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General

Introduction

NOTE! You should have administrator privileges on the PC before installing RobotStudio.

RobotStudio is categorized into the following two feature levels:

- **Basic** - Offers selected RobotStudio functionality to configure, program, and run a virtual controller. It also includes online features for programming, configuring, and monitoring a real controller connected over Ethernet.
- **Premium** - Offers full RobotStudio functionality for offline programming and simulation of multiple robots. The Premium level includes the features of the Basic level and requires activation.

RobotStudio offers the following installation options:

- **Minimal** - Installs only the features required to program, configure, and monitor a real controller connected over Ethernet. If installed with this option, only the Online tab is available.
- **Full** - Installs all the features required to run the complete RobotStudio. If installed with this option, additional features of Basic and Premium functionality are available.
- **Custom** - Installs user-customized features. This option allows excluding unwanted robot libraries and CAD converters.

Installation

Upon installation of RobotStudio 5.12.03, the user will be asked if any existing installation of RobotStudio 5.XX should be uninstalled automatically or the existing installation should remain untouched. Any previous installation of RobotStudio Online will remain untouched.

RobotStudio requires RobotWare to be installed. Optionally, the Track mediapool may also be installed to add support for the track motions IRBTx004.

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How to install RobotStudio on a PC

1. Insert the robot software DVD in the PC (or browse to the RobotStudio DVD image if it is saved on your computer).
2. Unless the installation menu appears automatically (which it should if you have inserted a DVD into the PC), then double-click the file **launch.exe** file to it bring up.
3. Select language for the installation menu.
4. On the installation menu, click **Install Products**.
5. On the Install Products menu, click **RobotStudio**. This opens an installation wizard, which will guide you through the rest of the RobotStudio installation.
6. Follow the instructions in the installation wizard.
7. Now, install RobotWare. On the Install Products menu, click **RobotWare**. This opens an installation wizard, which will guide you through the rest of the RobotWare installation.
8. (Optional) Proceed with installing the Track mediapool. On the Install Products menu, click **Additional Options**. This will open a file browser that displays the Track mediapool installation and other available options.
9. Double-click on the **TrackMotion** folder.
10. Double-click on the file **setup.exe** to start the installation wizard. Proceed through the wizard.
11. The next step is to activate RobotStudio, see below.

Note: For an immediate trial period of 30 days, RobotStudio will work without activation.

Activate RobotStudio

To continue using your product with all of its features after the trial period, you must activate it. RobotStudio Product Activation is based on Microsoft anti-piracy technology and designed to verify that software products are legitimately licensed.

Activation works by verifying that the Activation Key is not in use on more personal computers than are permitted by the software license.

How do I activate RobotStudio?

When you start RobotStudio for the first time after installation, you are prompted to enter your 25-digit Activation Key (xxxxx-xxxxx-xxxxx-xxxxx-xxxxx).

Trial period: Before entering a valid Activation Key, you can run the software, in Premium functionality mode, with all the features enabled (including the CAD converter options), for a trial period of up to 30 days. Please note that the trial period days start immediately after installation. After entering a valid Activation Key, you will see only the features you have purchased (if installed during the trial period you will lose the trial period time).

Basic functionality mode: After the trial period, the software reverts to Basic functionality mode unless you have entered a valid Activation Key. In Basic functionality

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mode, RobotStudio only allows the use of the Online and basic Virtual Controller features. No existing files or stations are harmed in Basic functionality mode. After activating your software, you will have full functionality for the features you have purchased.

Note: *Activation is not required for the Online features for programming, configuring and monitoring a real controller connected over Ethernet.*

Activate automatically over the Internet or manually

The Activation Wizard gives you two choices on how to proceed:


Automatic activation by using the Internet (recommended): Once you have selected the option *Activate RobotStudio over the Internet*, and proceeded through the Wizard, the Activation Wizard automatically contacts the ABB licensing servers over your Internet connection. If you are using a valid Activation Key that has not exceeded the number of installations allowed, your product is activated immediately.

When you activate over the Internet, your activation request is sent to ABB. Your license will then be automatically installed and your product ready for use. If you choose to activate over the Internet but are not currently connected, the wizard alerts you that there is no connection.

Manual activation: If the computer does not have an Internet connection, you must create a license request file by selecting the option *Create a license request file*. Proceed through the wizard, enter your Activation Key and save the License Request File to your computer. Use a removable medium, such as a USB stick or floppy disk, to transfer the file to a computer with an Internet connection. Open a web browser and go to <http://www101.abb.com/manualactivation/> and follow the instructions. The result will be a License File that should be saved and transferred back to the computer holding your product. Relaunch the Activation Wizard and select the option *Install a license file*. Proceed through the wizard, selecting the License File when requested. Upon completion, RobotStudio is activated and ready for use.

How do I activate later?


If you do not want to activate your copy of the software at installation, you can do so later. The following steps will launch the Activation Wizard:

1. Click the **RobotStudio button** , and then click on the **RobotStudio options** button beside **Exit**, and select the **Licensing** section.
2. Click **Activation Wizard** to launch the activation wizard.
3. If your RobotStudio installation has been activated, you will have valid licenses for the features covered by your subscription.

Which RobotStudio version are you using?

The version number of RobotStudio is displayed on the start page that appears when RobotStudio is started.

How can I tell whether my RobotStudio installation has already been activated?

1. Click the **RobotStudio button** , and then click on the **RobotStudio options** button beside **Exit**, and select the **Licensing** section.
2. Click **View Installed License Keys** to see the status of your current license.

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3. If your RobotStudio installation is activated, you will have valid licenses for the features covered by your subscription.

Network licenses

Network licenses are not available for RobotStudio 5.12.03.

How to proceed when contacting ABB

If you have any questions or problems with your RobotStudio installation, please get in touch with your local ABB contact, see <http://www.abb.com/robotics>.

Have the following in mind when contacting ABB

1. Give a brief description of how to reproduce your problem.
2. Create screenshots if applicable. (Use ALT + PRINT SCREEN to get an image of the active window instead of the entire screen.)
3. Generate a Full Scan with the RobotStudio Support Tool available next to RobotStudio in the Start menu, save the report and attach it with your problem description. (Click *Start* → *Programs* → *ABB Industrial IT* → *Robotics IT* → *RobotStudio* → *RobotStudio Support Tool*, click on *Run Full Scan* and then *Save Report*.)
4. We also need the following user information:
 - i. name
 - ii. company
 - iii. contact information
 - iv. what operating system you are running (incl. language)
 - v. subscription ID for your purchased license.

Note: When sending large (> 1 Mb) files, please compress them with WinZip® or WinRAR.

License support

For license-related questions, please contact the team responsible for license support directly at softwarefactory_support@se.abb.com

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Release Information

Release Name

The release name is RobotStudio 5.12.03

The release contains the following products:

- RobotStudio 5.12.03 build 3540.3023
(built with RobotWare 5.12.03 build 3023)

Release Information

The information should be considered as last-minute and most up-to-date.

