
**Intelligent transport systems —
Communication access for land mobiles
(CALM) — Non-IP networking —**

**Part 2:
Legacy system support**

iTeh STANDARD PREVIEW
*Systemes intelligents de transport — Accès aux communications des
services mobiles terrestres (CALM) — Réseautique non-IP —
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Partie 2: Support pour systèmes hérités*

[ISO 29281-2:2013](https://standards.iteh.ai/catalog/standards/sist/b64d7716-9fbe-45da-9453-718488e5fc05/iso-29281-2-2013)

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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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

The committee responsible for this document is ISO/TC 204, *Intelligent transport systems*.

This first edition of ISO 29281-2, together with ISO 29281-1, cancels and replaces ISO 29281:2011.

ISO 29281 consists of the following parts, under the general title *Intelligent transport systems — Communication access for land mobiles (CALM) — Non-IP networking*:

- *Part 1: Fast networking & transport layer protocol (FNTP)*
- *Part 2: Legacy system support*

Introduction

This part of ISO 29281 is part of a family of International Standards for communications access for land mobiles (CALM). An introduction to the whole set of International Standards is provided in ISO 21217.

This part of ISO 29281 is the second part of a multi-part series which determines intelligent transport systems (ITS) communication functionalities which are different to functionalities from the set of Internet protocols.

These functionalities are protocols and procedures located in the various layers and entities of the ITS station.

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Intelligent transport systems — Communication access for land mobiles (CALM) — Non-IP networking —

Part 2: Legacy system support

1 Scope

This part of ISO 29281 specifies elements of communications for cooperative ITS which are not based on the Internet protocol.

The following architectures, procedures and protocols are specified:

- Support of communication interfaces (DSRC-CI) using ISO 15628;
- Support of ISO 15628 DSRC applications via an ITS ad-hoc access technology.

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/IEC 8825-2, *Information technology — ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)*

ISO 15628, *Intelligent transport systems — Dedicated short range communication (DSRC) — DSRC application layer*

ISO 21217, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

ISO 21218, *Intelligent transport systems — Communications access for land mobiles (CALM) — Access technology support*

ISO 24102-1, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 1: Local management*

ISO 24102-3, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 3: Service access points*

ISO 24102-4, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 4: Station-internal management communications.*

ISO 24102-5, *Intelligent transport systems — Communications access for land mobiles (CALM) — ITS station management — Part 5: Fast service advertisement protocol (FSAP)*

ISO 24103, *Intelligent transport systems — Communications access for land mobiles (CALM) — Media adapted interface layer (MAIL)*

ISO 29281-1, *Intelligent transport systems — Communication access for land mobiles (CALM) — Non-IP networking — Part 1: Fast networking & transport layer protocol (FNTP)*

ETSI TS 102 985-1, *Intelligent transport systems (ITS) — Communications Access for Land Mobiles (CALM) — Test specifications for non-IP networking (ISO 29281) — Part 1: Protocol implementation conformance “statement (PICS) proforma*

ETSI TS 102 985-2, *Intelligent transport systems (ITS) — Communications Access for Land Mobiles (CALM) — Test specifications for non-IP networking (ISO 29281) — Part 2: Test suite structure & test purposes (TSS&TP)*

ETSI TS 102 985-3, *Intelligent transport systems (ITS) — Communications Access for Land Mobiles (CALM) — Test specifications for non-IP networking (ISO 29281) — Part 3: Abstract test suite and partial PIXIT (ATS) specification*

3 Requirements

Communication functionality, which is different to the functionality out of the set of Internet protocols (IP), is referred to as non-IP functionality in this multi-part series.

The functionality to support legacy systems, especially those related to ISO 15628 “DSRC application layer” shall be as specified in this part of ISO 29281.

