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DS4004 HIL Digital I/O Board

96 bidirectional digital I/O channels with signal conditioning

Highlights

- 96 digital I/O channels with general signal conditioning up to 60 V
- Measures and generates automotive signals and TTL signals
- All channels configurable via software



Key Benefits

The DS4004 comprises 96 digital I/O channels with signal conditioning for typical automotive systems with electrical system voltages of 12 V, 24 V, 36 V, and 48 V, etc., as well as for customary TTL levels. The 96 digital I/O channels of the DS4004 are arranged in three identical groups, each with two different voltage systems, ranging from 5 V to 60 V. Each of the 96 I/O channels of the DS4004 can be configured via software as digital I/O for PWM measurement or PWM generation, for frequency measurement, or for square wave generation. The digital I/O channels can be used individually, or synchronized in 32-bit words. You can set the values of the I/O channels for the initialization phase and for terminating the model.

Application Areas

The automotive signal conditioning on the DS4004 HIL Digital I/O Board is a cost-efficient way to start using HIL simulation for body electronics ECUs. The DS4004 can be used hassle-free and at low cost in an expansion box, the dSPACE Simulator Mid-Size and the dSPACE Simulator Full-Size. These simulators are frequently used to test body electronics ECUs with the DS4004.

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Technical Details

Parameter		Specification
I/O channels		■ 96 bidirectional digital I/O channels with automotive signal conditioning, arranged in three ports (P1, P2, P3) of 32 I/O lines each ■ Software-configurable as digital I/O or timing I/O (PWM I/O) ■ PWM functionality with up to 50 ns resolution
Digital inputs	Input voltage	■ 0 ... +60 V
	Threshold voltage level	■ 1 V ... 23.8 V (software-configurable)
	Input impedance	■ 390 kΩ
	Overvoltage protection	■ 0 ... +60 V continuous
Digital outputs	Output voltage	■ +5 V ... +60 V (supplied from external power source) ■ 6 independent rails VBAT_Px_y (two rails for each port P1 ... P3)
	Output current range	■ Max. ±50 mA; short circuit proof to GND and VBAT by self-resetting fuse
	$V_{out\ high,\ min.}$	■ VBAT -1.2 V; at +50 mA
	$V_{out\ low,\ max.}$	■ 0.4 V; at -50 mA
Interrupt controller	Interrupt channels	■ 3 x 2 pins (shared with I/O channels)
	Trigger source	■ Interrupt generation on falling edges, rising edges, or both edges (software-configurable)
	Threshold voltage level	■ 1 V ... 23.8 V (software-configurable)
Host interface		■ One 8- or 16-bit ISA slot (power supply only)
Physical characteristics	Physical size	■ 340 x 125 x 19 mm (13.4 x 4.9 x 0.7 in) ■ The board requires three brackets
	Ambient temperature	■ 0 ... 55 °C (32 ... 131 °F)
	Power supply (from host PC)	■ +5 V ±5%, 1.5 A max. (from host PC or expansion box) ■ +12 V ±5%, 0.4 A max. (without load on power supply outputs) ■ -12 V ±5%; 0.01 A max.
	Power supply (from external power source)	■ 6 VBAT_Px_y rails (+5 V ... +60 V DC) ■ Each supply rail (VBAT_Px_y): 0.2 A max. (0.05 A typ.) + load on digital outputs

Order Information

Product	Order Number
DS4004 Digital I/O Board	■ DS4004

Relevant Software

Software		Order Number
Required	■ Real-Time Interface (p. 56)	■ RTI

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