For more information, please visit the support web site at <http://www.robotstudio.com/community>. There you can find a discussion forum dedicated to RobotStudio.

Release Date

Release date **2009-Dec-07**

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RobotStudio 5.12.03

Supported Operating Systems

Microsoft Windows XP Professional Service Pack 3
 Microsoft Windows Vista Service Pack 1 Business or Enterprise

- Windows Media Encoder Hotfix KB929182

Note: RobotStudio 5.12.03 does not support 64-bit editions of Windows XP Professional or Vista Business or Enterprise.

Note: The Windows Firewall will try to block features necessary to run RobotStudio. Make sure to unblock these features when asked (Industrial Robot Discovery Server, RobotStudio StudioAppFramework module, Virtual RobotController (all published by ABB)). The blocking state of a certain program can be viewed and changed at Start/Control Panel/Windows Security Center/Windows Firewall. Read more on www.microsoft.com.

Note: RobotStudio 5.12.03 requires Microsoft .NET Framework 2.0 SP1 or higher to be installed. The installation procedure will try to download and install the appropriate .NET framework, if not already installed on the installation PC.

Recommended Hardware

High-performance desktop or laptop workstation:

CPU: 2.0 GHz or faster processor

Memory: 1 GB system memory at minimum, 2 GB if running Windows Vista, stations with several robot systems, or large CAD-models.

Free disk-space: 5+ GB free space

Graphics card: High-performance DirectX 9 or OpenGL-compatible graphics card with the corresponding **up-to-date drivers** installed

Screen resolution: 1280 x 1024 pixels or higher

DPI: Normal size (96 dpi)

Mouse: Three-button mouse

3D Mouse Any 3D mouse from 3DConnexion, see <http://www.3dconnexion.com>.

DVD-ROM Drive

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Supported RobotWare Versions

RobotStudio 5.12.03 is distributed with RobotWare 5.12.03 and works with RobotWare 5.05 up to 5.12.03. Please see below for details.

Compatibility Limitations

RobotWare 5.05 and 5.06 Compatibility

RobotWare 5.05 and 5.06 and revisions of those versions are supported with the following limitations:

General

- The RAPID Editor does not support RobotWare 5.05 or 5.06, but requires RobotWare 5.07 or later.
Workaround: Save the RAPID code to a text file and edit the code using any text editor. RAPID code can also be edited using the Virtual FlexPendant.
- The RAPID debugging features that are available in the Premium edition of RobotStudio (Step In, Step Over, Step Out, Breakpoints, Watch Window) are not available for 5.05 or 5.06 systems.
Workaround: None.

Offline

- The function *Sync to VC* may cause corrupt RAPID programs. The problem appears when lines (e.g. targets, paths) are removed from the RAPID program and paths are added to the RAPID program in the same *Sync to VC* operation. As a consequence, the new path may be added after the ENDMODULE statement. This problem does not appear when running RobotWare 5.07 or later.
Workaround: Do not add and remove RAPID paths and targets in the same operation. If the problem has appeared, resolve the syntax error using the Virtual FlexPendant or any text editor.
- The function *System from Layout* does not support RobotWare 5.05 or 5.06, but requires RobotWare 5.07 or later.
Workaround: Use a supported RobotWare version or create the system manually by using System Builder.

Online

- FlexPendant Viewer* does not work RobotWare 5.05 or 5.06

RobotWare 5.07 Compatibility

RobotWare 5.07 and its revisions of are supported with the following limitations:

General

- The location of the program pointer is not updated in the RAPID Editor during program execution.

Offline

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- A limitation in the versions 5.07.02, 5.07.03, and, 5.07.04 of RobotWare may cause the Virtual Controller to System Failure state during I-start on certain computers. The problem is due to the ctrl.bin-file not being correctly created.
Workaround: Create an empty ctrl.bin file in the INTERNAL folder of the controller system, and then perform a warm start.
Note: The problem will reappear if the system is I-started.

RobotWare 5.08 Compatibility

RobotWare 5.08 and its revisions of are supported with the following limitations:

Offline

- RobotWare 5.08 is not supported.
Workaround: Use RobotWare 5.08.01 or later.

RobotWare 5.10 Compatibility

- RobotWare 5.10 and its revisions of are supported with the following limitations:

Offline

- Starting a controller will generate internal UAS error in controller error log.

*RobotWare 5.11 Compatibility

- RobotWare 5.11 and its revisions of are supported with the following limitations:

Offline

- Linear jogging of a robot across joint values that will cause a change of confdata may fail. For example, if the robot is jogged linearly when joint values is passing 90 degrees for axis 1 may cause the robot to stop or to change configuration.

Safety Configuration

Safety configuration of a track motion IRC5 system equipped with a safety controller of type EPS or SafeMove can be done without the need to read track motion parameters manually when using RobotStudio 5.11.01 or later and RobotWare 5.11.01 or later. Encrypted parameters needed by the safety controller will be automatically read by EPS Wizard and SafeMove Configurator, respectively.

Support for future RobotWare versions

RobotStudio 5.12.03 supports all future minor revisions of RobotWare, but no future major releases. For example, RobotStudio 5.12.03 will support RobotWare 5.12.04 (if, and when available) but not RobotWare 5.13.

CAD Converter

Supported CAD Formats and Versions

RobotStudio includes advanced CAD import capabilities such as:

- ACIS (reads/writes versions v6 to R19)
- IGES (reads versions up to 5.3, writes version 5.3)
- STEP (reads versions AP203 and AP214 (geometry only), writes version AP214)

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- VDAFS (reads VDAFS up to 2.0, writes VDAFS 2.0)
- CATIA V4 (reads versions 4.1.9 to 4.2.4)
- CATIA V5 (reads CATIA V5 R6 to R19)
- Inventor (reads versions 6 to 2009)
- Pro/Engineer (reads versions 16 to Wildfire4)

Note: *The CAD converters require separate licenses (except ACIS).*

CAD Converter Options

The CAD Converter options can be set by using the *Advanced* button of the *Settings* dialog of the CAD Converter. By pressing the *Advanced* button, the *CADConverter.ini* file is opened. The file specifies all available options for CAD conversion. To change an option, simply uncomment the line by removing the semicolon and modify the option as desired. All options are described in the file *AcisInterOpConnectOptions.pdf* in the RobotStudio folder of the RobotWare DVD.

Demo stations

There are four demo stations included in this version.

- Demo Two Robots and Conveyor
- Demo FlexLoader
- Demo Exhaust Pipe
- Demo Palletizer

They are stored in the **Pack & Go** format and can be opened with the command **Unpack & Work** on the **Collaborate** section of the RobotStudio menu.

Tutorials

Tutorials are available at the RobotStudio Community at <http://www.robotstudio.com/community>.

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Robot Libraries

The folder *ABB Library* contains libraries of robots, tools, external axes, positioners and equipment.

