dSPACE Release

# Installing dSPACE Software

Release 2021-A – May 2021

dSPACE

## How to Contact dSPACE


| | |
|---|---|
| Mail: | dSPACE GmbH<br>Rathenaustraße 26<br>33102 Paderborn<br>Germany |
| Tel.: | +49 5251 1638-0 |
| Fax: | +49 5251 16198-0 |
| E-mail: | info@dspace.de |
| Web: | http://www.dspace.com |


## How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

- Local dSPACE companies and distributors: http://www.dspace.com/go/locations
- For countries not listed, contact dSPACE GmbH in Paderborn, Germany.
  Tel.: +49 5251 1638-941 or e-mail: support@dspace.de

You can also use the support request form: http://www.dspace.com/go/supportrequest. If you are logged on to mydSPACE, you are automatically identified and do not need to add your contact details manually.

If possible, always provide the relevant dSPACE License ID or the serial number of the CmContainer in your support request.

## Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit http://www.dspace.com/go/patches for software updates and patches.

## Important Notice

# Contents

# About This Document

**Contents**

This document shows you how to install and remove dSPACE software. It also describes the setup's automatic installation feature to make installation on multiple host PCs quicker and easier.

The appendix provides system requirements and gives other useful reference information.

**Required knowledge**

Knowledge in handling the host PC and the Microsoft operating system is assumed.

**Symbols**

dSPACE user documentation uses the following symbols:

| Symbol | Description |
|---|---|
| DANGER | Indicates a hazardous situation that, if not avoided, will result in death or serious injury. |
| WARNING | Indicates a hazardous situation that, if not avoided, could result in death or serious injury. |
| CAUTION | Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. |
| NOTICE | Indicates a hazard that, if not avoided, could result in property damage. |
| Note | Indicates important information that you should take into account to avoid malfunctions. |
| Tip | Indicates tips that can make your work easier. |
| | Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise. |
| | Precedes the document title in a link that refers to another document. |

### Naming conventions

dSPACE user documentation uses the following naming conventions:

**%name%** Names enclosed in percent signs refer to environment variables for file and path names.

**< >** Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

### Special folders

Some software products use the following special folders:

**Common Program Data folder** A standard folder for application-specific configuration data that is used by all users.

```
%PROGRAMDATA%\dSPACE\<InstallationGUID>\<ProductName>
```

or

```
%PROGRAMDATA%\dSPACE\<ProductName>\<VersionNumber>
```

**Documents folder** A standard folder for user-specific documents.

```
%USERPROFILE%\Documents\dSPACE\<ProductName>\
<VersionNumber>
```

**Local Program Data folder** A standard folder for application-specific configuration data that is used by the current, non-roaming user.

```
%USERPROFILE%\AppData\Local\dSPACE\<InstallationGUID>\
<ProductName>
```

### Accessing dSPACE Help and PDF Files

After you install and decrypt dSPACE software, the documentation for the installed products is available in dSPACE Help and as PDF files.

**dSPACE Help (local)** You can open your local installation of dSPACE Help:

- On its home page via Windows Start Menu
- On specific content using context-sensitive help via **F1**

**dSPACE Help (Web)** You can access the Web version of dSPACE Help at www.dspace.com/go/help.

To access the Web version, you must have a *mydSPACE* account.

**PDF files** You can access PDF files via the icon in dSPACE Help. The PDF opens on the first page.

# Safety Precautions

## General Warning

**Danger potential**

Using dSPACE software can be dangerous. You must observe the following safety instructions and the relevant instructions in the user documentation.

**Improper or negligent use can result in serious personal injury and/or property damage**

Using the dSPACE software can have a direct effect on technical systems (electrical, hydraulic, mechanical) connected to it.

The risk of property damage or personal injury also exists when the dSPACE software is controlled via an automation interface. The dSPACE software is then part of an overall system and may not be visible to the end user. It nevertheless produces a direct effect on the technical system via the controlling application that uses the automation interface.

- Only persons who are qualified to use dSPACE software, and who have been informed of the above dangers and possible consequences, are permitted to use this software.
- All applications where malfunctions or operating errors involve the danger of injury or death must be examined for potential hazards by the user, who must if necessary take additional measures for protection (for example, an emergency off switch).

**Liability**

It is your responsibility to adhere to instructions and warnings. Any unskilled operation or other improper use of this product in violation of the respective safety instructions, warnings, or other instructions contained in the user documentation constitutes contributory negligence, which may lead to a limitation of liability by dSPACE GmbH, its representatives, agents and regional dSPACE companies, to the point of total exclusion, as the case may be. Any exclusion or limitation of liability according to other applicable regulations, individual agreements, and applicable general terms and conditions remain unaffected.

**Data loss during operating system shutdown**

The shutdown procedure of Microsoft Windows operating systems causes some required 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.

# Basics on dSPACE Software Installation

**Where to go from here**

Information in this section



## Obtaining dSPACE Software

**Distribution**

dSPACE Release 2021-A is distributed as follows:

- dSPACE software is delivered on two DVDs: All main products are contained on the DVDs.
- Each DVD is available as an ISO image. You can download the images from the dSPACE website at http://www.dspace.com/go/releasedownload.
- The complete content of both DVDs is also available as a merged ZIP file and can be downloaded from the dSPACE website at http://www.dspace.com/go/releasedownload.

  This download is useful if you want to install several dSPACE software products that are not contained on the same DVD.
- The following dSPACE products/tools can be downloaded from the dSPACE website as separate software packages with own setup programs:
  - dSPACE Variable Editor at http://www.dspace.com/go/releasedownload.
  - ConfigurationDesk for RapidPro, DCI-GSI Configuration Package, dSPACE Firmware Manager, dSPACE Firmware Archives, and dSPACE Installation Manager at http://www.dspace.com/go/tooldownload.

These products/tools are also part of the dSPACE Release and installed automatically with the related product sets.

- dSPACE Profiler at http://www.dspace.com/go/tooldownload.

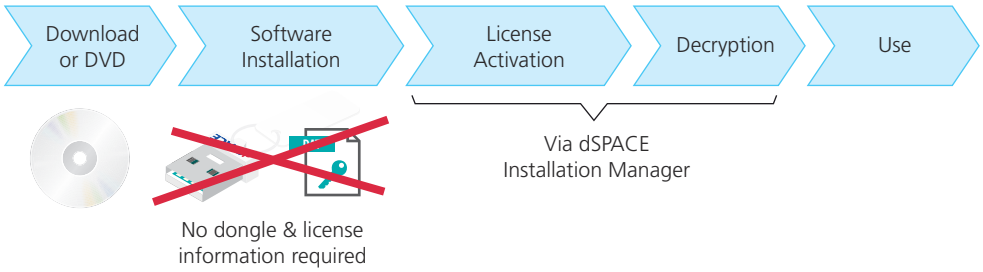
**DVD contents**

For information on which products each DVD contains, refer to Information About Product Sets on page 19.

# About dSPACE Software Installation

**Workflow**

The software installation process is license-independent, as shown below. No license information and/or dongles are required during the installation. This simplifies the installation process significantly.




As a consequence, you can install the complete dSPACE Release without any license. However, specific parts of dSPACE software, the documentation, demo models, .NET code, etc. are installed in encrypted archives on your host PC.

**Tip**

License activation and decryption do not require administrator rights, so the end users can perform these steps themselves.

**License activation** After software installation, license activation is necessary to run license-protected dSPACE software. License activation is done via a database (dSPACE License Central) and uses a ticket-based system.

**Decryption** To use the full functionality of the installed dSPACE software, you have to decrypt the files which are installed in encrypted archives. You can only decrypt parts of the dSPACE installation for which you have licenses. Use dSPACE Installation Manager for decrypting them.

**Using dSPACE Installation Manager**

dSPACE Installation Manager is required to activate licenses and decrypt files. Furthermore, it lets you manage all the dSPACE installations available on your host PC. For example, it provides detailed information on installed products and supports the integration of dSPACE software into a MATLAB® installation.

**Note**

You cannot use dSPACE Installation Manager to install dSPACE software or modify dSPACE installations (add or remove software) on your host PC.

For a short feature overview, refer to Introduction to the dSPACE Installation Manager on page 17.

**Installation methods**

The dSPACE Setup provides two installation methods:

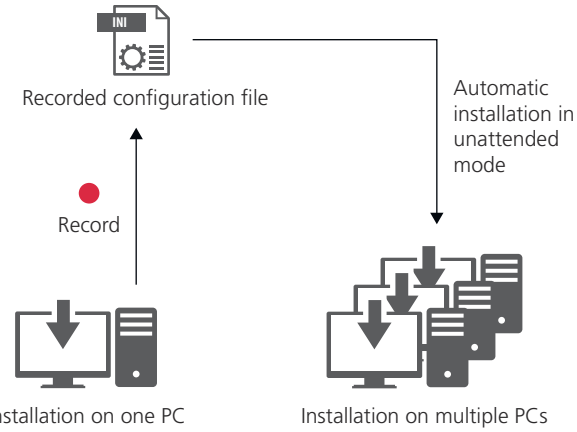
- Interactive installation with manual input (= standard installation)

  For instructions, refer to Installing dSPACE Software Products on page 39.
- Preconfigured automatic installation in unattended mode

  With this method, you can record an initial interactive installation and store your installation configuration to a configuration file. Later, you can use this file to install dSPACE software on multiple host PCs automatically in unattended mode.

**Note**

In record mode no software is installed on your host PC. You only save your settings to a configuration file.




For basics and instructions on initializing and running a preconfigured automatic installation, refer to Automating Installation Tasks on page 59.

**Using dSPACE software on virtual machines (VM)**

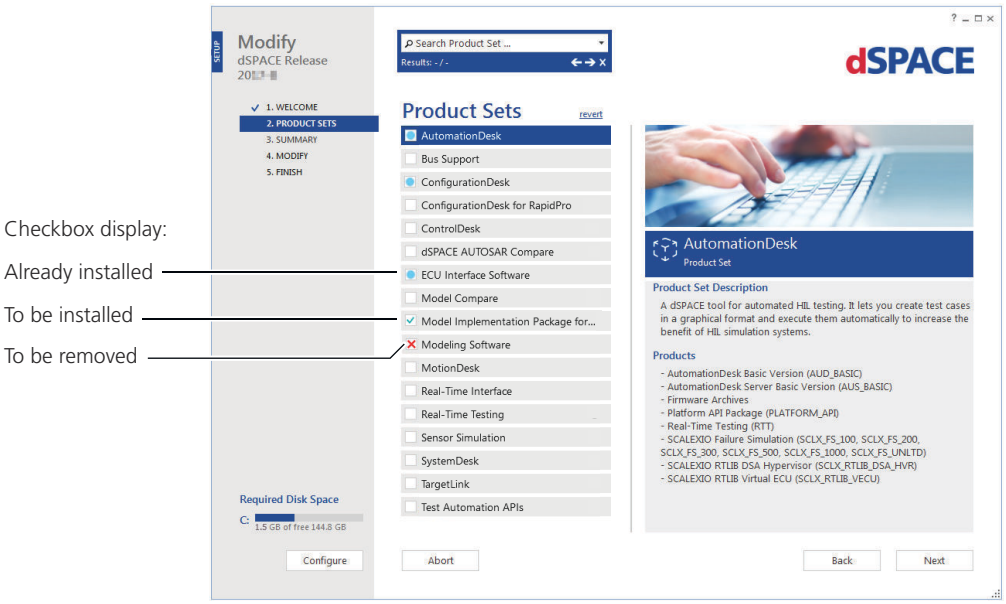
You can operate several dSPACE software products installed on virtual machines. For more information, refer to Using dSPACE Software on Virtual Machines (VMs) on page 47.

# Introduction to the dSPACE Setup Program

## Design and functionality

The setup program has been designed to simplify the installation process. dSPACE Setup also supports removing a complete dSPACE Release, as well as modifying and repairing an existing installation.

dSPACE Setup is the central setup program for all dSPACE software products. It has a modern, clean user interface:




As shown above, you can select product sets from a flat list. There is no complex tree of installable software components you can or must select from, requiring detailed knowledge about which component is located where.

## Installation on product set level

dSPACE software is installed in larger units, called product sets. Each set contains software components and options that are typically used together. Product sets provide a good balance between disk space requirements and usability.

You can install and uninstall software only on the product set level. It is not possible to add or remove single products.

Keep in mind that a specific product can be contained in several product sets. However, each product will be installed only once, regardless of how many product sets contain it.

**Products in a product set** dSPACE Setup provides a description of the selected product set on the right-hand side of the window. The description also lists all products of the product set, including their order numbers. If you select a product set, the listed products are selected for being installed on your host PC.

For an overview of all available product sets and their contained products, refer to Mapping Between Products and Product Sets on page 19.

**Search products** If you do not find the product that you want to install in the product set list, you can enter the product name or order number (e.g., AUS_BASIC) in the search field in dSPACE Setup. The matches are highlighted in the product set description field. The related product set is highlighted as well.

A product can be part of multiple product sets. You can switch between the matches to see if one of the related products sets is already installed.


**Installation progress** A progress bar visualizes the progress of the installation process regarding all selected product sets in percentage. Below the progress bar, the current installation step is displayed.

### Multiple installations

**Note**

Multiple installations of the same Release are not supported. You can install only one instance of a product set (for example, ControlDesk, AutomationDesk, Model Compare, ECU Interface Software, VEOS, TargetLink) on your host PC.

However, you can install different Releases of a product set on your host PC.

### Configure the host PC to shut down after installation

The installation is performed without any user interaction during the installation process. The new setup collects all required information before the installation starts. You can specify to shut down your host PC after the installation. This lets you complete dSPACE software installation without having to be physically present.

**Note**

Make sure that no application or software product is running on the host PC, because this might prevent the host PC from shutting down. This can be the case if an application contains unsaved changes, for example.
You also have to observe the notes in Protecting the Installation Process Against Blocking on page 35.

### Accessing dSPACE Setup

You can access the setup program (`Install_Release.exe`) as follows:

- Via the root directory on both dSPACE DVDs .
- Via the root directory of the downloaded installation files (mounted ISO images or unpacked ZIP files) .
- After the initial installation of dSPACE Release 2021-A: Via the Windows Control Panel (**Programs - Programs and Features - dSPACE Release 2021-A**).

SYNECT is available on DVD 2 and has its own setup program (`Install_Synect.exe`).

dSPACE products/tools that can be downloaded from the dSPACE website as separate software packages also have their own setup programs, identifiable by their names (for example, `Install_Profiler.exe`). However, the features, the workflow, and the design of the setup programs are always the same.

**Installation from merged data** It is recommended to install the dSPACE software from a merged folder. Therefore, copy the contents of both dSPACE DVDs to a common folder. This enables you to install product sets from both DVDs in one step without changing the medium. For example, for unattended installations it is easier to install the software from a merged folder to prevent interrupting automatic installations.

When you copy the files and folders to a common merged folder, confirm any requests for folder and/or file replacement that Windows displays.

**Tip**

You can also download the complete content of both DVDs as a merged ZIP file from the dSPACE website.

# Introduction to the dSPACE Installation Manager

**Purpose**

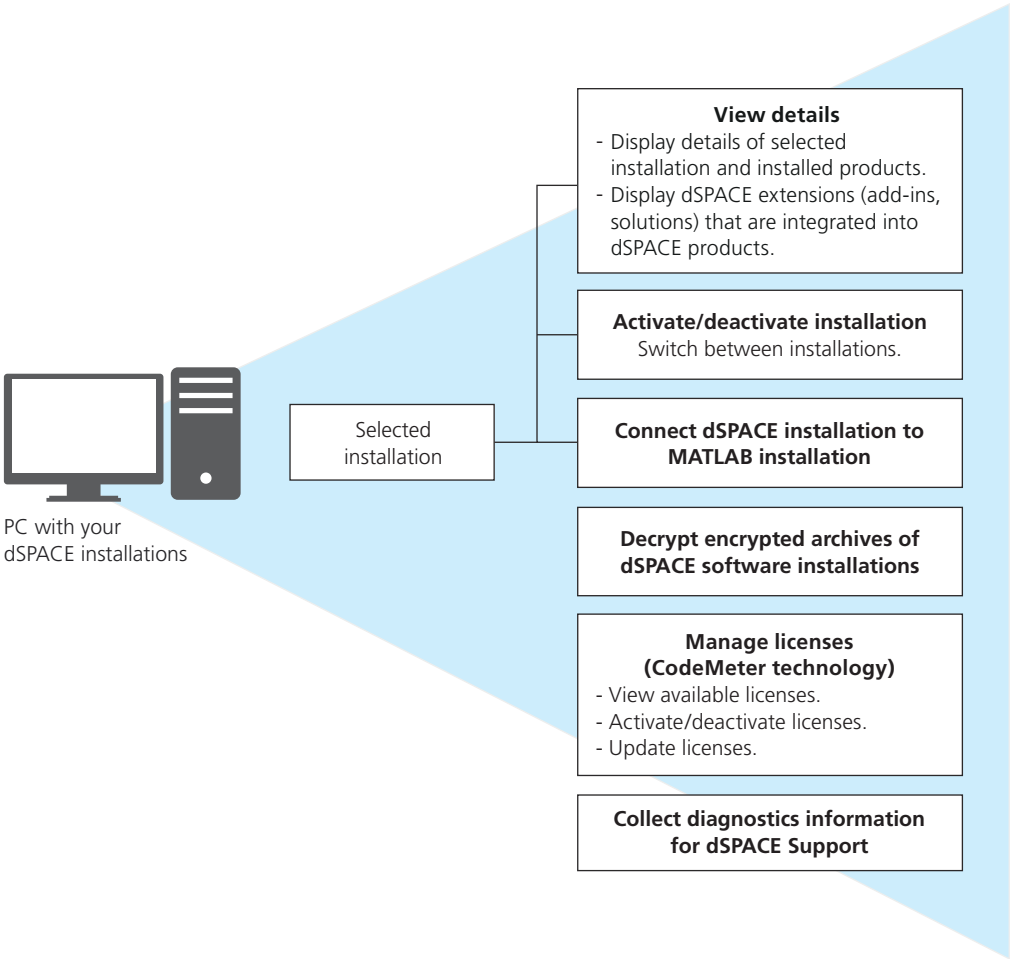
dSPACE Installation Manager lets you manage all the dSPACE installations on your host PC, lets you activate licenses and decrypt encrypted archives of dSPACE installations.

**Installation**

The dSPACE Installation Manager is installed automatically during dSPACE software installation. It can also be downloaded from the dSPACE website and installed separately.

**Feature overview**

The following illustration shows the features of the dSPACE Installation Manager 5.0 and later.



**Compatibility**

dSPACE Installation Manager is downward-compatible with the last eight dSPACE Releases. So you can always use its latest version to manage the installations on your host PC.

**Managing licenses for earlier dSPACE Releases**

To manage licenses for software installations from dSPACE Release 2017-A and earlier, you have to use the **dSPACE License Manager (Legacy)**. This is a separate tool that is always installed together with dSPACE Installation Manager 5.0 and later.

