
**Road vehicles — Open interface for
embedded automotive applications —**

**Part 4:
OSEK/VDX Communication (COM)**

*Véhicules routiers — Interface ouverte pour applications automobiles
embarquées —*

Partie 4: Communications (COM) OSEK/VDX



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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 17356-4 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 3, *Electrical and electronic equipment*.

ISO 17356 consists of the following parts, under the general title *Road vehicles — Open interface for embedded automotive applications*:

- *Part 1: General structure and terms, definitions and abbreviated terms*
- *Part 2: OSEK/VDX specifications for binding OS, COM and NM*
- *Part 3: OSEK/VDX Operating System (OS)*
- *Part 4: OSEK/VDX Communication (COM)*
- *Part 5: OSEK/VDX Network Management (NM)*
- *Part 6: OSEK/VDX Implementation Language (OIL)*

Introduction

This part of ISO 17356 specifies a uniform communication environment for automotive control unit application software. It increases the portability of application software modules by defining common software communication interfaces and behaviour for internal communication [communication within an electronic control unit (ECU)] and external communication (communication between networked vehicle nodes), which is independent of the communication protocol used.

This part of ISO 17356 describes the behaviour within one ECU. It assumes that the communication environment described in this part of ISO 17356 is used together with an operating system that conforms to ISO 17356-3. For information on how to run the communication environment described in this part of ISO 17356 on operating systems that do not conform to ISO 17356-3, refer to Annex A.

Requirements

The following main requirements are fulfilled by this part of ISO 17356:

General communication functionality

This part of ISO 17356 offers services to transfer data between tasks and/or interrupt service routines. Different tasks may reside in one and the same ECU (internal communication) or in different ECUs (external communication). Access to ISO 17356-4 services is only possible via the specified Application Program Interface (API).

Portability, reusability and interoperability of application software

It is the aim of this part of ISO 17356 to support the portability, reusability and interoperability of application software. The API hides the differences between internal and external communication as well as different communication protocols, bus systems and networks.

Scalability

This part of ISO 17356 ensures that an ISO 17356-4 implementation can run on many hardware platforms. The implementation requires only a minimum of hardware resources, therefore different levels of functionality (conformance classes) are provided.

Support for ISO 17356-5 (Network Management-NM):

Services to support Indirect NM are provided. Direct NM has no requirements of this part of ISO 17356.

Communication concept

Figure 1 shows the conceptual model of this part of ISO 17356 and its positioning within the architecture defined by ISO 17356. This model is presented for better understanding, but does not imply a particular implementation of this part of ISO 17356.

