INTERNATIONAL STANDARD

ISO 20794-7

First edition
2020-10

Road vehicles — Clock extension peripheral interface (CXPI) —

Part 7: Data link and physical layer conformance test plan

Véhicules routiers — Interface périphérique d'extension d'horloge (CXPI) —

Partie 7: Plan de test de conformité des couches de liaison de données et physique

Reference number
ISO 20794-7:2020(E)

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Published in Switzerland

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Foreword

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 31, *Data communication*.

A list of all parts in the ISO 20794 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 20794 (all parts) specifies the application (partly), application layer, transport layer, network layer, data link layer, and physical layer requirements of an in-vehicle network called clock extension peripheral interface (CXPI).

CXPI is an automotive low-speed single wire network. It is an enabler for reducing vehicle weight and fuel consumption by reducing wire counts to simple devices like switches and sensors.

CXPI serves as and is designed for automotive control applications, for example door control group, light switch and HVAC (Heating Ventilation and Air Condition) systems.

The CXPI services, protocols and their key characteristics are specified in different parts according to the OSI layers.

— Application and application layer:

  — application measurement and control data communication to exchange information between applications in different nodes based on message communication;

  — wake-up and sleep functionality;

  — two kinds of communication methods can be selected at system design by each node:

    i) the event-triggered method, which supports application measurement- and control-based (event-driven) slave node communication; and

    ii) the polling method, which supports slave node communication based on a periodic master schedule;

  — performs error detection and reports the result to the application;

  — application error management.

— Transport layer and network layer:

  — transforms a message into a single packet;

  — adds protocol control information for diagnostic and node configuration into each packet;

  — adds packet identifier for diagnostic and node configuration into each packet;

  — performs error detection and reports the result to higher OSI layers.

— Data link layer and physical layer:

  — provides long and short data frames;

  — adds a frame identifier into the frame;

  — adds frame information into the frame;

  — adds a cyclic redundancy check into the frame;

  — performs byte-wise arbitration and reports the arbitration result to higher OSI layers;

  — performs frame type detection in reception function;

  — performs error detection and reports the result to higher OSI layers;

  — performs Carrier Sense Multiple Access (CSMA);

  — performs Collision Resolution (CR);