ABB Robot Libraries supported by RobotStudio 5.12.03

Variant	Library name
120 3kg/0.58m	IRB120_3_58_01.rslib
140 5kg/0.8m Type A/B	IRB140_5_81_01.rslib
140 5kg/0.8m Type C	IRB140_5_81_C_01.rslib
140 6kg/0.8m Type C	IRB140_6_81_C_01.rslib
1400 Type A/B	IRB1400_5_144_01.rslib
1400H Type A/B	IRB1400H_5_128_01.rslib
140T 5kg/0.8m Type C	IRB140T_6_81_C_01.rslib
1410	IRB1410_5_144_01.rslib
1600 5kg/1.2m	IRB1600_5_120_01.rslib
1600 5kg/1.2m Type A	IRB1600_5_120_A_01.rslib
1600 5kg/1.45m	IRB1600_5_145_01.rslib
1600 5kg/1.45m Type A	IRB1600_5_145_A_01.rslib
1600 6kg/1.2m	IRB1600_6_120_02.rslib
1600 6kg/1.45m	IRB1600_6_145_02.rslib
1600 7kg/1.2m	IRB1600_7_120_01.rslib
1600 7kg/1.2m Type A	IRB1600_7_120_A_01.rslib
1600 7kg/1.45m	IRB1600_7_145_01.rslib
1600 7kg/1.45m Type A	IRB1600_7_145_A_01.rslib
1600 8kg/1.2m	IRB1600_8_120_02.rslib
1600 8kg/1.45m	IRB1600_8_145_02.rslib
1600ID 4kg/1.5m	IRB1600ID_4_150_02.rslib
2400 10kg	IRB2400_10_150_01.rslib
2400 16kg	IRB2400_16_150_01.rslib
2400L	IRB2400L_7_180_02.rslib
2600 12kg/1.65m	IRB2600_12_165_01.rslib
2600 20kg/1.65m	IRB2600_20_165_01.rslib
2600 12kg/1.85m	IRB2600_12_185_01.rslib
260	IRB260_30_150_01.rslib
340	IRB340_01.rslib
360 1kg/1130 Std No axis 4	IRB360_1_1130_3D_STD_03.rslib
360 1kg/1130 Wash-down No axis 4	IRB360_1_1130_3D_WD_03.rslib
360 1kg/1130 Standard	IRB360_1_1130_4D_STD_03.rslib
360 1kg/1130 Wash-down	IRB360_1_1130_4D_WD_04.rslib
360 1kg/1130 Stainless	IRB360_1_1130_4D_WDS_03.rslib
360 1kg/800 Std No axis 4	IRB360_1_800_3D_STD_03.rslib
360 1kg/800 Wash-down No axis 4	IRB360_1_800_3D_WD_03.rslib
360 1kg/800 Std	IRB360_1_800_4D_STD_03.rslib
360 1kg/800Wash-down	IRB360_1_800_4D_WD_04.rslib
360 3kg/1130 Std No axis 4	IRB360_3_1130_3D_STD_03.rslib
360 3kg/1130 Wash-down No axis 4	IRB360_3_1130_3D_WD_03.rslib
360 3kg/1130 Standard	IRB360_3_1130_4D_STD_03.rslib
360 3kg/1130 Wash-down	IRB360_3_1130_4D_WD_04.rslib
360 3kg/1130 Stainless	IRB360_3_1130_4D_WDS_03.rslib
360 1kg/1600 Standard	IRB360_1_1600_4D_STD_01.rslib

Variant	Library name
4400 45kg	IRB4400_45_196_01.rslib
4400 60kg	IRB4400_60_196_01.rslib
4400L 10kg	IRB4400L_10_255_01.rslib
4400L 30kg	IRB4400L_30_243_01.rslib
4400S 30kg	IRB4400S_30_243_01.rslib
4450S 30kg	IRB4450S_30_240_01.rslib
4600 20kg/2.5m	IRB4600_20_250_02.rslib
4600 40kg/2.55m	IRB4600_40_255_02.rslib
4600 45kg/2.05m	IRB4600_45_205_02.rslib
4600 60kg/2.05m	IRB4600_60_205_02.rslib
6400R 200kg/2.5m	IRB6400R_200_250_01.rslib
6400R 200kg/2.8m	IRB6400R_200_280_01.rslib
660 180kg/3.15m	IRB660_180_315_01.rslib
660 250kg/3.15m	IRB660_250_315_01.rslib
6600 175kg/2.55m	IRB6600_175_255_01.rslib
6600 175kg/2.80m	IRB6600_175_280_01.rslib
6600 225kg/2.55m	IRB6600_225_255_01.rslib
6600ID 185kg/2.55m	IRB6600ID_185_255_01.rslib
6620 150kg/2.2m	IRB6620_150_220_01.rslib
6620LX-150/1.9m	Wizard
6640 130kg/3.2m	IRB6640_130_320_03.rslib
6640 180kg/2.55m	IRB6640_180_255_03.rslib
6640 185kg/2.8m	IRB6640_185_280_03.rslib
6640 205kg/2.75m	IRB6640_205_275_03.rslib
6640 235kg/2.55m	IRB6640_235_255_03.rslib
6640ID 170kg/2.75m	IRB6640ID_170_275_04.rslib
6640ID 200kg/2.55m	IRB6640ID_200_255_04.rslib
6650 125kg/3.2m	IRB6650_125_320_01.rslib
6650 200kg/2.75m	IRB6650_200_275_01.rslib
6650ID 170kg/2.75m	IRB6650ID_170_275_01.rslib
6650S 125kg/3.5m	IRB6650S_125_350_01.rslib
6650S 200kg/3.0m	IRB6650S_200_300_01.rslib
6650S 90kg/3.9m	IRB6650S_90_390_01.rslib
6660 130kg/3.1m	IRB6660_130_310_02.rslib
6660 205kg/1.9m	IRB6660_205_190_01.rslib
7600 150kg/3.5m	IRB7600_150_350_01.rslib
7600 325kg/3.1m	IRB7600_325_310_01.rslib
7600 340kg/2.8m	IRB7600_340_280_01.rslib
7600 400kg/2.55m	IRB7600_400_255_01.rslib
7600 500kg/2.3m	IRB7600_500_230_01.rslib
7600 500kg/2.55m	IRB7600_500_255_01.rslib
940	IRB940_01.rslib

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Robot Libraries Paint

RobotStudio is distributed with the following Paint robot types that are available in the Robots folder of the ABB Library.

ABB Paint Robot Libraries supported by RobotStudio 5.12.03

Variant	Library name
52 short vertical arm	IRB52_12_475_1005_01.rslib
52 std vertical arm	IRB52_12_700_1005_01.rslib
580-12 std arm	IRB580_12_1000_1620_02.rslib
580-12 short arm	IRB580_12_1000_1220_01.rslib
5400-12 std arm	IRB5400_12_1200_1620_02.rslib
5400-13 std arm	IRB5400_13_1200_1620_02.rslib
5400-14 std arm	IRB5400_14_1200_1620_02.rslib
5400-22 process arm	IRB5400_22_1200_1620_02.rslib
5400-23 process arm	IRB5400_23_1200_1620_02.rslib
5400-24 process arm	IRB5400_24_1200_1620_02.rslib
5400-12 std arm axis 2 +60 deg	IRB5400_12_1200_1620_60P_01.rslib
5400-13 std arm axis 2 +60 deg	IRB5400_13_1200_1620_60P_01.rslib
5400-14 std arm axis 2 +60 deg	IRB5400_14_1200_1620_60P_01.rslib
5500 35A b_80	IRB5500_35A_1300_1720_01.rslib
5500 35B b_80	IRB5500_35B_1300_1720_01.rslib

Track Libraries

RobotStudio is distributed with the following track types that are available in the Track folder of the ABB Library.

