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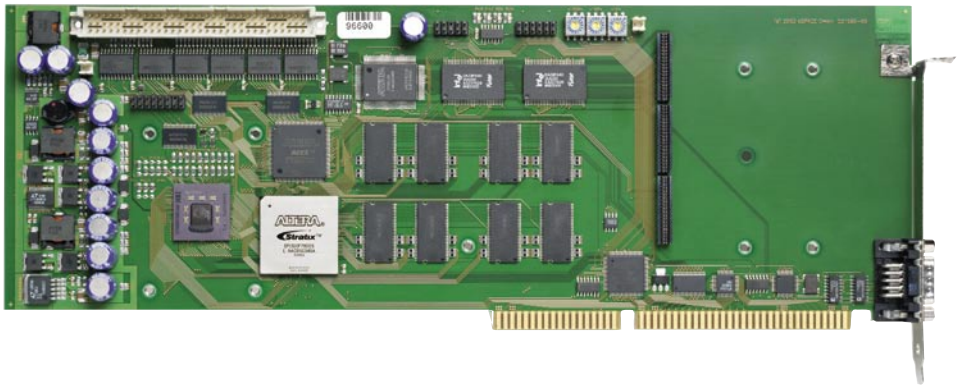
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DS1005 PPC Board



- Hardware core for real-time systems
- PowerPC 750GX running at 1 GHz

dSPACE

DS1005 PPC Board

Computing power and scalability



Key Features

- **PowerPC 750GX running at 1 GHz**
- **Multiprocessor system of several DS1005 PPC Boards via fiber-optic connection (Gigalinks)**
- **Compatibility with all earlier DS1005 PPC Boards**
- **Fully programmable from Simulink®**
- **High-speed connection to all dSPACE I/O boards via PHS bus**

Description

Key Benefits

The revised DS1005 features a PowerPC 750GX processor running at 1 GHz (replacing a GX processor at 933 MHz), so it has ample power for the vast majority of cases. If you need even more calculation power, the DS1005 PPC Board meets all multiprocessing requirements.

The DS1005 is directly connectable to all dSPACE I/O boards via PHS and PHS++ bus. The PHS++ bus standard is compatible with the standard PHS bus, but allows faster communication with I/O boards supporting PHS++ bus access, such as the DS2211.

Modular Hardware Concept

The DS1005 PPC Board is one of dSPACE's processor boards that form the core of dSPACE's modular hardware (the other being the DS1006 Processor Board). Processor boards provide the computing power for your real-time system and also function as interfaces to the I/O boards and the host PC. The DS1005 is the board of choice for applications with high sampling rates and a lot of I/O capacity.

Great processor power plus fast access to I/O hardware with minimum latencies make dSPACE processor boards considerably faster than solutions based on commonly available PCs.

Multiprocessor Setup

The processor board can be connected to other DS1005 boards via an additional optical interface (DS910 Gigalink Module) to create DS1005 multiprocessor systems of all sizes, so that your modular hardware can be tailored exactly to your requirements. Multiprocessor systems can mix old and new DS1005 boards without impairing performance. Synchronization between the boards is ensured, since interrupts can be dispatched to other DS1005 boards via hardware, with minimal latencies.

The DS1005 (1 GHz) is compatible with all of its earlier versions. Programs or models compiled for the older versions run on the DS1005 (1 GHz) without modifications.

Technical Details

Parameter		Specification
Processor		■ IBM PowerPC 750GX, 1 GHz ■ Up to 4 instructions in parallel ■ 32 KB L1 data cache ■ 32 KB L1 instruction cache
Memory		■ 1 MB L2 cache ■ Cache running at processor clock ■ 128 MB SDRAM global main memory for host data exchange and application ■ 16 MB flash memory for boot firmware and for user-specific applications, with flight recorder functionality for data recording ■ Full host access to global memory
Timer		■ 2 general-purpose timers ■ Synchronous time base unit (for multiprocessor systems)
Interrupt controller		■ Interrupt controller with up to 18 interrupt sources
Interfaces	Serial interface	■ RS232 interface with standard UART allowing transfer rates of up to 115.2 Kbaud
	Connection to I/O boards	■ PHS++ bus Interface ■ 32-bit I/O bus for modular I/O configuration ■ Peak transfer rate 20 MB/s, up to 30 MB/s for new I/O boards ■ Up to 64 PHS bus interrupts
Host interface		■ One full-size 16-bit ISA slot required ■ Interface via eight 16-bit I/O ports (ISA bus) ■ Bidirectional interrupt line (PPC/host PC) ■ Plug & Play support
Multiprocessor systems		■ Building multiprocessor systems with further DS1005 PPC Boards ■ Up to 20 DS1005 PPC Boards ■ High-speed link via one DS910 Gigalink Module on each DS1005 ■ Cable length of up to 100 m
Physical characteristics	Physical size	■ 340 x 125 x 15 mm (13.4 x 4.9 x 0.59 in)
	Ambient temperature	■ 0 … 55 °C (32 ... 131 °F)
	Cooling	■ Passive cooling
	Power supply	■ +5 V ±5%, 4 A (without DS910 Gigalink Module) ■ +5 V ±5%, 5.2 A (with DS910 Gigalink Module)

