

Top-level solutions for local bus applications

A recognized leader in in-vehicle networking (IVN), NXP Semiconductors is a key player in promoting the Local Interconnect Network (LIN) bus as the industry standard for low-cost communications in automotive applications. We offer an extensive range of LIN solutions giving you the utmost freedom and flexibility when designing LIN-based automotive systems.

Key features

- ▶ Single-wire bus
- ▶ Single-master/multiple-slave concept
- ▶ Based on standard UART/SCI serial data link
- ▶ Maximum transmission speed of 20 Kbit/s
- ▶ Self-synchronization of slave with RC-based clock source

Key benefits

- ▶ Low cost
- ▶ Shorter time-to-market
- ▶ Reduced design risk through guaranteed interoperability
- ▶ High system reliability
- ▶ Enhanced diagnosis capability
- ▶ Distributed power
- ▶ Frees up backbone bandwidth
- ▶ High re-use factor leading to reduced design costs
- ▶ Easy to use
- ▶ Reduced wiring harness

The LIN physical layer is an enhanced version of the ISO 9141 standard offering improved Electromagnetic Emission (EME) and Electromagnetic Immunity (EMI) performance. As a low-cost, low-speed (class-A) serial communication system, it provides a cost-effective communication channel for local automotive systems. Based on a standard UART/SCI serial data link interface, LIN is a single-master/multiple-slave concept. No bus arbitration is required as the master is exclusively in control of bus access.

LIN lets you easily interconnect locally applied sensors, actuators and switches (in switch panels, door and seat modules for example) to the CAN backbone with a standardized front end. This helps significantly reduce costs and design-in effort for a wide range of human reaction time triggered applications, such as powered mirrors and windows.

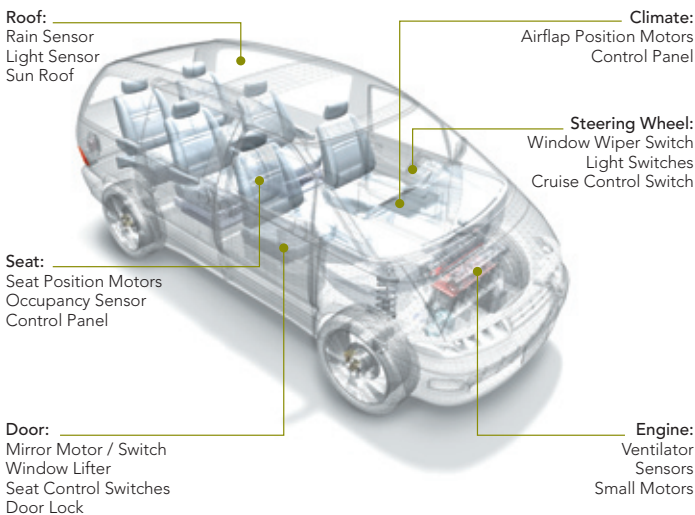
As an Associate Member of the LIN consortium, NXP has given momentum to the introduction of this latest standard for in-vehicle sub-networks and has driven the re-definition of the LIN physical layer. To provide a complete suite of IVN solutions,

NXP offers a growing family of LIN2.0/SAE-J2602 compatible ICs complementing our proven CAN portfolio – from stand-alone LIN transceivers and both general-purpose and application-specific LIN slaves up to highly integrated CAN/LIN Fail-Safe System Basis Chips (SBCs).

Stand-alone LIN transceivers

Our stand-alone LIN transceivers deliver the robustness and quality that is essential to automotive network design. For example, the first-generation transceiver TJA1020 exhibited best-in-class performance in independent electromagnetic compatibility (EMC) tests. It also boasts very low power consumption and unique fail-safe features, making it ideal for solid, cost-effective LIN master and slave applications.

The LIN 2.0 transceiver TJA1021 is a drop in replacement for the TJA1020, offering excellent ESD and EMC performance. A dedicated low slope version is available, meeting the requirements of the J2602 standard.



Integrated LIN Slave Nodes - Typical Target Applications

LIN I/O slave

We also offer a versatile, easy-to-use and cost-effective fail-safe LIN I/O slave. This device, commonly used in local applications such as door, roof and seat assembly units, is fully configurable via the LIN bus in accordance with the LIN2.0 configuration standard. Besides I/O functionality (including ADC and PMW), this general-purpose LIN slave features internal LIN slave termination, very low quiescent current and a configurable 'limp home' state if required. Our application-specific LIN slaves are single-chip solutions for systems including climate and headlight control. They incorporate a LIN transceiver, protocol handler, dedicated application controller and any necessary power components.

Fail-Safe System Basis Chips

Our Fail-Safe SBC family intelligently integrates all major peripheral functions around the microcontroller of a typical automotive ECU into a single chip. This allows you to re-use hardware and software development, improving time-to-market and saving on development and qualification costs.

Specifically NXP's LIN-based Fail-Safe SBCs include LIN transceiver, voltage regulator, watchdog and autonomous Fail-Safe system, resulting in reliable and cost-effective modules. We offer Fail-Safe CAN/LIN SBCs for LIN masters as well as LIN-only SBCs targeting LIN slave implementations using stand-alone microcontrollers.

Digital IVN: gateway and body controllers

As in-vehicle networks become more complex, NXP is launching a family of 32-bit ARM-based automotive microcontrollers featuring full gateway and/or body control functionality. The first member of this family, the SJA2020 includes four dedicated LIN masters plus six CAN channels. Each LIN master is equipped with receive and transmit message buffers, message interrupts and other features to reduce CPU load.



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NXP Semiconductors is in the process of being established as a separate legal entity in various countries worldwide. This process will be finalized in the course of 2006.

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