

ISO 17987-2:2016 Transport Protocol and Network Layer services.

What is ISO 17987-2:2016 Transport Protocol and Network Layer services?

ISO 17987-2:2016 specifies a transport protocol and network layer services tailored to meet the requirements of LIN-based vehicle network systems on local interconnect networks. The protocol specifies an unconfirmed communication.

The LIN protocol supports the standardized service primitive interface as specified in ISO 14229-2.

ISO 17987-2:2016 provides the transport protocol and network layer services to support different application layer implementations like

- normal communication messages, and
- diagnostic communication messages.

The transport layer defines transportation of data that is contained in one or more frames. The transport layer messages are transported by diagnostic frames. A standardized API is specified for the transport layer.

Use of the transport layer is targeting systems where diagnostics are performed on the backbone bus (e.g. CAN) and where the system builder wants to use the same diagnostic capabilities on the LIN sub-bus clusters. The messages are in fact identical to the ISO 15765-2 and the PDUs carrying the messages are very similar.

The goals of the transport layer are

- low load on LIN master node,
- to provide full (or a subset thereof) diagnostics directly on the LIN slave nodes, and
- targeting clusters built with powerful LIN nodes (not the mainstream low cost).

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URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 22, *Road vehicles*, SC 31, *Data communication*.

- A list of all parts in the ISO 17987 series can be found on the ISO website.

Introduction

This ISO 17987 (all parts) specifies the use cases, the communication protocol and physical layer requirements of an in-vehicle communication network called Local Interconnect Network (LIN).

The LIN protocol as proposed is an automotive focused low speed universal asynchronous receiver transmitter (UART) based network. Some of the key characteristics of the LIN protocol are signal based communication, schedule table-based frame transfer, master/slave communication with error detection, node configuration and diagnostic service transportation.

The LIN protocol is for low cost automotive control applications, for example, door module and air condition systems. It serves as a communication infrastructure for low-speed control applications in vehicles by providing:

- — signal based communication to exchange information between applications in different nodes;
- — bitrate support from 1 kbit/s to 20 kbit/s;
- — deterministic schedule table-based frame communication;
- — network management that wakes up and puts the LIN cluster into sleep mode in a controlled manner;
- — status management that provides error handling and error signaling;
- — transport layer that allows large amount of data to be transported (such as diagnostic services);
- — specification of how to handle diagnostic services;
- — electrical physical layer specifications;
- — node description language describing properties of slave nodes;
- — network description file describing behavior of communication;
- — application programmer's interface.

ISO 17987 (all parts) is based on the open systems interconnection (OSI) basic reference model as specified in ISO/IEC 7498-1 which structures communication systems into seven layers. The OSI model structures data communication into seven layers called (top down) *application layer* (layer 7), *presentation layer*, *session layer*, *transport layer*, *network layer*, *data link layer* and *physical layer* (layer 1). A subset of these layers is used in ISO 17987 (all parts). ISO 17987 (all parts) distinguishes between the services provided by a layer to the layer above it and the protocol used by the layer to send a message between the peer entities of that layer. The reason for this distinction is to make the services, especially the application layer services and the transport layer services, reusable also for other types of networks than LIN. In this way, the protocol is hidden from the service user and it is possible to change the protocol if special system requirements demand it. ISO 17987 (all parts) provides all documents and references required to support the implementation of the requirements related to the following.

- — ISO 17987-1: This part provides an overview of the ISO 17987 (all parts) and structure along with the use case definitions and a common set of resources (definitions, references) for use by all subsequent parts.
- — ISO 17987-2: This part specifies the requirements related to the transport protocol and the network layer requirements to transport the PDU of a message between LIN nodes.
- — ISO 17987-3: This part specifies the requirements for implementations of the LIN protocol on the logical level of abstraction. Hardware related properties are hidden in the defined constraints.
- — ISO 17987-4: This part specifies the requirements for implementations of active hardware components which are necessary to interconnect the protocol implementation.
- — ISO/TR 17987-5: This part specifies the LIN application programmers' interface (API) and the node configuration and identification services. The node configuration and identification services are specified in the API and define how a slave node is configured and how a slave node uses the identification service.
- — ISO 17987-6: This part specifies tests to check the conformance of the LIN protocol implementation according to ISO 17987-2 and ISO 17987-3. This comprises tests for the data link layer, the network layer and the transport layer.
- — ISO 17987-7: This part specifies tests to check the conformance of the LIN electrical physical layer implementation (logical level of abstraction) according to ISO 17987-4.

1 Scope

This document specifies a transport protocol and network layer services tailored to meet the requirements of LIN-based vehicle network systems on local interconnect networks. The protocol specifies an unconfirmed communication.

The LIN protocol supports the standardized service primitive interface as specified in ISO 14229-2.

This document provides the transport protocol and network layer services to support different application layer implementations like

- — normal communication messages, and
- — diagnostic communication messages.