Order Information

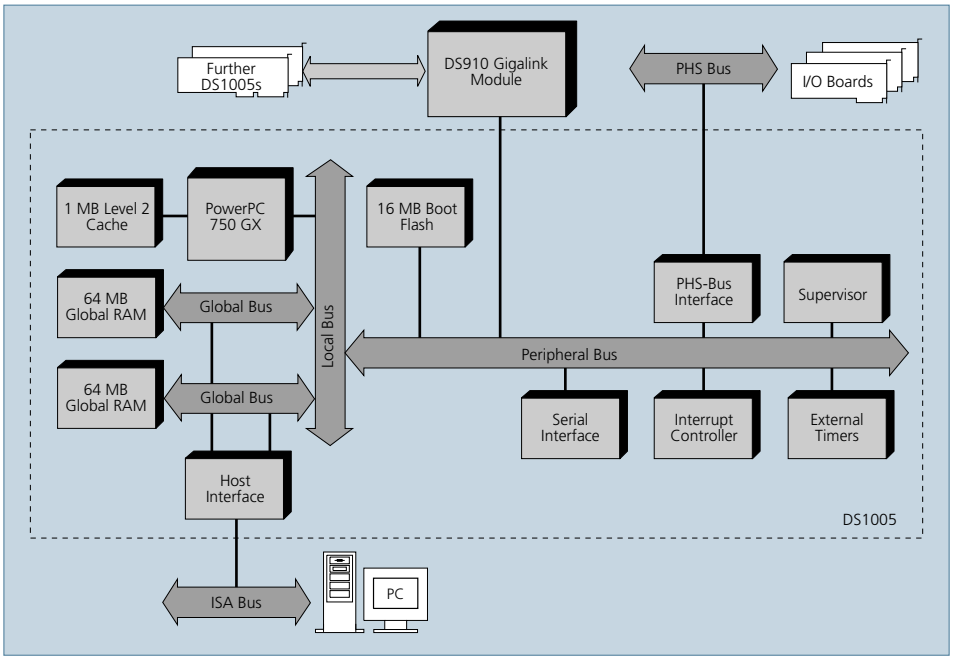
Product	Order Number
DS1005 PPC Board	■ DS1005

Relevant Software and Hardware

Software		Order Number
Included	■ C Real-Time Library ■ Experiment and Platform Manager	– –
Required	■ Real-Time Interface for programming from Simulink	■ RTI
	■ Microtec C compiler for PowerPC	■ CCPPPC
Optional	■ Real-Time Interface for multiprocessor systems extension ■ CLIB C libraries	■ RTI_MP ■ CLIB

Hardware		Order Number
Optional	■ PHS bus cable (with x connectors and terminator) ■ DS910 Gigalink Module	■ PHS-CABx ■ DS910

