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System Requirements for dSPACE Release 6.1

If your system meets the following requirements, you can work with RCP and HIL software (containing RTI, ControlDesk, AutomationDesk, ConfigurationDesk, MotionDesk, ModelDesk, etc.), TargetLink, CalDesk, Model Compare, and SystemDesk. Performing more complex tasks has additional requirements regarding your system, see *Additional Requirements for Specific Products and Tasks* on page 3.

Host PC Hardware

You can use x86-compatible personal computers as host PCs for your dSPACE applications.

Host Processor

RCP and HIL software, TargetLink, CalDesk, and Model Compare require at least a Pentium III at 800 MHz (or equivalent). Pentium 4 at 1.6 GHz or higher recommended.
SystemDesk requires at least a Pentium 4 at 2 GHz (or equivalent). Pentium 4 at 3 GHz (or equivalent) recommended.

Main Memory

- To work with RCP and HIL software, TargetLink, or Model Compare, the main memory must be at least 512 MB RAM (1 GB RAM or more recommended).
- To work with CalDesk, the main memory must be at least 256 MB RAM (512 MB RAM or more recommended).
- To work with SystemDesk, the main memory must be at least 2 GB RAM (3 GB recommended).

Disk Space

- For a complete installation of the DVD, you need 3.5 GB of free hard disk space (plus 1.5 GB on the system partition).
- To install RCP and HIL software, you need at least 900 MB of free hard disk space (plus 300 MB on the system partition). A typical dSPACE installation needs about 1.4 GB (plus 500 MB on the system partition). A complete installation needs about 2.3 GB (plus 600 MB on the system partition).
- To install TargetLink, you need at least 350 MB (plus 100 MB on the system partition). A complete installation needs about 500 MB (plus 100 MB on the system partition).
- To install CalDesk, you need at least 520 MB (plus 380 MB on the system partition if Microsoft .NET Framework 2.0 and Python 2.5 must be installed).
- To install Model Compare, you need at least 350 MB (500 MB or more recommended).
- To install SystemDesk, you need at least 200 MB (plus 1.1 GB on the system partition if Microsoft .NET Framework 2.0, Microsoft SQL Express, and Python 2.5 must be installed). SystemDesk must be installed on a local hard disk. You need write access to this.

Additional disk space is required for non-dSPACE software, such as software from The MathWorks.

Disk Drives

- DVD drive for the software installation
- 3.5'' floppy disk drive for copying license files from the Key-Disk to your PC.

Required Ports for Connecting Hardware

RCP and HIL software

- For communication with RapidPro hardware, you need a USB port.
- For using the SteeringController Instrument in ControlDesk, you need a game port or USB port to connect a game controller device.
- For using ControlDesk Failure Simulation, you need a serial port (COM1, COM2, COM3 or COM4) that can be run at 9,600 bps to connect dSPACE Simulator's failure insertion unit (FIU).

TargetLink

For production code target simulation, you need:

- A serial port (COM1, COM2, COM3 or COM4) that can be run at 19,200, 38,400 or 57,600 bps
- A free USB port when using the RapidPro Control Unit with MPC5554
- A free USB port for target simulation when using the CI_V850F3377, S12XEVB_USB, or SK_EBXC2287 evaluation board

CalDesk

A USB port version 1.1 (USB 2.0 recommended)

Display

To work with RCP and HIL software or TargetLink, MATLAB requires

- An OpenGL-compliant graphics adapter (16, 24, or 32-bit)
- The color must be set to at least 16-bit in the Windows Display Properties.

Additional Requirements for License Handling

- Dongle licenses: To install the execution key (dongle), you need a USB port. A special version of the execution key for connection to a parallel port is available.
- Floating network licenses: All the PCs on which you want to run dSPACE software (dSPACE License Clients) need to be able to establish a TCP/IP connection to the dSPACE License Server.
- Node-locked licenses: You need a network adapter (Ethernet) to identify the host PC.

