ICS 33.060.30, 35.240.60 SLOVENSKÁ TECHNICKÁ NORMA Február 2025

STN	**Vesmír** **Aplikácia na určovanie polohy založená na GNSS pre inteligentné dopravné systémy (ITS) v cestnej doprave** **Časť 4: Definície a postupy systémového inžinierstva pre návrh a validáciu skúšobných scenárov**	**STN** **EN 16803-4** 31 0545

Space - Use of GNSS-based positioning for road Intelligent Transport Systems (ITS) - Part 4 : Definitions and system engineering procedures for the design and validation of test scenarios

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. 01/25

Obsahuje: EN 16803-4:2024

obsahuje farebné strany

139984

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 16803-4

November 2024

ICS 33.060.30; 35.240.60

English version

Space - Use of GNSS-based positioning for road Intelligent Transport Systems (ITS) - Part 4 : Definitions and system engineering procedures for the design and validation of test scenarios

Espace - Utilisation du positionnement GNSS pour les systèmes de transport routier intelligents (ITS) - Partie 4: Définitions et procédures d'ingénierie système pour la conception et la validation de scénarios d'essai

Raumfahrt - Anwendung von GNSS-basierter Ortung für Intelligente Transportsysteme (ITS) im Straßenverkehr - Teil 4: Definitionen und systemtechnische Verfahren für den Entwurf und die Validierung von Testszenarien

This European Standard was approved by CEN on 13 October 2024.

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

Ref. No. EN 16803-4:2024 E

Contents

Page

European foreword

This document (EN 16803-4:2024) has been prepared by Technical Committee CEN/TC 5 “Space”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by May 2025, and conflicting national standards shall be withdrawn at the latest by May 2025.

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.

EN 16803, *Space — Use of GNSS-based positioning for road Intelligent Transport Systems (ITS)*, consists of the following parts:

— Part 1: Definitions and system engineering procedures for the establishment and assessment of performances;

— Part 2: Assessment of basic performances of GNSS-based positioning terminals;

— Part 3: Assessment of security performances of GNSS-based positioning terminals;

— Part 4: Definitions and system engineering procedures for the design and validation of test scenarios.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Türkiye and the United Kingdom.

Introduction

The EN 16803 series of CEN-CENELEC standards deals with the use of GNSS technology in the intelligent transport domain and addresses more particularly the issue of performance assessment.

As recalled in the following Figure 1, the generic functional architecture of a road ITS system based on GNSS, two main sub-systems can be considered: the positioning system [GNSS-based positioning terminal (GBPT) + external terrestrial sources of data] and the road ITS application processing the position quantities output by the terminal to deliver the final service to the user.

The EN 16803 series tends to give keys in order to assess the whole positioning-based road ITS system.

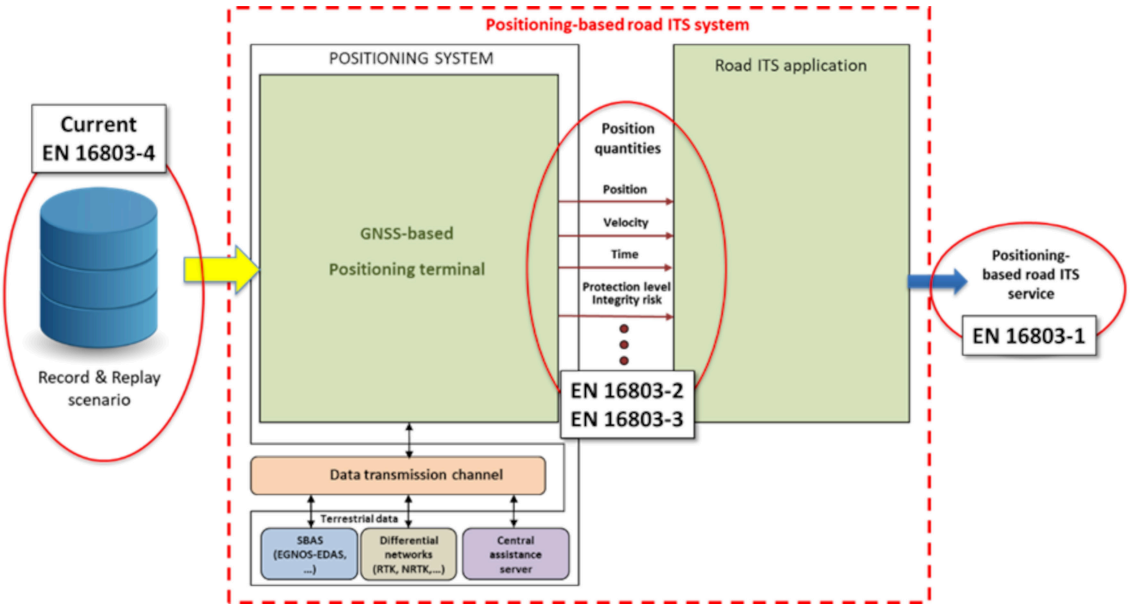

Figure 1 — Generic functional architecture of a road ITS system based on GNSS
[SOURCE: EN 16803-1:2020: *Space — Use of GNSS-based positioning for road Intelligent Transport Systems (ITS) — Part 1: Assessment of security performances of GNSS-based positioning terminals*]