Note: in order to use the IRBTX004 tracks the user must install the appropriate Trackmediapool from the RobotWare DVD.

Track family	Length
IRBT4003	1.7 m to 10.7 m
IRBT4004	1.9 m to 19.9 m
IRBT6003	1.7 m to 10.7 m
IRBT6004	1.7 m to 19.7 m
IRBT7003	1.7 m to 10.7 m
IRBT7004	1.7 m to 19.7 m
RTT_Bobin	1.7 m to 11.7 m
RTT_Marathon	1.7 m to 11.7 m
Paint Rails	2 m to 20 m

Positioner Libraries

RobotStudio is distributed with the standard positioners of type IRBP A, B, C, D, K, L and R. The section *Supporting Information* contains more information about the combinations of robots, track motions and positioners that RobotStudio supports.

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Language Support

RobotStudio 5.12.03 is available in the following seven languages:

- English
- French
- German
- Spanish
- Italian
- Japanese
- Chinese - simplified

Documentation

User documentation for RobotStudio is available from the *Help* button () in the upper-right corner of RobotStudio.

The complete documentation in PDF for RobotWare including RobotStudio is available on DVD and can be ordered separately

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New Functionality in RobotStudio 5.12.03 (since RobotStudio 5.12.02)

No new functionality added

New Functionality in RobotStudio 5.12.02 (since RobotStudio 5.12)

EPS and SafeMove in Offline.

The EPS and SaveMove wizard are now available in the Offline mode. This allows users to configure the safety configurations without the need to connect to a real controller.

Solved Limitations in RobotStudio 5.12.03

***Link to web page for Manual Activation is changed**

The URL to use for manual activation has been changed to <http://www101.abb.com/manualactivation/>. The new link is open and does not require any login.

***CATIA V5 Converter failure on Windows Vista**

An environment variable was not correctly set on Windows Vista causing the CATIA V5 converter to fail. This is now fixed.

***Task selection problem in Task Window**

A limitation in the Task Windows prevented the last task from being properly checked in systems with several tasks. The limitation has been removed.

***Conveyor Tracking simulation with multiple conveyors**

Conveyor tracking with two or more conveyors required the I/O Simulator window to be opened for the simulation to work correctly. This is no longer required as this limitation has been removed.

***Corrected 'Product Defect Document'**

Title	PDD Number
Conveyor movement and process timer are not always synchronized.	PDD9300
Robot work envelope not correct	PDD9412
Graphic problem in recorder options window in French	PDD9399
Incorrect position of objects attached to a conveyor	PDD9393
RobotStudio Free does not recognize deleted VCs	PDD9378
Incorrect show work envelope	PDD9286

Known Limitations

An asterix (*) indicates new information since Release Notes 5.12.

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General

Installing a license for RobotStudio Premium removes trial licenses for PowerPacs

When installing a RobotStudio license for the Premium functionality, the trial licenses are removed. This means that possible remaining trial time for features not part of the installed license, e.g. PowerPacs, will no longer be available. The current behaviour implies that in order to test a PowerPac for free you must do it within the trial time of RobotStudio (30days).

Compatibility of RobotStudio Library and Stations with older RobotStudio versions

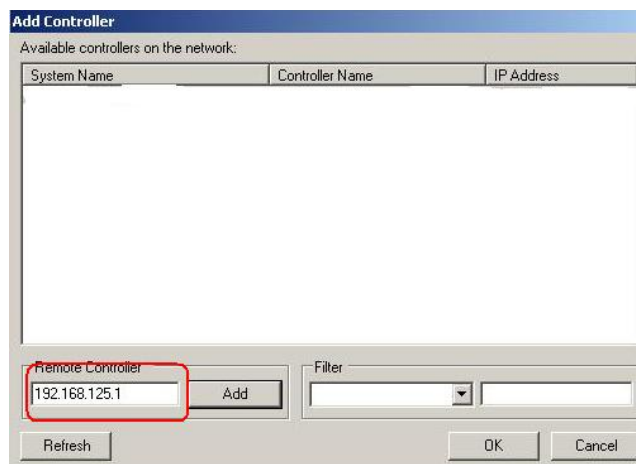
RobotStudio is not upward compatible, i.e. it is not possible to load RobotStudio 5.12.03 into an earlier version of RobotStudio such as e.g. RobotStudio 5.11.

Online

*Not able to connect to controller due to Firewall policy

Firewall settings may prevent RobotStudio from connecting to a robot controller through the function **'Add Controller'** or **'One-click Connect'**.

Workaround: enter the IP-adress manually in the **'Add Controller'** dialog.



Or make sure that none of the below processes and ports are blocked:

Executables (exact .exe location is o/s language and in many cases user specific):

RobotStudio.exe

RobotStudioOnline.exe

RobComCtrlServer.exe

RobNetscanHost.exe

RobVC.exe

Ports & Protocols:

From	To	Port	Protocol
------	----	------	----------

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RobNetscanHost	IRC5 Controller	5512	Proprietary UDP
IRC5 Controller	RobNetscanHost	5513	Proprietary UDP
RobNetscanHost	IRC5 Controller	5514	Proprietary UDP
RobComCtrlServer	IRC5 Controller	5515	Proprietary TCP
RobComCtrlServer	IRC5 Controller	21	FTP
RobotStudio	<internet>	80	HTTP
RobotStudio	IRC5 Controller	21	FTP

*Switching Networkcable

Switching cable from ServicePort to LAN and maintaining an existing connection does not work. It is necessary to close the connection and reconnect. In case this fails, it is necessary to restart RobotStudio and reconnect.

FlexPendant Viewer running with automatic reloading

When having FlexPendant Viewer running with automatic reloading of the screens and at the same time jogging the robot with the joystick the robot jogging might halt when the FlexPendant Viewer reloads.

Backup for Paint systems does not create backup of the PIB board

The Backup function of RobotStudio does not create a backup of the PIB board of the IRC5P system.

Workaround: Create the backup of the PIB board with the FlexPaint Pendant using an USB-stick.

Go Offline does not work for Paint systems

The Go offline function will not create a working Virtual controller system for Paint system unless the Paint package I/O option is set to Simulated.

Restart of Controller when connected through the service port

Re-connection of controller may fail when a controller is restarted from a service port connection.

Generating many signals using Add Signals tool may fail.

Adding many signals in one operation (>100) may fail and display the error message *Failed to apply changes to controller*.