Required Slots

- To install a DS1103, you need one free, full-size ISA slot with a 16-bit connector (long socket) and two additional, free, adjacent brackets.
- To install a DS1104, you need one free 33 MHz/32-bit 5 V PCI slot.
- To install a modular system based on DS1005, you need as many free full-size ISA slots with 16-bit connectors as the number of boards (DS1005, DS2302, and DS4201) you want to install. The other boards require only 8-bit connectors. Note that the DS2210 requires two adjacent brackets altogether. The DS2202, DS2211, and DS4003 each require a total of three adjacent brackets.
- To connect your modular system installed in an expansion box, MicroAutoBox, dSPACE Simulator Compact, or dSPACE Simulator Mid-Size to the host PC via a bus connection, you need link boards in your host PC:
  - The DS813 Link Board (PC) requires one half-size ISA slot with a 16-bit connector.
  - The DS815 Link Board (PC) requires one free PC card slot (type 2).
  - The DS817 Link Board (PC) requires one free 5 V PCI slot.
  - The DS819 Link Board (PC) requires one free PCI Express slot (x1 ... x32).
  - The DS821 Link Board (PC) requires one free ExpressCard/54 slot.

  The DS819 and DS821 Link Boards (PC) are supported by the dSPACE software as of dSPACE Release 5.2.

Operating System

Operating System on Host PC

Your operating system must be:

- Windows 2000 with Service Pack 4 (not supported by SystemDesk)
- Windows XP (32-bit version) with Service Pack 2
- Windows Vista (32-bit version) (not supported by CalDesk and SystemDesk)

Windows XP Professional x64 Edition and Windows Vista (64-bit version) are not supported.
It is strongly recommended to install the latest Service Packs.

Operating System on dSPACE License Server

If you purchased floating network licenses, you have to install and configure one of the networked PCs as the dSPACE License Server. The operating system of the dSPACE License Server must be Windows 2000, Windows XP (32-bit version), Windows Vista (32-bit version), or Windows Server 2003.
The dSPACE License Server does not support non-Windows operating systems.

Windows Vista Limitations

Some limitations apply to Windows Vista as the operating system when you use it in combination with dSPACE software:

- **MATLAB support:** Under Windows Vista, the dSPACE software supports only MATLAB versions since MATLAB R2007a+.
- **Sleep mode:** The dSPACE software does not support Windows Vista's sleep mode for power saving.
- **Fast user switching:** The dSPACE software does not support the fast user switching feature of Windows Vista.
- **Closing dSPACE software before PC shutdown:** The modified shutdown procedure of Windows Vista causes some required

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processes to be aborted although they are still being used by dSPACE software. To avoid data loss, the dSPACE software must be terminated manually before a PC shutdown is performed.

- **Connecting/disconnecting DCI-GSI1 via USB:** If you use a DCI-GSI1, repeatedly connecting and disconnecting the DCI-GSI1 via USB to the host PC can cause a bluescreen on the host PC.
- **Allowing communication via additional firewall rules:** During installation of the dSPACE software, two additional Windows Vista firewall rules are installed. The first rule allows communication with a dSPACE expansion box, for example, AutoBox. The second rule allows MotionDesk to receive motion data from a network channel.

Third-Party Software

Microsoft Internet Explorer

dSPACE Release 6.1 supports all versions of the Microsoft Internet Explorer from version 6 SP1 up to the current version 7. However, limitations can occur when you use the Microsoft Internet Explorer with dSPACE software, for example, with AutomationDesk. Refer to the limitations chapter in the relevant documentation.
To use the dSPACE HelpDesk of dSPACE Release 6.1, you need Microsoft Internet Explorer 6.0 or later.

Microsoft Office

You can automate Microsoft Office applications such as writing data to an Excel sheet with Python. dSPACE Release 6.1 and the operating systems support the following Microsoft Office versions:

- Microsoft Office 2000 (not supported by Windows Vista 32-bit version)
- Microsoft Office XP (not supported by Windows Vista 32-bit version)
- Microsoft Office 2003
- Microsoft Office 2007 (not supported by Windows 2000)

Third-Party Software for RCP and HIL Software, and TargetLink

MATLAB®

Working with RTI, RTI Blocksets, RTI-MP, Automotive Simulation Models (ASM), MLIB/MTRACE, ControlDesk to control Simulink simulations, AutomationDesk to automate MATLAB via AutomationDesk's MATLAB Access library, MTest, Model Compare, and TargetLink requires that you have installed MATLAB R2006a+, R2006b, R2007a+, or R2007b.
For C-code generation with RTI and RTI-MP, and from Automotive Simulation Models (ASMs) you need Real-Time Workshop from The MathWorks.
Make sure that the MATLAB and Simulink versions are supported by the dSPACE software you intend to install. For details refer to our Web site at http://www.dspace.com/goto?compatibility.

