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Nederlandse norm

# **NEN-ISO 24101-2**

(en)

Intelligent transport systems - Communications access for land mobiles (CALM) - Application management - Part 2: Conformance test (ISO 24101-2:2010, IDT)

ICS 03.220.01; 35.240.60

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Als Nederlandse norm is aanvaard:

- ISO 24101-2:2010.IDT

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Normcommissie 381042 "Telematica voor wegverkeer en -vervoer"

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**Intelligent transport systems —  
Communications access for land mobiles  
(CALM) — Application management —**

**Part 2:  
Conformance test**

*Systemes intelligents de transport — Accès aux communications des  
services mobiles terrestres (CALM) — Gestion d'application —*

*Partie 2: Essai de conformité*



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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 24101-2 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

ISO 24101 consists of the following parts, under the general title *Intelligent transport systems — Communications access for land mobiles (CALM) — Application management*:

- Part 1: General requirements
- Part 2: Conformance test

## Introduction

This part of ISO 24101 is part of a family of International Standards for communications access for land mobiles (CALM) which determine a common architecture, network protocols and air interface definitions for wireless communications using cellular second generation, cellular third generation, 5 GHz, millimeter, and infrared communications. Other air interfaces can be added at a later date. Air interfaces included in the CALM International Standards provide facilities for broadcast, point-to-point, vehicle-to-vehicle, and vehicle-to-point communications in the intelligent transport systems (ITS) sector.

The application management (AM), as defined in ISO 24101-1:2008, is the function to install, uninstall and modify the ITS applications in a reliable and secure manner, and it addresses the following requirements:

- a) installation of applications on CALM equipment after the equipment has been deployed;
- b) updating of applications, including uninstalling, on on-board equipment (OBE) as well as wireless access equipment (WAE) after the equipment has been deployed;
- c) providing a standardized interface and functionality so that application developers and system operators can successfully perform the functions in a) and b).

The purpose of this part of ISO 24101 is to specify a standardized conformance test for the AM, which verifies that the function of the developed AM complies with the requirements specified in ISO 24101-1:2008. See Figure 1.

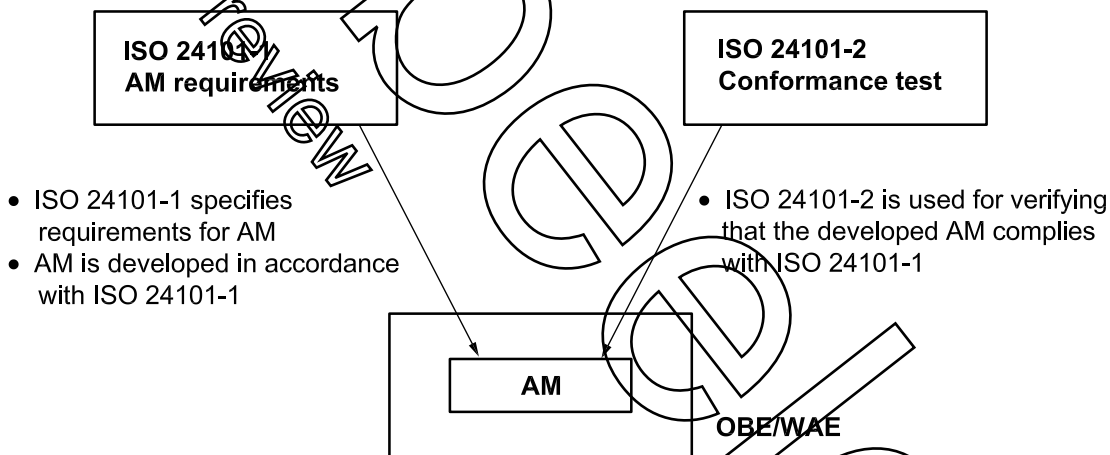


Figure 1

Voorbereid  
Preview



# Intelligent transport systems — Communications access for land mobiles (CALM) — Application management —

## Part 2: Conformance test

### 1 Scope

This part of ISO 24101 specifies the test system, test cases, test conditions, test procedures and test results for examining the function of the communications access for land mobiles (CALM) application management (AM).