Workaround: After start of RobotStudio, the first thing to do is to launch the Add Signals tool and generate the amount of signals you want. Do **not** expand the Configuration node of the browser and do **not** launch the Configuration Editor until the signals have been generated.

I/O Viewer is not refreshed after controller restart

When looking at I/O Signals launched for the entire I/O System this works just fine. However, due to a design limitation it is not possible for I/O Windows launched by Bus or Unit to be updated after a controller restart.

Task activation in Offline and Online

When starting program execution from the RAPID Editor, the tasks currently activated in the controller will be started. This applies both to Offline and Online controllers.

For Offline controllers, the active tasks are defined in the *Setup Simulation* dialog. This setting only applies to the Simulation Play button. The task settings of the controller will not be used in the Offline case.

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Offline

*Virtual Controller does not support UNC paths

UNC paths cannot be used to locate Virtual Controller systems. Using UNC paths for VC systems will cause the log message '**Failed to initialize FW upgrade framework**' to appear when the system starts. Subsequent attempts to work with the VC such as synchronizing RAPID data will fail.

*Creating and starting systems located on a network drive

When using a network drive to store RobotStudio data such as RobotWare systems or the RobotWare mediapool, the following problems may occur

- Virtual controller does not start
- Not possible to open VirtualFlexpendant

Cause: By default, the .NET Framework 2.0 does **not** allow execution of code from a remote file system. This means the application may behave unexpectedly if the media used by the system or the system itself resides on a network share.

Workaround: To resolve this, the user must explicitly grant the required permissions:

1. Open Control Panel / **Administrative Tools** / **Microsoft .NET Framework 2.0 Configuration**
2. Open **My Computer** / **Runtime Security Policy** / **Machine** / **Code Groups** / **All_Code**
3. Right-click on **All_Code** and select **New...**
4. Type a name for the code group (for example "RobotWare") and click **Next**
5. In the condition dropdown select **URL**. Type the path to the RobotWare location, for example Z:\RobotWare* and click **Next**
6. Select **FullTrust** and click **Next**.
7. Click **Finish**

*Instruction template update

RobotStudio will not automatically update the Instruction template files in the "My Documents\RobotStudio\Instruction Templates" folder, since these files are considered to be user files.

Workaround: The user has to manually copy the newest files from "%ProgramFiles%\ABB Industrial IT\Robotics IT\RobotStudio 5.xx\Instruction Templates" to the data folder.

***Baseframe coordination Robot with Mechunit** RobotStudio will not handle baseframe coordination correctly, if the robot's "Baseframe moved by" MechUnit name differs from the single/robot name in that MechUnit. I.e.:

MOC.CFG:

...

MECHANICAL_UNIT:

```
-name "TRACK" -use_run_enable "" -use_activation_relay ""\
-use_brake_relay "rob1_brake" -use_single_0 "M7DM1" -stand_by_state \
-activate_at_start_up
```

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A configuration like this will cause RobotStudio to miss the target positions by the amount of the external axis motion.

Workaround: Rename the Mechanical Unit name to be the same as the single/robot name.

*UiShow switches to Automatic mode

RobotStudio will automatically request mastership to the controller to update a data value, whenever "UiShow" instruction is used. This will only happen if the Virtual Operator Window is enabled. When starting Virtual Flexpendant with enabled Virtual Operator Window, a message window is launched, explaining that unexpected behaviour may occur.

Workaround: Disable the Virtual Operator Window in RobotStudio options.

*Unexpected behavior with Virtual Operator Window "

RobotStudio will automatically request mastership when committing data to the controller, when actions are taken in Virtual Operator Window. This can cause undesired effect when using the Virtual FlexPendant at the same time.

Workaround: Disable the Virtual Operator Window in RobotStudio options.

*Paint backups from RW 5.12.01 not compatible with RW 5.12.02 or later

Restoring a paint system backup from RobotWare 5.12.01 will cause SysFail for RobotWare 5.12.02

Workaround: Add the following parameters to the configuration files

EIO.CFG:

```
EIO_SIGNAL:
    -Name "doMainInMC" -SignalType "DO" -Unit "SysComm" -UnitMap "44"
    -Name "AlHVErrNo" -SignalType "GO" -Unit "SysComm" -UnitMap "150-151\"
    -Access "ALL"
    -Name "AlHVEEn" -SignalType "DO" -Unit "SysComm" -UnitMap "155\"
    -Access "ALL"

EIO_CROSS:
    -Res "AlHVEEn" -Act1 "HVEEnabled"
```

SYS.CFG:

```
CAB_TASK_MODULES:
    -File "INTERNAL:/pntrapid/T_ROB1/cycinfo.sys" -ModName "cycinfo\"
    -Task "T_ROB1"
    -File "INTERNAL:/pntrapid/csvlkup.sys" -ModName "csvlkup" -AllTask \
    -Hidden
```

*Breakpoints deactivated when running simulation.

When running a simulation (Simulation Play) in time slice mode, all breakpoint set in the RAPID editor window(s) will be deactivated temporarily. This will prevent a situation, that will cause RobotStudio to hang, when a hitting a breakpoint during simulation.

*VC does not start with RRI option and GSI folder structure missing.

Starting a VC with RRI (Robot Reference Interface) Option enabled and missing GSI folder structure in the HOME directory, will cause the VC to hang.

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Workaround: create GSI Folder before starting the VC inside the HOME directory of the system.

*Load station without geometry

Loading a station without geometry and save that station subsequently will permanently remove the geometry.

Workaround: none.

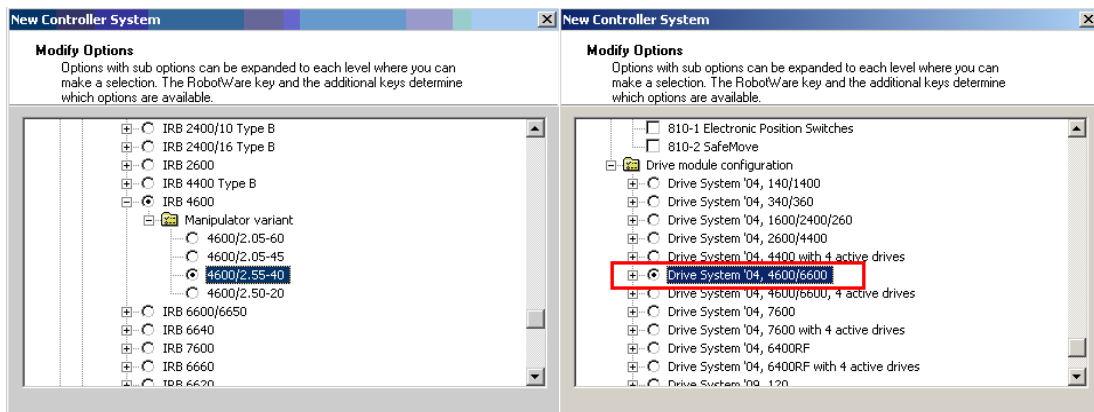
*Modify system with additional Mediapool(s) not in default location.