Detailed requirements are specified in the following clauses of this part of ISO 29281:

- [Clause 4](#) specifies architectural elements;
- [Clause 5](#) specifies facility layer protocols;
- [Clause 6](#) specifies conformance declaration;
- [Clause 7](#) specifies test methods;
- [Annexes A](#) and [B](#) provide further mandatory requirements;
- The informative [Annex C](#) provides 15628 legacy service guidelines.

4 Architecture

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4.1 ITS station

The specifications given in this part of ISO 29281 shall comply with the ITS station architecture and with the concept of an ITS station communication unit (ITS-SCU) as specified in ISO 21217 and ISO 24102-4.

4.2 Communication scenarios

Communication scenarios are specified in ISO 24102-1 and in ISO 21217.

4.3 Implementation scenarios

The protocols specified in this part of ISO 29281 may support the implementation architectures introduced in ISO 21217 and illustrated in [Figures 1](#) and [2](#) with an ITS station and a peer DSRC station.

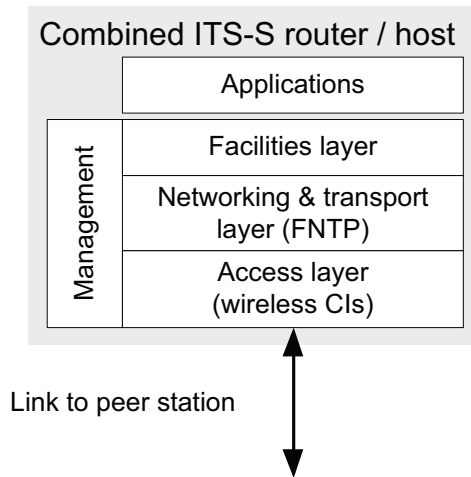


Figure 1 — Combined ITS-S host/router

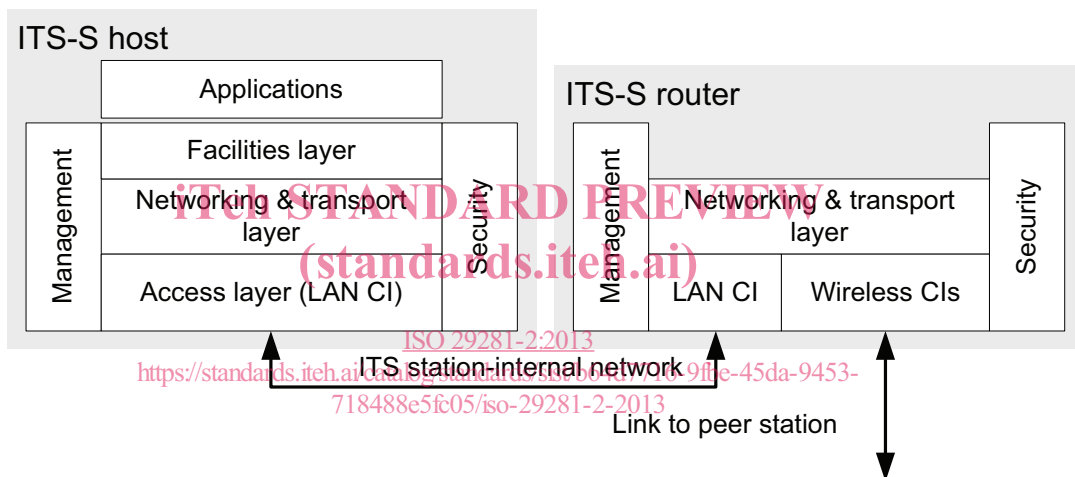


Figure 2 — ITS-S host and ITS-S router separated in different ITS-SCUs

4.4 Legacy CIs

An existing ITS-S access layer technology may be implemented in an ITS station as a “Legacy CI”, as presented in Figure 3, such that it can communicate with peer stations that are not necessarily aware of any ITS-S context, and where none of the networking protocols specified for ITS-S are used in the wireless link.