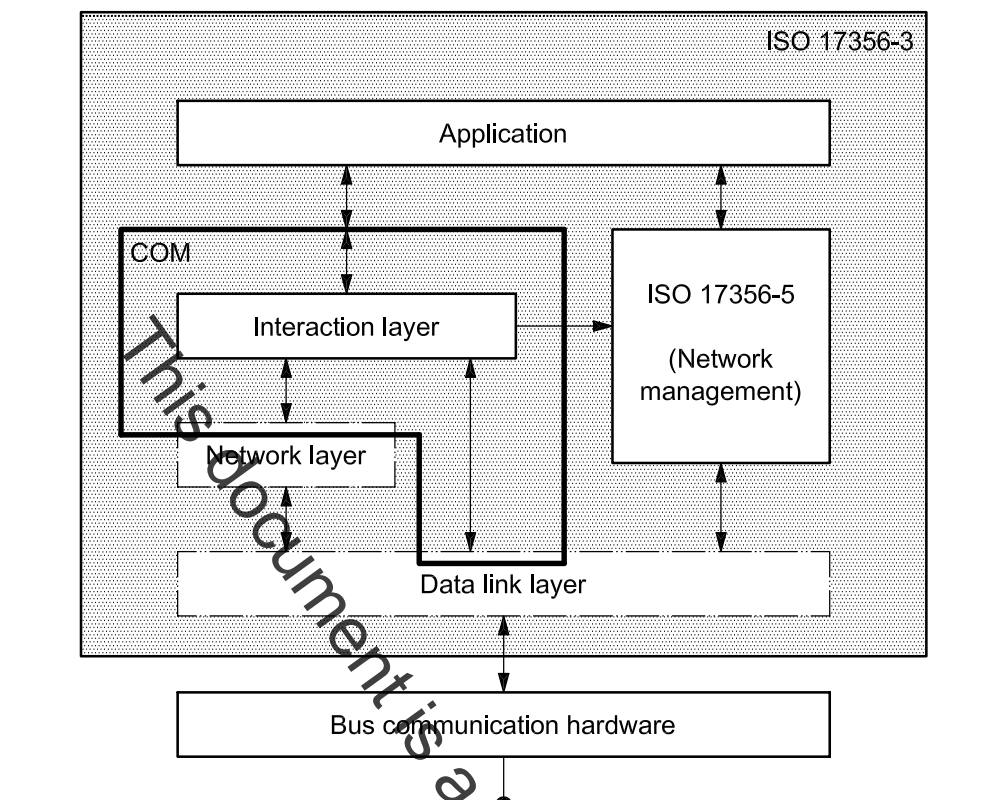


Figure 1 — COM's layer model

In this model, the scope of this part of ISO 17356 partly or entirely covers the following layers:

Interaction Layer

The Interaction Layer (IL) provides the ISO 17356-4 API which contains services for the transfer (send and receive operations) of messages. For external communication it uses services provided by the lower layers, whereas internal communication is handled entirely by the IL.

Network Layer

The Network Layer handles — depending on the communication protocol used — message segmentation/recombination and acknowledgement. It provides flow control mechanisms to enable the interfacing of communication peers featuring different levels of performance and capabilities. The Network Layer uses services provided by the Data Link Layer. This part of ISO 17356 does not specify the Network Layer; it merely defines minimum requirements for the Network Layer to support all features of the IL.

Data Link Layer

The Data Link Layer provides the upper layers with services for the unacknowledged transfer of individual data packets (frames) over a network. Additionally, it provides services for the NM. This part of ISO 17356 does not specify the Data Link Layer; it merely defines minimum requirements for the Data Link Layer to support all features of the IL.

Structure of this document

In the following text, the specification chapters are described briefly. Clauses 1 to 5 are normative, the appendices are descriptive.

Clause 1: Scope

This clause describes the motivation and requirements for this part of ISO 17356, the conceptual model used and the structure of the document.

Clause 2: Normative references

Clause 3: Interaction Layer

This clause describes the functionality of the IL of the ISO 17356-4 model and defines its API.

Clause 4: Minimum requirements of lower communication layers

This clause lists the requirements imposed by this part of ISO 17356 on the lower communication layers (Network Layer and Data Link Layer) to support all features of the IL.

Clause 5: Conformance Classes

This clause specifies the Communication Conformance Classes, which allow the adaptation of the feature content of ISO 17356-4 implementations to the target system's requirements.

Annex A: Use of this part of ISO 17356 (Com) with an OS not conforming to ISO 17356-3

Annex A gives hints on how to run this part of ISO 17356 on operating systems that do not conform to ISO 17356-3.

Annex B: Application notes

Annex B provides information on how to meet specific application requirements with the given ISO 17356-4 model.

Annex C: Callouts

Annex C supplies application examples for callouts.

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Road vehicles — Open interface for embedded automotive applications —

Part 4: OSEK/VDX Communication (COM)

1 Scope

This part of ISO 17356-4 (COM) specifies a uniform communication environment for automatic control unit application software.

It increases the portability of application software modules by defining common software communication interfaces and behaviours for internal communication (communication within an ECU) and external communication (communication between networked vehicle nodes), which is independent of the used communication protocol.

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 17356-2, *Road vehicles — Open interface for embedded automotive applications — Part 2 OSEK/VDX specifications for binding OS, COM and NM*

ISO 17356-3, *Road vehicles — Open interface for embedded automotive applications — Part 3 OSEK/VDX Operating System (OS)*

ISO 17356-5, *Road vehicles — Open interface for embedded automotive applications — Part 5 OSEK/VDX Network Management (NM)*

ISO 17356-6, *Road vehicles — Open interface for embedded automotive applications — Part 6 OSEK/VDX Implementation Language (OIL)*

3 Interaction Layer

3.1 Overview

3.1.1 Presentation

The communication in this part of ISO 17356 is based on messages¹⁾. A message contains application-specific data. Messages and message properties are configured statically via OIL (ISO 17356-6). The content and usage of messages is not relevant to this part of ISO 17356. Messages with a length of zero (see *zero-length messages*, Annex B) are allowed.

1) Messages are often called *signals*. Thus, COM offers a signal-based interface.