C Compiler for RCP and HIL Software

- For MicroAutoBox, the DS1103, DS1104 and DS1005 boards, and the RapidPro Control Unit with MPC5554, you must install the Microtec PowerPC C Compiler Ver. 3.3.
- For the DS1006, the dSPACE DS1006 Compiler Ver. 1.5 based on GNU C Compiler Ver. 3.3.5 is installed automatically together with the dSPACE software.
- For compiling slave applications for the DS2302, DS2210, and DS2211 I/O boards, you must install TMS 320C3x/C4x Code Generation Tools Ver. 4.70 or 5.11 or TMS 320C3x/C4x Code Composer Tools Release 4.10 from Texas Instruments.
- For compiling slave applications for the DS1103, you must install Texas Instruments C2000 Code Composer Tools (including TMS320C2x/C2xx/C5x Compiler Vs 7.0)

Driver for CAN Interfaces from Vector Informatik GmbH for ControlDesk Failure Simulation

To use CAN interfaces from Vector Informatik GmbH with ControlDesk Failure Simulation, you need the appropriate driver:

- CANcardX driver Ver. 3.x or later.
- CANcardXL driver Ver. 4.3 or later.

Download it from http://www.vector-informatik.de.

C Compiler for TargetLink

You must install one of the following C compilers to build MATLAB MEX files:

- Microsoft Visual C/C++ Ver. 6.0, 7.1, or 8.0 (recommended, see the MATLAB documentation)
- LCC Compiler as shipped with the supported MATLAB versions

Production Code Target Simulation

- An evaluation board (EVB) has to be available (see list below)
- A target compiler has to be available (see list below)

