
**Intelligent transport systems —
Reference model architecture(s) for the
ITS sector —**

**Part 5:
Requirements for architecture description
in ITS standards**

*Systèmes intelligents de transport (ITS) — Architecture(s) de modèle de
référence pour le secteur ITS —*

*Partie 5: Exigences pour la description d'architecture dans les normes
ITS*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 14813-5 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This first edition of ISO 14813-5 cancels and replaces ISO/TR 14813-5:1999, of which it constitutes a technical revision.

ISO 14813 consists of the following parts, under the general title *Intelligent transport systems — Reference model architecture(s) for the ITS sector*:

- *Part 1: ITS service domains, service groups and services*
- *Part 2: Core TICS reference architecture* [Technical Report]
- *Part 3: Example elaboration* [Technical Report]
- *Part 4: Reference model tutorial* [Technical Report]
- *Part 5: Requirements for architecture description in ITS standards*
- *Part 6: Data presentation in ASN.1*

Introduction

“Architecture” can be defined as “*Design; the way components fit together*”¹⁾. Architecture is implicit in any construction, be it of a physical entity (such as a building), an operational entity (such as a company or organisation), a system entity (such as a software system) or a business entity (such as a commercial business operation).

While it may be stated that every entity has an architecture, the particular architecture may be an explicit construction as a result of a deliberate design process or the implicit result of an unplanned series of events, or sometimes the combination of both.

In physical construction, it is generally recognised that a deliberate design process will produce a better and more efficient building than one where a group of individuals have collected whatever materials happened to be nearby in order to create a shelter.

Intelligent transport systems (ITS) are systems deployed in transportation environments to improve both the driving experience and the safety and security of drivers, passengers and pedestrians. ITS can also assist in the labour, energy, environmental and cost efficiency of transportation systems. It is a feature of most ITS that their architecture involves the collection, use and exchange of information/data within and between software systems which affect or control the behaviour of physical equipment, providing a service to the actors involved in, or interacting with, the transport sector.

In order to maximise the efficiency of co-existing ITS, to obtain compatibility and/or interoperability and to eliminate contention, the systems need to co-exist and operate within a known and supportive architectural framework.

The ITS sector is still emerging and developing and is still close to the start of its evolution and application. The technology is developing and changing rapidly and ITS services have generally to make provision not only for its interaction with other services, but with migration from one technology generation to later iterations.

This part of ISO 14813 is designed to ensure that, in order to obtain maximum interoperability, efficiency and migration capability, architecture is an explicit process in the development of, and specifications defined within, ITS standards.

“Architecture” is used in an informal manner to mean a variety of different concepts and, in formal architecture design, there are differing methodologies and opinions as to their suitability for use in ITS system and standards design. This has limited effective communication in the ITS sector by causing uncertainty as to the meaning of the word when it is used in one context or another. A second function of this part of ISO 14813 is to provide consistent terminology to be used in describing architectural aspects of ITS standards and provide a consistent form for ITS architecture description in standards in the ITS sector.

An ITS architecture is a framework for ITS deployments. It is a high-level description of the major elements and the interconnections among them. It provides the framework around which the interfaces, specifications and detailed ITS designs can be defined. An ITS architecture is not a product design or a detailed specification for physical deployment and is not specific to any one location. “Systems architecture” is perhaps the closest general term, but this is sometimes too specific to include the conceptual aspects included in the term “ITS Architecture” and often also implies a location-specific solution. The purpose of an ITS architecture is to maximise efficiency, interoperability and multimodality of multiple interacting ITS in a complex and developing sector.

1) *Interoperability Clearinghouse Glossary of Terms*, <http://www.ichnet.org/glossary.htm>

This part of ISO 14813 does not give preference to any one methodology for architecture development and description. It requires only that the consideration of architecture be an explicit process that takes into account the interrelationships and interoperability of ITS, and that an architecture description be provided within ITS standards.

This part of ISO 14813 requires that the architecture aspects of ITS standards be described explicitly in each and every ITS standard, and that all such standards be related to the (one or more) ITS service domains, service groups and services set out in ISO 14813-1 that they are designed to enable or support.

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Intelligent transport systems — Reference model architecture(s) for the ITS sector —

Part 5: Requirements for architecture description in ITS standards

1 Scope

This part of ISO 14813 gives requirements for the description and documentation of the architecture of intelligent transport systems (ITS) in standards dealing with ITS. It also defines the terms to be used when documenting or referencing aspects of architecture description in those standards (see Annex B).

Although the use of contemporary systems engineering practices is assumed by this part of ISO 14813, it does not define such practices.

NOTE Guidance on the use of the unified modelling language (UML) in ITS architectures can be found in ISO/TR 17452 and ISO/TR 24529. Guidance on the use of the process-orientated methodology in ITS architectures can be found in ISO/TR 26999.

2 Conformance

There are no specific conformance tests specified within or associated with this part of ISO 14813.

Developers of standards claiming conformance with this part of ISO 14813 are, however, required to describe the architecture of their system in their deliverables, or to make reference to other standards or publicly available documents that provide such description. The level of detail or the methodology used for such description is not specified and is left to the discretion of the standards developers.

Implementers of ITS cannot, of course, be required to make such provision, but are advised to do so in their plans and tender documents. This part of ISO 14813 is therefore also designed as a consistent reference for ITS system designers.

3 Normative references

The following referenced documents are indispensable for the application 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/IEC 8824 (all parts), *Information technology — Abstract Syntax Notation One (ASN.1)*²⁾

ISO/IEC 8825 (all parts), *Information technology — ASN.1 encoding rules*²⁾

2) ASN.1 standards are divided into the abstract syntax notation one (ASN.1) specifications and the ASN.1 encoding rules. ISO/IEC 8824-1 to ISO/IEC 8824-4 and ISO/IEC 8825-1 to ISO/IEC 8825-4 correspond to ITU-T Recommendations X.680, X.681, X.682 and X.683, and X.690, X.691, X.692 and X.693, respectively. See <http://www.itu.int/ITU-T/studygroups/com17/languages/>.