The scope of relevance of the different parts of the EN 16803 series is reminded hereafter:

— EN 16803-1:2020 proposes a method called “sensitivity analysis” to assess the adequacy of the GBPT’s performances to the end-to-end performance of the road ITS system. In addition, this first EN defines the generic architecture, the generic terms and the basic performance metrics for the positioning quantities. EN 16803-1:2020 can be of interest for many different stakeholders but is targeting mainly the ITS application developers;

— EN 16803-2:2020 proposes a test methodology based on the replay in the lab of real data sets recorded during field tests, assuming no security attack during the test;

— EN 16803-3, proposes a complement to this **Record and Replay (R&R)** test methodology to assess the performance degradation when the GNSS signal-in-space (SIS) is affected by intentional or unintentional radio-frequency (RF) perturbations. Next sections below stress the importance of this assessment in the context of the security threats.

These two ENs (part 2 and part 3) are mainly targeting the generalist RF test laboratory that will be in charge of assessing the performances of GBPTs for different applications using replay techniques.

This document, EN 16803-4, describes the methodology needed for the record of the real data sets and is targeting mainly the GNSS-specialized test laboratories that will be in charge of elaborating the test scenarios.

Important note on EN ISO/IEC 17025 standard:

The EN 16803 series has the scope to define the methodology for the assessment of performances of GBPT for road intelligent transport. As a reminder: a complete certification process shall follow the EN ISO/IEC 17065. And the current norm doesn't address that.

Intrinsically, this statement means that any laboratory working either for the creation of the scenario or for the evaluation of the GBPT, using the created scenario, should be accredited EN ISO/IEC 17025 norm with the suitable scopes. Even if EN ISO/IEC 17025 can be mentioned in this document, authors remind here that EN 16803 series (especially this current part 4) can be used outside of the scope of EN ISO/IEC 17025, i.e. outside of the scope of accredited laboratories. Nevertheless, users of the EN 16803 series have still to keep in mind that producing accredited test results will always have higher liability and quality.

As a summary of that note:

1. EN 16803 series can be used for performing accredited tests; and this is even encouraged. EN ISO/IEC 17025 is the right standard to respect in that context;

2. EN 16803 series can also be used for performing internal or private tests, outside of any accreditation or certification schemes;

3. a complete certification process shall follow the EN ISO/IEC 17065 standard. And this is not the topic of the EN 16803 series.

1 Scope

This document is mainly addressed to GNSS-specialized laboratories, in charge of creating reference test scenarios that will be replayed by other users such as generalist RF lab. It is a fundamental key-point to be able to deliver homogenous test scenarios. Indeed, in the context of GNSS receiver certification, the process itself is independent from the laboratory which designed and made the scenario. In other words, the conformity level of any GNSS-based positioning terminal (GBPT) is the same whatever the specific scenario used. Using a specific urban scenario from a GNSS-specialized laboratory A leads to the same conclusion as using another specific urban scenario from a GNSS-specialized laboratory B. This is really the aim of this document: giving requirements and guidelines to all GNSS-specialized laboratories in order to make inter-operable test scenarios.

It will thus provide requirements and guidelines on the following topics:

— what technical documentations are required to design test scenarios (Clause 4) through:

  o technical documentation for “R&R”,

  o list of documents to produce for simulation scenario;

— how to collect data in order to build test scenarios (Clause 5) through:

  o identification of the technical documentation,

  o requirements for human resources,

  o requirements for tests platform,

  o requirement for RTMeS,

  o requirement for GNSS signals digitization,

  o requirements for GNSS constellations simulator,

  o requirements for benchmark GNSS receiver,

  o requirement for GBPT embedded,

  o requirements for other sensors;

— how to validate data – after a data collection– in order to be sure of it (Clause 6) through:

  o validation of the field test,

  o validation of data for reference trajectory,

  o validation of digitized GNSS signals,

  o validation of SENSORS inertial measurements,

  o validation of corrections data (NRTK, PPP…),

  o characterization of the scenario.

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.

EN 16803-1:2020, *Space - Use of GNSS-based positioning for road Intelligent Transport Systems (ITS) - Part 1: Definitions and system engineering procedures for the establishment and assessment of performances*

EN 16803-2:2020, *Space - Use of GNSS-based positioning for road Intelligent Transport Systems (ITS) - Part 2: Assessment of basic performances of GNSS-based positioning terminals*