Compatible Evaluation Boards for Target Simulation in TargetLink	Compatible Target Compilers
Freescale 56F8367 Evaluation Module (56F8367EVM)	Metrowerks 56800E C/C++ Compiler (V8.1)
i+ME eCAN C167C Promo Evaluation Board (Promo167)	Altium Tasking 80166 C Cross-Compiler (V6.0 ... V8.6)
Renesas H8S Evaluation Board (EVB2633F)	Renesas H8S, H8/300 Series C/C++ Compiler (V3.0 ... V6.2)
MCT HCS12 T-Board (HCS12EVB and HCS12DP512EVB)	• Cosmic C Cross-Compiler for MC68HCS12 (V4.4 ... V4.7) • Metrowerks C Compiler CodeWarrior for MC68HCS12 (V1.2 ... V3.1)
MCT S12X T-Board (S12XEVB)	• Cosmic C Cross-Compiler for S12X (V4.6 and V4.7) • Metrowerks C Compiler CodeWarrior for MC9S12X (V4.1 ... V4.6)
MCT S12X T-Board (S12XEVB_USB)	
Renesas Evaluation Board MSA2114 (MSA2114)	• Renesas CC32R C Compiler (V2.0 ... V5.0) • Gaio Technology General Purpose Cross C Compiler (V9 and V10)
Renesas Evaluation Board M3A-2154 (M3A2154)	
Axiom CME-0555 Single Board Computer (CME555)	• Wind River Diab PowerPC Family C Compiler (V4.3 ... V5.5) • Green Hills PowerPC C Compiler (V3.0 ... V5.0) • Metrowerks PowerPC Family C Compiler CodeWarrior (V6.0 ... V8.7)
Axiom CMD-0565 Single Board Computer (CMD565)	• Wind River Diab PowerPC Family C Compiler (V5.0 ... V5.5)
Axiom MPC5554DEMO Evaluation Board (MPC5554DEMO)	• Wind River Diab PowerPC Family C Compiler (V5.2 ... V5.5) • Green Hills MPC55xx C Compiler (V4.0 ... V5.0) • Metrowerks MPC55xx Family C Compiler CodeWarrior (V1.5 and V2.2) • GNU GCC MPC55xx Family C Compiler (V3.4)
dSPACE RapidPro Control Unit with MPC5554	• Wind River Diab PowerPC Family C Compiler (V5.3 and V5.5) • Mentor Graphics Microtec PowerPC Family C Compiler (V3.2 and V3.3)
NEC DriveIt Evaluation Board (DI_V850F3239)	• Green Hills V8xx C Compiler (V3.5 ... V4.2) • NEC V8xx C Compiler (V2.5 ... V3.1)
NEC CANIt Evaluation Board (CI_V850F3377)	
Renesas SH7055F Evaluation Board (SH2eEVB)	Renesas SH Series C Compiler (V6.0 ... V9.1)
Renesas CDK7058 (EVB7058)	
Renesas SDK72513 Evaluation Board (SDK72513)	Renesas SH Series C Compiler (V9.0 and V9.1)
FS Forth-Systeme STart276 Development Board (STart276)	Altium Tasking C166/ST10 C Cross-Compiler (STart276) (V7.5 ... V8.6)
Texas Instruments TMS470R1x Evaluation Board (EVB470R1)	TI Code Composer Studio 1.3 for the TMS470R1x (V1.31 ... V2.21)
Infineon TriBoard TC1775 Evaluation Board (TBTC1775)	• Altium Tasking TriCore C Cross-Compiler (V1.1 ... V1.5) • Altium Tasking TriCore C Cross-Compiler (V2.2 ... V2.5)
Infineon TriBoard TC1766 Evaluation Board (TBTC1766)	Altium Tasking TriCore C Cross-Compiler (V2.2 ... V2.5)
Infineon TriBoard TC1796 Evaluation Board (TBTC1796)	• Altium Tasking TriCore C Cross-Compiler (V2.2 ... V2.5) • HighTec GNU Toolchain for TriCore (V3.3 and V3.4)
Infineon Starter Kit XC2287 Evaluation Board (SK-EB XC2287)	• Tasking VX – Toolset for C166 Compiler (V2.1)

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Third-Party Software for CalDesk

Configuration Software for DAQ Modules

You need appropriate tools for configuring DAQ modules:

- CSM ScanMess modules (CAN-based only) require xx-Scan Config Ver. 4.51 (or later).
- IMC CANSAS DAQ modules require CANSAS V1.3 Rev 17 (or later)
- IPETRONIK SIM DAQ modules require IPEconf V2.20.60 (or later)

The configuration tools are required to provide CalDesk with the relevant files containing the channel configurations of the DAQ modules.

Driver for CAN Interfaces from Vector Informatik GmbH

To use CAN interfaces from Vector Informatik GmbH with CalDesk, you need the appropriate driver:

- CANcardX driver Ver. 3.x or later
- CANcardXL driver Ver. 4.3 or later

Download it from http://www.vector-informatik.de.

Driver for CAN Interfaces from Kvaser

To use Kvaser CAN interfaces with CalDesk, you need the appropriate Kvaser driver Ver. 3.9 or later. Download it from http://kvaser.com.

USB Driver for ECUs With XCP on USB

To communicate with an ECU with XCP on USB, CalDesk requires Thesycon's USB driver. The CalDesk installation contains the Thesycon USB driver for the Bosch EDC17 ECU. To communicate with an ECU with XCP on USB other than Bosch's EDC17, you have to provide the Thesycon USB driver yourself, and make it available to CalDesk.

Expansion Box Requirements

Connecting an Expansion Box and Host PC via Bus Connection

- The DS814 Link Board has to be installed in the expansion box.
- The DS813, DS815, DS817, DS819, or DS821 Link Board has to be installed in the host PC.
  The DS819 and DS821 Link Boards (PC) are supported by the dSPACE software as of dSPACE Release 5.2.
- You cannot connect the currently available dSPACE boards to the host PC via DS811 and DS812 Link Board.

