International Standard

ISO 19116

Geographic information — Positioning services

Information géographique — Services de positionnement

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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 document 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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, Geographic information/Geomatics, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 19116:2019), which has been technically revised. It also incorporates the Amendment ISO 19116:2019/Amd 1:2021.

The main changes are as follows:

— ISO 19107 has been removed from Clause 2 based on a re-examination of the provisions and UML models in this edition of the document;

— the document has been harmonized with ISO 19111:2019 (CoordinateMetadata) and ISO 19157-1:2023.

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.

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Introduction

0.1 Overview

Positioning services are among the processing services identified in ISO 19119. Processing services include services that are computationally oriented and operate upon the elements from the model domain, rather than being directly integrated in the model domain itself. This document defines and describes positioning services.

Positioning services employ a wide variety of technologies that provide position and related information to a similarly wide variety of applications, as depicted in Figure 1. Although these technologies differ in many respects, there are important items of information that are common among them and serve the needs of these application areas, such as the position data, time of observation and its accuracy. There are also items of information that apply only to specific technologies and are sometimes required in order to make correct use of the positioning results, such as signal strength, geometry factors and raw measurements. Therefore, this document includes both general data elements that are applicable to a wide variety of positioning services and technology-specific elements that are relevant to specific technologies.

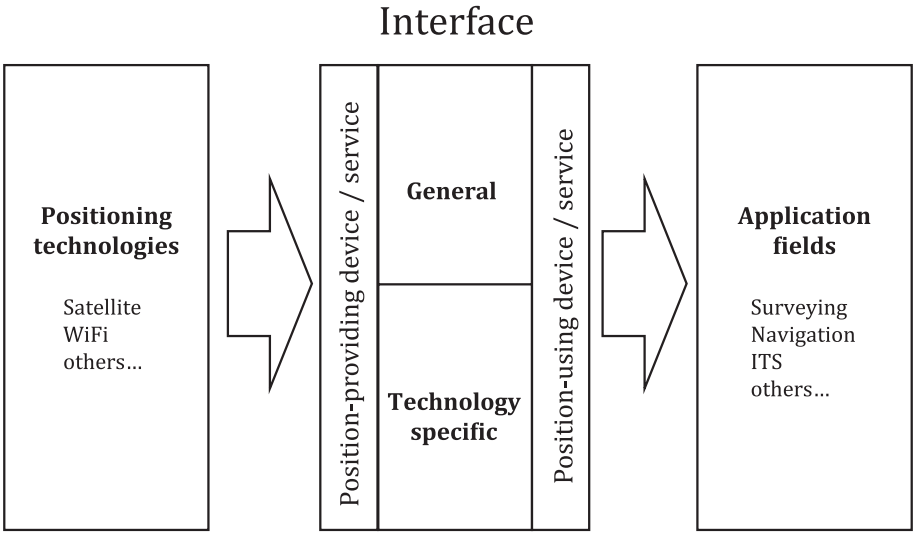


Figure 1 — Positioning services overview

Electronic positioning technology can measure the coordinates of a location on or near the Earth with great speed and accuracy, thereby allowing geographic information systems to be populated with any number of objects. However, the technologies for position determination have neither a common structure for expression of position information, nor common structures for expression of accuracy and reliability. The positioning services interface specified in this document provides data structures and operations that allow spatially oriented systems to employ positioning technologies with greater efficiency and interoperability.

0.2 Decimal marker

In accordance with the ISO/IEC Directives, Part 2, 2018, *Rules for the structure and drafting of International Standards*, in International Standards the decimal sign is a comma on the line. However, the General Conference on Weights and Measures (Conférence Générale des Poids et Mesures) at its meeting in 2003 passed unanimously the following resolution:

"The decimal marker shall be either a point on the line or a comma on the line."

In practice, the choice between these alternatives depends on customary use in the language concerned. In the technical areas of geodesy and geographic information it is customary for the decimal point always to be used, for all languages. That practice is used throughout this document.

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Geographic information — Positioning services

1 Scope

This document specifies the data structure and content of an interface that permits communication between position-providing device(s) and position-using device(s) enabling the position-using device(s) to obtain and unambiguously interpret position information and determine, based on a measure of the degree of reliability, whether the resulting position information meets the requirements of the intended use.

A standardized interface for positioning allows the integration of reliable position information obtained from non-specific positioning technologies and is useful in various location-focused information applications, such as surveying, navigation, intelligent transportation systems (ITS) and location-based services (LBS).

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 19103, *Geographic information — Conceptual schema language*

ISO 19111, *Geographic information — Referencing by coordinates*

ISO 19115-1, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19157-1, *Geographic information — Data quality — Part 1: General requirements*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
absolute accuracy
external accuracy
closeness of reported coordinate values to values accepted as or being true

Note 1 to entry: Where the true coordinate value is potentially not perfectly known, accuracy is normally tested by comparison to available values that can best be accepted as true.

[SOURCE: ISO/TS 19159-2:2016, 4.1 modified — Notes 1 and 2 to entry have been removed and replaced by a new Note 1 to entry.]

3.2
accuracy
closeness of agreement between a test result or measurement result and the true value

Note 1 to entry: For positioning services, the test result is a measured value or set of values.

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