**dSPACE License Manager (Legacy)** provides the same license management functionalities as dSPACE Installation Manager 4.3 (distributed with dSPACE Release 2017-A) and earlier. This applies to dongle licenses (based on the WibuKey technology) as well as to floating network licenses (based on the FlexNet technology).

**Related topics**

Basics

Managing dSPACE Software Installations
Providing Diagnostic Information
Working with CodeMeter Licensing Technology
Working with Legacy Licensing Technologies

# Information About Product Sets

**Where to go from here**

Information in this section



## Mapping Between Products and Product Sets

**Product sets**

dSPACE software is installed in larger units, called product sets. Each set contains all software components and options that are typically used together. Product sets provide a good balance between disk space requirements and usability.

**Mapping tables**

The following tables show dSPACE products and their order number. They are mapped to the product sets they are contained in.

The last column shows, which products are part of the RCP and HIL software package. These software products are installed in a common folder (RCP and HIL installation). dSPACE Installation Manager can handle the products in the RCP and HIL installation only as a unit.

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| ASM Brake Hydraulics Library | ASM_L_BH | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_BH_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Diesel Exhaust Library | ASM_L_DEXH | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_DEXH_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Drivetrain Basic Library | ASM_L_DTB | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_DTB_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Electric Components Library | ASM_L_EC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_EC_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Engine Diesel Library | ASM_L_ED | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_ED_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Engine Diesel InCylinder Library | ASM_L_EDIC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_EDIC_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Engine Gasoline Library | ASM_L_EG | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_EG_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Engine Gasoline InCylinder Library | ASM_L_EGIC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_EGIC_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Environment Library | ASM_L_ENV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_ENV_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM InCylinder Base Library | ASM_L_ICB | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_ICB_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Kinematics and Compliance Testbench | ASM_L_KNC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Pneumatics Library | ASM_L_PNM | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_PNM_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Turbocharger Library | ASM_L_TC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_TC_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| ASM Trailer Library | ASM_L_TRA | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_TRA_RTC | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Traffic Library | ASM_L_TRF | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_TRF_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Truck Library | ASM_L_TRU | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_TRU_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| ASM Vehicle Dynamics Library | ASM_L_VD | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| | ASM_L_VD_RTV | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| AutomationDesk Basic | AUD_BASIC | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| AutomationDesk Automation Server Basic | AUS_BASIC | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Bus Manager | BUS_MANAGER | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| Compiler for ConfigurationDesk platforms | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | ✓ |
| Compilers for dSPACE platforms | CCPPPC | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| | DS1007_COMP | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| | MLBX_COMP | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| ConfigurationDesk for RapidPro | CFD_C | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ConfigurationDesk | CFD_I_100 | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| | CFD_I_200 | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| | CFD_I_300 | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| | CFD_I_1000 | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| | CFD_I_UNLTD | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk MultiCore | CFD_I_MC | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| ConfigurationDesk MultiProcessor | CFD_I_MP | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk CAN Module | CFD_I_CAN | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk LIN Module | CFD_I_LIN | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk Ethernet Module | CFD_I_ETH | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk Virtual ECU Module | CFD_I_VECU | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ConfigurationDesk XCP Module | CFD_I_XCP | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| Container Manager | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | ✓ | - | - | - |
| ControlDesk | CONTROLDESK | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ControlDesk Bus Navigator Module | CONTROLDESK_BNV | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ControlDesk ECU Diagnostics Module | CONTROLDESK_DIAG | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ControlDesk ECU Interface Module | CONTROLDESK_ECU | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ControlDesk Operator Version | CONTROLDESK_OPERATOR | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ControlDesk Signal Editor Module | CONTROLDESK_SE | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Data Dictionary Manager | DSDD_MANAGER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| DCI-GSI Configuration Package | - | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | - |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| dSPACE AUTOSAR Compare | DARC | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - |
| dSPACE CAN API | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ECU Flash Programming Tool | DSPACE_ECU_FLASH | - | - | - | - | ✓ | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - |
| ECU Interface Base Package | EIF_BASE | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface Binary Code Management for MPC5XXX | EIF_BCM_MPC5XXX | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface Binary Code Management for TriCore | EIF_BCM_TRICORE | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface Binary Code Management for V850X | EIF_BCM_V850X | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface On-Target module for ARM | EIF_OT_ARM | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface On-Target module for MPC5XXX | EIF_OT_MPC5XXX | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface On-Target module for TriCore | EIF_OT_TRICORE | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| ECU Interface On-Target module for V850X | EIF_OT_V850X | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| Failure Simulation Package | FAILURE_SIM | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| Firmware Archives | - | ✓ | - | ✓ | - | ✓ | - | ✓ | - | - | ✓ | - | ✓ | - | - | - | - | - | - | - |
| Firmware Manager | - | - | - | ✓ | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | - |
| FlexRay Configuration Blockset | FLEXRAY_BUS | - | ✓ | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| FlexRay Configuration Tool | FLEXRAY_BUS | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| HighTec C Compiler for Freescale MPC5xxx | HIGHTECC_MPC5XXX | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| HighTec C Compiler for Infineon TriCore | HIGHTECC_TRICORE | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| HighTec C Compiler for Renesas V850/RH850 | HIGHTECC_V850X | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| Model Compare | MOC | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - |
| ModelDesk | MODELDESK | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ |
| Model Interface Package for Simulink | - | - | ✓ | ✓ | - | - | - | - | ✓ | - | ✓ | - | - | - | - | - | - | - | ✓ | ✓ |
| Model and Sensor Interface Blockset | - | - | ✓ | ✓ | - | - | - | - | ✓ | - | ✓ | - | - | - | - | - | - | - | ✓ | ✓ |
| MotionDesk | MOTIONDESK | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - |
| MotionDesk Animated Characters Library | MOTIONDESK_ANIM_CHAR | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - |
| MotionDesk SensorSim Camera Module | MOTIONDESK_SENSOR_CAM | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| MotionDesk SensorSim Lidar Module | MOTIONDESK_SENSOR_LIDAR | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - |
| MotionDesk SensorSim Radar Module | MOTIONDESK_SENSOR_RADAR | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | - | - |
| MotionDesk Blockset | - | - | - | ✓ | - | - | - | - | ✓ | - | ✓ | ✓ | ✓ | - | - | - | - | - | ✓ | ✓ |
| Platform API Package | PLATFORM_API | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - |
| QNX Compiler for dSPACE systems | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| Real-Time Testing | RTT | ✓ | - | - | - | ✓ | - | - | - | - | - | - | - | ✓ | - | - | - | ✓ | - | - |
| Real-Time Interface | RTI | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| Real-time libraries for dSPACE platforms | - | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI Bypass Blockset | EIF_BASE | - | - | - | - | - | - | ✓ | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI CAN Blockset | RTICAN_BS | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI CAN MultiMessage Blockset | RTICANMM_BS | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI E-Motor Control Blockset | RTI_EMC_BS | - | - | - | - | - | - - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI Ethernet I/O Package | RTI_ETHERNET_IO | - | - | - | - | - | | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI FPGA Programming Blockset | RTIFPGA_BS | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI FPGA Programming | RTIFPGA_HC | - | - | ✓ | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| Blockset Handcode Interface | | | | | | | | | | | | | | | | | | | | |
| RTI FlexRay Configuration Blockset | FLEXRAY_BUS | - | ✓ | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI LIN MultiMessage Blockset | RTILINMM_BS | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI Multiprocessor | RTI_MP | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI RapidPro Blockset | RTI_RP_BS | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI Synchronized Time Base Manager Blockset | - | - | ✓ | ✓ | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| RTI Watchdog Blockset | RTI_WATCHDOG_BS | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |
| Real-time libraries for MicroAutoBox III and SCALEXIO systems | - | - | - | ✓ | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ |
| Sensor Simulation | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - |
| SystemDesk Modeling Module | SYD_MOD | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - |
| SystemDesk V-ECU Generation Module | SYD_GEN | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - |
| TargetLink Base Suite | TBS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| TargetLink AUTOSAR Module | TAS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |

| Product | Order Number | Product Set | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AutomationDesk | Bus Support | ConfigurationDesk | ConfigurationDesk for RapidPro | ControlDesk | dSPACE AUTOSAR Compare | ECU Interface Software | Model Implementation Package for Simulink | Model Compare | Modeling Software | MotionDesk | Real-Time Interface | Real-Time Testing | Sensor Simulation | SystemDesk | TargetLink | Test Automation APIs | VEOS | Part of RCP and HIL software |
| TargetLink Adaptive AUTOSAR Module | TAAS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| TargetLink Module for MATLAB Code | TMMLC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| TargetLink Module for Operating Systems - OSEK | TMOS_OSEK | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| Target Optimization Module/C16x | TOM_C16X_TASKING | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| Target Optimization Module/SH2 | TOM_SH2_SHC | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| Target Optimization Module/Tricore | TOM_TRICORE_TASKING | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| TargetLink Simulation Module | TSM | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - |
| VEOS - AUTOSAR Adaptive Platform | VEOS_AAP | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| VEOS - Base | VEOS_BASE | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| VEOS - Virtual CAN | VEOS_CAN | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| VEOS - Virtual ECU | VEOS_ECU | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| VEOS - Virtual Automotive Ethernet | VEOS_ETH | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| VEOS - Virtual LIN | VEOS_LIN | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | ✓ | - |
| XCP Host Blockset | XCP_HOST_BS | - | - | - | - | - | - | - | - | - | - | - | ✓ | - | - | - | - | - | - | ✓ |

**SYNECT product sets**

The SYNECT setup (`Install_Synect.exe`) contains all products that are required to install and run SYNECT, including the required SYNECT servers. The available product sets (SYNECT, SYNECT Server, SYNECT License Server, Microsoft SQL Server Express for SYNECT) are usually not installed on a single PC. They are installed on separate PCs for clients, server and licenser server connected in a common network.

## Product Sets on DVDs

**Which product set is on which DVD?**

| Product Set | DVD 1 | DVD 2 |
|---|---|---|
| AutomationDesk | - | ✓ |
| Bus Support | ✓ | - |
| ConfigurationDesk | ✓ | - |
| ConfigurationDesk for RapidPro | - | ✓ |
| ControlDesk | - | ✓ |
| dSPACE AUTOSAR Compare | - | ✓ |
| ECU Interface Software | ✓ | - |
| Model Compare | - | ✓ |
| Model Impementation Package for Simulink | ✓ | - |
| Modeling Software | ✓ | - |
| MotionDesk | ✓ | - |
| Real-Time Interface | ✓ | - |
| Real-Time Testing | - | ✓ |
| Sensor Simulation | - | ✓ |
| SystemDesk | - | ✓ |
| TargetLink | - | ✓ |
| Testautomation APIs | - | ✓ |
| VEOS | ✓ | - |

| Product Set for SYNECT[1)] | DVD 1 | DVD 2 |
|---|---|---|
| SYNECT | - | ✓ |
| SYNECT License Server | - | ✓ |
| SYNECT Server | - | ✓ |
| Microsoft SQL Server Express for SYNECT Server | - | ✓ |

1) The product sets for SYNECT are accessible via `Install_SYNECT.exe`.

# What Do You Want To Do?

## What Do You Want To Do?

**Overview of possible tasks**

The following table gives you an overview of possible tasks and guides you to the respective source of information.

| What Do You Want To Do? | | Required dSPACE Tool | Refer To ... | |
|---|---|---|---|---|
| Install dSPACE Software | Install dSPACE software initially | dSPACE Setup | How to Install dSPACE Software on page 39 | This document |
| | Add software to an existing installation | | | |
| | Install patches | | How to Install dSPACE Software Patches on page 43 | |
| | Install dSPACE software automatically in unattended mode on multiple host PCs | | How to Install dSPACE Software Automatically on Multiple Host PCs in Unattended Mode on page 63 | |
| | Install dSPACE Bypassing Services | | Installing dSPACE Bypassing Services on page 45 | |
| Use dSPACE software on virtual machines | | — | Using dSPACE Software on Virtual Machines (VMs) on page 47 | |
| Handle dSPACE licenses (CodeMeter licensing technology) | Activate dSPACE licenses | dSPACE Installation Manager | License Activation | Working with CodeMeter Licensing Technology 🕮 |
| | Deactivate dSPACE licenses | | License Deactivation | |
| | Update dSPACE licenses | | License Update | |
| | Borrow licences | | License Borrowing | |
| | Migrate dongles | | Dongle Migration | |
| | Work with floating network licenses: Establish | | How to Set up the dSPACE License Server | |
| | | | How to Set up a Connection Between Client and Server | |

| What Do You Want To Do? | | Required dSPACE Tool | Refer To ... | |
|---|---|---|---|---|
| | connection between server and client | | | |
| Decrypt encrypted archives of dSPACE software installations | | dSPACE Installation Manager | How to Decrypt Encrypted Archives of dSPACE Software Installations | Managing dSPACE Software Installations 🕮 |
| Manage dSPACE installations | View details of dSPACE software installations | dSPACE Installation Manager | How to View dSPACE Installations and Installed Products | Managing dSPACE Software Installations 🕮 |
| | Change the connection between dSPACE software and a MATLAB installation | | How to Change the MATLAB Connection | |
| | Activate a dSPACE installation | | How to Activate a Single dSPACE Installation | |
| Remove dSPACE software | Remove single dSPACE products sets | dSPACE Setup | How to Remove Product Sets of dSPACE Release 2021-A on page 54 | This document |
| | Remove the complete dSPACE Release 2021-A | | How to Remove the Complete dSPACE Release 2021-A on page 57 | |
| | Remove dSPACE software automatically in unattended mode | | How to Remove the Complete dSPACE Release 2021-A Automatically in Unattended Mode on page 67 | |
| Troubleshooting | | — | Checking dSPACE Installations on page 71 | |
| | | dSPACE Setup | How to Repair a dSPACE Software Installation as of dSPACE Release 2017-B on page 73 | |
| Collect diagnostic information for dSPACE Support | | dSPACE Installation Manager | How to Collect Diagnostic Information via dSPACE Installation Manager | Providing Diagnostic Information 🕮 |

# Before You Start

**Motivation**

Before starting the installation, you should familiarize yourself with the installation workflow. You also have to check if the preconditions and required settings for a proper installation are met.

**Where to go from here**

Information in this section



## Installation Workflow

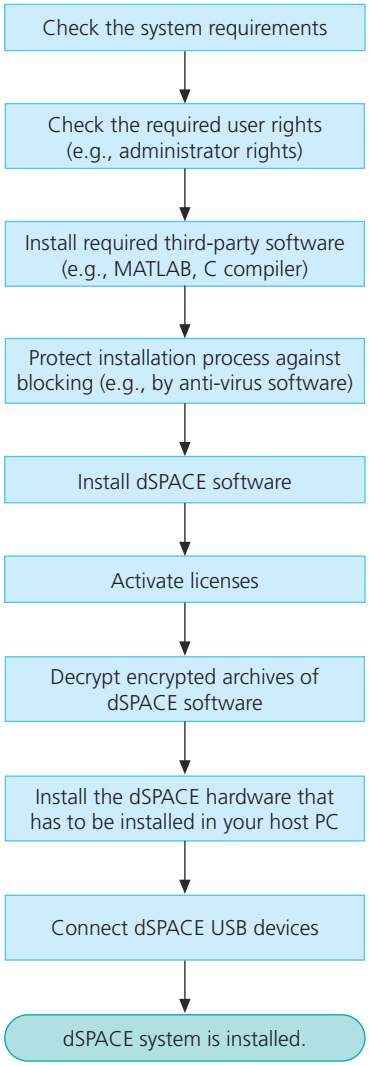
**Installation workflow**

***NOTICE***

Changing the installation sequence might lead to unpredictable results or even corrupted the software installation.

- Read the instructions carefully before starting an installation. Install the components of your system in exactly the order specified.
- Observe all warnings that are given.
- Do not install dSPACE hardware in the host PC (e.g., DS81x link boards, DS1104) or connect dSPACE USB devices (e.g., RapidPro hardware) before software installation is completed. Failing to do so will cause problems with assigning dSPACE device drivers correctly.

The following flow chart shows the installation sequence required for installing dSPACE software.




**License activation** After software installation, license activation is necessary to run license-protected dSPACE software. Use dSPACE Installation Manager for activating licenses. Refer to License Activation (Working with CodeMeter Licensing Technology 🕮).

**Decryption** To use the full functionality of the installed dSPACE software, you have to decrypt the files which are installed in encrypted archives. You can only decrypt parts of the dSPACE installation for which you have licenses. Use dSPACE Installation Manager for decrypting them. Refer to Decrypting Encrypted Archives of dSPACE Software Installations (Managing dSPACE Software Installations 🕮).

# Notes on Installing and Using Third-Party Software

**Required third-party software**

Some dSPACE products require specific third-party products to be installed first to ensure correct operation and full functionality. Refer to Overview of Required Third-Party Software on page 85.

**Note**

Though it is possible to install third-party software after dSPACE software, it is strongly recommended to install it before you install dSPACE software.

**Providing legal notes for using third-party software**

Several dSPACE software products of dSPACE Release 2021-A use or contain third-party software. The third-party components may be subject to additional terms and conditions or terms and conditions that deviate from the ones that apply to the dSPACE software. Copyright notices and license terms of third-party components must be adhered to. If the user is required to be explicitly informed of and to comply with the terms and conditions of third-party components, the relevant information on terms and conditions is stated in separate OSSAcknowledgements files for each dSPACE product.

You can find the OSSAcknowledgements files as follows:

- In the **Legal** folders accessible via the root directory on both dSPACE DVDs and the root directory of the downloaded installation files (mounted ISO images or unpacked ZIP files).
- After you install the dSPACE software in the **<main installation path of dSPACE Setup>\<subfolder of InstallationSet>\Legal** folder.

**Enabling Windows 8dot3name creation option**

**Note**

It is strongly recommended that the Windows **8dot3name creation** option is enabled for all drives (drives used for installation and drives used for work) before you install third-party software, such as MATLAB®/Simulink®, and the dSPACE software.

If the option is disabled during software installation, serious errors can occur when you run the dSPACE software. For example, the build process might be aborted. To repair an installation that was installed while the **8dot3name creation** option was disabled, you have to install dSPACE software and required third-party software again.

For instructions on checking the setting and enabling the option, refer to http://www.dspace.com/faq?346 or to the Microsoft Windows documentation.

**Settings in Windows for user locale and system locale must match**

MATLAB reads the user locale and system locale settings that are specified in Windows operating systems. The user locale and the system locale must match. If these settings are not the same, the system might not behave as expected when working with MATLAB and dSPACE software.

For instructions on checking and changing the settings, refer to https://www.mathworks.com/help/matlab/matlab_env/setting-locale-on-windows-platforms.html?s_tid=gn_loc_drop.

This affects all MATLAB versions and all Windows operating systems, that are supported by dSPACE.

**Modify rights for MATLAB startup file required**

If you want to work with dSPACE software that requires MATLAB, the dSPACE software must be integrated into a MATLAB installation. Only integrated dSPACE software is prepared for use with MATLAB.

For this, dSPACE Setup modifies the MATLAB startup file of the MATLAB installation during installation or later by changing the integration (via dSPACE Installation Manager).