NOTE Accreditation and certification are outside the scope of this part of ISO 24101.

### 2 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 24101-1:2008, *Intelligent transport systems — Communications access for land mobiles (CALM) — Application management — Part 1: General requirements*

### 3 Terms and definitions

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

#### 3.1 communication station

wireless station that communicates with the equipment under test (EUT) by using the communications access for land mobiles (CALM) medium for the application management (AM) conformance test

#### 3.2 normal operation

coincidence of the test results and the predetermined states, which are defined before the test, when the test application is executed on the equipment under test (EUT)

#### 3.3 test applications

applications that are used for installing, uninstalling or modifying an application and are pre-installed in the equipment under test (EUT) or the test installer for the application management (AM) conformance test

#### 3.4 test installer

installer that is used for the application management (AM) conformance test

**ISO 24101-2:2010(E)**

- 3.5 test operator**  
operator who operates the test installer for the application management (AM) conformance test
- 3.6 verification means**  
means that verifies the results of the application management (AM) conformance test and sets the equipment under test (EUT) to the state defined by the test procedures

**4 Abbreviated terms**

For the purposes of this document, the following abbreviated terms apply.

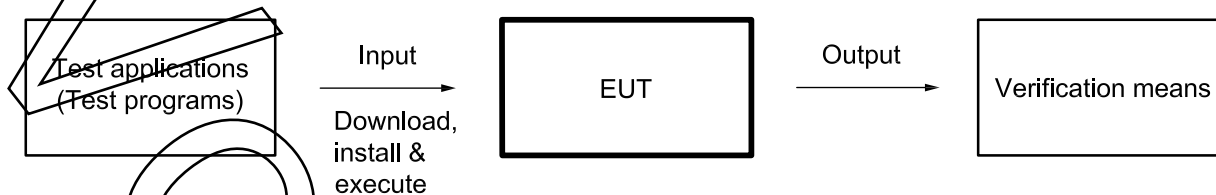
AM	Application Management
AME	Application Management Entity
AMT	Application Management Table
API	Application Programming Interface
BER	Bit Error Rate
CALM	Communications Access for Land Mobiles
CPU	Central Processing Unit
ETSI	European Telecommunications Standards Institute
EUT	Equipment Under Test (ISO/IEC 9646-1:1994)
ICS	Implementation Conformance Statement (ISO/IEC 9646-1:1994)
ITS	Intelligent Transport Systems
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
IUT	Implementation Under Test (ISO/IEC 9646-1:1994)
IXIT	Implementation eXtra Information for Testing (ISO/IEC 9646-1:1994)
OBE	On-Board Equipment
OS	Operating System
PER	Packet Error Rate
RSSI	Received signal strength indication
TS	Test System
TTCN-3	Testing and Test Control Notation Version 3
URL	Uniform Resource Locator
VM	Virtual Machine
WAE	Wireless Access Equipment

## 5 General

The methodology and concepts of the AM conformance test are based on ISO/IEC 9646-1:1994.

An AM is developed firstly by the service provider in accordance with ISO 24101-1:2008. The developed AM is software and is installed in the equipment under test (EUT), i.e. on-board equipment (OBE) or wireless access equipment (WAE), prior to the AM conformance test.

Figure 2 shows the basic approach to the AM conformance test.



**Figure 2 — Basic approach to conformance test**

The basic approach is as follows:

- a) collect requirements and specifications for the EUT;
- b) prepare implementation conformance statement(s) (ICS) and implementation eXtra information for testing [IXIT(s)];
- c) prepare some test applications;
- d) prepare test suites, i.e. the set of basic tests and advanced tests, and test system including the verification means, etc.;
- e) install the AM in the EUT, and install the test applications in the EUT and the test installer;
- f) perform the conformance test;
  - 1) download and install the test application into the EUT for installation or modification,
  - 2) execute the test application,
  - 3) confirm the results of the execution by the verification means, and compare the results with the predetermined states, i.e. expected states;
    - i) when all results coincide with the predetermined states: verdict is set into pass,
    - ii) if there are one or more differences: verdict is set into fail;
  - 4) send the command of uninstallation to the EUT and confirm the results of the execution by reading the contents of the application management table (AMT) by the verification means, and
- g) analyse results and prepare the conformance test report.