Types of CIs are specified in ISO 21218 in I-parameter 22 “Medium”. The only legacy CI medium identified so far in ISO 21218 is “DSRC” with an application layer specified in ISO 15628. Further types may be added.

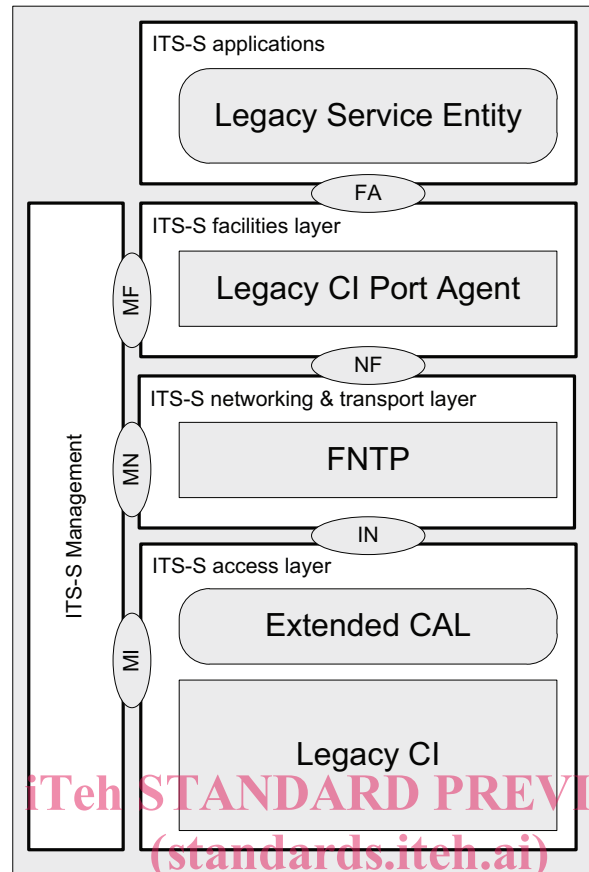


Figure 3 — Legacy CI

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Inside the ITS station, the Fast networking & transport layer protocol (FNTTP) specified in ISO 29281-1 shall be used for the forwarding of packets between the ITS-S access layer and the ITS-S facilities layer.

This requires:

- implementing a CALM adaptation layer (CAL) as specified in ISO 21218, extended with the additional functionality for FNTTP support as specified in this part of ISO 29281, which optionally may also include parts of the service processing functionality;
- making use of the “Legacy CI Port Agent” as specified in this part of ISO 29281 and in ISO 24102-1.

Legacy CIs shall specify the medium specific parameters presented in Table 1 (see ISO 21218 for the I-parameter 254 “MediumParameter”).

Table 1 — Legacy CI parameters

MediumParam.mediumPar.no	MediumParam.detail	Description
0	LegacyOption	Optional classification of different options of the same legacy CI.
1	PortPA	Port number of the “Legacy CI Port Agent” connecting to the applicable “Legacy Service Entity”.

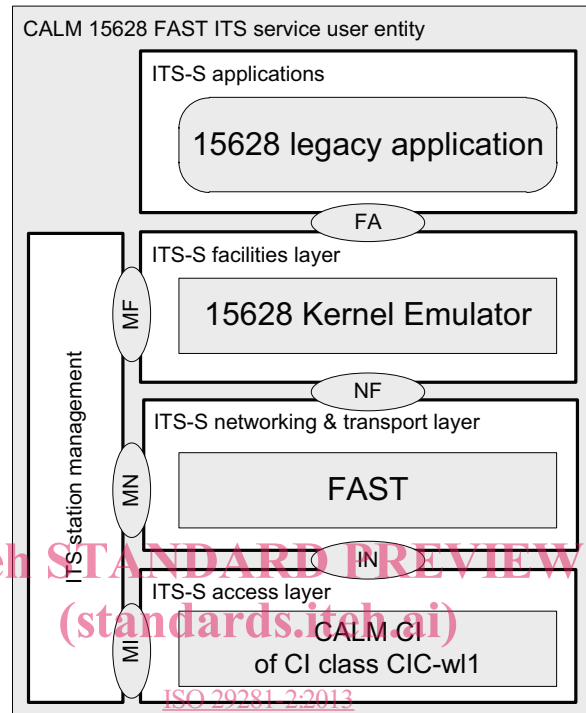
The “Legacy Service Entity” shall register at the “Legacy CI Port Agent” indicating the CI class and legacy option of the required legacy CI.