When MATLAB starts, it automatically executes the `matlabrc.m` file. dSPACE Setup and dSPACE Installation Manager try to modify this file by adding the `dspacerc` function call to the script.

dSPACE software does not check whether MATLAB is installed on a network drive or locally on your host PC. You must have modify rights for the `matlabrc.m` file and the MATLAB folder that contains it:

- If you do not have modify rights, dSPACE Setup and dSPACE Installation Manager cannot integrate dSPACE software and display an error message.
- If you have modify rights, dSPACE Setup and dSPACE Installation Manager modify `matlabrc.m` automatically.

## Required User Rights

**Required rights for software installation**

You need unrestricted administrator rights to install dSPACE software and manage dSPACE installations.

You can check whether your user account has administrator rights in the followings ways:

- Via the Control Panel of your operating system.

  From **Start** – **Windows System** – **Control Panel** – **User Accounts**, select **Change account type**.

  If your user name is associated with the *Administrators* group, you have administrator rights.

- Via dSPACE Installation Manager.

  From **Start – dSPACE Installation Manager**, select **dSPACE Installation Manager**.

  Check the status bar of dSPACE Installation Manager at the bottom of the screen.

  If the status bar is red and displays **Restricted**, you do not have unrestricted administrator rights.

**Required rights for license activation and decryption**

License activation and decryption of encrypted parts of the dSPACE software does not require administrator rights. Therefore users without administrator rights can perform these steps themselves.

**Required rights for integrating into MATLAB**

If you want to work with dSPACE software which requires MATLAB, dSPACE software must be integrated into a MATLAB installation. To support this, modify rights are required for the MATLAB startup file. Refer to Notes on Installing and Using Third-Party Software on page 33.

**Required rights for MotionDesk and ModelDesk**

To change objects in the 3-D object library as a user with restricted rights, you need write access to the library root folder.

This is necessary because objects in the library are also modified if you work with the ModelDesk Road Generator or ModelDesk Traffic Editor.

## Protecting the Installation Process Against Blocking

**Motivation**

To ensure that the installation finishes without blocking or interruptions, you have to specify some settings before you start the setup. In particular, this is required in the following cases:

- To automatically shut down the host PC after the installation. This lets you complete software installation without having to be physically present.
- To install dSPACE software in the setup's unattended mode.

**Disabling system protection software**

Make sure that the installation is not blocked by system protection software like Windows Defender, firewalls, or anti-virus software. It is recommended to disable this software (except Windows Firewall) during installation.

**Required settings for decrypting dSPACE Help**

After you installed dSPACE software, Help contents cannot be decrypted if document encryption for `.doc` files is enabled on your host PC via a digital rights management (DRM) system. If you cannot remove this security setting, you have

to define an exception for the following files, for example, by adding them to the related whitelist of your DRM system:

- C:\Program Files\Common Files\dSPACE\HelpDeskAccess\bin\HelpInstaller.exe
- C:\Program Files\Common Files\dSPACE\HelpDeskAccess\bin\HelpInstallerHandler.exe

**Avoiding power-saving states**

The installation process must not be interrupted by your host PC activating a power-saving state triggered by a user action or by Microsoft Windows. An interrupted dSPACE installation process cannot be continued after you have started your host PC again. It is recommended to disable all power-saving states, for example, the sleep or the hibernation state during installation.

**Enabling Windows 8dot3name creation option**

**Note**

It is strongly recommended that the Windows **8dot3name creation** option is enabled for all drives (drives used for installation and drives used for work) before you install third-party software, such as MATLAB®/Simulink®, and the dSPACE software.

If the option is disabled during software installation, serious errors can occur when you run the dSPACE software. For example, the build process might be aborted. To repair an installation that was installed while the **8dot3name creation** option was disabled, you have to install dSPACE software and required third-party software again.

For instructions on checking the setting and enabling the option, refer to http://www.dspace.com/faq?346 or to the Microsoft Windows documentation.

**Disabling Windows User Account Control (UAC)**

It is recommended to disable Windows User Account Control (UAC) during the installation of dSPACE software. If you cannot disable it, note the following Windows behavior:

- If UAC is enabled, the setup programs run with the administrator account instead of the user account. Therefore, it is important that the administrator account has access to the required drives, particularly to the required network drives.
- If a device driver installation is necessary, the system might display messages for the device drivers asking if you want to install the software. Select **Always trust software from...** and click **Install**. If you do not click **Install** and therefore abort the driver installation, the dSPACE software will not work correctly. For information on suppressing security warnings, refer to the following section.

# Installing Root Certificates Required for dSPACE Software

## Introduction

As of dSPACE Release 2020-B, all dSPACE executable files are digitally signed with a dSPACE certificate. To check this certificate, a valid chain of trust must be established on the PC on which the dSPACE software is installed. Part of the chain of trust are root certificates, which are available from trusted certification authorities and are installed via the Windows update mechanism.

**Note**

- If the dSPACE software is installed on a PC with Internet access, the root certificates are automatically installed on the PC via the Windows update mechanism. No further user actions are required.
- If you want to install dSPACE software on a PC without an Internet connection, the root certificates must be installed manually on your PC. dSPACE strongly recommends installing the certificates before installing the dSPACE software. It is possible that the security software installed on your PC blocks the installation of the dSPACE software if no root certificates are available on your PC.

## Checking already installed certificates

You can check if the required certificates are already installed on your PC via the Certificate Manager of Windows. In the Trusted Root Certification Authorities folder, the following four entries must be displayed among others:

- Certum Trusted Network CA
  Serial number: 04:44:c0
- GlobalSign Root CA
  Serial number: 04:00:00:00:00:01:15:4b:5a:c3:94
- VeriSign Universal Root Certification Authority
  Serial number: 40:1a:c4:64:21:b3:13:21:03:0e:bb:e4:12:1a:c5:1d
- AAA Certificate Service
  Serial number: 01

**Tip**

To access the Certificate Manager, type `certmgr.msc` in the search field of the Windows taskbar, and press Enter.

## Installing certificates manually on PC with dSPACE software

If the dSPACE software is installed on a PC without an Internet connection, and the above listed certificates are not already installed on your PC, you have to download and install the required root certificates manually.

1. Download the following four root certificates:
   - From Certum:
     https://www.certum.eu/en/cert_expertise_root_certificates/#id2

Select the certificate with the serial number 0444C0 in the CRT format.

- From GlobalSign: https://support.globalsign.com/ca-certificates/root-certificates/globalsign-root-certificates

  Select the certificate with the serial number 04:00:00:00:00:01:15:4b:5a:c3:94 in the CRT format (= **Binary/DER Encoded** option).
- From VeriSign: https://symantec.tbs-certificats.com/vsign-universal-root.crt

  The link leads directly to the certificate.
- From Sectigo: http://crt.comodoca.com/AAACertificateServices.crt

  The link leads directly to the certificate.

2. Open each of the downloaded files, for example, by double-clicking.

   The related Certificate window opens. Complete the following steps for each required root certificate.
3. On the **General** page, click the **Install Certificate** button.

   The **Certificate Import Wizard** opens.
4. Select either **Current User** or **Local Machine** (recommended setting) as store location and click **Next**.

   **Tip**

   To use the local machine as store location, administrator rights are required.
5. Select **Place all certificates in the following store**.
6. Search and select the **Trusted Root Certification Authorities** store via the **Browse** button and click **OK**.
7. In the **Certificate Import Wizard**, click **Next**.

   An information window with the setting you have made is displayed.
8. Click **Finish**, to import the root certificate to the selected store.

**Installation of dSPACE certificates in unattended mode**

After downloading, you also can install the dSPACE certificates in unattended mode. However, this is only available for the **Local Machine** store and can be done as follows:

Open the administrative Command Prompt window and enter: `certutil.exe -addstore -enterprise -f -v root <Path to certificate file>`

# Installing dSPACE Software Products

**Where to go from here**

Information in this section



Information in other sections



## How to Install dSPACE Software

**Objective**

To install dSPACE software, use dSPACE Setup. With dSPACE Setup, you can initially install dSPACE software and modify an existing dSPACE installation: Modify means adding a new software product (and the associated product set) or removing installed product sets in one step.

**Installation from merged data**

If you want the PC to shut down after the installation without having to be physically present, it is recommended to install the dSPACE software from a merged folder. Therefore, copy the contents of both dSPACE DVDs to a common folder on the PC or network drive. This enables you to install product sets from both DVDs in one step without changing the medium.

**Tip**

You can also download the complete content of both DVDs as a merged ZIP file from the dSPACE website.

**Installation folder**

The installation folder must not be a subfolder of an existing dSPACE installation.

As of dSPACE Release 2017-B, you have to specify only the main installation path. dSPACE Setup then creates the required subfolders for the dSPACE installations. Some dSPACE tools have fixed installation paths that differ from the specified main installation path.

**Automatic installation of basic software**

Required basic software is automatically installed if the software is not on your PC yet, for example:

- Microsoft .NET Framework 4.8
- Microsoft Visual C++ 2012 Redistributable: Installed for dSPACE products that require the software.
- Python 3.9: Installed for dSPACE products that require Python.

**Preconditions**

- Your host PC meets specific requirements. Refer to Appendix: System Requirements on page 76.
- Your host PC has Internet access during installation of the software. If you want to install dSPACE software on a PC without an Internet connection, you have to manually install specific root certificates on the PC before installing the dSPACE software. Refer to Installing Root Certificates Required for dSPACE Software on page 37.
- The host PC has an Internet connection during installation of the software. If you want to install dSPACE software on a PC without an Internet connection, you have to manually install specific root certificates on the PC before installing the dSPACE software. Refer to InstallingRootCertificates.
- The required third-party software is installed. Refer to Notes on Installing and Using Third-Party Software on page 33.
- You have unrestricted administrator rights. For other required rights, refer to Required User Rights on page 34.
- The installation process is not blocked. Refer to Protecting the Installation Process Against Blocking on page 35.
- You have access to the source media, e.g., dSPACE DVDs or downloaded installation files.

**Method**

**To install dSPACE software**

1 Close all running programs and finish all runnings deinstallation processes before installation.

2 Start dSPACE Setup.

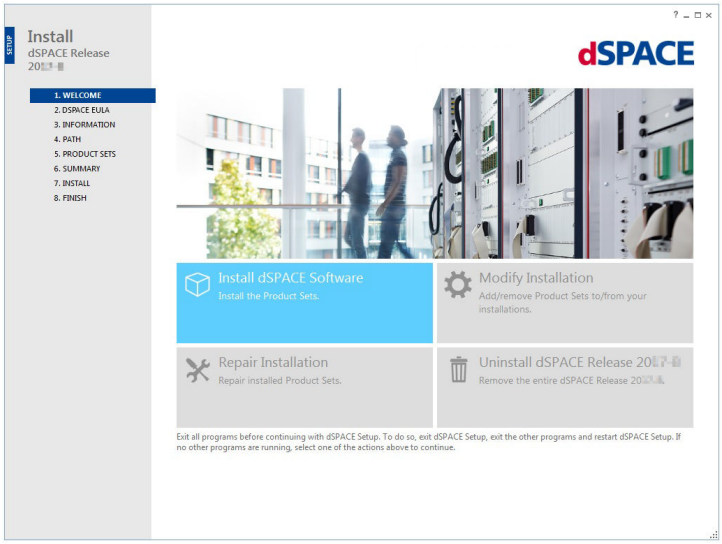
| Install Software Initially | Add and/or Remove Software |
|---|---|
| Execute `Install_Release.exe`.<br>You can access dSPACE Setup as follows:<br>▪ Via the root directory on both dSPACE DVDs.<br>▪ Via the root directory of the downloaded installation files (mounted ISO images or unpacked ZIP files) | From Start – Windows System – Control Panel – Programs and Features, double-click dSPACE Release 2021-A |

**Note**

Some dSPACE products have their own setup program, which can be identified by their names:
- SYNECT (`Install_Synect.exe`)
- dSPACE tools that can be downloaded from the dSPACE website as separate software packages (e.g., `Install_Profiler.exe`)

The features, the workflow, and the design of the setup programs are always the same.

dSPACE Setup starts.

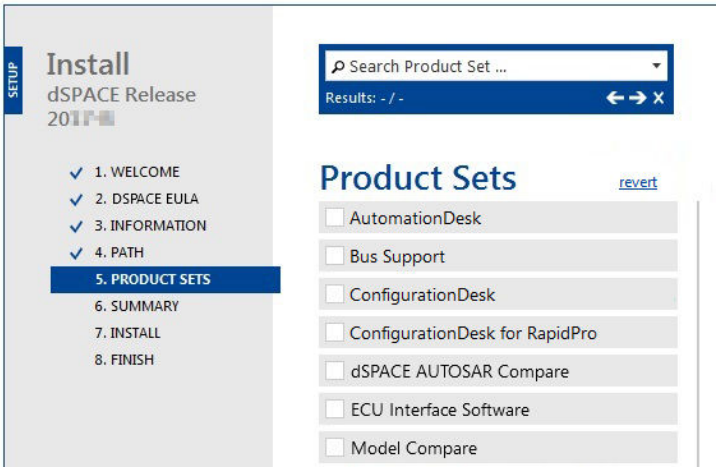



Depending on existing dSPACE software on your host PC, only one of the installation options is available (install software initially or modify an existing dSPACE installation).

3 Depending on your use case, select from the following options:

| Install Software Initially | Add and/or Remove Software |
|---|---|
| Select Install dSPACE Software. | Select Modify Installation. |
| Specify the main installation path. | - |

4 Select the product sets you want to install.




A check mark in a checkbox indicates product sets to be installed.

Valid for Modify Installation:

- Product sets with a blue dot are already installed and will remain installed. Clicking a blue dot changes it to a red X and selects a product set for being removed.
- If a product is contained in multiple product sets, it will not be removed until you remove the last product set that contains it.

**Tip**

If you are not sure which product set contains the product you want to add and/or remove, locate it via the search field. Type the product name into the field (Search Product Set ...) at the top of the window.

5 Click Next.

The Summary page opens.

6 Select the options to be executed after the installation has finished, i.e., select Shut down after ... and/or clear Start Installation Manager after ....

**Tip**

You can still change your selection after you have started the installation process.

7 Click Start to begin dSPACE software installation.

8 When prompted, restart your host PC.

**Note**

In some cases, the installation of dSPACE Help is not complete when you are prompted. Check the installation status and wait before restarting the PC. However, if you restart the PC before installation is complete, the installation of dSPACE Help is continued and then finishes without errors.

9 Log on as the same user directly after restart. This allows the system to complete the installation correctly. If you must log on with administrator rights, dSPACE Setup prompts you to do this.

**Tip**

If the Windows auto logon functionality is enabled on your PC, press the **Shift** key directly after restarting your PC, and hold the key until the logon screen opens. This lets you log on as the same user with administrator rights.

10 Go to http://www.dspace.com/go/patches and check the website for patches for your dSPACE installation.

11 Download and install the available patches. Refer to How to Install dSPACE Software Patches on page 43.

12 If applicable: Install dSPACE solutions. For instructions, refer to the documentation of the solution.

**Result**

You installed or modified dSPACE software.

**Next steps**

To work with your installed software, you have to activate the required licenses. For this, use dSPACE Installation Manager. Refer to License Activation (Working with CodeMeter Licensing Technology 🕮).

After the required licenses are activated, you have to decrypt encrypted software archives of your dSPACE installation. For this, use dSPACE Installation Manager. Refer to Decrypting Encrypted Archives of dSPACE Software Installations (Managing dSPACE Software Installations 🕮).

## How to Install dSPACE Software Patches

**Objective**

Software patches usually contain bug fixes for your dSPACE software.

**Keeping your dSPACE installation up to date**

To keep your dSPACE installations up to date, dSPACE strongly recommends that you visit our website at http://www.dspace.com/go/patches periodically and download and install the most recent software patches.

**Required tasks after installing software patches**

After the dSPACE installation was updated with a software patch, check if dSPACE Installation Manager displays "Out of Date" archives on the Encrypted Parts page. In this case, you have to run the decryption process again for the patched installation.

**Notes on removing patches**

To remove patches or hotfixes of a specific dSPACE Release, you need the related dSPACE software source media during the removal process, such as the dSPACE DVD set or the merged contents of both DVDs.

After removing software patches, you also have to check if you have to run a decryption process again. This is the case if dSPACE Installation Manager displays files as out of date.

**Preconditions**

- You have administrator rights.
- The dSPACE product for which you want to install the software patch is installed on your host PC.
- Depending on the patch, the dSPACE installation that contains the product to be updated must be the active installation. In this case, the patch setup informs you that you have to activate the corresponding installation first. For instructions on how to activate an installation, refer to How to Activate a Single dSPACE Installation (Managing dSPACE Software Installations 🕮).

**Method**

**To install dSPACE software patches**

1. Go to http://www.dspace.com/go/patches.
2. Check for patches for your current dSPACE installation.
3. Download and install available patches.
4. When prompted, restart your host PC.

**Result**

The dSPACE installation is updated with the software patches.

**Next steps**

Check, if you have to run a decryption process again with dSPACE Installation Manager. Refer to Decrypting Encrypted Archives of dSPACE Software Installations (Managing dSPACE Software Installations 🕮).

# Installing dSPACE Bypassing Services

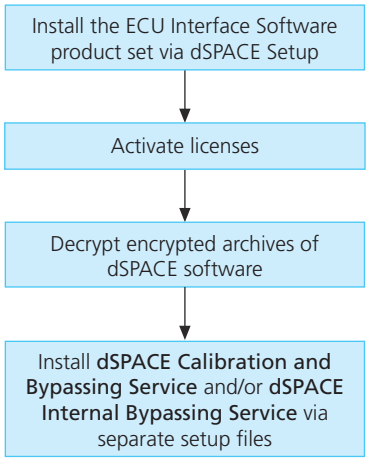
**Motivation**

Before you can use the dSPACE Calibration and Bypassing Service and/or dSPACE Internal Bypassing Service, you have to install them in separate steps after you have installed the related product set (ECU Interface Software) via dSPACE Setup.

The bypassing services are installed encrypted on your host PC. Their setup programs are not available until you have decrypted their installation files.

**Workflow**

The following flowchart shows the required sequence required to install dSPACE Calibration and Bypassing Service and/or dSPACE Internal Bypassing Service.




**Accessing setup programs**

After decryption, the following setup files reside in the `%ProgramData%\dSPACE\<InstallationGUID>\dsECU\Services` folder:

- `dSPACECalibrationAndBypassingService_<version>.exe`
- `dSPACEInternalBypassingService_<version>.exe`

**Tip**

You can access the `<InstallationGUID>` folder via the shortcut in the Windows Start menu.
Select Start – dSPACE RCP and HIL 2021-A – RCP and HIL 2021-A ProgramData Folder.

**Installation**

Start the setup program and follow the instructions on the screen.

**Note**

You can select any existing folder as the installation folder or create a new one. Write permission for the installation folder is required.