Trying to modify a system which references additional Mediapool(s) not placed in the same folder as the RobotWare Mediapool will cause the Systembuilder to fail modifying the system.

Workaround: copy Mediapool to default RobotWare Mediapool (i.e. %ProgramFiles%\ABB Industrial IT\Robotics IT\Mediapool\)

*Mismatching drivesystem for selected manipulators in Systembuilder

Creating a system in System Builder with a virtual key, will result in a default drive system selection for 140/1400 manipulator types. For all manipulators different from these, the appropriate drive system has to be selected manually.



*Reachability check for Jointtarget with less than 6 joints not useful

Trying to check reachability for jointtargets created for robot models with less than 6 axis does return a 'question mark' result instead of reachable/unreachable.

Lack of Virtual Controller support for the Paint systems

Paint systems that are configured using the Paint package I/O option Discrete, Compact or Fieldbus, will result in a SysFail state.

Workaround: Re-create the system with the simulated I/O option.

No Virtual FlexPaint Pendant available

There is no Virtual FlexPaint Pendant available for Virtual Controller systems with paint robots.

Workaround: Use the regular Virtual FlexPendant instead.

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Hidden main entry point for Paint systems

Controller systems for Paint robots (IRB5XXX) has a hidden main procedure to handle the so-called *job-queue*. This is why the user must define a new entry point, e.g. *main2*, using the *Setup Simulation* tool to avoid conflicts when working with a paint robot in RobotStudio.

Only single robot setups supported for Paint systems

It is possible to create the system with System builder for both single & multi paint robot systems using Virtual Key & Paint option. But a System failure will occur starting the Multi paint robot system. Only Single paint robot system can be started.

Not possible to use Create Path from Curve with a jointtarget instruction template

It is not possible to create a path from a curve when a jointtarget instruction template is active, for example MoveAbsJ, using the the Create Path from Curve tool. The Apply button will be disabled until an instruction template based on rotarget is selected.

This behavior is by design but is not documented.

The Virtual Controller may fail to start on 64-bit editions of Windows XP and Vista

The Virtual Controller may fail to start on 64-bit editions of Windows XP and Vista .

Circular Conveyor Tracking not supported

RobotStudio does not support tracking of circular conveyors. Only linear conveyors are supported.

Compiling a Conveyor Mechanism does not disable the Compile button

After compiling a conveyor mechanism, using the *Create Mechanism* tool, the *Compile Mechanism* button is not disabled. If the user presses the *Compile* button again, without changing anything, another identical conveyor mechanism will be created .

System in *Guard Stop* state in *Automatic* mode after run-time error

Certain run-time errors may cause the controller system to enter *Guard Stop* state in *Automatic* mode. This is the same behavior as in a physical robot controller system. This typically happens when a run-time error related to Conveyor Tracking occurs. A simulation cannot be started when the controller is in this state.

Workaround: *To reset the controller state, open the Control Panel window and first switch to Manual mode, and then back to Automatic mode.*

Conveyor Tracking programs must be started with the *Simulation-Play* button

It is not possible to successfully run a RAPID program with Conveyor Tracking from the Virtual FlexPendant or from the RAPID Editor. The reason is that RobotStudio must simulate the *Conveyor Encoder Unit* in order to provide the required I/O signals to the system. This is only possible when running a simulation.

Workaround: *Start the simulation with the Simulation-Play button of RobotStudio instead of the Virtual FlexPendant or the RAPID Editor.*

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The same part can only be attached once on a Conveyor

It is not possible to attach the same part on a conveyor more than once.

Workaround: Import the same part several times, or copy and paste the part in the Layout browser, before attaching them to the conveyor.

Note: The part must not be attached to the conveyor during the copy and paste operations, then the copy will get the wrong transform.

Not possible to Modify System for Pack&Go file.

It is not possible to use the function Modify System of the System Builder for a system that uses a mediapool embedded in a Pack&Work file.

Workaround: Copy the mediapool to the common Mediapool folder, and create the system from the backup.

Cannot create a system from layout with IRBx and IRBTX004

The function Create System from Layout will use the installed Track mediapools on the users system. This might fail due to incompatibility between RobotWare vs. Track mediapool version. The user should make sure to use the latest Trackmediapool delivered on the RobotWare 5.12.03 DVD.

Workaround: Use System Builder to manually create a system with the correct mediapool combination .

Absolute Accuracy may cause the VC to miss the programmed position

The robot will not go to the programmed location if the controller has the Absolute Accuracy option activated and parameters from a real robot. The virtual robot in RobotStudio will move to fake targets in the same way as the real robot. The reason is that the robot models in RobotStudio are nominal and do not correspond to the real, physical robots calibrated with Absolute Accuracy parameters.

Workaround: Reset the Absolute Accuracy parameters for the virtual system.

Error Message: Sync. to Station completed with errors

Error Message: Sync to Station completed with errors: New data <name> <type> has same name as existing object in same block <routine>.

When this error message appears, there is a storage type mixup between data already stored in RS and in the VC. Because of this, and per design, the data is not considered the same data.

Workaround: 1. Ensure all data declarations have the same definition in RS as in RAPID (there is no user interface for this).

2. Sync to station should now work.

3. Sync back to controller, and remember to change the data declarations back to what you want.

Move/Copy of Virtual Controller systems

Warm-started systems cannot be moved to another location and/or PC. This will result in a non-working VC.

A typical symptom of the problem is that the Virtual Controller reports *Failed to retrieve procedure*.

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Workaround and recommended method of working:

1. Use *'Pack & Go'* to pack the station and system backups in a zip file.
2. Use *'Unpack & Work'* to unpack the zip file created by *'Pack & Go'*.

Array of robtargets, tooldata and workobjects are not supported

RAPID programs containing arrays of tooldata, robtargets and workobjects are not supported, i.e. they will not be synchronized to the station.

LOCAL declarations in RAPID are not supported the Paths & Targets browser

RobotStudio does not support LOCAL declarations of data or routines. RobotStudio will show an error message if such declarations are used.

The RAPID functions Offs and RelTool are not fully supported

RobotStudio doesn't fully support instructions using Offs or RelTool functions. They will be synchronized and will appear in the element browser, but commands such as "View Tool at Target" and "Locate Target" will not work. Targets used in the instructions will not be visible in the graphics.

Error message starting system with IRB260/660

Starting a system with IRB260/660 gives you an error message: "The number of joints is different between the model and VC". The reason is that the IRB260/660 is modeled with six joints in RobotStudio of which two are locked, but has four joints in the VC .

Incorrect error message "IRBxxx: Could not change motor state"

When starting the VC, the error message "IRBxxx: Could not change motor state" may appear in the output window. This message may be displayed even though the VC has started successfully.

Working range of IRB340

In some cases, it may be possible to Jump to Target and get Configurations for targets that are outside the working range of IRB340. This is due to the working range being defined as a cylinder and not only defined by the joint limits. It is however not possible to jog the robot to these targets.

