Exclusive Offers for Universities

Special pricing:
Advanced Control Education Kit (ACE Kit)
and TargetLink
<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Offers for Universities</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Control Education Kit – ACE Kit</td>
<td>5-7</td>
</tr>
<tr>
<td>Typical Work Setups</td>
<td>8-9</td>
</tr>
<tr>
<td>Typical Applications at Universities</td>
<td>10-11</td>
</tr>
<tr>
<td>The Control Development Process</td>
<td>12-13</td>
</tr>
<tr>
<td>Implementation Software</td>
<td>14-15</td>
</tr>
<tr>
<td>Real-Time Hardware</td>
<td>16-23</td>
</tr>
<tr>
<td>Experiment Software</td>
<td>24-25</td>
</tr>
<tr>
<td>Production Code Generation Software</td>
<td>26-27</td>
</tr>
</tbody>
</table>
Would you like to use the latest cutting-edge technology from industry in your teaching and research? With our special prices for universities, that may be less expensive than you think!

Current offers:
Advanced Control Education Kit (ACE Kit)
- ACE Kit 1104
- ACE Kit 1103
- ACE Kit 1005
- ACE Kit MicroAutoBox

Production Code Generation Software
- TargetLink
dSPACE offers a highly attractive tool for university users: The ACE Kit, a real-time development system with powerful simulation hardware and comprehensive software tools. dSPACE has four different ACE Kit versions to choose from: the ACE Kit 1104 (a cost-effective base package), the ACE Kit 1103 with the DS1103 PPC Controller Board for demanding tasks in rapid control prototyping, the ACE Kit 1005 with the DS1005 PPC Board as the core of dSPACE’s modular hardware, and the ACE Kit MicroAutoBox with dSPACE’s robust, small rapid prototyping ECU for in-vehicle experiments.

- Software for the seamless integration of MATLAB® and Simulink®, the standard modeling tools
- Greatly reduced kit price in comparison to individual components
ACE Kit Components

MATLAB / Simulink / Stateflow
Real-Time Workshop

ACE Kit variant*

Implementation Software
Real-Time Interface

Real-Time Hardware
Hardware component (depending on ACE-Kit variant)*

Experiment Software
ControlDesk  MLIB/MTRACE

*) ACE-Kit 1005 with DS1005 PPC Board
ACE-Kit 1103 with DS1103 PPC Controller Board
ACE-Kit 1104 with DS1104 R&D Controller Board
ACE-Kit MicroAutoBox with MicroAutoBox
The ACE Kit Enables You to

- Concentrate fully on your actual control design task
- Test even the most complex control systems in real time
- Demonstrate high-end control development – from block diagram design to online controller optimization
- Let your students gain experience with industrial control development tools
- Work under easy-to-use, intuitive Windows interfaces
- Implement your Simulink models within seconds on dSPACE real-time hardware
- Observe the effects of parameter changes on your system’s behavior

System Requirements

- Windows 98, Windows Me, Windows 2000, Windows NT 4.0 or Windows XP
- ≥ 128 MB RAM recommended
- MATLAB, Simulink and Real-Time Workshop® from The MathWorks
When you work with your controller board, you want easy access to all its input and output signals. One way is to combine the ACE Kit 1103 and the ACE Kit 1104 with a tailored connector panel or a connector/LED combi panel, so you can easily access I/O signals with BNC and Sub-D connectors. The connector/LED combi panels contain additional LED panels that indicate the current level of a board’s digital signals.

The DS1103 PPC Controller Board can be installed in your PC or, if no full-size ISA slot is available, in one of our expansion boxes, which can be connected to your PC. There is a special offer for an ACE Kit 1103 combined with one PX4 expansion box and – optionally – with a connector panel or a connector/LED combi panel.

Typical work setup with a PC (monitor, PC and accessories not included in our offers) with integrated DS1103 PPC Controller Board, ControlDesk, a PX4 expansion box and a CLP1103 Connector/LED Combi Panel.
The DS1005 PPC Board requires only one ISA slot to set up a single-processor system. Your modular hardware can be assembled in a minimum of space. The DS1005 is directly connectable to all dSPACE I/O boards via PHS bus. Both our expansion boxes and our compact AutoBox for in-vehicle experiments are ideal places to mount the DS1005.