# Installation Notes for the SYNECT Server

**Scenarios for working with a SYNECT server**

You can use the SYNECT server and SYNECT in the following scenarios:

| Scenario | Description |
|---|---|
| Development server | The SYNECT server and SYNECT are installed on the same PC. The SQL Server Express installation, which can be installed via dSPACE Setup is used as a database.<br>This scenario is useful for quick installation and configuration, testing, and development purposes. Do not use this scenario to cooperate with a large number of other users or work with large amounts of data.<br>For instructions on a quick server configuration, refer to Getting Started with the SYNECT Server (The SYNECT Server Guide 🕮). |
| Production server | The SYNECT server is installed on a server PC. SQL Server is used as a database. For supported versions, refer to Third-Party Software for SYNECT and SYNECT Server on page 94. Typically, the system administrator installs and configures the SYNECT server.<br>Refer to Configuring Servers (The SYNECT Server Guide 🕮). |
| Integrating system models | If you want to use SYNECT solely for integrating system models and for building OSA files, it is sufficient to install and configure the SYNECT server as a development server.<br>Use a production server for all other use scenarios. |

**Microsoft SQL Server 2017 Express installation**

The dSPACE Setup provides an installation of Microsoft SQL Server 2017 Express, which you can use as pre-installed database for development servers.

You can install this preconfigured version by selecting the **Microsoft SQL Server Express for SYNECT Server** product set during setup. In this case, the database is installed together with the SYNECT server.

Do not install SQL Server 2017 Express if you want to perform one of the following tasks:

- Install the SYNECT server for a production server.

  In this case, install a supported version of SQL Server. Refer to the table above.

**Note**

Do not install SQL Server 2017 Express on a PC with a server operating system such as Microsoft Windows Server 2016.

- Install the SYNECT server on a PC with a previously installed SQL Server 2017 Express installation, e.g., for migration scenarios.

  In this case, use the existing version as the SYNECT database.

**Removing a SYNECT server** If you installed the SQL Server 2017 Express with the SYNECT server the databases that you created with SQL Server 2017 Express and the runtime are not removed when you remove the SYNECT server.

You can uninstall the SQL Server 2017 Express runtime via **Programs and Features** from the Windows Control Panel if it is no longer required by other (non-dSPACE) software installed on your PC.

**Problems when installing Microsoft SQL Server Express for SYNECT Server** The installation of Microsoft SQL Server Express for SYNECT Server might not complete in the following cases:

- The installation of Microsoft SQL Server 2017 Express for SYNECT Server might not complete if SQL Server 2012 Native Client is installed.
- The installation of Microsoft SQL Server Express for SYNECT Server cannot be completed if the Windows service **Windows Modules Installer** is stopped.

For solutions, refer to Troubleshooting (The SYNECT Server Guide 🕮).

# Using dSPACE Software on Virtual Machines (VMs)

**Introduction**

You can operate several dSPACE products installed on virtual machines. However, some dSPACE products support VMs only with limitations, and other dSPACE products cannot be operated on VMs at all.

**Usage restrictions**

**Note**

The dSPACE End User License Agreement (EULA) prohibits:

- Using a virtual machine for circumventing license protection mechanisms, for multiple use of an acquired license or for use outside the use determined by the license type.
- Accessing dSPACE software via Internet or network applications (e.g., Citrix, Microsoft Remote Desktop or other terminal/device servers) or to grant such access to third parties.

If you have any questions or encounter any problems, contact dSPACE Support (www.dspace.com/go/supportrequest).

**Recommended virtual machine software**

dSPACE tests the functionality of dSPACE software products with current VMware products and VM hardware compatibility version 10 and version 13.

You can use Windows, Linux, or macOS® as the host operating system.

### Support of dSPACE software on virtual machines

**Note**

The following table shows the compatibility for all dSPACE products. For products that support VMs with limitations, the known limitations are listed. For these products, further limitations might apply depending on the use case.

| Product | Full Support | Support with Known Limitations | | No Support |
|---|---|---|---|---|
| ASM | ✓ | — | | — |
| AutomationDesk | — | ✓ | Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| Bus Manager | ✓ | — | | — |
| ConfigurationDesk for RapidPro | ✓ | — | | — |
| ConfigurationDesk | ✓ | — | | — |
| Container Manager | ✓ | — | | — |
| ControlDesk | — | ✓ | Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| Data Dictionary Manager | ✓ | — | | — |
| DCI-GSI Configuration Package | ✓ | — | | — |
| dSPACE AUTOSAR Compare | ✓ | — | | — |
| dSPACE Installation Manager | ✓ | — | | — |
| ECU Flash Programming Tool | ✓ | — | | — |
| ECU Interface Base Package | ✓ | — | | — |
| ECU bypassing target compiler | ✓ | — | | — |
| Failure Simulation Package | — | ✓ | Supported only in combination with the VEOS platform. Combinations with other platforms are not tested and therefore not released for use on VMs. | — |
| Firmware Archives<br>Firmware Manager | — | ✓ | Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| FlexRay Configuration Tool | ✓ | — | | — |

| Product | Full Support | Support with Known Limitations | No Support |
|---|---|---|---|
| Model Compare | ✓ | — | — |
| ModelDesk | — | ✓ Known limitations:<br>▪ The Traffic Object Manager cannot show custom sensor points in the preview.<br>▪ Plotting occasionally does not start if a start trigger is used. | — |
| Model Interface Package for Simulink | ✓ | — | — |
| MotionDesk | — | — | ✓ [1] |
| Platform API Package | — | ✓ Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| Real-Time Testing | — | ✓ Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| RTI Blocksets (Real-Time Interface) | — | ✓ Known limitations:<br>▪ Access to DS1006 modular systems via dSPACE link boards is not possible.<br>▪ Access to DS1006 modular systems via Ethernet connection and slot CPU: Communication and therefore the performance is very low.<br>▪ Access to DS1104 R&D Controller Boards is not possible. | — |
| Sensor Simulation | — | — | ✓ [1] |
| SYNECT | ✓ | — | — |
| SYNECT Server | ✓ | — | — |
| SYNECT License Server | ✓ | — | — |
| SystemDesk | ✓ | — | — |
| TargetLink | ✓ | — | — |
| VEOS | ✓ [2] | — | — |

[1] VMs do not fulfill the requirements for graphics adapters.

[2] If you want to simulate adaptive AUTOSAR V-ECUs, refer to Hypervisor Requirements for Adaptive V-ECU Simulation (VEOS Manual 🕮).

### Required knowledge for setting up a virtual machine

To set up a virtual machine, you must have knowledge about the technology of VMs.

In virtual environments, significantly higher latencies and lower network performance (network throughput) must be expected compared to physical PCs. dSPACE has no influence on this.

**Using virtual machines in parallel** If you use multiple VMs simultaneously on one PC, sharing of host resources such as CPU, network, and disk I/O bandwidth can cause timing issues. dSPACE recommends using a physical PC if high performance is required by an application.

## Using a virtual machine on the host PC

**System requirements** PCs that host virtual machines with dSPACE software, must meet at least the requirements listed in Appendix: System Requirements on page 76. You are recommended to use a PC with more resources so that the software runs smoothly on a VM, because the VM software itself uses up some of the resources:

- The CPU speed and RAM size must be sufficient to run the operating system and the software on the host PC as well as the guest operating system and the application software on the VM.
- You also require sufficient free disk space to install the VM software and the software you want to run, just as you would if you were installing it directly on your PC.

**Connecting dongle-based devices** If you use dongle-based single-user licenses to use dSPACE software, you first have to connect the CmDongle to the host PC. Then you have to connect the **WIBU-Systems CodeMeter-Stick** device to the virtual machine on the host PC. For instructions, refer to the documentation of the VM software you use.

**Using floating network licenses** If you use floating network licences, the virtual machine requires access to the dSPACE License Server. For further instructions, refer to How to Set up a Connection Between Client and Server (Working with CodeMeter Licensing Technology 🕮).

**Optimal display of dSPACE Help** For an optimal display of the content in dSPACE Help, you have to activate the **ClearType** setting in the VM (= default setting).

You can access this setting via the Windows Start menu (**Start – Control Panel – Appearance and Personalization – Display – Adjust ClearType text**).

## Using the 'Revert to snapshot' feature

***NOTICE***

**Using the 'Revert to snapshot' feature causes licenses to become invalid.**

If you use the 'Revert to snapshot' feature in a VM, all software-based CmContainers on your host PC (dSPACE Activation Container and/or dSPACE Borrow Container) become invalid and the contained licenses are lost.

- Do not use the 'Revert to snapshot' feature for VMs that contain software-based CmContainers with activated licenses.
- Store the license information on CmDongles. There, the CmContainers do not become invalid after use the 'Revert to snapshot' feature.

### Moving the virtual machine to a host PC with a different hardware configuration

***NOTICE***

**Moving the virtual machine to a PC with a different hardware configuration causes licenses to become invalid.**

If you move your virtual machine to a host PC with a different hardware configuration, all software-based CmContainers on your host PC (dSPACE Activation Container and/or dSPACE Borrow Container) become invalid and the contained licenses are lost. This happens, for example, if the CPU type of the physical PC changes.

- Do not move a virtual machine that contains software-based CmContainers with activated licenses to a host PC with a different hardware configuration.
- Store the license information on CmDongles. There, the CmContainers do not become invalid after the virtual machine is moved.
- However, if moving the virtual machine is absolutely necessary, contact dSPACE Support (www.dspace.com/go/supportrequest) beforehand to find solutions that can avoid major downtimes.

# Removing dSPACE Software

**Where to go from here**

Information in this section



Information in other sections



## Notes on Removing dSPACE Software

**Removal only on product set level**

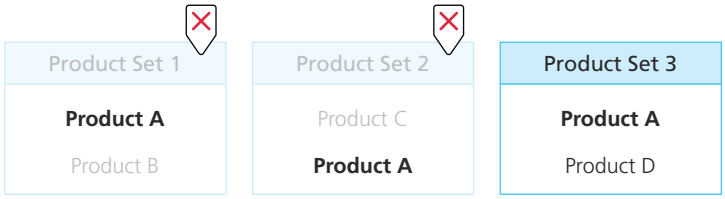
As of dSPACE Release 2017-B, dSPACE software is installed in larger units, called product sets. Therefore, you can uninstall software only on the product set level. It is not possible to remove single products.

If you want to remove a specific software product from your host PC, you have to remove the related product set(s).

**Note**

Before removing a product set, check which products are contained in the set to ensure that you do not to remove any product you still need.

dSPACE Setup does not remove a product as long as it is used by another installed product set. Products are not installed multiple times.




As shown in the example, a product that is to be removed (for example, Product A) might be included in multiple installed product sets. If you remove Product Sets 1 and 2, Product A remains on your host PC until you remove the last product set containing Product A (e.g., Product Set 3).

For an overview of available product sets and the contained products, refer to Mapping Between Products and Product Sets on page 19.

**Effects of removing dSPACE software as of dSPACE Release 2017-B**

If you remove one or several products sets, the complete dSPACE installation folder (as shown in the Path field in dSPACE Installation Manager) might be deleted. In this case, the following applies.

If the dSPACE installation folder is not empty after you remove software, because it contains modified files or user files, dSPACE Setup does the following:

- It renames the initial installation folder to `<Name of Installation>_UninstalledButNotEmpty`, e.g.,: `dSPACE ControlDesk 6.2_UninstalledButNotEmpty`.
- It packs all the files in the folder to a ZIP archive below the renamed folder.

If you need the archived files later, you can manually extract the archive and copy the files back to the installation folder after installing the dSPACE software again. If you do not need the files any longer, manually delete the backup folders.

**Removing software from dSPACE Release 2017-A and earlier**

For the methods and more information on removing software from dSPACE Release 2017-A and earlier, refer to the *Software Installation and Management Guide* of the related dSPACE Release.

## How to Remove Product Sets of dSPACE Release 2021-A

**Objective**

To remove a specific software product from dSPACE Release 2021-A, you have to remove the related product sets. It is not possible to remove single products.

**Tip**

You can also remove all products sets with one click. To do this, you have to use the setup's **Uninstall dSPACE Release 2021-A** functionality. Refer to How to Remove the Complete dSPACE Release 2021-A on page 57.

**Preconditions**

- You have unrestricted administrator rights.
- All dSPACE products, dSPACE Installation Manager and MATLAB are closed.
- You have access to the source media, e.g., dSPACE DVDs or downloaded installation files.

**Method**

**To remove product sets of dSPACE Release 2021-A**

1 Disconnect all dSPACE USB devices (e.g., RapidPro hardware) from your system.

2 From the **Start - Control Panel** menu, select **Programs and Features** and double-click **dSPACE Release 2021-A**.

dSPACE Setup starts.

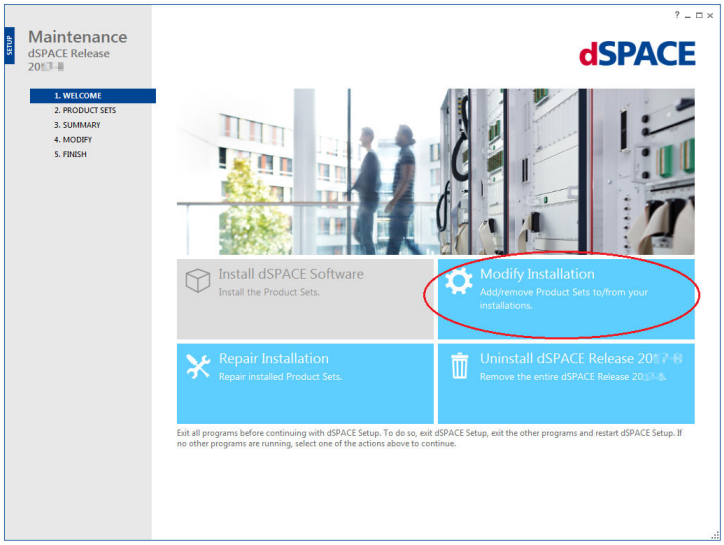
**Note**

Some dSPACE products have their own entries in the **Programs and Features** folder, which can be identified by their names:

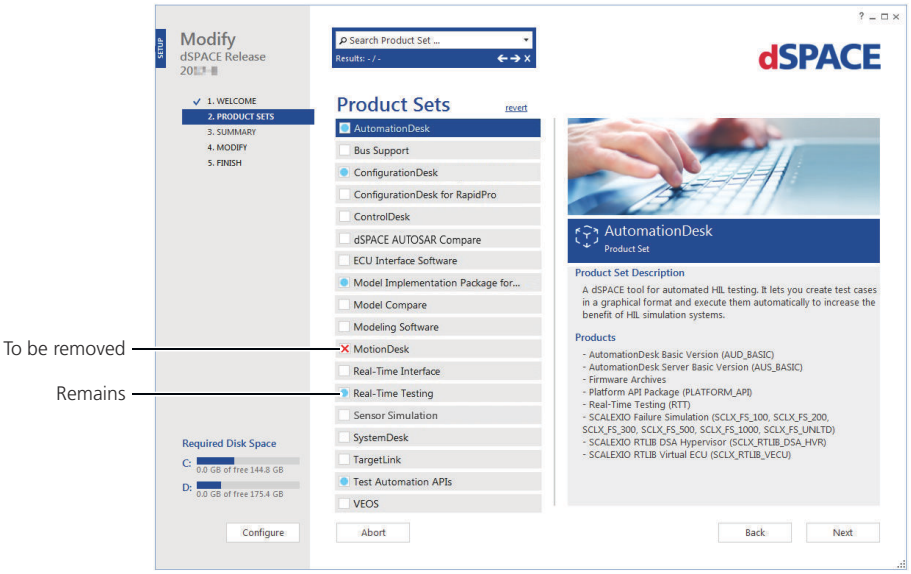
- SYNECT (`dSPACE SYNECT <x>.<y>`)
- dSPACE tools that you have downloaded from the dSPACE website as separate software packages (e.g., `dSPACE TargetLink Blockset <x>.<y>`)

The features, the workflow, and the design of the setup programs are always the same.

3 Select Modify Installation.




4 Select the product sets you want to remove.




Product sets with a blue dot are already installed and will remain installed. Clicking a blue dot changes it to a red X and selects a product set for being removed.

**Tip**

If you are not sure which product set contains the product you want to remove, locate it via the search field. Type the product name into the field (Search Product Set ...) at the top of the window.

5 Click Next.

The Summary page opens.

6 Select the options to be executed after removal has finished, i.e., select **Shut down after ...** and/or **Start Installation Manager after ...**.

**Tip**

You can still change your selection, after you started the removal process.

7 Click **Start** to remove the selected software.

8 After removal has finished, restart your host PC when prompted.

**Result**

- You removed the selected product sets from your host PC.
- The dSPACE installation folders, as shown in the **Path** field in dSPACE Installation Manager, are deleted according to the rules described in Notes on Removing dSPACE Software on page 53.
- The dSPACE installation that you modified is now the *active installation*, even though it was an inactive installation before starting modifying the installation.

# How to Remove the Complete dSPACE Release 2021-A

**Objective**

To remove all installed product sets of dSPACE Release 2021-A use dSPACE Setup's **Uninstall dSPACE Release 2021-A** functionality.

Keep in mind that SYNECT, dSPACE Installation Manager and other dSPACE tools with their own setup programs, for example, the Variable Editor must be removed in separate steps.

**Preconditions**

- You have unrestricted administrator rights.
- All dSPACE products, dSPACE Installation Manager and MATLAB are closed.

**Tip**

Access to the source media, e.g., dSPACE DVDs or downloaded installation files is not required.

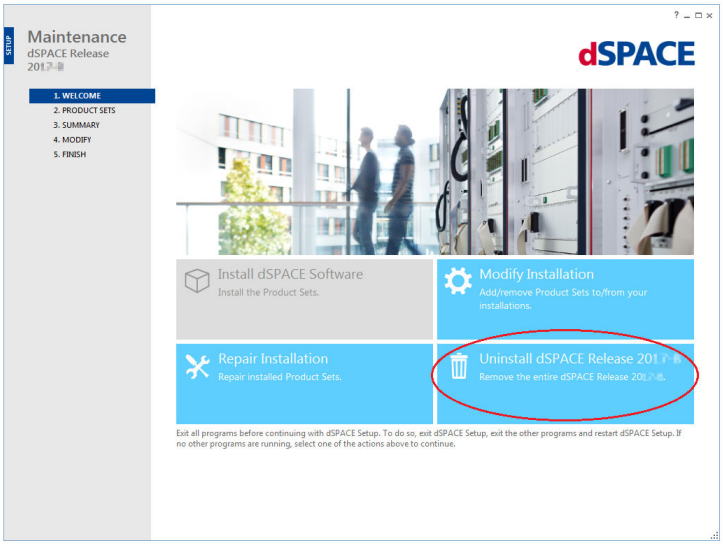
**Method**

**To remove the complete dSPACE Release 2021-A**

1 Disconnect all dSPACE USB devices (e.g., RapidPro hardware) from your system.

2 From the **Start - Control Panel** menu, select **Programs and Features** and double-click **dSPACE Release 2021-A**.

The dSPACE setup program starts.




3 Select **Uninstall dSPACE Release 2021-A**.

The **Summary** page opens.

4 Select the options to be executed after removal has finished, i.e., select **Shut down after ...** and/or clear **Start Installation Manager after ...**.

**Tip**

You can still change your selection, after you started the removal process.

