DS4330 LIN Interface Board

Interface to LIN bus

Highlights

- Connects PHS-based dSPACE real-time systems to the LIN bus
- LIN master and slave support
- 16 independent LIN channels

Application Areas in Rapid Control Prototyping
The DS4330 and the corresponding software can be used for developing and testing electronic control units (ECUs) which communicate with Local Interconnect Network (LIN) actors and sensors. For rapid control prototyping purposes – laboratory-based or vehicle-based – real LIN slaves can be connected to the prototyping system that simulates the ECU under development as the master node.

Application Areas in Hardware-in-the-Loop Simulation
Using dSPACE Simulator and a DS4330, you can test the LIN network features of an electronic control unit. The dSPACE system simulates the LIN nodes, which are connected to the LIN bus. The simulated LIN nodes behave in exactly the same way as real bus members (restbus simulation).

Test Scenarios
The DS4330 can be used in many different ways. Several scenarios are possible:

- Testing of:
  - Transmission of message frames
  - Communication timing constraints
  - Specification limits
  - Diagnostic and failure conditions
  - Energy-saving modes

Comprehensive Software Support
The DS4330 provides a LIN interface for the connection of dSPACE systems to LIN buses. You can set up and control these simulated LIN buses with the RTI LIN MultiMessage Blockset (p. 76).

The RTI LIN MultiMessage Blockset (supporting LIN standards 1.3, 2.0, 2.1 and 2.2) is an extension for Real-Time Interface and can be used for combining dSPACE systems with LIN communication networks and for configuring these LIN networks. With the RTI LIN MultiMessage Blockset you can handle complex LIN setups, which lets you control and configure all unconditional and event-triggered LIN frames from one single Simulink® block (configuration via database file).

- RTI LIN MultiMessage Blockset (p. 76)
Technical Details

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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| General                       | ▪ 16 independent LIN channels  
▪ One onboard LIN transceiver per channel  
▪ Simulation of up to 16 LIN slaves per LIN channel  
▪ Software-selectable individual baud rates from 1000 baud up to 20 kBd for each channel  
▪ Piggyback module socket for up to 16 custom LIN transceivers  
▪ Transmitting and receiving LIN data from within a Simulink model |
| Processor                     | Slave DSP  
▪ IBM® PowerPC 405CR, 200 MHz  
▪ PowerPC can boot from DPMEM or flash memory (selectable by software) |
| Memory                        | Onboard memory  
▪ 64 MB SD-RAM, 100 MHz  
▪ 8 MB flash memory  
Dual port memory (DPMEM)  
▪ 32 k x 32 bit dual-port memory for communication between PHS bus and slave processor |
| Interrupt controller          | ▪ UART interrupt for each LIN channel  
▪ LIN transceiver wake-up interrupt for each LIN channel  
▪ All interrupts can be enabled/disabled separately by software |
| Onboard LIN transceiver       | Transceiver chip  
▪ Infineon TLE6259  
▪ Integrated pull-up resistors for TXD and RXD lines  
▪ On-chip termination resistor for LIN slave applications  
▪ 2 additional bidirectional I/O lines per channel at customization module connectors for general purposes  
▪ Thermally protected  
Further details  
▪ External 1 kΩ termination resistor for using the LIN channel as a master (selectable via software) |
| Host interface                | ▪ One 8- or 16-bit ISA slot (power supply only) |
| Physical characteristics      | Physical size  
▪ 340 x 125 x 15 mm (13.4 x 4.9 x 0.6 in)  
Ambient temperature          | ▪ 0 … 70 °C (32 … 158 °F) |
Power supply                  | ▪ +5 V ±5%, 1.5 A  
▪ +12 V ±5%, 750 mA (supplies the VCC12 pin on the interface connector only) |

Order Information

<table>
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<tr>
<th>Product</th>
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<td>DS4330 LIN Interface</td>
<td>DS4330</td>
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Relevant Software

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<th>Software</th>
<th>Order Number</th>
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| Required                  | Real-Time Interface (RTI) (p. 62)  
▪ RTI |
| Optional                  | RTI LIN MultiMessage Blockset (p. 76)  
▪ RTILINMM_B5 |
The strong point of the RTI LIN MultiMessage Blockset is handling complex LIN setups, allowing you to control and configure all unconditional and diagnostic LIN frames from one single Simulink® block.

Block Diagram

![Block Diagram](image-url)