AutoBox (open) with DS1005 PPC board and DS4330 LIN Interface Board inside.

Our MicroAutoBox is hardly larger than an ECU and can be placed virtually anywhere in the vehicle.

MicroAutoBox with a notebook running ControlDesk.
Industrial customers such as Audi, Boeing, DaimlerChrysler, Ford, General Motors, NASA, and Toyota rely on dSPACE systems in their development projects, and so do universities. More than 1200 ACE Kits are already in action worldwide. The real-time development systems are used extensively, not only in research and development but also in university laboratories.

Massachusetts Institute of Technology (MIT): The Institute uses numerous ACE Kits and offers courses based on the ACE Kit, for example, the summer course “Digital Control System Design for Applications”. 
Typical fields of application:

- Electromechanical positioning systems and stepper motors
- Automotive control
- Drives and motors
- Three-phase induction motors
- Noise and active vibration control
- Demonstration systems, such as the inverted pendulum
- Hydraulics and pneumatics
- Intelligent robots
- System identification (FFT analysis)

Here is a small cross-section of university customers:

- California Institute of Technology, USA
- ETH Zurich, Switzerland
- Harvard University, USA
- Massachusetts Institute of Technology (MIT), USA
- Ohio State University, USA
- Princeton University, USA
- RWTH Aachen, Germany
- Stanford University, USA
- TH Darmstadt, Germany
- Technical University of Munich, Germany
- Technical University of Vienna, Austria
- University of Auckland, New Zealand
- University of Paderborn, Germany
- University of Oxford, England
- University of Tokyo, Japan
- Victoria University of Technology, Australia
The ACE Kit supports you in all the steps of the control development process. This is an integrated software/hardware combination that enables you to concentrate fully on control design.

The tools from dSPACE and The MathWorks guide you through control design, testing and optimization.

Modeling

Modeling is easily done in MATLAB/Simulink. You can choose from a broad range of control design toolboxes. Simulink conveniently expands MATLAB with a block-oriented, graphical interface.

Implementation

After the modeling process is complete, your model is implemented on the dSPACE hardware. Real-Time Interface (RTI) generates the required real-time code together with Real-Time Workshop from The MathWorks.
Real-Time Simulation

Once your model is implemented, the simulation runs completely on the real-time hardware DS1103, DS1104, MicroAutoBox or DS1005. The integrated I/O (DS1103, DS1104, MicroAutoBox) enables you to connect the boards to your plant graphically. The DS1005 offers a high-speed connection to all dSPACE I/O boards via PHS bus.

Experiment Control

The ACE Kit has software tools which help you control the experiment. For example, you can display or store variables and change parameters with ControlDesk.
Implementation Software

Connection to I/O with RTI.
Real-Time Interface (RTI)
- Run your Simulink and Stateflow models on dSPACE real-time hardware
- Configure your I/O easily in graphical form and generate real-time code automatically
- Reduce your implementation time to a minimum

Microtec Compiler
- C Cross Compiler for PowerPC processors
- Assembler and linker included
DS1104 R&D Controller Board

Cost-effective system for control development.
DS1104 R&D Controller Board
- Component of the ACE Kit 1104
- Single-board PCI hardware for use in PCs
- Power PC 603e / 250 MHz
- Texas Instruments’ DSP TMS320F240

Comprehensive on-board I/O:
- 8 MB boot flash for applications
- 32 MB global DRAM
- 4 ADC inputs, 16 bit, multiplexed, 2 µs sampling time *
- 4 ADC inputs, 12 bit, 800 ns sampling time *
- 8 DA channels, 16 bit, 10 µs max. settling time
- Incremental encoder interface (2 digital inputs)
- 20 bits of digital I/O (bit-selectable)
- Serial interface
- Three-phase PWM outputs plus 4 single PWM outputs