5 Click **Start** to remove dSPACE Release 2021-A.

6 After removal has finished, restart your host PC when prompted.

**Result**

You removed all product sets of dSPACE Release 2021-A from the PC. The dSPACE installation folders, as shown in the **Path** field in dSPACE Installation Manager, are deleted according to the rules described in Notes on Removing dSPACE Software on page 53.

**Next steps**

Some basic software components still remain on the PC. Remove them via the Windows **Uninstall Program** function. To avoid problems, you must remove them in the following order:

1. Remove dSPACE Installation Manager.
2. Remove dSPACE Help

# Automating Installation Tasks

**Installation**

To simplify the software installation, all setup tasks can also be carried out automatically in unattended mode with a preconfigured configuration, for example, to install dSPACE software on multiple PCs.

**Where to go from here**

Information in this section



## Basics on Preconfigured Automatic Installations

**Motivation**

If you want to install dSPACE software on multiple host PCs, you can use the automatic installation features of the setup to make installation quicker and easier.

**Preconfigured automatic installations**

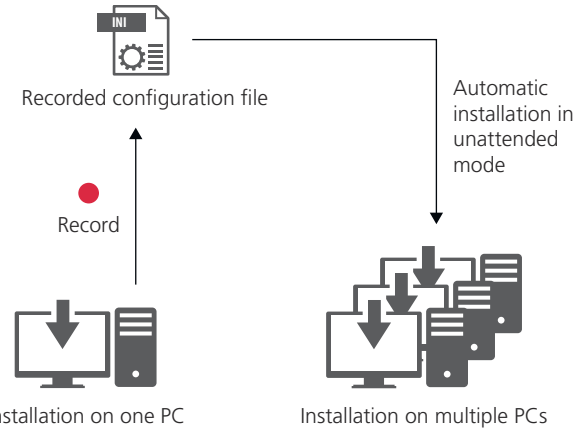
The dSPACE setups are based on the MSI technology from Microsoft. They install the products MSI setups and make it possible to install preconfigured software automatically. It is therefore not possible to use third-party MSI deployment tools that use MSI transformations for automatic installation on multiple PCs.

For preconfigured automatic installations you have to use a record mode and an unattended mode. Using the record mode, you can record the installation

configuration of dSPACE software. This configuration is saved to a configuration file with the *INI* file format (for example, `myReleaseInstallation.ini`). The file contains all the settings you made while recording. Afterwards, you can use the recorded configuration file to install the software on multiple PCs in unattended mode.

**Note**

In record mode, no software is installed on your host PC. You only save your settings to a configuration file.




A log file tells you if the installation was completed successfully or if any errors occurred.

You can also automatically install several setups successively via a batch file in a queue.

**Using record mode**

To record setup tasks, the same setups are used (for example, `Install_Release.exe` or `Install_Synect.exe`) as for the interactive installation (i.e., standard installation).

You can access record mode of these setups via their command line utilities using `cmd.exe` from Windows.

***NOTICE***

To run `Release_<xy>.exe`, it is recommanded that you open a Command Prompt window with the Run as administrator option.

If you use long path and file names with spaces in the command line, enclose the names in double quotation marks. This indicates that spaces within the quotation marks are not command line delimiters.

**Using unattended mode**

For unattended setup tasks, a separate command line setup (`SetupCmd.exe`) is provided. This setup suppresses all user prompts during all installation tasks.

You can access the `SetupCmd.exe` command line setup via `cmd.exe` from Windows.

**NOTICE**

To run `SetupCmd.exe`, it is required that you open a Command Prompt window with the Run as administrator option.

If you use long path and file names with spaces in the command line, enclose the names in double quotation marks. This indicates that spaces within the quotation marks are not command line delimiters.

### Available commands for both modes

With the available commands and additional optional parameters, you can perform specific tasks. Refer to Commands and Parameters for Unattended Installations on page 68.

**Note**

Commands and parameters such as `--configonly` are case-sensitive.

### Opening a help list

For help on the commands and parameters, open a Command Prompt window with the Run as administrator option and enter:

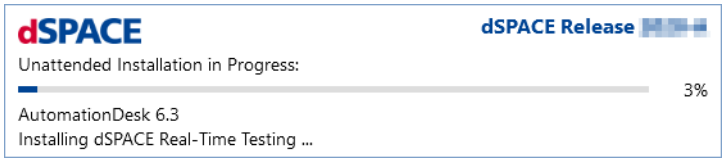
- `<Drive>\Install_<xy>.exe --help`: if you are using the setup in the record mode, for example, the `Install_Release.exe` setup
- `<Path>\SetupCmd.exe --help`: if you are using the setup in unattended mode `SetupCmd.exe`

  The `SetupCmd.exe` is located in subfolders and not in the root folder. For example, on the dSPACE DVDs these are the `\RLS` and `\SYNECT` folders.

### Obtaining the status of the installation process

If you install dSPACE software in unattended mode, no user interface is displayed. However, there is a dSPACE icon shown in the system tray on the taskbar.

Move the mouse cursor over the icon to see the current status of the installation process as a percentage. To open a more detailed progress window, you can double-click the tray icon at any time during the installation or use its context menu. In this window, a progress bar displays the progress of the overall installation process and the current installation step. Refer to the following illustration.



To display the progress window during unattended installations automatically, you can use the `--showprogress` parameter. You also can save the current progress to a separate log file, for example, to monitor the installation progress over the network. Refer to Commands and Parameters for Unattended Installations on page 68.

### Executing setup tasks in a queue

You can use a batch file to execute a sequence of setup tasks:

1. Record each setup task in a separate configuration file.
2. Create a batch file containing commands and additional parameters, as shown in the following example.

**Batch file example**

```
<Path>\SetupCmd.exe --install --load "c:\_myReleaseinstallation.ini" --noreboot --ignorependingreboot
<Path>\SetupCmd.exe --install --load "c:\_mySYNECTinstallation.ini" --noreboot --ignorependingreboot
```

**Note**

To avoid circumstances that interrupt queued setup tasks, you must:

- Add the `--noreboot` and the `--ignorependingreboot` parameters to the command. Refer to the previous example.
- In the Summary dialog of dSPACE Setup: Clear the Shut down after installation and Start Installation Manager after installation checkboxes.

Restart the PC manually when the actions defined in the batch file are finished.

### Installing patches

You can also install patches in unattended mode. For help on the available commands and parameters, open a Command Prompt window, go to the folder that contains the patch, and enter: `<Patchname>.exe --help`

To install a product together with its patch, use a batch file, as shown in the following example.

```
<Drive>\Install_Release.exe --install --load "c:\_myReleaseinstallation.ini" --noreboot --ignorependingreboot
<Drive>\Updates\<Patchname>.exe --install --noreboot --ignorependingreboot
```

### Repairing an installation

If a software product displays errors messages, e.g., about missing files, the installation might be corrupted. You can repair it.

**Note**

If you want to repair dSPACE software, you have to select the product sets in record mode and save a separate configuration file. Store this configuration to a new file, for example, `_myRepairing.ini`.

Use this configuration file with the command shown below.

Open a Command Prompt window (with the **Run as administrator** option) and type the following command to repair an installation:

To install dSPACE software on multiple host PCs: `<Drive>\Install_<xy>.exe --repair --load "c:\_myRepairing.ini"`

Optional parameters can be added to the command to perform specific tasks. Refer to Commands and Parameters for Unattended Installations on page 68.

## How to Install dSPACE Software Automatically on Multiple Host PCs in Unattended Mode

**Objective**

The automatic installation feature of dSPACE setup enables you to install dSPACE software initially or to modify an existing dSPACE installation on multiple host PCs. Modifying an installation includes adding dSPACE software and/or removing dSPACE software in one installation process.

**Basic information**

Before starting the installation process familiarize yourself with the basics in Basics on Preconfigured Automatic Installations on page 59.

**Restrictions**

You need a separate recording for each release of the dSPACE software. For example, you cannot use a recording of TargetLink from dSPACE Release 2020-B with the next release of TargetLink.

**Preconditions**

- You have unrestricted administrator rights.
- To handle product sets on both DVDs without user interaction, you have to merge both dSPACE DVDs into a folder on a network drive or use the "dSPACE Release 2021-A 2 DVDs merged.ZIP" download package.
- The host PCs on which you want to install software in unattended mode and the host PC on which you record the installation must have the same configuration. This includes the operating system and all installation folders (including the drive letter). If the configuration of the host PCs on which you want to install software differs from the configuration of the host PC on which you record the installation, this can cause errors because the installation waits for answers from dialogs that were not recorded.
- Make sure that the host PCs on which you want to install the software has sufficient disc space available on the system partition as well as on the program partition.
- Microsoft .NET Framework 4.8 must first be installed on the host PCs on which you want to intall the software to prevent the installation from being aborted .

- The required dSPACE certificates (CER files) must be installed on the host PCs on which you want to install the software. This is to suppress security warnings when the setup installs the dSPACE device drivers, thus preventing the installation process from being interrupted. Refer to Installing Root Certificates Required for dSPACE Software on page 37.

**Workflow**

To install dSPACE software automatically in unattended mode on multiple host PCs, you have to perform the following steps:

- Record an interactive dSPACE software installation and save it to a configuration file. Refer to Part 1 on page 64.
- Install the recorded installation automatically on multiple host PCs. Refer to Part 2 on page 65.

**Part 1**

**To record an interactive dSPACE software installation**

1. Open a Command Prompt window with the **Run as administrator** option and type `<Drive>\Install_<xy>.exe --configonly`

   The related dSPACE Setup starts in record mode.
2. Depending on the dSPACE software that is already installed, select one of the following options:
   - **Install dSPACE Software** to install dSPACE software initially.
   - **Modify Installation** to add and/or remove product sets to/from your dSPACE installation.
3. Configure your dSPACE software installation:
   - Specify the main installation path (only initial installation) and click **Next**.
   - Select the product sets to be installed and/or removed and click **Next**.

   The **Summary** dialog opens.
4. In the **Summary** dialog, select the options to be executed after the installation or modification, i.e., select **Shut down after installation** and/or clear **Start Installation Manager after installation**.

   **Note**

   If you use a batch file to execute a sequence of setup tasks, you must clear the **Shut down after installation** and **Start Installation Manager after installation** checkboxes. Otherwise, the batch file execution is stopped.
5. Click **Save** to specify the name and the path of your configuration file, for example, `c:\_myReleaseinstallation.ini`.
6. Click **Abort** to close dSPACE Setup.

**Interim result**

You saved your settings to a configuration file. No software is installed on your host PC.

Part 2

**To install the recorded installation automatically on multiple host PCs**

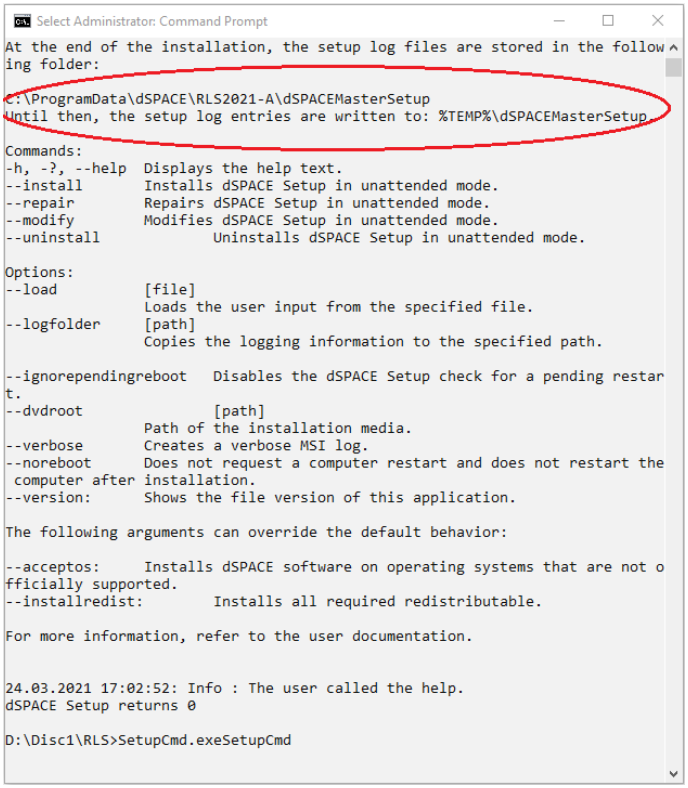
1. Copy your configuration file to the host PCs on which you want to install the software.
2. Open a Command Prompt window with the **Run as administrator** option.
3. In the Command Prompt window, change to the folder with the `SetupCmd.exe`. On the dSPACE DVDs these are the `\RLS` and the `\SYNECT` folders.
4. Enter the following command according to the use case. The command must include the configuration file to be executed and its path:
   - `<Path>\SetupCmd.exe --install --load "c:\_myReleaseinstallation.ini"`
   - `<Path>\SetupCmd.exe --modify --load "c:\_myReleaseinstallation.ini"`

   Optional parameters can be added to the command to perform specific tasks. Refer to Commands and Parameters for Unattended Installations on page 68.
5. Restart the host PCs.
6. Check the setup log files for errors:

   Open a Command Prompt window with the **Run as administrator** option and type `<Path>\SetupCmd.exe --help`

   The `SetupCmd.exe` is located in subfolders and not in the root folder. For example, on the dSPACE DVDs these are the `\RLS` and `\SYNECT` folders.

The full path to the folder with the setup log files is displayed in the Command Prompt window. Refer to the following example:




**Tip**

In some error cases, the `dSPACE_MasterSetup.log` is located in the %temp%\dSPACEMasterSetup folder.

The `dSPACE_MasterSetup.log` file contains the result code indicating whether or not the unattended installation succeeded. An integer value is assigned to the MASTER_SETUP_GLOBALRETURN key name at the end of the log file. A successful unattended installation has the result code 0. Refer to the following example:

```
285 2017-09-15 11:17:19.4946 TRACE dSPACE.SetupGen.MasterSetup.App.OnExit: MASTER_SETUP_GLOBALRETURN: 0
```

Contact dSPACE Support (www.dspace.com/go/supportrequest) for further instructions if either of these situations arises:

- The result code (`MASTER_SETUP_GLOBALRETURN`) is not 0.
- The `dSPACE_MasterSetup.log` file is not located in one of the folders described above.

**Result**

You installed the dSPACE software on multiple host PCs.

# How to Remove the Complete dSPACE Release 2021-A Automatically in Unattended Mode

**Objective**

To remove the complete dSPACE Release 2021-A automatically from multiple host PCs, you can use the unattended mode to make removing quicker and easier.

**Tip**

To remove single product sets, use the `--modify` command. Refer to How to Install dSPACE Software Automatically on Multiple Host PCs in Unattended Mode on page 63.

**Preconditions**

- You have unrestricted administrator rights.
- All dSPACE products, dSPACE Installation Manager and MATLAB are closed.

**Method**

**To remove the complete dSPACE Release 2021-A automatically in unattended mode**

1. Open a Command Prompt window with the **Run as administrator** option.
2. In the Command Prompt window, change to the folder with the `SetupCmd.exe`.

   The `SetupCmd.exe` is located in subfolders and not in the root folder. For example, on the dSPACE DVDs these are the `\RLS` and `\SYNECT` folders.
3. Enter the following command:
   `<Path>\SetupCmd.exe --uninstall`

   **Tip**

   If you do not have access to dSPACE Setup, you can remove dSPACE software via the local installation on your host PC as well.
   - In the Command Prompt window, go to the following folder: `%ProgramFiles(x86)%\CommonFiles\dSPACE\Setup\RLS2021-A`.
   - Enter the following command to start the removal process: `dSPACE.MasterSetup.exe --uninstall`.

   Optional parameters can be added to the command to perform specific tasks. Refer to Commands and Parameters for Unattended Installations on page 68.
4. Restart your host PCs after removal has finished.

**Result**

You removed all product sets of dSPACE Release 2021-A from your host PC. The dSPACE installation folders, as shown in the **Path** field in dSPACE Installation

Manager, are deleted according to the rules described in Notes on Removing dSPACE Software on page 53.

**Next steps**

Some basic software components still remain on the PC. Remove them via the Windows **Uninstall Program** function. To avoid problems, you must remove them in the following order:

1. Remove dSPACE Installation Manager.
2. Remove dSPACE Help.

## Commands and Parameters for Unattended Installations

**Rules**

**Note**

Commands and parameters such as `--configonly` are case-sensitive.

**Overview of available commands**

| Command | Description |
|---|---|
| `--configonly` | ▪ Starts dSPACE Setup in record mode.<br>▪ Not supported by the `SetupCmd.exe` command line setup. |
| `--install` | Installs dSPACE software initially in unattended mode. This command requires the `--load "<path>"` parameter. |
| `--modify` | Modifies a dSPACE software installation (adds and/or removes software) in unattended mode. This command requires the `--load "<path>"` parameter. |
| `--uninstall` | Removes all product sets from the related dSPACE release from your PC in unattended mode.<br>SYNECT, dSPACE Installation Manager, and other dSPACE tools with their own setup programs, for example, the Variable Editor, must be removed in separate steps. |
| `--repair` | Repairs a dSPACE software installation in unattended mode. This command requires the `--load "<path>"` parameter. |
| `--version` | ▪ Displays the version of the used `SetupCmd.exe` command line setup.<br>▪ Only supported by the `SetupCmd.exe` command line setup. |
| `--help` | ▪ Displays a list with all available commands and parameters.<br>▪ Displays the full path to the folder with the setup log files. |

### Overview of available parameters

| Parameter | Description | To be Used With ... | | | |
|---|---|---|---|---|---|
| | | Install | Modify | Uninstall | Repair |
| `--load "<path>"` | Loads a previously saved configuration file. You have to enter the full path to the file, e.g., `"c:\_myReleaseinstallation.ini"`.<br>This parameter is required by the `--install`, `--modify` , and `--repair` commands. | ✓ | ✓ | – | ✓ |
| `--dvdroot "<path>"` | This parameter describes the path to the source media (original installation files). You have to use this parameter only if you want to access the locally installed dSPACE setup program on your host PC. | – | ✓ | ✓ | ✓ |
| `--ignorependingreboot` | Use this optional parameter if you want to skip the detection for a pending restart when the setup starts. It is helpful in the following use cases:<br>▪ Multiple setup tasks have to be executed in a queue.<br>▪ dSPACE Setup displays a restart request even if a restart was just performed. This can happen if third-party software sets specific registry entries to trigger dSPACE software to restart. | ✓ | ✓ | ✓ | ✓ |
| `--nogui` | ▪ If you use this optional parameter, the setup hides all warning and error dialogs during the initialization phase (before the installation starts).<br>▪ Use this parameter only if you want to access the dSPACE setup program from the source media (dSPACE DVDs or downloaded installation files).<br>▪ Not supported by the `SetupCmd.exe` command line setup. | ✓ | ✓ | ✓ | ✓ |
| `--noreboot` | If you use this optional parameter, the restart dialog at the end of the setup is not displayed and the setup task finishes without a restart. If you do not use this parameter, the PC is restarted after finishing the setup task without a prompt. Use this parameter if you want to execute several setup tasks in a queue. | ✓ | ✓ | ✓ | ✓ |
| `--acceptos` | ▪ Use this optional parameter if you want to install the dSPACE software on an operating system that is not officially supported by dSPACE and therefore issues a warning message. Without using this parameter, the setup is aborted in this case.<br>▪ Only supported by the `SetupCmd.exe` command line setup. | ✓ | – | – | – |
| `--installredist` | ▪ Use this optional parameter if the required redistributable (e.g., Microsoft .NET Framework 4.8) is not installed on the PC. If you use this parameter, the redistributable is installed before installing the dSPACE software.<br>▪ Without this parameter, the setup is aborted if the required redistributable has not been installed.<br>▪ Only supported by the `SetupCmd.exe` command line setup. | ✓ | – | – | – |
| `--logfolder "<path>"` | Use this optional parameter if you want to save a copy of the log files to a specific folder. After the software is installed, the log files are in the specified folder. You have to provide the full path for the folder with the log files.<br>All log files are saved in `%ProgramData%\dSPACE\` by default. | ✓ | ✓ | ✓ | ✓ |
| `--verbose` | Use this optional parameter only for troubleshooting purposes to create detailed verbose MSI log files. Verbose log files require a lot of disk space on the host PC. For example, a verbose log file for a large installation requires approx. 155 MB. | ✓ | ✓ | ✓ | ✓ |

| Parameter | Description | To be Used With ... | | | |
|---|---|---|---|---|---|
| | | Install | Modify | Uninstall | Repair |
| `--showprogress` | Use this optional parameter if you want to display the progress of the installation process in a separate progress window on your screen. | ✓ | ✓ | ✓ | ✓ |
| `--progressfile "<path & filename>"` | Use this optional parameter if you want to save the current progress to a separate log file. You can use this log file, for example, to monitor the installation progress over the network.<br>The file contains only the current progress, for example, `Running: 1%`. As the progress continues, the progress information in the file is overwritten. When a single step of the installation process is complete, the file contains the following entry: `Finished: 100%`.<br>You have to provide the full path and the name of the progress log file. For example: `c:\_MyProgress.log`. | ✓ | ✓ | ✓ | ✓ |

### Tips for using the progress logging

- The progress log file must remain writable during the installation process and therefore must not be opened exclusively by any editor. If you want to view the file contents during the installation, use a program such as Notepad++. This type of editor allows the setup to write to the log file even if it is open.
- If the progress status is logged on several PCs and the files are to be saved to a network folder, you must ensure that a separate log file is used for each PC, otherwise the logs will overwrite each other.