Connecting an Expansion Box and Host PC via Ethernet

- A slot CPU with an integrated network adapter has to be installed in the expansion box.
- The host PC must have a 10baseT (twisted pair, 10 Mbit/s or faster) network adapter.
- Only if you use the AutoBoot option: To install the PC Card reader, one free bracket is required in the expansion box.

Required Slots

- To install a DS1103, you need one free, full-size ISA slot and two additional, free, adjacent brackets.
- To install a modular system based on DS1005 or DS1006, you need as many free slots in the box as the number of boards you want to install. Note that the DS2210 requires two adjacent brackets altogether. The DS2211 and the DS4003 each require a total of three adjacent brackets.
- One free full-size ISA slot is required either by the DS814 (bus connection) or the slot CPU (Ethernet connection).
  Note that the slot CPU (supplied as of March 2008) requires two slots if you use it in an AutoBox with a DS1005 with Gigalink modules.
- The DS1006 has special slot requirements to ensure proper cooling of the AMD Opteron™ processor:
  - In a PX20, each DS1006 requires four slots (including one slot for the DS814 Link Board or the slot CPU).
  - In a PX10, the DS1006 requires either two slots (with Gigalink module) or one slot (without Gigalink module), if installed next to the box's power supply (recommended).

Installing DS1006 in an Expansion Box

- The DS1006-based modular system must be installed in a PX10 or PX20 Expansion Box. PX10 supports one, PX20 up to two DS1006.
- The Expansion Boxes need special power supplies and connectors which fulfill the DS1006 requirements. For information on whether your existing expansion box fulfills these requirements, refer to http://www.dspace.com/goto?pxboxvers.
- You cannot insert a DS1006 in a host PC, a PX4 Expansion Box, or an AutoBox/TandemAutoBox.

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Additional Requirements for Specific Products and Tasks

For some complex tasks, your system has to meet additional requirements.

Remote Control of Measurement and Calibration Systems According to ASAM-MCD 3MC (ASAP3) via AutomationDesk

Software Requirements

- A description file for your ECU
- A binary data (HEX) file containing the basic configuration of the ECU
- A properly installed ASAM MC 3MC-compatible measurement and calibration (MC) system

Hardware Requirements

- An ECU that can be connected to a measurement and calibration (MC) system
- If your host PC provides two free serial interface connectors, both AutomationDesk and the MC system can run on it. Otherwise, AutomationDesk and the MC system require one PC each.

3-D Online Animation via MotionDesk

Software Requirements

The latest driver for the graphics adapter with HW-accelerated OpenGL support should be installed.

Hardware Requirements

- The DS1005, DS1006, DS1103, MicroAutoBox, dSPACE Simulator Compact, or dSPACE Simulator Mid-Size must be installed.
- At least a Pentium III at 800 MHz, 512 MB RAM. Workstation with Pentium 4 at 3.2 GHz or higher, 512 MB RAM or higher recommended.
- At least 100 MB free disk space
- High-performance graphics accelerator card (OpenGL-compliant) with at least 32 MB RAM. High-performance dual-head graphics accelerator card (OpenGL-compliant) with at least 128 MB RAM recommended.
- For a Multi-PC solution (not for DS1103), you need MotionDesk Multi-PC Interface Kit for the simulator and 10 MBit/s Ethernet card for each connected MotionDesk PC.
- For a Simulink simulation, the Simulation PC and each connected MotionDesk PC must have at least a 10 MBit/s Ethernet card. If simulation and visualization run on the same PC, one 10 MBit/s Ethernet card is sufficient for that PC.

Additional Requirements for Notebooks

MotionDesk has very high requirements with regard to graphic performance. dSPACE does not therefore guarantee that MotionDesk can run on notebooks. If the notebook is equipped with an NVIDIA graphics processing unit, it should be one of the NVIDIA Quadro® family, like the NVIDIA Quadro®4 GO GL.

Onboard Graphic Adapters

dSPACE does not guarantee that MotionDesk will run on computers with onboard graphic adapters for the following reasons:

- The specialized on-board graphics processing units often behave differently from high-end graphics cards.
- Even if the technical specifications of these processing units match the formal requirements (OpenGL hardware acceleration, 32 MB RAM), drivers are often not stable enough to satisfy the requirements of CAD-like applications.