Path handling of instructions with multiple joint targets

The path functions Rotate, Translate, and Mirror do not work as expected with instructions containing via points as jointtargets. The functions will leave the jointtargets as is. Interpolate Path gives an Unknown Error and Tool Compensation reports an error message.

Process time is displayed only for Simulation - Play in Time Slice mode

This is the only combination for which a correct cycle time can be guaranteed when custom mechanisms are involved in the simulation. It is only in Time Slice mode that RobotStudio controls the time and can synchronize the execution of the Virtual Controller with custom mechanisms. For simulations that only involve robot motion, the cycle time is correct for other combinations as well (RAPID Editor – Play and FreeRun). The Process Timer will turn yellow if the process time cannot be guaranteed.

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Minor difference in process time of “*Simulation Play*” and “*RAPID Editor Play*”

The cycle time deviation between “Simulation Play” and “RAPID editor” is 0.05 s (constant). The difference is due to the program execution starting in different ways in the two scenarios. The play button of the RAPID Editor starts program execution in the same way as the FlexPendant, whereas the play button of the Simulation toolbar uses a slightly different mechanism. When executing program from the RAPID editor, it takes a small amount of time for RobotStudio to be aware that the simulation has started, which is why the “RAPID Editor” cycle time is 0.05 s smaller. The process time of the “Simulation” play is more accurate.

Event Manager: Simulation cannot be triggered by analog system signals

The event manager only supports analog station signals, not analog system signals.

Virtual Flex Pendant: Emergency Stop button

When the emergency stop button is pressed on the Virtual FlexPendant, it cannot be reset through the VC Control Panel. The button must be reset on the Virtual FlexPendant.

System From Layout requires custom made track motion to be saved as library

The System From Layout requires that any custom made track motions used to be saved as library.

Baseframe incorrect for robot with pedestal on track motion

Having a robot on track with a pedestal causes a wrong baseframe written into the controller configuration database (MOC). The track must be rebuilt with Mechanism Modeler if a pedestal not part of the distributed track motion libraries is to be used.

Workaround: *Adjust the track position manually in RobotStudio and answer No to the baseframe update question that appears when restarting a VC.*

Graphics and Geometry

The Healing option may increase size of CAD models

The healing option may be used during CAD import to try and heal CAD-models. For some CAD-models the size is increased a factor of ten.

Workaround: *Uncheck the Healing option in the Import Geometry dialog or the CAD-converter.*

DirectX may require manual installation

The DirectX components that are installed with the Full installation of RobotStudio have been seen to require manual installation on certain computers.

Workaround: *Install DirectX manually. It can be downloaded from <http://www.microsoft.com>.*

Virtual FlexPendant impairs performance when on top of graphics viewer

The control panel of the Virtual FlexPendant (VFP) might affect the performance of the graphical window if placed inside it. If this is the case on your computer, make sure to set the display mode of the VFP to simple mode. This is done by clearing the ‘Enable transparency’ option in the *RobotStudio Option* dialog (a restart of the VFP is required after changing mode). Refreshing the graphical view might however still be somewhat delayed, especially when moving the VFP rapidly over the screen.

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Problems when undoing Boolean operations on Geometry

Undoing a Boolean operation might not succeed. To recover from these problems, you need to delete the items that caused the problem.

Out of memory

The application might fail when out of memory due to the import of very large ACIS files or load of very large stations. There is no immediate workaround for this problem.

JointTargets for external axis

JointTargets for external axis are not visualized in the graphical window.

Direct3D limitations

The following two settings in the 'Graphics Performance' dialog (Tools/Options) have no effect

- Cull back-facing triangles.
- Enable two-sided lighting.

Workaround: Select the graphical object in the object browser and open the "Graphics Appearance" dialog box (context menu) that handles these options per object instead.

Use Direct3D on Windows Vista for improved performance

Windows Vista is optimized for Direct3d, which is why it is recommended to use it as the graphics renderer for RobotStudio. This can be changed in *RobotStudio* → *Main Menu* → *Tools* → *Options* → *Graphics* → *Renderer* → *Direct3D*.

Use CAD Converter when converting CATIA V4 files

It is recommended to use the CAD Converter when converting CATIA V4 files, instead of importing the files directly into RobotStudio using "Import Geometry".

Note: The CATIA V4 converter requires a separate license.

Visual Studio Tools for Applications

The RobotStudio API is not thread safe*

Access to the RobotStudio API is not inherently thread safe. Only access the API from the thread that your Add-In was called from by RobotStudio. If multiple threads manipulate the object model it can be left in an inconsistent state.

Problem with using PC-SDK event handlers from VSTA*

The PC-SDK events are raised on a separate thread. When running a VSTA Add-In from RobotStudio it is not possible to call back to the RobotStudio API from a PC-SDK event handler directly as the call will then be made from another thread.

There is no verified method to dispatch the call to the RobotStudio main thread.

Workaround:

For the events *DigitalSignal.Change* and *AnalogSignal.Change*, the workaround is to use the *EvenTable* class in RobotStudio. Add an *EventTableTriggerIO* object to the event table, and connect it an action that should be done when a digital or analog signal is changed. The action can be to execute a VSTA macro, or set another signal.

From a hosted Add-In it is possible dispatch the call from the event handler to the main thread by using for example *Control.Invoke*.

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Properties and methods that use the type **System.Drawing.Color** will not work in VSTA.

This is a limitation on the Visual Studio Tools for Applications (VSTA) environment.

Note: *There is a new VSTA-class VSTABridge that can be used to work around this problem, see API documentation.*

Static events cannot be called from applications developed in VSTA.

This affects for example the Simulation – Tick event.

Workaround: *Create a standard add-in if static events are to be used. Alternatively, use the VSTABridge class that can workaround this problem, see API documentation.*

Debugging of VSTA Applications

When debugging a VSTA application that adds menu items to the RobotStudio environment, then the menu will not be removed when the program execution stops. This may cause multiple entries of the same menu to be added in RobotStudio. This only affects VSTA add-ins being debugged and not completed VSTA add-ins.

Workaround: *Restart RobotStudio to remove the extra menus.*

VSTA Library add-ins not available

In the Add-ins browser there is a folder for so-called VSTA Library add-ins. This feature is not available.

Use Visual Studio 2008 Express for advanced add-in

The purpose of VSTA is to write custom actions and minor utilities. For advanced add-in development use Visual Studio 2008 Express that can be downloaded free of charge from <http://www.microsoft.com/express/>

RsLoadData does not work from VSTA

(CQ7935)

VSTA limitation

The 'FindDataDeclarationsByType' method used in VB.net throw an exception
Limitation added to API doc.

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Supporting Information

How to automatically create a system with external axes

The recommended way to create a system with external axis is to use the wizard *Create System From Layout* that can be started by pressing the button *Add Robot System -> --- from Layout*. The function will analyze the contents of your station and create a matching system. Simply import the desired robots, positioners and track libraries, and run through the wizard.

Tracks

The following tracks with lengths from 1.7 to 19.7 meters are supported. The track can run in a separate task or in a robot task. The system allows 1-3 tracks per task (dependent of the TCP manipulator type).