# Troubleshooting

**Motivation**

If you have problems with your dSPACE software and suspect they are related to the installation, check the following topics.

**Getting further support**

**Support Knowledge Base** If the information in this section does not help you to solve the problem, check the Support Knowledge Base on our website. See http://www.dspace.com/go/kb.

**dSPACE Support** If self-help does not help you to solve the problem, contact dSPACE Support and provide information about your dSPACE environment and the problems you have. It is recommended to use the support request form provided on the website at http://www.dspace.com/go/supportrequest. However, you can also send an e-mail or phone us.

**Where to go from here**

Information in this section



## Checking dSPACE Installations

**Motivation**

If you encounter any problems during or after the installation, follow these instructions to identify the problem and solve it.

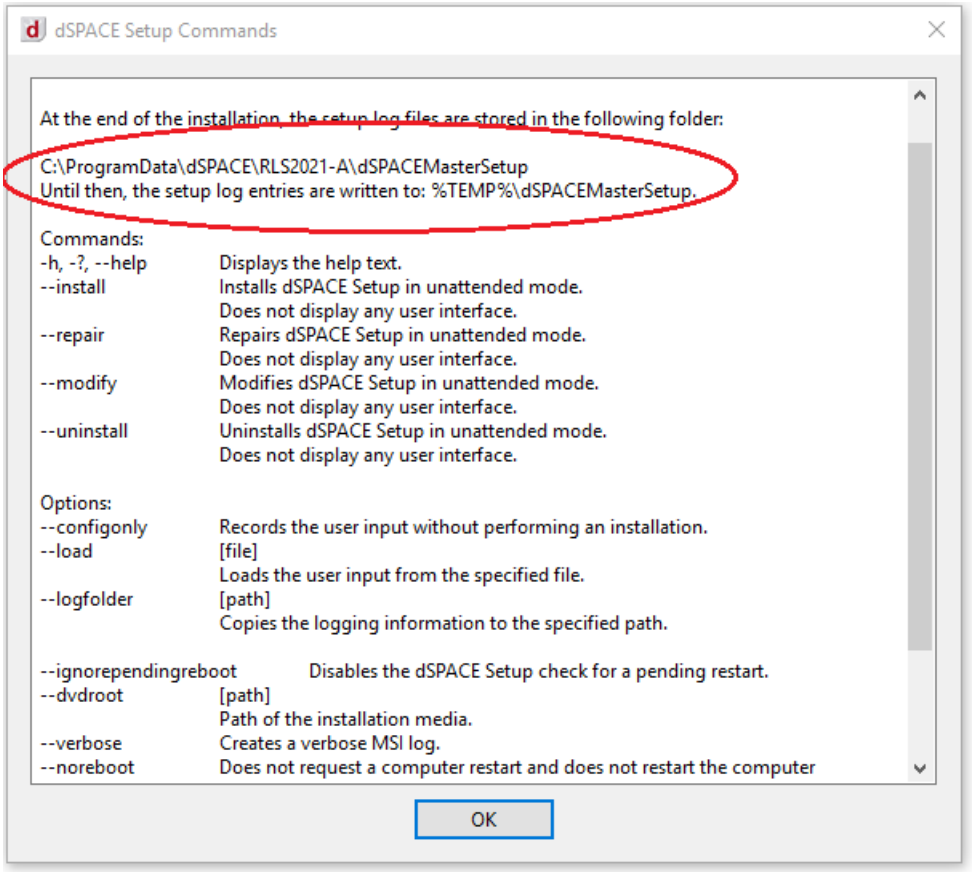
**Checking log files**

If you want to check the setup log files for errors, you can find them at the following location:

`C:\%ProgramData%\dSPACE\RLS20<xx-x>\dSPACEMasterSetup`

To get the location of log files of other installations, for example, from a SYNECT installation, run `<DVD>\Install_Synect.exe --help`. Note that you can only access the help from dSPACE Setup from the DVD.

The full path to the folder with the setup log files is displayed in the dSPACE Setup Commands dialog. Refer to the following example:




This also applies to dSPACE tools with their own setup programs, which are available as software packages on the dSPACE website, for example, dSPACE Variable Editor.

### Checking the functionality of the MATLAB MEX command

Start MATLAB and compile one of Simulink's sample S-functions by typing the following commands in the MATLAB Command Window in the specified order:

1. Type `cd <writable and temporary directory>`.
2. Get MATLAB root with `matlabroot`.
3. Type

   ```
   !copy
   <MATLAB_ROOT>\toolbox\simulink\simdemos\simfeatures\src\limi
   ntc.c
   ```

4. Type `mex('limintc.c')` to create a new `limintc.mexw64` file.

5. Type `dir limintc.mexw64` to check if the file has been built.

   If `limintc.mexw64` is listed, the MATLAB MEX command works correctly. Refer to the MATLAB manual *Application Program Interface Reference* if you encounter any problems.
6. Delete the `<writable and temporary directory>`.

**Checking the integration of MATLAB-dependent products into MATLAB**

1. Enter **ver** in the MATLAB Command Window to display the version numbers of the installed toolboxes.
2. If the expected dSPACE products (for example, TargetLink) are not listed, make sure that the MATLAB installation used, is linked to the related dSPACE installation. For instructions on linking, refer to How to Change the MATLAB Connection (Managing dSPACE Software Installations 🕮).

## How to Repair a dSPACE Software Installation as of dSPACE Release 2017-B

**Objective**

To repair a software installation of dSPACE Release 2017-B and later, you have to use dSPACE Setup.

**Motivation**

Repair your dSPACE software installation if problems such as the following occur:

- You unintentionally changed your installation, for example, you unintentionally deleted files from installed folders.
- The software outputs error messages concerning missing files.

**Preconditions**

- You have unrestricted administrator rights.
- All dSPACE products, dSPACE Installation Manager, and MATLAB are closed.
- You have access to the source media, e.g., dSPACE DVDs or downloaded installation files.

**Method**

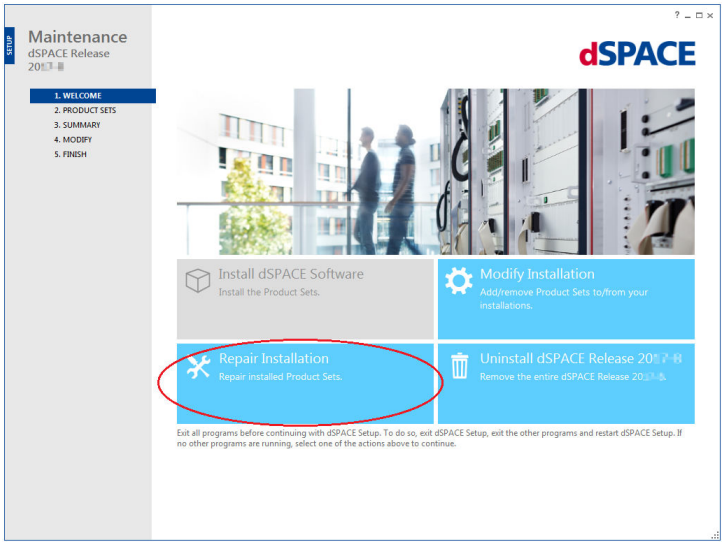
**To repair a dSPACE software installation as of Release 2017-B**

**1** Disconnect all dSPACE USB devices (e.g., RapidPro hardware) from the PC.

**2** From the **Start - Control Panel** menu, select **Programs and Features** and double-click **dSPACE Release** <yyyy-x>.

The dSPACE setup program starts.

3 Select **Repair Installation**.




The **Product Sets** page opens, displaying only the product sets that are installed on your PC.

4 Select all product sets to repair your software installation. If you know which product set you have to select for repairing, select only the one you want to repair.

5 Click **Next** to continue.

The **Summary** page opens.

6 Select the options to be executed after repairing has finished, i.e., select **Shut down after ...** and/or **Start Installation Manager after ...**.

**Tip**

You can still change your selection, after you have started the repairing process.

7 Click **Start** to repair your software installation.

8 When prompted, restart your PC.

**Note**

In some cases, the installation of dSPACE Help is not complete when you are prompted. Check the installation status and wait before restarting the PC. However, if you restart the PC before installation is complete, the installation of dSPACE Help is continued and then finishes without errors.

**Result**

- You repaired your software installation.
- The dSPACE installation you repaired is now the *active installation*, even though if it was an inactive installation before you started the repair process.

# Appendix

**Where to go from here**

Information in this section

# Appendix: System Requirements

**Objective**

Check whether your system meets the system requirements. The requirements for third-party software, for example, software from MathWorks®, might be higher. For more information, refer to the corresponding software documentation.

**Where to go from here**

Information in this section



## Host PC Hardware

**Host PC requirements**

You need a x64-based personal computer as a host PC for your dSPACE software.

| Hardware | dSPACE Software | Minimum Requirements |
|---|---|---|
| Host processor | All dSPACE software products | ▪ Intel Core 2 Duo processor at 2 GHz or equivalent |

| Hardware | dSPACE Software | Minimum Requirements |
|---|---|---|
| | | ▪ Intel Core i7 processor (for desktop PCs) or equivalent (recommended) |
| Main memory | All dSPACE software products | ▪ 8 GB RAM<br>▪ 16 GB RAM or more (recommended) |
| | SYNECT Server | ▪ 8 GB RAM<br>▪ 32 GB RAM or more (recommended) |
| Disk space[1)] | Installation of all dSPACE software products which support Windows | ▪ Up to 28.0 GB of free disk space on the program partition<br>▪ In addition, up to 20 GB of free disk space on the system partition, for example, for run-time software like the Microsoft .NET Framework |
| | SYNECT Server | 1 GB of free disk space on the system partition |
| | Installation of all dSPACE software products which support Linux | ▪ Up to 1 GB of free disk space on the /opt mount point<br>▪ Up to 500 MB of free disk space on the /usr mount point |
| Disk drives | All | DVD drive for software installation from DVD |
| | SYNECT Server | It is recommended to use a solid state drive for the system partition. |
| Ports for connecting hardware | ConfigurationDesk for RapidPro | For communication with RapidPro hardware, you need a USB port version 2.0. dSPACE does not guarantee compatibility with USB 3.0 or higher. |
| | TargetLink | For processor-in-the-loop (PIL) simulation, you need a serial port (RS232) or a free USB port, depending on the type of the evaluation board |
| | ControlDesk | ▪ To connect DCI-KLine1, you need a USB port version 1.1 (compatible with USB 2.0). dSPACE does not guarantee compatibility with USB 3.0 or higher.<br>▪ To connect DCI-CAN2 and DCI-CAN/LIN1, you need a USB port version 2.0 (compatible with USB 1.1 and USB 3.0 or higher).<br>▪ To use the Steering Controller instrument, you need a USB port to connect a game controller device.<br>▪ To use the graphical user interface of the ControlDesk XIL API EESPort via the RS232 interface, your host PC needs an RS232 serial port that can run at 9,600 bit/s to connect the Failure Insertion Unit (FIU) of PHS-bus-based HIL systems.<br>As an alternative you can use an external RS232 converter:<br>▪ USB-to-RS232 converter: Only converters with an FTDI chipset and the newest FTDI driver are supported. Refer to http://www.ftdichip.com/FTDrivers.htm.<br>▪ Ethernet-to-RS232 converter: The IOLAN DS1 converter from Perle is recommended by dSPACE. Refer to http://www.dspace.com/go/eth2rs232. |

| Hardware | dSPACE Software | Minimum Requirements |
|---|---|---|
| | | There are limitations if you use an external RS232 converter: Software triggers and dynamic errors are not supported. Communication is also time-critical and can cause communication errors.<br>▪ To connect a GNSS receiver to the GNSS device, you need a COM port (RS232), a USB port (USB 1.1 up to USB 3.0), or a USB-to-RS232 converter, depending on the GNSS receiver you are using. In ControlDesk, the connected GNSS receiver is assigned to the GNSS device via a COM port. |
| Graphics adapter and display | All dSPACE software products[2)] | ▪ Standard graphics adapter with a minimum resolution of 1024 x 768 pixels.<br>▪ Standard graphics adapter with a resolution of 1280 x 800 pixels or more (recommended for ConfigurationDesk). |
| | ControlDesk | If you use ControlDesk in a VMware environment, 3-D support must be enabled in VMware. |
| | SYNECT | If you use 4K monitors, the SYNECT graphical user interface might not be displayed properly in some cases, but this does not cause functional limitations. |
| | Real-Time Testing | The Real-Time Test Manager, the user interface for handling RTT sequences, does not support working with 4K monitors. |
| | FlexRay Configuration Package | The FlexRay Configuration Tool does not support working with 4K monitors. |

1) Additional disk space is required for non-dSPACE software, for example, from MathWorks®.
2) For using MotionDesk your host PC has to meet additional requirements. Refer to Additional Requirements for 3-D Online Animation via MotionDesk on page 96.

### Using MicroAutoBox Embedded PC as host PC

ControlDesk can also be installed on:

- MicroAutoBox Embedded PC 6th Gen. Intel® Core™ i7-6822EQ Processor, running on Microsoft® Windows® 10 IoT Enterprise LTSB 2016, 64-bit version
- MicroAutoBox III Embedded PC, running on Microsoft® Windows® 10 IoT Enterprise LTSC 2019, 64-bit version

### Requirements for license handling

| Subject | Host PC and Network Requirements |
|---|---|
| Enabling dongle licenses | A USB port (Version 1.1 min.): to connect the dongle. |
| Enabling floating network licenses | All the PCs on which you want to use dSPACE software (*license clients*) must be able to establish a TCP/IP connection to the *license server*. A standard TCP/UDP protocol is required.<br>The default port number is 22350 (TCP and UDP), which is an officially registered port number (IANA). If needed, you can change the port number. |

| Subject | Host PC and Network Requirements |
|---|---|
| Activating licenses | dSPACE Installation Manager needs an Internet connection to connect to dSPACE License Central (https://licensing.dspace.de/gateways, HTTPS, Port 443). It can work with proxy servers and can also handle proxy servers with authentication (user name, password). |
| Required software[1)] | ▪ dSPACE Installation Manager (required for activating licenses)<br>▪ CodeMeter Runtime Version 7.10b |
| Hardware | For a host PC on which only dSPACE Installation Manager is installed or which only works as license server, the following hardware is required:<br>▪ Intel Core 2 Duo processor at 2 GHz or equivalent<br>▪ 4 GB RAM main memory (or more) |

1) The required software is installed with dSPACE Setup.

### Required slots for dSPACE boards

The dSPACE boards have different slot requirements for installation in the host PC.

**DS1104** To install a DS1104, you need one free 33 MHz/32-bit 5 V PCI slot or one free PCIe slot, depending on the board variant.

**Modular system based on DS1006, or DS1007** You cannot install a DS1006 or DS1007 in your host PC. You can install these systems only in an expansion box.

**Link boards** A link board is required in your host PC: To connect your DS1006 installed in an expansion box to the host PC via a bus interface.

**Note**

The DS1007, MicroAutoBox II, MicroAutoBox III, MicroLabBox, and the SCALEXIO system do not require a link board. Host PC communication is established via integrated Ethernet.

The possible link boards require the following slots in your host PC:

| Link Board | Required Slots |
|---|---|
| DS817 | ▪ One free 5 V PCI slot (up to board revision DS817-03)<br>▪ One free 3.3 V / 5 V Universal PCI slot (board revision DS817-04 and later) |
| DS819 | One free PCI Express slot (x1 ... x32) |
| DS821-34 mm | One free ExpressCard/34 slot or one free ExpressCard/54 slot |
| DS821-54 mm | One free ExpressCard/54 slot |

**dSPACE system with Ethernet connection** To connect your dSPACE system to the host PC via an Ethernet connection, your host PC must have a 10BASE-T network adapter (twisted pair, 10 Mbit/s or faster). 10BASE-T: Adapted and reprinted with permission from IEEE. Copyright IEEE 2018. All rights reserved.

# Operating System

**Windows operating system on host PC**

The dSPACE products of dSPACE Release 2021-A support the following operating systems:

- The following editions, channels, and servicing options of Windows 10:
  - Windows 10 Professional, Education, and Enterprise (64-bit versions)

    The Windows 10 Home, Mobile, and Windows 10 S editions are not supported.
  - Long-Term Servicing Branch: LTSB 2016
  - Long-Term Servicing Channel: LTSC 2019
  - Semi Annual Channel: The compatibility statement of Microsoft applies. This means that newer versions released in this channel should be compatible with all previous versions. dSPACE used the 20H2 version of the Semi Annual Channel for testing.
- Windows Server 2016 Standard and Datacenter edition, each with the Desktop Experience installation option

  Only the listed editions are supported. The Windows Server 2016 Essentials, MultiPoint Premium Server editions are not supported.
- Windows Server 2019 Standard and Datacenter editions, each with the Desktop Experience installation option

  Only the listed editions are supported. The Windows Server 2019 Essentials edition is not supported.

