010): "Network Time Protocol Version 4: Protocol and Algorithms Specification".
- [i.14] IEC 60050: "International Electrotechnical Vocabulary", 113-01-08 (instant), 113-01-10 (time interval), 113-01-13 (duration).
- [i.15] IS-QZSS-L6-001: "Quasi-Zenith Satellite System Interface Specification Centimeter Level Augmentation Service".

NOTE: Available at <https://qzss.go.jp/en/technical/download/pdf/ps-is-qzss/is-qzss-l6-001.pdf>.

- [i.16] IETF RFC 8173 (June 2017): "Precision Time Protocol Version 2 (PTPv2) Management Information Base".

- [i.17] EN ISO 22418: "Intelligent transport systems - Fast service announcement protocol (FSAP) for general purposes in ITS" (produced by CEN).
- [i.18] IEEETM 1609.3: "IEEE Standard for Wireless Access in Vehicular Environments (WAVE) -- Networking Services".

koniec náhľadu – text ďalej pokračuje v platenej verzii STN