The transport layer defines transportation of data that is contained in one or more frames. The transport layer messages are transported by diagnostic frames. A standardized API is specified for the transport layer.

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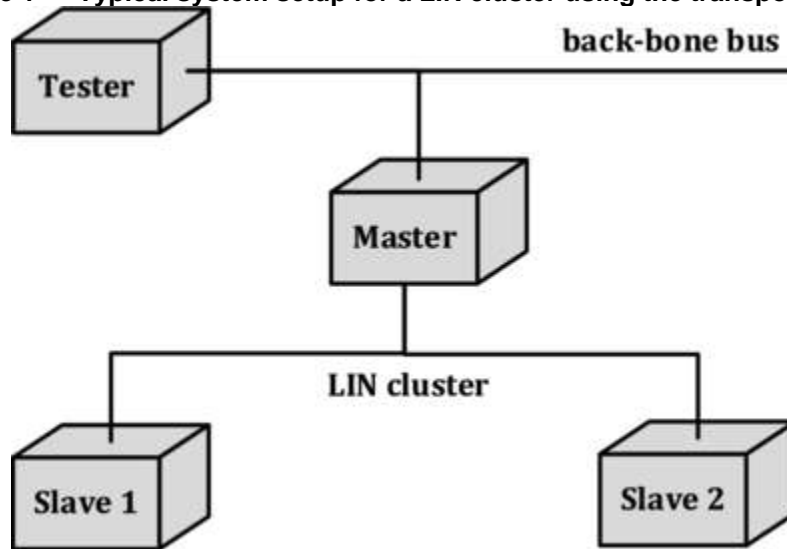
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A typical system configuration is shown in

Figure 1 — Typical system setup for a LIN cluster using the transport layer



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.

List of International Organization for Standardization standards

This is a list of published International Organization for Standardization (ISO) standards and other deliverables. For a complete and up-to-date list of all the ISO standards, see the ISO catalogue.

The standards are protected by copyright and most of them must be purchased. However, about 300 of the standards produced by ISO and IEC's Joint Technical Committee 1 (JTC 1) have been made freely and publicly available.



ISO Brand

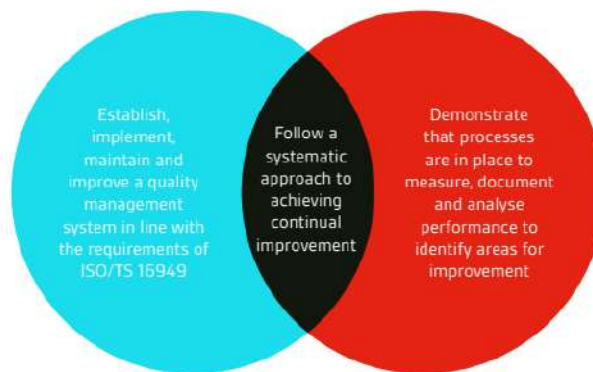
This is a dynamic list and may never be able to satisfy particular standards for completeness. You can help by adding missing items with reliable sources.

Which of the ISO standard provide guidelines for management system?

ISO 27001: Information Security Management System

ISO 27001 is the standard for an Information Security Management System (ISMS). The basic objective of the standard is to provide a model for establishing and maintaining an effective IT information management system based on the process approach.

The principal requirements of the standard are illustrated below:



The next few pages of the guide takes you through the Plan-Do-Check-Act (PDCA) methodology, common in all ISO management systems and how DCS can help and support you on your ISO/TS 16949 journey.

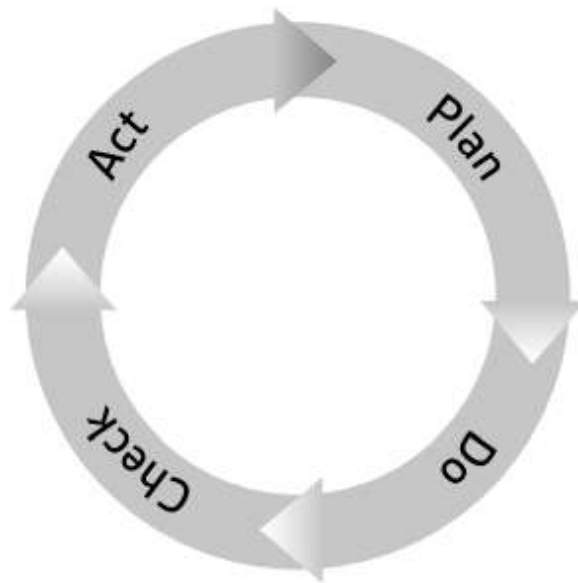
Understanding the principles of continual improvement

Act

Correct and improve your plans to meet and exceed your planned results

Check

Measure and monitor your actual results against your planned objectives



Plan

Establish objectives and draft your plans (analyse your organization's current systems, establish overall objectives, set interim targets for review and develop plans to achieve them)

Do

Implement your plans within a structured management framework