* Speed and timing specifications describe the capabilities of the hardware components and circuits of our products. Depending on the software complexity, the attainable overall performance figures can deviate significantly from the hardware specifications.
DS1103 PPC Controller Board

For demanding tasks in rapid control prototyping.
DS1103 PPC Controller Board

- Component of the ACE Kit 1103
- Single-board solution for the most demanding applications in rapid control prototyping
- Power PC 604e / 400 MHz
- Texas Instruments DSP TMS320F240

Comprehensive intelligent on-board I/O:

- 2 MB local SRAM
- 128 MB global DRAM
- 4 ADC units 16 bit, multiplexed (4 channels each), 4 µs sampling time *
- 4 ADC channels 12 bit, 800 ns sampling time *
- 8 DA channels, 14 bit, 5 µs settling time
- Incremental encoder interface (6 digital inputs and 1 analog input)
- 4 channels with 8 bits of digital I/O
- Serial interface
- CAN interface
- Three-phase PWM outputs plus 4 single PWM outputs

* Speed and timing specifications describe the capabilities of the hardware components and circuits of our products. Depending on the software complexity, the attainable overall performance figures can deviate significantly from the hardware specifications.
MicroAutoBox

The new MicroAutoBox 1401/1505/1506 with FlexRay, LIN and CAN interfaces.
MicroAutoBox

- Component of the ACE Kit MicroAutoBox
- Small in-vehicle box with real-time hardware, I/O, signal conditioning and flight recorder
- Stand-alone rapid prototyping ECU with automatic boot-up
- PowerPC 603e running at 300 MHz
- NEW: MicroAutoBox variants with LIN interface / with LIN interface plus FlexRay interface available
- 8 MB main memory
- 4 MB memory exclusively for communication purposes between MicroAutoBox and PC/notebook
- 16 MB nonvolatile flash memory containing code section and flight recorder data
- Signal conditioning for automotive signal levels, no power driver included
- Cast aluminium box
DS1005 PPC Board

Powerful core of dSPACE’s modular hardware.
DS1005 PPC Board

- Component of the ACE Kit 1005
- Processor board for modular dSPACE systems
- Power PC 750 running at 480 MHz
- 128 MB SDRAM main memory (cached) for host data exchange and application
- Communicates with additional DS1005 PPC Boards via fiber-optic connections (Gigalinks)
- Fully programmable from Simulink
- High-speed connection to all dSPACE I/O boards via PHS bus
- Multiprocessor systems possible with up to 20 DS1005 PPC Boards
Controlling, instrumentation and experiment automation with ControlDesk.

Real-time access to MATLAB with MLIB/MTRACE.
ControlDesk

- One integrated tool to manage Simulink and real-time experiments
- Intuitive development by drag & drop
- Integrated Simulink interface for offline management of your controller models
- Advanced automation features
- Interfaces to common version management systems

MLIB/MTRACE

- Automation of experiment control from MATLAB
- Test scripting
- Long-term and large-scale data logging
- Online controller optimization
- Access to MATLAB’s powerful toolboxes
TargetLink

Generating production C code straight from the graphical model specification.
TargetLink

- Production code generation directly from MATLAB/Simulink/Stateflow
- ANSI C code with the efficiency of handwritten code, for fixed-point and floating-point microcontrollers
- Easy to integrate into existing development environments
- Target-specific code with Target Optimization Modules
- Target Simulation Module for testing the generated code on evaluation boards

System Requirements

- Windows 98, Windows Me, Windows NT 4.0 (Service Pack 6), Windows 2000, or Windows XP
- Pentium 3 PC, min. 450 MHz, 256 MB RAM

Software Requirements

- MATLAB, Simulink and Stateflow® from The MathWorks
- Possible compilers for host simulation (MATLAB MEX): Microsoft Visual C++ Ver.4.2, 5.0, or 6.0, LCC2.4 Watcom C/C++ Ver.10.6 or 11
- Target-specific compiler for processor-in-the-loop tests with Target Simulation Module (optional)
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