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dSPACE Simulator Mid-Size: Hardware Details

The hardware of dSPACE Simulator Mid-Size is mounted in a 19" desktop rack (height: 6 – 9 HU). The simulation model runs on the processor board. dSPACE Simulator Mid-Size generates and measures I/O signals via the DS2211 HIL I/O Board, which also performs the signal conditioning. Additional I/O and signal conditioning can be added on request.

- Hardware summary (p. 86)



Connection to Host PC

All dSPACE software (p. 106) for experiment setup and control runs on your PC or notebook. The dSPACE Simulator hardware is connected to your PC via link boards (ISA, PCMCIA, or PCI, p. 322).

Typical Fields of Application

- Engine, transmission and vehicle dynamics HIL
- Realistic software system tests/unit tests
- Function integration tests
- Open-loop or closed-loop environment
- Automated testing of diagnostic functions that check the ECU outputs

Hardware Components

- Installation in 19" desktop rack (see table)
- Integrated signal conditioning for all DS2211 signals

Enclosure Variants

dSPACE Simulator Mid-Size	Standard variant, 2-voltage system optional	Small variant, 1-voltage system
DS1005 PPC Board or DS1006 Processor Board	●	●
DS2211 HIL I/O Board	●	●
Failure insertion units	❍	❍
Load cards	●	●
Power supply	●	●
Second power supply	❍	–
Free ISA slots for expansion	■ 1 (PX5 version, only for DS1005 PPC Board) ■ 5 (PX10 version)	■ 1 (PX5 version, only for DS1005 PPC Board)
Height units	9	6

● Included
❍ Optional

Signal Conditioning

- On-board for DS2211 HIL I/O Board signals
- Two spare slots for additional signal conditioning (e.g., current measurement for diesel and stratified injection applications, lambda probe simulation or signal conditioning for additional I/O boards)

Failure Insertion Units

A standard dSPACE Simulator Mid-Size supports electrical failure simulation on all ECU output pins connected to the DS2211. A hardware extension allows electrical failures to be simulated on ECU inputs as well. The host PC controls both types of failure simulation via an RS232 interface. See p. 67 for further information.

- ECU outputs: Five failure insertion units (FIUs) with 10 channels, connected to all 50 actuator channels; Optional: replaced with 5 x DS792 Fuse Cards
- ECU inputs: optional, via hardware extension (p. 67)
- Remote-controlled with ControlDesk Failure Simulation and (on request) automated with AutomationDesk
- Simulation of shorts: shorts from ECU pins to ground or battery voltage
- Cable break simulation (open wire)
- Simulation of cross-wired short circuits via two fail planes
- Simultaneous activation of multiple failures (latch mode)

Load Capabilities

- Five load cards, 10 single-ended loads or 5 double-ended loads each
- 2 W maximum continuous power per load (substitute loads)
- 8 A maximum load current per pin (real loads)
- LED indicators displaying current load states (display mode selectable)
- Front connector for measurement or connection of real loads

VBat Jacks

- Provides power voltage of both power supplies for external devices (e.g., external test or diagnostic devices)
- 4 mm sockets

Power Supply

- Programmable switched-mode power supplies (remote-controlled, 2 power supplies required for simulation of vehicle batteries in 2-voltage systems)
- Support of 24-V systems with the first system
- Support of 42-V systems with the second system
- Three switched battery rails for each battery voltage, e.g., main relay, ECU-controlled high rail
- 16 A maximum current for each rail of first battery voltage
- 7.5 A maximum current for each rail of second battery voltage

Other Hardware Components

- Break-out box (optional)

Expandability

- Expansion with further DS2211 HIL I/O Boards (cascadable), ECU Interface or CAN Interface boards
- Inclusion of real loads, additional, or customer-specific signal conditioning (e.g., current measurement for diesel or stratified injection applications) or signal conditioning for an additional I/O board
- Customer-specific modifications/extensions possible

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