Some limitations apply when you use dSPACE software in conjunction with features of Windows. Refer to Limitations for Using Windows Features on page 82.

**Support of Windows Docker** You can also run some dSPACE products in a Windows Docker container. For more details, contact dSPACE Support (www.dspace.com/go/supportrequest).

**Linux operating system on host PC**

The dSPACE products of dSPACE Release 2021-A with Linux compatibility support the following operating systems:

- Ubuntu 18.04 LTS with the General Availability Kernel in the Desktop, Server, and Cloud version

Some limitations apply when you use dSPACE software in conjunction with features of Linux. Refer to Limitations for Using Linux Features on page 84.

**Support of Linux Docker** You can also run the dSPACE products with Linux compatibility in a Linux Docker container. For more details, refer to https://www.dspace.com/go/ProductsForLinux.

**Using MicroAutoBox Embedded PC as host PC**

ControlDesk can also be installed on:

- MicroAutoBox Embedded PC 6th Gen. Intel® Core™ i7-6822EQ Processor, running on Microsoft® Windows® 10 IOT Enterprise, LTSB 2016, 64-bit version

- MicroAutoBox III Embedded PC, running on
  Microsoft® Windows® 10 IoT Enterprise LTSC 2019, 64-bit version

**Operating system on SYNECT server**

The SYNECT server supports the following operating systems:

- The same operating systems as listed above for all dSPACE products of dSPACE Release 2021-A.
- Windows Server 2012, Windows Server 2012 R2

**Operating system on server for floating network licenses**

If you purchased floating network licenses, you have to specify one of the network PCs as a license server. Any PC with CodeMeter Runtime software can be used as a license server.

**Valid for servers without dSPACE software** dSPACE tests license servers only with Microsoft Windows operating systems in combination with protected dSPACE software.

**Note**

Non-Windows operating systems, such as Ubuntu Linux, are not tested. You can use them at your own risk. dSPACE does not provide support in this case.

**Valid for servers with dSPACE Installation Manager** dSPACE Installation Manager supports the same operating systems as the other dSPACE software products described above.

**Allowing communication**

**Installing of additional firewall rules** Additional Windows firewall rules are installed during the installation of various dSPACE software products. For example, one rule allows communication with a dSPACE expansion box, such as AutoBox. Another rule allows MotionDesk to receive motion data from a network channel. These example rules are created by the following commands:

- `netsh advfirewall firewall add rule name="dSPACE Net Service" service=any dir=in action=allow profile=any protocol=icmpv4:0, any description="Allow the dSPACE Net Service to connect to a dSPACE expansion box via network."`
- `netsh advfirewall firewall add rule name="dSPACE MotionDesk" program=<main installation path>\dSPACE MotionDesk 2021-A\MotionDesk\Bin\MotionDesk.exe" dir=in action=allow profile=any description="Allow dSPACE MotionDesk to receive motion data via network."`

**Required open TCP/IP network ports** If you are using third-party firewall software on your host PC, ensure that the TCP/IP communication of dSPACE software is not blocked:

- VEOS requires the following open TCP/IP network ports: 111 (TCP and UDP), 3702 (UDP), 7214 (TCP and TCP6), 7215 (TCP and UDP), 7216 (TCP), 8090 (TCP), 9923 (UDP), 15000 (UDP), 49152 ... 65535 (TCP, TCP6 and UDP)
- dSPACE Installation Manager and CodeMeter licensing software require the following open TCP/IP network ports:
  - 22350 (TCP and UDP) for communication in a LAN network (if not changed from the default setting).
  - 22352 (TCP and UDP): To access CodeMeter WebAdmin via http.
  - 22353 (TCP and UDP): To access CodeMeter WebAdmin via https.
- dSPACE Help requires an open TCP/IP network port for interprocess communication between its components. The default port number is 11000. If this port number is already being used, another free port is used automatically. The related processes can be identified via the following prefixes: `HelpAbsLayer<xxx>`, `HelpInstaller<xxx>`.

## Limitations for Using Windows Features

| | |
|---|---|
| **Motivation** | Some limitations apply to using dSPACE software in conjunction with features of Windows. |
| **Installing and running dSPACE software within the Windows service accounts** | Non-service-based dSPACE software is not designed to be installed or run in the context of any predefined Windows service account (LocalService, NetworkService, LocalSystem). |
| **Fast user switching not supported** | dSPACE software does not support the fast user switching feature of Windows. |
| **Closing dSPACE software before PC shutdown** | The shutdown process of Windows operating systems might cause some required processes to be aborted although they are still being used by dSPACE software. To avoid a loss of data, it is recommended to close the dSPACE software manually before shutting down the PC. |
| **User Account Control** | It is recommended to disable the Windows User Account Control (UAC) during the installation of dSPACE software. If you cannot disable UAC, note the following Windows behavior: If UAC is enabled, the setup programs use the administrator account instead of the user account. Therefore, it is important that the administrator account has access to the required drives, particularly the required network drives. |

**USB devices**

If you connect dSPACE USB devices that use cables with optoisolation to the PC for the first time, there might be a message that the device driver software was not installed successfully. However, the dSPACE device will work properly later on.

**Using 4K monitors**

The following dSPACE software products have limitations for working with 4K monitors:

- SYNECT: If you use 4K monitors, the SYNECT graphical user interface might not be displayed properly in some cases, but this does not cause functional limitations.
- Real-Time Testing: The Real-Time Test Manager, the user interface for handling RTT sequences, does not support working with 4K monitors.
- FlexRay Configuration Package: The FlexRay Configuration Tool does not support working with 4K monitors.

**FIPS support**

dSPACE software was not developed for or tested against the FIPS PUB 140-2 U.S. government computer security standard (Security Requirements for Cryptographic Modules). For more information on FIPS, refer to https://docs.microsoft.com/en-us/windows/security/threat-protection/fips-140-validation.

**Long paths**

dSPACE software does not support the long path syntax of the Windows API. If a path that exceeds 260 characters is used directly or indirectly, the behavior of the dSPACE software is not defined.

**Enabling Windows 8dot3name creation option**

**Note**

It is strongly recommended that the Windows **8dot3name creation** option is enabled for all drives (drives used for installation and drives used for work) before you install third-party software, such as MATLAB®/Simulink®, and the dSPACE software.

If the option is disabled during software installation, serious errors can occur when you run the dSPACE software. For example, the build process might be aborted. To repair an installation that was installed while the **8dot3name creation** option was disabled, you have to install dSPACE software and required third-party software again.

For instructions on checking the setting and enabling the option, refer to http://www.dspace.com/faq?346 or to the Microsoft Windows documentation.

**Settings in Windows for user locale and system locale must match**

MATLAB reads the user locale and system locale settings that are specified in Windows operating systems. The user locale and the system locale must match.

If these settings are not the same, the system might not behave as expected when working with MATLAB and dSPACE software.

For instructions on checking and changing the settings, refer to https://www.mathworks.com/help/matlab/matlab_env/setting-locale-on-windows-platforms.html?s_tid=gn_loc_drop.

This affects all MATLAB versions and all Windows operating systems, that are supported by dSPACE.

## Limitations for Using Linux Features

**FIPS support**

dSPACE software was not developed for or tested against the FIPS PUB 140-2 U.S. government computer security standard (Security Requirements for Cryptographic Modules). For more information on FIPS, refer to https://ubuntu.com/blog/fips-certification-ubuntu-18-04-lts.

**Long paths**

dSPACE software does not support the available path length of 4,096 characters. If a path that exceeds 260 characters is used directly or indirectly, the behavior of the dSPACE software is not defined.

**Locale**

dSPACE software was tested only on a system with a US English locale.

## Run-Time Compatibility of dSPACE Software

**Definition**

Run-time compatibility means that:

- dSPACE products can be used in parallel after software installation, even if they are installed in different folders.
- dSPACE products without interaction can run independently of each other.

**Compatibility of products in dSPACE Release 2021-A**

dSPACE recommends using only software products from the same dSPACE Release. This ensures maximum run-time compatibility.

Observe the following points:

- Limitations regarding run-time compatibility in the dSPACE tool chain might occur if products from different dSPACE Releases are used together.

  If dSPACE products interact directly (through automation interfaces) or indirectly (through common file types like A2L), limitations might apply. For minor limitations, refer to the relevant product documentation. The major limitations are described in the following.

In rare cases, an additional patch must be installed for a product to achieve run-time compatibility. For more information on the patch and whether a patch is required, refer to http://www.dspace.com/go/CompPatch.

- RCP and HIL software products (of Release 2021-A) cannot be used in combination with RCP and HIL software products from earlier dSPACE Releases.

**Major limitation for working with a SCALEXIO system and with MicroAutoBox III** The products for working with a SCALEXIO system and with MicroAutoBox III must be compatible. This is guaranteed only for products delivered with the same dSPACE Release. Contact dSPACE for more information.

**Compatibility of real-time applications loaded to a DS1006, DS1104 or MicroAutoBox II platform** If a real-time application is loaded to one of these platforms with a software product of dSPACE Release 2016-B or later, software products of dSPACE Release 2016-A (and earlier) do not detect that the loaded real-time application is the same as the real-time application stored on your host PC. In this case, you cannot work with the related software product without restrictions.

This also applies if you load a real-time application with a software product of dSPACE Release 2016-A or earlier and use software products of dSPACE Release 2016-B or later, for example, for experimenting.

**Combining dSPACE products from earlier Releases**

For more information and notes on the combined use of different products from and with earlier Releases, refer to http://www.dspace.com/go/ds_sw_combi.

## Overview of Required Third-Party Software

**Overview**

You might need to install third-party products to work with dSPACE products. The following table shows which dSPACE product requires which third-party software.

| Third-Party Software | RCP and HIL Software[1)] | AutomationDesk | TargetLink | Model Compare | ControlDesk | VEOS |
|---|---|---|---|---|---|---|
| MATLAB®/Simulink® | To work with:<br>▪ Simulink models in ConfigurationDesk<br>▪ Model Interface Package for Simulink<br>▪ RTI, RTI-MP, and various RTI blocksets | To automate MATLAB via AutomationDesk's MATLAB Access library | To work with TargetLink | To work with Model Compare | – | – |

| Third-Party Software | RCP and HIL Software[1)] | AutomationDesk | TargetLink | Model Compare | ControlDesk | VEOS |
|---|---|---|---|---|---|---|
| | ▪ MotionDesk Blockset<br>▪ Model and Sensor Interface Blockset<br>▪ Automotive Simulation Models (ASM) | | | | | |
| Simulink® Coder™ and MATLAB Coder™ | ▪ For code generation of Simulink models with ConfigurationDesk<br>▪ For code generation with Model Interface Package for Simulink<br>▪ For code generation with RTI, RTI-MP, and various RTI blocksets<br>▪ For C code generation of Automotive Simulation Models (ASM) | – | – | – | – | – |
| C compiler | ▪ For compiling *real-time applications* for the DS1104, DS1006, DS1007, MicroAutoBox II, MicroAutoBox III, MicroLabBox, the RapidPro Control Unit with MPC5554, and SCALEXIO systems<br>▪ For compiling real-time applications for internal bypass targets used by the RTI Bypass Blockset<br>▪ For compiling *slave applications* for the DS2210, DS2211, and DS2302<br>▪ For building MATLAB MEX files for the RTI CAN MultiMessage Blockset and RTI LIN | – | ▪ For building an application for software-in-the-loop (SIL) or processor-in-the-loop (PIL) simulation<br>▪ For building MATLAB MEX files | – | – | For building an application for software-in-the-loop (SIL) |

| Third-Party Software | RCP and HIL Software[1] | AutomationDesk | TargetLink | Model Compare | ControlDesk | VEOS |
|---|---|---|---|---|---|---|
| | MultiMessage Blockset.<br>▪ For using the MotionDesk Blockset in Simulink's Rapid Accelerator simulation mode (for building MATLAB MEX files)<br>▪ For using the Model and Sensor Interface Blockset in Simulink's Accelerator simulation mode (for building MATLAB MEX files) | | | | | |
| CAN interface driver | To use CAN interfaces from Vector Informatik GmbH | – | – | – | To use CAN interfaces from Kvaser or Vector Informatik GmbH | – |
| LIN interface driver | – | – | – | – | To use LIN interfaces from Kvaser or Vector Informatik GmbH | – |
| Xilinx software | To work with the RTI FPGA Programming Blockset. | – | – | – | – | – |
| Browser software | To work with various dSPACE software products, such as the Browser instrument of ControlDesk or to view HTML reports generated with AutomationDesk | | | | | |
| Microsoft Office | To automate Microsoft Office applications, such as writing data to an Excel sheet with Python | | | | | |
| PDF Reader | To read PDF files, for example, of the dSPACE documentation | | | | | |

[1] 'RCP and HIL software' is a generic term for a software package containing several dSPACE software products, for example, ASM, RTI, ConfigurationDesk, and ModelDesk. These software products are installed in a common folder.

Make sure, that the versions of the third-party software you intend to install are supported by the dSPACE software. For detailed version and compatibility information, see below. You also can refer to http://www.dspace.com/go/sw3rdparty.

**Details**

For details, refer to:


- Required MATLAB Releases on page 88
- Required C and C++ Compilers on page 89
- Required Browser Software for dSPACE Products on page 93
- Third-Party Software for ControlDesk on page 93
- Third-Party Software for the RTI FPGA Programming Blockset on page 94
- Third-Party Software for SYNECT and SYNECT Server on page 94


# Required MATLAB Releases

**MATLAB®/Simulink®**

Various dSPACE products require a MATLAB installation on the host PC.

**Tip**

For system requirements of MathWorks® software, refer to http://www.mathworks.com/support/sysreq.html.

| MATLAB Release... | ...Is Supported by dSPACE Release 2021-A | | | | | |
|---|---|---|---|---|---|---|
| | RCP and HIL Software [1), 2)] | AutomationDesk 6.5[3)] | TargetLink 5.1 | Model Compare 3.1 | dSPACE Python Extensions 4.0 [4)] | XIL API .NET MAPort 2021-A |
| R2021a | ✓ [5)] | ✓ | – | – | ✓ | ✓ |
| R2020b | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| R2020a | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| R2019b | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| R2019a | – | – | ✓ | ✓ [6)] | – | – |

1) 'RCP and HIL software' is a generic term for a software package containing several dSPACE software products, for example, ASM, RTI, ConfigurationDesk, and ModelDesk. These software products are installed in a common folder.
2) MATLAB/Simulink Student Suite is not supported by Automotive Simulation Models (ASM).
3) The AutomationDesk MATLAB Access Library requires MATLAB.
4) matlablib2 of dSPACE Python Extensions requires MATLAB.
5) R2021a is not supported by the RTI FPGA Programming Blockset – FPGA Interface.
6) R2019a is supported by Model Compare only if at least R2019a Update 5 is used.

For up-to-date information on additional MATLAB releases that can be used in combination with dSPACE software, refer to http://www.dspace.com/go/MATLABCompatibility.

## Required C and C++ Compilers

**C/C++ compiler for dSPACE hardware systems**

The C/C++ compiler you need depends on the dSPACE hardware you use.

| Hardware | Required Compiler |
|---|---|
| DS1006 | dSPACE DS1006 C/C++ Compiler Version 3.0 based on GNU C/C++ Compiler Ver. 4.8.3[1)] |
| DS1007 | QNX C/C++ Compiler for dSPACE Systems Version 3.1[1)] based on GNU C/C++ Complier Ver. 5.2 |
| DS1104 | Microtec PowerPC C/C++ Compiler Ver. 3.8.7[1)] |
| MicroAutoBox II | Microtec PowerPC C/C++ Compiler Ver. 3.8.7[1)] |
| MicroAutoBox III | Compiler for ConfigurationDesk Platforms Version 1.2[1)] based on GNU C/C++ Compiler Ver. 5.5 |
| MicroLabBox | QNX C/C++ Compiler for dSPACE Systems Version 3.1[1)] based on GNU C/C++ Compiler Ver. 5.2 |
| DS2210<br>DS2211<br>DS2302 | One of the following Texas Instruments tools[2)] (including an ANSI C compiler):<br>▪ TMS 320C3x/C4x Code Generation Tools Ver. 4.70<br>▪ TMS 320C3x/C4x Code Generation Tools Ver. 5.11<br>▪ TMS 320C3x/C4x Code Composer Tools Release 4.10 (including TI Compiler Ver. 5.11)[3)]<br>For compiling slave applications, it does not matter which of the above versions of TMS 320C3x/C4x Code Generation Tools you use. |
| SCALEXIO | Compiler for ConfigurationDesk Platforms Version 1.2[1)] based on GNU C/C++ Compiler Ver. 5.5 |

1) For compiling real-time applications.
2) For compiling slave applications.
3) Installation of TMS 320C3x/C4x Code Composer Tools Release 4.10 (containing C3x/C4x Code Generation Tools 5.11) under the 64-bit version of Windows 7 is not possible. For information on a workaround, refer to http://e2e.ti.com/support/development_tools/code_composer_studio/f/81/t/211223.aspx or contact dSPACE Support.

**Microtec PowerPC C/C++ Compiler** The compiler is installed automatically with the dSPACE software as encrypted archive. If you ordered the required license, you can decrypt the archive and use the compiler afterwards.

**Texas Instruments ANSI C compiler** The Texas Instruments ANSI C compilers are not part of the dSPACE Releases and have to be purchased and installed separately. It is recommended to install them *before* you install the dSPACE software.

For more information on the installation processes, refer to the RTLib documentation of the related dSPACE hardware.

**DS1006 C/C++ Compiler** The dSPACE DS1006 C/C++ Compiler Version 3.0 based on GNU C/C++ Compiler Ver. 4.8.3 is free of charge and is installed automatically with the dSPACE software. The original GNU C/C++ Compiler Ver. 4.8.3 is available from dSPACE on demand. Contact dSPACE Support to get the original ZIP archive, which is also available at http://gcc.gnu.org.

**Tip**

For detailed information on the GNU C/C++ Compiler, its features, incompatibilities, how to use it and how to report bugs, refer to the *GCC 4.8.3 Manual*. It is available at the following locations:

- `<main installation path>\dSPACE RCPHIL 2021-A\Compiler\X86Tools\doc\index.html` (after installation of the dSPACE software)
- http://gcc.gnu.org/onlinedocs/gcc-4.8.3/gcc

**QNX C/C++ Compiler for dSPACE Systems** The QNX C/C++ Compiler for dSPACE Systems contains the required GNU C/C++ Compiler versions for the DS1007, and MicroLabBox as provided by QNX Software Systems. The required GNU C/C++ Compiler is installed automatically with the dSPACE software as encrypted archive. If you ordered the required license, you can decrypt the archive and use the compiler afterwards. The installation also includes libraries and header files. They reside in `%PROGRAMDATA%\dSPACE\<InstallationGUID of RCP and HIL>\Compiler\QNX650_520`. You can access them after installation and decryption via: Start - dSPACE RCP and HIL 2021-A - RCP and HIL 2021-A ProgramData Folder.