Figure 3 shows the conformance test process.

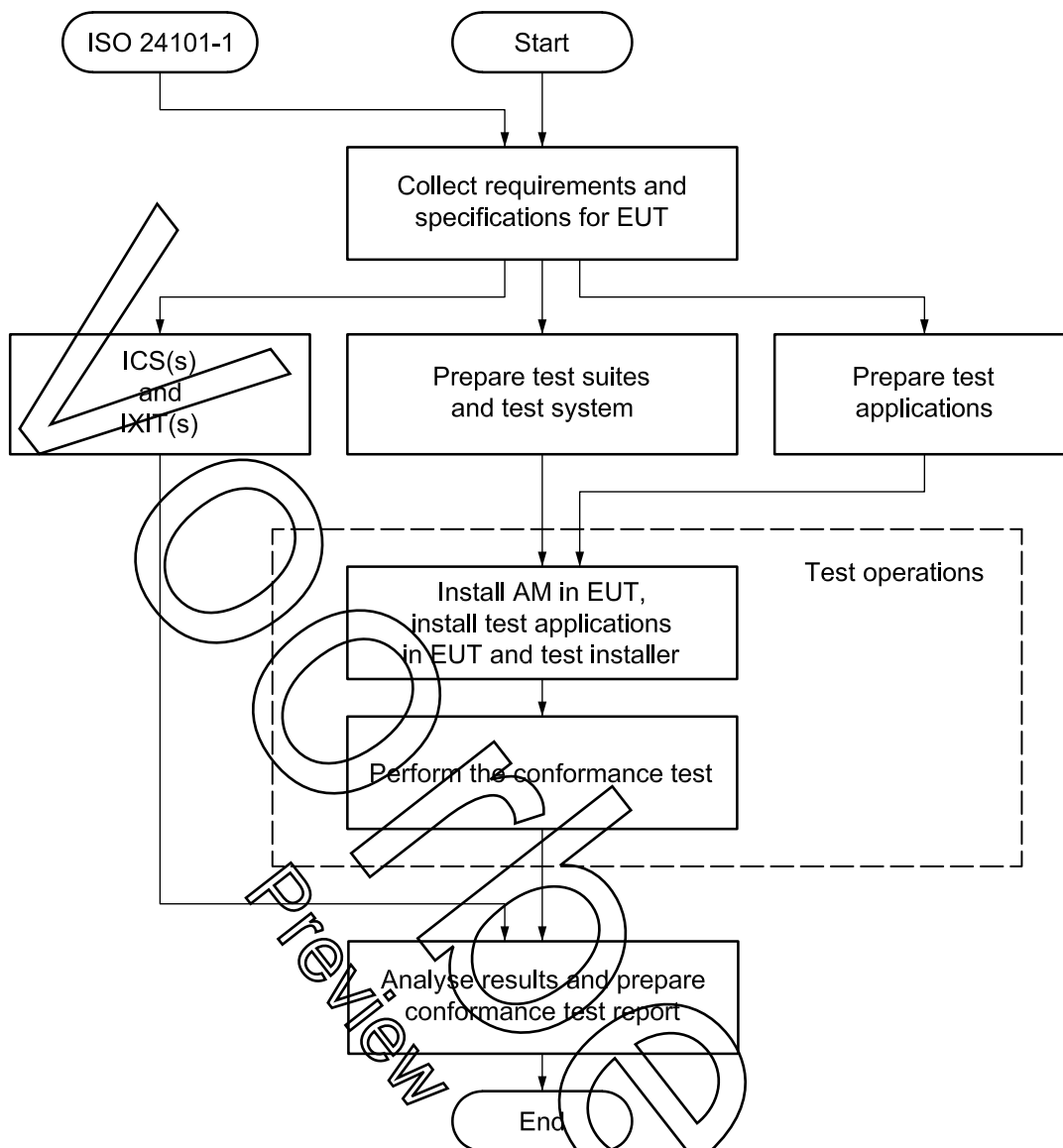


Figure 3 — Conformance test process

## 6 Test system

Figure 4 shows the test system for the AM conformance test.

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