Using Automotive Simulation Models (Vehicle Dynamics)

If you use the models for vehicle dynamics simulations, your host PC has to meet the following requirements.

Host PC requirements

- At least a Pentium 4 at 1.6 GHz. Workstation with Pentium 4 at 3.2 GHz or higher recommended.
- The main memory must be at least 1 GB RAM (2 GB RAM recommended).

Using AutoBoot Option

The AutoBoot Option is only available for DS1005 and DS1103.

Hardware Requirements

- AutoBoot Option requires an expansion box with a slot CPU connected to the host PC via Ethernet and one free bracket for the PC Card reader.
- Your host PC must support the reading and writing of CompactFlash cards. If your host PC has a PC Card socket, you can use the PC Card adapter to access the CompactFlash card. Otherwise, you can use a common USB CompactFlash card reader.

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Resource Requirements of dSPACE Boards

dSPACE boards require different resources in the host PC and the expansion box depending on the installation.

Installation in the Host PC

The following table lists the required I/O address ranges together with the default addresses and the required memory of dSPACE boards when installed in the host PC. Some dSPACE boards support Plug & Play in which case they require an interrupt request line (IRQ). However the boards operate correctly even if no free IRQ is available.

Board	Required I/O Address Range	Default I/O Base Address	Required Memory Range	Required IRQ
DS1003[1)]	8H	318H	64 KB, range starting at 0xD0000H	None
DS1003/DS1004 (AlphaCombo) [1)]	10H	310H	64 KB, range starting at 0xD0000H	None
DS1005	10H	300H	None	None
DS1102[1)]	10H	300H	None	None
DS1103	10H	Plug & play	None	1 (ISA)
DS1104	None		Two 4 KB blocks (Plug & play)	1 (PCI)
DS2301 and DS2302	10H	320H	None	None
DS811 (no DS1003 in the connected expansion box) [2)]	40H	300H	None	None
DS811 (one or more DS1003 in the connected expansion box) [2)]	40H	300H	64 KB, range starting at 0xD0000H	None
DS813	10H	Plug & Play	None	1 (ISA)
DS815	10H	Plug & Play	None	1 (ISA)
DS817	10H	Plug & Play	None	1 (PCI)
DS819 [3)]	10H	Plug & Play	None	1 (PCI Express)
DS821 [3)]	10H	Plug & Play	None	1 (PCI Express)

[1)] No longer supported
[2)] Can be used only with DS1102, DS1003, or DS1004
[3)] Supported by the dSPACE software as of dSPACE Release 5.2

Installation in the Expansion Box

When installed in an expansion box, dSPACE boards require the following resources in the expansion box:

Board	Required Address Bytes	Default I/O Base Address	Required Memory	Required IRQ
DS1003[1)]	8H	318H	64 KB, range starting at 0xD0000H	None
DS1003/DS1004 (AlphaCombo) [1)]	10H	310H	64 KB, range starting at 0xD0000H	None
DS1005	10H	300H	None	None
DS1006	10H	300H	None	None
DS1102[1)]	10H	300H	None	None
DS1103	10H	300H	None	None
DS2301 and DS2302	10H	320H	None	None

[1)] No longer supported

Connection via DS811 Link Board (PC)

The Link Board requires the following resources in the host PC:

Required Address Bytes	Default I/O Base Address	Required Memory	IRQ
40H	300H	None (no DS1003 in the connected expansion box)	None
40H	300H	64 KB, range starting at 0xD0000H (one or more DS1003 in the connected expansion box)	None

Connection via DS813, DS815, DS817, DS819, or DS821 Link Board

The Link Boards require the following resources in the host PC:

Required Address Bytes	Default I/O Base Address	Required Memory	IRQ	
10H	Plug & Play	None	1	• ISA for DS813/DS815 • PCI for DS817 • PCI Express for DS819/DS821

The DS819 and DS821 Link Boards are supported by the dSPACE software as of dSPACE Release 5.2.

For the system requirements of older dSPACE Releases, refer to http://www.dspace.com/goto?sysreq.

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