Block Diagram



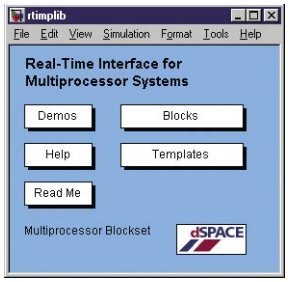
Graphical Programming

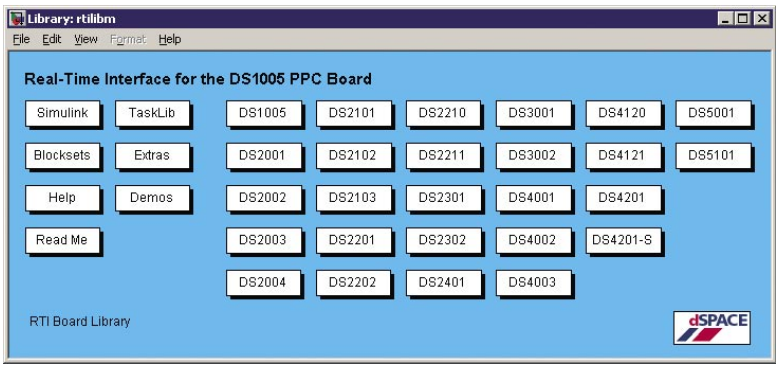
Using Real-Time Interface

Programming from MATLAB/Simulink/Stateflow

You can easily program the DS1005 PPC Board from Simulink via Real-Time Interface. A set of Simulink blocks gives access to the entire range of dSPACE I/O Boards. Even setting up multiprocessor systems is simple thanks to dedicated RTI-MP blocks.

Dialogs for altering simulation parameters such as solver options and simulation time, and for generating C code, are directly accessible from the Simulink environment.





DS910 Gigalink Module

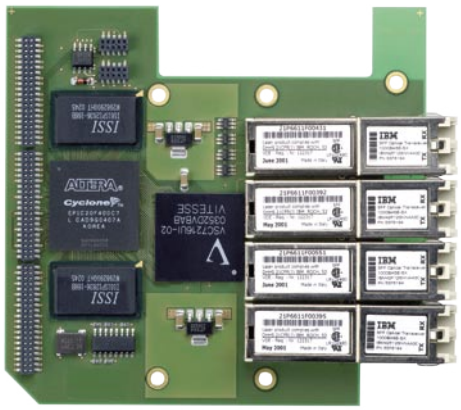
Expanding Processor Power
With modular hardware based on the DS1005 PPC Board, you can reach any performance you need simply by expanding your hardware with further DS1005 boards. Tasks can be shared between the processor boards to attain optimum response times and performance. And what is more, you automatically increase the I/O capacity of your system.

Gigalink Modules
All variants of the DS1005 PPC Boards are connected via optional Gigalink modules, which allow high-speed serial data transmission via fiber-optic cable and 1.25 Gbit/s technology. You can connect up to 20 processor boards in a system, and over distances up to 100 meters, in this way.

Multiprocessor Setup

Technical Details – DS910 Gigalink Module

Parameter	Specification
General	■ Hardware extension to DS1005 PPC Board for building multiprocessor systems ■ Requires several DS1005 PPC Boards (1 GHz, 933 MHz, 800 MHz, or 480 MHz variant), each with a DS910 Gigalink Module ■ Gross transfer rate: 1.25 Gbit/s ■ Distance up to 100 m
Hardware details	■ 4 optical, high-speed communication ports (Gigalinks), each providing 16 bidirectional interrupt lines and 16 bidirectional data channels (2 kilowords width on each channel) ■ I/O access speed of send operations adapted to Gigalink's capabilities: Data is sent directly without a FIFO buffer ■ 32-bit or 64-bit read/write operations allowed: 32-bit access for single 32-bit (or shorter) data words, fast 64-bit access for block transfer functions wherever possible ■ Real-time interrupt dispatching ■ Passive cooling



Headquarters in Germany

dSPACE GmbH
Technologiepark 25
33100 Paderborn
Tel.: +49 5251 1638-0
Fax: +49 5251 66529
info@dspace.de

USA and Canada

dSPACE Inc.
28700 Cabot Drive
Suite 1100
Novi · MI 48377
Tel.: +1 248 567 1300
Fax: +1 248 567 0130
info@dspaceinc.com

France

dSPACE Sarl
Parc Burospace · Bâtiment 20
Route de la Plaine de Gisy
91573 Bièvres Cedex
Tel.: +33 1 6935 5060
Fax: +33 1 6935 5061
info@dspace.fr

Japan

dSPACE Japan K.K.
West Tower 9F
Yokohama Business Park
134 Godo-cho · Hodogaya-ku
Yokohama-shi
Kanagawa-ken 240-0005
Tel.: +81 45 338 3361
Fax: +81 45 338 3362
info@dspace.jp

United Kingdom

dSPACE Ltd.
Unit B7 · Beech House
Melbourn Science Park
Melbourn
Hertfordshire
SG8 6HB
Tel.: +44 1763 269 020
Fax: +44 1763 269 021
info@dspace.ltd.uk

www.dspace.com

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