Further details depend on the existing communication interface technology. Normative examples for legacy systems compliant with ISO 15628 are provided in Annex B.

4.5 15628 applications

Applications built on top of the DSRC application layer as specified in ISO 15628 may be operated over an ITS CI of CI class CIC-w1 specified in ISO 21218. The services shall interface with the FNTTP via the “15628 Kernel Emulator”, see [Figure 4](#).

NOTE In the given context, 15628 applications are also referred to as 15628 legacy applications.



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Figure 4 — 15628 legacy service

The 15628 initialization phase shall be implemented with the groupcast functionality specified in ISO 24102-1 and in ISO 24102-5.

The “15628 Kernel Emulator” shall perform the following tasks:

- Register at server groupcast manager for periodic transmission of BST, if applicable;
- Register at client groupcast manager for transmission of VST, if applicable;
- Emulate the 15628 T-Kernel interface for usage by applications;
- Map the 15628 “FlowControl” on BC-VCI and UC-VCI.

The purpose of 15628 LID shall be served by Link-ID specified in ISO 21218.

Detailed procedures are specified in [Clause 5](#).

5 Facilities layer protocols

5.1 General

The ITS-S facilities layer comprises the OSI layers five, six and seven as specified in ISO 21217.

The ITS-S facilities layer shall use the service primitives provided by the ITS management entity in the MF-SAP for management purposes as specified in ISO 24102-3.

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The ITS-S facilities layer shall be connected to services via an API. Details of the API are outside the scope of this part of ISO 29281.

The ITS-S facilities layer shall use the services provided in the NF-SAP by the ITS-S networking & transport layer.

5.2 Groupcast registration handler

The groupcast registration handler shall be as specified in ISO 24102-5.

5.3 Repetitive packet transmission handler

The ITS-S facilities layer shall be responsible for repetitive transmission of data packets, as requested by the service.

5.4 Legacy CI Port Agent

Upon registration of a legacy CI at the ITS station management entity as specified in ISO 24102-1, the ITS station management entity notifies the “Legacy CI Port Agent” about the presence of this legacy CI, indicating the Link-ID and the type of legacy CI as specified in ISO 21218.

The “Legacy CI Port Agent” shall:

- use the NF-SAP service NF-FNTP-PORT of the FNTP to get a host port number from the port number manager assigned as specified in ISO 29281-1;
- notify the port number to the ITS station management entity, indicating also the Link-ID of the related legacy CI.

The “Legacy CI Port Agent” shall maintain a separate host port number for each legacy CI registered in the ITS station.

Details on ISO 15628 legacy CIs are provided in B.1.

5.5 15628 kernel emulator

5.5.1 15628 legacy applications

15628 legacy applications “option 3” shall be treated in the same way as ITS-S applications designed for the FNTP.

NOTE The functionality of ACn commands specified in EN 12795:2003 is not supported.

5.5.2 CI classes

The 15628 kernel emulator enables ITS applications built on ISO 15628 to be operated over a CALM wireless CI of CI class CIC-w11 specified in ISO 21218, based on the FNTP. Usage of CIs of CI class CIC-w15 specified in ISO 21218 shall be prohibited.

5.5.3 Registration of 15628 applications

In a server station the 15628 kernel emulator shall register available 15628 applications at the groupcast manager using MF-REQUEST 1 “GCregerServer” specified in ISO 24102-5 with parameters as specified in [Table 2](#).