**Tip**

- For detailed information on the GNU C/C++ Compiler, its features, incompatibilities, how to use it and how to report bugs, refer to the *GCC 5.2.0 Manual*. It is available at http://gcc.gnu.org/onlinedocs/gcc-5.2.0/gcc/.
- Information on the QNX libraries are available at http://www.qnx.com/developers/docs/6.5.0SP1.update/#./com.qnx.doc.neutrino_lib_ref/about.html.

**Compiler for ConfigurationDesk platforms** The compiler for ConfigurationDesk platforms contains the required compiler versions for MicroAutobox III and SCALEXIO. The required compiler is installed automatically with the dSPACE software. The installation also includes libraries and header files. They reside in `%PROGRAMDATA%\dSPACE\<InstallationGUID of RCP and HIL>\Compiler\Linux440_520`.

**C/C++ compiler for building MEX files (non TargetLink)**

If you want to use software products that require a MEX compiler, such as RTI CAN MultiMessage Blockset, or RTI LIN MultiMessage Blockset, you need to

install a C/C++ compiler and configure it as a MEX compiler in MATLAB. dSPACE software supports the following C/C++ compiler to build MATLAB MEX files:

- Microsoft Visual Studio 2017 Professional
- MinGW compiler as supported by the related MATLAB release:

  MinGW (GNU Compiler Collection (GCC 6.3.0)): MATLAB R2019b, R2020a, and R2020b, and R2021a.

  MinGW compilers are available free of charge. Refer to the MathWorks documentation on how to obtain and install the compiler with MATLAB. For troubleshooting and limitations, refer to http://mathworks.com/help/matlab/matlab_external/compiling-c-mex-files-with-mingw.html.

**C compiler for internal bypass targets used by the RTI Bypass Blockset**

For compiling real-time applications for internal bypass targets, you need a C compiler depending on the microcontroller family used:

| On-Target Module | Target-Specific C Compiler |
|---|---|
| ARM Cortex-R4/R5 | ▪ GNU compiler[1)]<br>▪ Green Hills compiler<br>▪ Standard GNU compiler |
| Freescale MPC5xxx | ▪ HighTec compiler<br>▪ Green Hills compiler<br>▪ Standard GNU compiler |
| Infineon TriCore | ▪ HighTec compiler<br>▪ Green Hills compiler |
| Renesas V850x | ▪ HighTec compiler<br>▪ Green Hills compiler<br>▪ Standard GNU compiler |

1) The compiler is part of the RCP and HIL software installation and installed automatically.

**C compiler for TargetLink**

For compatibility reasons, TargetLink requires the installation of specific C compilers for building MATLAB MEX files and processor-in-the-loop (PIL) simulation applications:

- One of the following C compilers to build MATLAB MEX files and software-in-the-loop (SIL) simulation applications:
  - Microsoft Visual Studio C/C++ Professional 2015 (Ver. 14.0), 2017 (Ver. 15.0), or 2019 (Ver. 16.0) for MATLAB R2019a, R2019b, R2020a, and R2020b.
  - MinGW (GNU Compiler Collection (GCC 6.3.0)): R2019a, R2019b, R2020a and R2020b.
  - The LCC compiler cannot be used to build 64-bit MEX files, because the shipped LCC-Win64 compiler does not support building MEX files or S-functions.

  For a list of supported compilers, refer to http://www.mathworks.com/support/compilers.

- A target-specific compiler to build processor-in-the-loop (PIL) simulation applications:

  If your target is not listed here, refer to the TargetLink PIL Support website at http://www.dspace.com/go/tlpil.

| Compatible Evaluation Boards for PIL Simulation in TargetLink | Compatible TargetLink Compilers |
|---|---|
| Emerge-Engineering ARM MEDKit | Keil 5.2 |
| Lauterbach Simulator for ARM CortexM3 [1)] | Keil 5.2 |
| Freescale MPC5748GEVB | Green Hills 2019 |
| | Wind River Diab 5.9 |
| Freescale EVB9S12XEP100 | Cosmic 4.8 |
| | Metrowerks CodeWarrior 5.1 |
| I+ME Promotion Package 166 | Altium TASKING C166/ST10 Toolset 8.6 |
| Infineon TriBoard TriCore 1766 | Altium TASKING TriCore VX-Toolset 3.2 |
| Infineon TriBoard TriCore 1766 20 MHz | Altium TASKING TriCore VX-Toolset 3.2 |
| Infineon TriBoard TriCore 1767 | Altium TASKING TriCore VX-Toolset 3.2 |
| Infineon TriBoard TriCore 1796 | Altium TASKING TriCore VX-Toolset 3.2 |
| Infineon TriBoard TriCore 275 | Altium TASKING TriCore VX-Toolset 6.3 |
| | HighTec GNU 4.9 |
| Lauterbach Simulator for TriCore 275 [1)] | Altium TASKING TriCore VX-Toolset 4.2 |
| Infineon EasyKit XC2287 | Altium TASKING C166/ST10 VX-Toolset 3.0 |
| Renesas YRH850F1L_R7F7010354 | Green Hills 2019 |
| Renesas EVB7058 | Renesas 9.3 |
| Renesas SH72513 System Development Kit | Renesas 9.4 |
| Renesas AB_050_Fx4_70F4012 | Green Hills 2019 |
| Texas Instruments LAUNCHXL2570LC43 | Texas Instruments Code Composer Studio 7.0 |

[1)] The instruction set simulators are not supplied by dSPACE and have to be obtained from their respective providers.

For more information on the evaluation boards, microcontrollers, and compilers, refer to Evaluation Board Reference 🕮.

**C/C++ compiler for VEOS**

VEOS requires the installation of specific C/C++ compilers to build software-in-the-loop (SIL) simulation applications:

- Microsoft Visual C/C++ Compiler as in Visual Studio 2017. Enterprise, Professional, Build Tools, and Community editions of this version are also supported.
- C/C++ Compiler of the GNU Compiler Collection (GCC). The GCC Ver. 5.2 is shipped with the dSPACE software and installed automatically.

# Required Browser Software for dSPACE Products

**Supported browsers**

The dSPACE products of dSPACE Release 2021-A support the following browsers:

- Google Chrome released in the stable channel, starting with version 87.0, which dSPACE used for testing. The compatibility statement of Google applies. According to Google, later versions released in this channel will be compatible with all previous versions.
- Mozilla Firefox released in the release or ESR channel, starting with version 78.5.0, which dSPACE used for testing. The compatibility statement of Mozilla applies. According to Mozilla, later versions released in this channel will be compatible with all previous versions.
- Microsoft Edge released in the stable channel, starting with version 87.0, which dSPACE used for testing. The compatibility statement of Microsoft applies. According to Microsoft, later versions released in this channel will be compatible with all previous versions.

To use Web interfaces of dSPACE hardware devices or to view HTML reports generated with AutomationDesk or with TargetLink the Microsoft Internet Explorer 11 is also supported.

**Limitation** For the browser instrument of ControlDesk, only Microsoft Internet Explorer 11 is supported.

# Third-Party Software for ControlDesk

**Driver software**

**Driver software for CAN/LIN interfaces** To use CAN/LIN interfaces with ControlDesk, you need the appropriate driver software versions:

| CAN/LIN Interface[1), 2)] | Required Third-Party Software |
|---|---|
| Interfaces from Vector Informatik GmbH | To use CAN/LIN interfaces from Vector Informatik GmbH with ControlDesk, you need the appropriate API and driver:<br>▪ API: XL Driver Library 9.7.26 (or later) is required. The ControlDesk installation provides the Vector XL Driver Library 9.7.26<br>▪ Driver: Vector Driver Ver. 9.8 or later. You need a driver version that is compatible with the API you use.<br>Download the driver from http://www.vector.com. |
| Interfaces from Kvaser | To use Kvaser CAN/LIN interfaces with ControlDesk, you need the appropriate Kvaser drivers:<br>▪ Kvaser CAN: Ver. 5.17 or later |

| CAN/LIN Interface[1), 2)] | Required Third-Party Software |
|---|---|
| | ▪ Kvaser LIN: Ver. 5.17 or later<br>Download them from http://www.kvaser.com. |

1) Refer to Supported CAN Interfaces (ControlDesk Platform Management 🕮).
2) Refer to Supported LIN Interfaces (ControlDesk Platform Management 🕮).

## Third-Party Software for the RTI FPGA Programming Blockset

**Required third-party software for RTI FPGA Programming Blockset**

Working with the RTI FPGA Programming Blockset requires the following products of the Xilinx® Vivado® Design Suite version 2020.2:

- Xilinx Vivado for designing, simulating, and building the FPGA application.
- Xilinx System Generator for DSP Blockset (XSG) for modeling FPGA applications with Simulink.

Note: The Windows Server 2016 operating system is not officially supported by Xilinx Vivado, but tested by dSPACE.

## Third-Party Software for SYNECT and SYNECT Server

**Third-party software for SYNECT**

The following table lists compatible third-party software for SYNECT:

| Product | Compatible Versions | Purpose |
|---|---|---|
| Microsoft Office | 2010, 2013, 2016, 365 | To import items such as test cases from Excel files. |
| MATLAB | Refer to MATLAB Compatibility of Model Management (SYNECT Guide 🕮). | ▪ To open and execute Simulink models.<br>▪ To import and export Simulink model files. |
| IronPython | 2.7 (64-bit) | To program server scripts. |
| Apache™ Subversion® | 1.7, 1.8, 1.9 | To connect SYNECT with a configuration management (CM) system for exchanging files, such as Simulink model files or AutomationDesk project files. |
| PTC® Integrity | 10 | |
| Azure DevOps Server | 2019 | |

**Supported databases for SYNECT server**

SYNECT server supports the following databases:

- Microsoft SQL Server:
  - SQL Server 2012
  - SQL Server 2014

  - SQL Server 2016
  - SQL Server 2017
  - SQL Server 2019
- Microsoft SQL Server 2017 Express: This version is provided by the dSPACE Setup and can be used for development servers.

## Expansion Box Hardware

**DS1104**

It is not possible to install the DS1104 in an expansion box, because this board has a PCI or PCIe connector.

**DS1006**

The DS1006-based modular system must be installed in a PX10 or PX20 Expansion Box.

- The PX10 Expansion Box supports one DS1006.
- The PX20 Expansion Box supports up to two DS1006.

**Note**

- The PX10/PX20 Expansion Boxes need power supplies and connectors which meet the DS1006 requirements to support a DS1006-based modular system. For information on whether your existing expansion box meets the requirements, refer to http://www.dspace.com/go/pxboxvers.
- The system must not exceed the max. amperage of 75 A (PX20) or 40 A (PX10) at 5 V. The DS1006 needs 22 A at 5 V.
- You cannot insert a DS1006 in a PX4 Expansion Box or in an AutoBox/Tandem-AutoBox.

**DS1007**

The DS1007-based modular system can be installed in a PX10 or PX20 Expansion Box or in an AutoBox/Tandem-AutoBox.

- The PX10 Expansion Box and AutoBox support one DS1007.
- The PX20 Expansion Box and Tandem-AutoBox support up to two DS1007.

**Note**

You cannot insert a DS1007 in a PX4 Expansion Box.

**Required slots**

The dSPACE boards have different slot requirements for the installation in an expansion box.

**Modular system based on DS1006 or DS1007** If you want to install a modular system, 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 DS5203 requires two adjacent brackets, if the DS5203M1 I/O modules are installed. The DS2202, DS2211, DS4003, and DS4004 each require a total of three adjacent brackets.

- Valid for DS1006: One free full-size ISA slot is required either by the DS814 (bus connection) or the slot CPU (Ethernet connection).
- The DS1006 has special slot requirements to ensure proper cooling of the AMD Opteron™ processor:
  - In a PX20 Expansion Box, the slot requirement depends on the board revision: Up to board revision DS1006-03, each DS1006 requires four slots. One of them can be used for the DS814 Link Board or the slot CPU. As of board revision DS1006-06, each DS1006 requires three slots. However, none of the slots can be used for the DS814 Link Board or the slot CPU.
  - In a PX10 Expansion Box, the DS1006 can be installed next to the box's power supply (recommended). It then requires two slots, if a DS911 Gigalink Module is mounted. It requires one slot without the DS911 Gigalink Module.
- Valid for DS1007: One free full-size ISA slot is required in an expansion box without a DS911 Gigalink Module mounted on the DS1007. Two slots are required if a DS911 Gigalink Module is mounted.

**Connecting an expansion box and host PC via bus connection**

- The DS814 Link Board has to be installed in the expansion box.
- The DS817, DS819, or DS821 Link Board has to be installed in the host PC.

  The DS819 and DS821 Link Boards have been supported by the dSPACE software since dSPACE Release 5.2.
- You cannot connect the available dSPACE boards to the host PC via the DS811 or the DS812 Link Board.

**Connecting an expansion box and host PC via Ethernet**

- Valid for DS1006 systems: To install your dSPACE system in an expansion box connected to the host PC via Ethernet, a slot CPU with an integrated network adapter has to be installed in the expansion box.
- Valid for DS1007 systems: The DS1007 provides an onboard Ethernet interface to connect the system installed in the expansion box to the host PC via Ethernet.
- The host PC must have a 10BASE-T network adapter (twisted pair, 10 Mbit/s or faster). 10BASE-T: Adapted and reprinted with permission from IEEE. Copyright IEEE 2018. All rights reserved.

## Additional Requirements for 3-D Online Animation via MotionDesk

**Introduction**

You can use MotionDesk with the DS1006, DS1007, MicroAutoBox II, MicroAutoBox III, MicroLabBox, dSPACE Simulator Compact, dSPACE Simulator

Mid-Size, dSPACE Simulator Full-Size, SCALEXIO systems, or VEOS. In these cases, your system must meet the following additional requirements.

The requirements for MotionDesk are also listed at http://www.dspace.com/go/mdhwrequ.

**Software requirements**

The latest driver for the graphics adapter must be installed. This driver must support OpenGL Ver. 4.2.

**Hardware requirements**

| Hardware | Minimum Required | Recommended |
|---|---|---|
| Host processor | Intel Core 2 Duo processor at 2 GHz or equivalent | Intel Core i7 processor or equivalent |
| Main memory | 8 GB RAM | 16 GB RAM |
| Disk space | At least 8 GB for the initial installation | – |

| Graphics Card | Specification |
|---|---|
| Type | ▪ NVIDIA graphics accelerator (OpenGL-compliant) |
| Supported cards | ▪ NVIDIA Quadro<br>▪ NVIDIA GeForce Titan family<br>▪ NVIDIA GeForce RTX family<br>▪ NVIDIA GeForce GTX family higher than GeForce GTX 285<br>▪ NVIDIA GeForce GTX Ti family<br>Requirements for using lidar/radar sensors (available with additional solutions): NVIDIA graphics accelerator that supports NVIDIA CUDA Toolkit 10.2 |
| Limited supported cards[1)] | ▪ Quadro FX<br>▪ Intel graphics accelerators as of Intel HD Graphics 530 or faster |
| Unsupported cards | ▪ NVIDIA Quadro NVS<br>▪ NVIDIA GeForce GT family, GTS family<br>▪ ATI/AMD graphics accelerators<br>▪ Intel graphics accelerators earlier than Intel HD Graphics 530 |
| Graphics memory | ▪ Required: At least 2 GB RAM<br>▪ Recommended: At least 8 GB RAM and two output channels (one output channel to display MotionDesk, the other to display ModelDesk, ControlDesk, or MATLAB).<br>▪ Requirements for using lidar/radar sensors (available with additional solutions):<br>Recommended: 16 GB of graphics memory |

1) Comprehensive functionality is not tested and therefore not guaranteed.

**Additional hardware requirements**

- For a multi-PC solution with DS1006, you need:
  - MotionDesk Multi-PC Interface Kit for the simulator
  - 10 Mbit/s Ethernet card (or faster) for each connected MotionDesk PC

**Note**

- A multi-PC solution is not possible with MicroAutoBox II.
- For a multi-PC solution in combination with DS1007, MicroLabBox, MicroAutoBox III, SCALEXIO systems or VEOS, additional hardware is not required.

- For a Simulink simulation, the simulation PC and each connected MotionDesk PC must have at least one 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 high requirements with regard to graphic performance and driver quality. In some cases, MotionDesk will not operate properly.
- The notebook should be equipped with a supported NVIDIA graphics accelerator (see list above).
- MotionDesk requires the NVIDIA GPU to be selected as the rendering GPU. This setting can be done in the NVIDIA Control Panel (on the Manage 3D Settings page).

**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, drivers are often not stable enough to satisfy the requirements of 3-D real-time applications.

For trouble-free operation, the NVIDIA graphics accelerator must be the only active graphics accelerator.

## Additional Requirements for Sensor Simulation

**Introduction**

You can use the SensorSim application with SCALEXIO systems or VEOS for sensor simulation. In these cases, your system must meet the following additional requirements.

The requirements for SensorSim application are also listed at http://www.dspace.com/go/sensimhwrequ.

| | |
|---|---|
| **Software requirements** | The latest driver for the graphics adapter must be installed. |
| **Hardware requirements** | dSPACE Sensor Simulation PC (recommended) with the following configuration:<br>▪ Intel Xeon E3-1275v6 (3.8 GHz)<br>▪ 4 cores<br>▪ 32 GB RAM<br>▪ 480 GB SSD<br><br>The graphics card (NVIDIA Quadro RTX 6000) can be ordered separately. |
| **Supported environments** | ▪ The SensorSim application supports only NVIDIA® graphics cards. For using lidar/radar sensors (available with additional solutions) the graphics card must support NVIDIA CUDA Toolkit 10.2.<br>▪ The SensorSim application supports only the Microsoft® Windows® operating system. |

# Appendix: Resource Requirements of dSPACE Boards

**Motivation**

Depending on the installation, dSPACE boards require resources in the host PC and the expansion box.

**Where to go from here**

Information in this section



## Installation in the Host PC

**Resources in the host PC**

The following table lists the required I/O address range together with the default address 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.

**Note**

The resource requirements listed in this table apply to the host PC.

| Board | Slot Type | Required I/O Address Range | Default I/O Base Address | Required Memory Range | Required IRQ |
|---|---|---|---|---|---|
| DS1104 | PCI | – | – | 2 x 4 KB | 1 (PCI) |
| DS1104 (PCIe variant) | PCIe | – | – | 2 x 4 KB | 1 (PCIe) |
| DS817 | PCI | 10H | Plug & play | None | 1 (PCI) |
| DS819 | PCI Express | 10H | Plug & play | None | 1 (PCI Express) |
| DS821 | ExpressCard | 10H | Plug & play | None | 1 (PCI Express) |

# Installation in the Expansion Box

**Resources in the expansion box**

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

**Note**

The resource requirements listed in this table apply to the expansion box, not to the host PC.

| Board | Required Address Bytes | Default I/O Base Address |
|---|---|---|
| DS1006 up to board revision DS1006-03 | 10H | 300H |
| DS1006 as of board revision DS1006-06 (multicore processor board) | 40H | 300H |
| DS2302 | 10H | 380H |

**Note**

The DS1007 PPC Processor Board does not need any resources in the expansion box because it is connected to the host PC via Ethernet.

**Resources in the host PC**

The resource requirements for the host PC depend on the connection between the host PC and the expansion box:

**Connection via 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 | ▪ PCI for DS817<br>▪ PCI Express for DS819/DS821 |