IRBT4003
IRBT4004
IRBT6003
IRBT6004
IRBT7003
IRBT7004
RTT_Bobin
RTT_Marathon
Paint Rail

Note: *IRBTx004 can only be used in the first task. Only one track of this type can be used per system.*

Supported external axis configurations

Combination of IRB, Track Motion & Positioner	A	B	C	D	K	L	2xL	R
1 IRB (positioner in same task)	✓	✓	✓	✓	✓	✓	✓	✓
1 IRB (positioner in separate task)	✓	✓	✓	✓	✓	✓	✓	✓
2 IRB (positioner in separate task)	✓	✓	✓	✓	✓	✓	✗	✓
1 IRB on Track Motion (positioner in same task)	✓	✗	✗	✗	✓ ¹	✓	✓	✗
1 IRB on Track Motion (positioner in separate task)	✓	✗	✗	✗	✓ ¹	✓	✓	✗
2 IRB on Track Motion (positioner in separate task)	✓	✗	✗	✗	✓ ¹	✓	✗	✗

¹) Manual mapping of mechanical units and joints required. Select the models from the station and combine them with the appropriate mechanical units with the System Configuration windows. Select OK to close the window before the next step. Open the window again and click on *Change...* in the lower right corner. Map the joints 1 to 3 for the positioner. Press OK to close the window. Reopen the window and point out the baseframe (use current station values).

✓ Combination is supported

✗ Combination is not supported

Track Motion Create System From Layout only supports tracks of type RTT and IRBTx003 in combination with positioners., i.e. IRBTx004 is not supported in combination with positioners.

Single task: Positioner in same task as robot

Separate task Positioner in separate task from robot. (Track motion is always in same task as robot.)

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How to manually set up a system with track motion of type RTT or IRBTx003?

Track configuration files to be used for track motions or type RTT or IRBTx003 (x = 4, 6, or, 7) can be found in the folder %PROGRAMFILES%/ABB Industrial IT\Robotics IT\RobotStudio 5.12\ABB Library\Tracks folder.

Follow the instructions below to manually create a system with track motion of type RTT Bobin, RTT Marathon or IRBT4003, IRBT6003 or IRBT7003.

1. Create a system for the desired robot variant using *System Builder*, which can be found in the *Offline* tab of RobotStudio. The system must include the corresponding *Additional axes configuration option*:
 - a. Select the desired robot variant
 - i. In the *Create New Controller System Wizard* of the System Builder, go to the *Modify Options* page,
 - ii. expand *DriveModule1* → *Drive module application* → *ABB standard manipulator*, and,
 - iii. choose the appropriate robot variant, e.g. *IRB6620*.
 - b. Select the corresponding *Additional axes configuration*
 - i. Further down on the *Modify Options* page expand *Additional axes configuration*,
 - ii. expand *Add axes IRB/drive module 6600*, (or whatever option that matches your selected robot variant), and
 - iii. select *770-4 Drive W in pos Y2* or similar option. The options differ slightly depending on the *Additional axes configuration* used: the exact drive and position may differ. The important thing here is to select one drive in any position.
 - c. Press *Finish*.
2. Add the system to the station.
3. Open *System Configuration* in RobotStudio and add the corresponding track configuration file of the desired track motion model by pressing the *Add* button, see below*. The system will restart when pressing the *OK* button.

Note: *The system will end up in System Failure state unless the matching "Additional axes configuration" is selected.*
4. Point out the desired track model when the system asks for a mechanical unit for TRACK. Either choose one of the suggested models or browse for a different track.
5. Open *System Configuration* again, select the *ROB_1* node, and set *BaseFrame Moved By* to *TRACK*. The system will restart when pressing the *OK* button.

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* How to select the correct track configuration file?

The track configuration files are available for different track lengths and different tasks. The track length is encoded in the name of the configuration file, e.g. if the track length is 4.7 m then the configuration file to pick is called *TRACK_4_7.cfg*.

If the track is used for a robot in a MultiMove system, then the task number must also be taken into account, e.g. if the track length is 19.9 m and the robot attached to the track is connected to task 4 of the MultiMove system, then the configuration file to pick is called *TRACK_19_9_Task4.cfg*.

How to manually set up a system with track motion of type IRBTx004?

For configuration of tracks of type IRBT4004, IRBT6004 or IRBT7004, the user must install the appropriate Track mediapool from the RobotWare DVD (RobotWare DVD\Additional Options\TrackMotion\).

Follow the instruction below to manually create a system for the IRBTx004 track motion.

1. Create a system for the desired robot variant using *System Builder*, which can be found in the *Offline* tab of RobotStudio. The system must include the corresponding *Additional axes configuration option*:
 - a. Add the additional options mediapool for IRBTx004
 - i. In the *Create New Controller System Wizard* of the System Builder, go to the *Add Additional Options* page,
 - ii. select the "... " button and browse to the key (.kxt file) located in the mediapool *Track.5.xx*.
 - iii. Press the arrow → to add the option.
 - b. Select the desired robot variant and track motion to use
 - i. Proceed to the *Modify Options* page,
 - ii. expand *DriveModule1* → *Drive module application* → *ABB standard manipulator*, and, choose the appropriate robot variant, e.g. *IRB6600*.
 - c. Select the corresponding additional axes configuration
 - i. Further down on the *Modify Options* page, expand *Additional axes configuration*,
 - ii. expand *Add axes IRB/drive module 6600*, (or whatever option that matches your selected robot variant), and
 - iii. select *770-4 Drive W in pos Y2* or similar option. The options differ slightly depending on the Additional axes configuration used. The drive and position may differ. The important thing here from a RobotStudio point-of-view is to select one drive in any position.
 - iv. Select the desired robot variant and track motion to use
 - i. Scroll down to *TRACK*, expand it and select *Drive Module 1* → *Track Motion Type* → *IRBT 6004* → *Irb Orientation on Track* →

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Inline → *Select Track Motion Length* → 1.7 m, or whatever variant you prefer.

- v. Press Finish.
2. Add the system to the station. The system will start.
3. When the *Select Library* dialog appears, press the *Other* button, browse to the folder *ABB Library/Track* and select the track motion library corresponding to your system.
4. Done!

Note: *RobotStudio will adjust the joint limits of the mechanisms to the limits of the VC. If the incorrect track configuration file is selected, this may cause mismatch between the used joint limits of the RobotStudio/VC and the geometry of the track motion model in RobotStudio.*

Code Snippets

The RAPID Editor of RobotStudio contains Code Snippets that are integrated with the Pick List. Code Snippets are pieces of code that can be inserted into the editor on user request. RobotStudio comes with a number of predefined Code Snippets, such as:

- array2x2x4.snippet
- array2x4.snippet
- array2x4x2.snippet
- array4x2.snippet
- function with return value bool.snippet
- module header.snippet
- procedure parameters.snippet
- procedure with error handler.snippet
- robtargt.snippet
- tooldata.snippet
- TRAP routine example.snippet
- wobjdata.snippet

In addition, the user can create customized Code Snippets and add to the existing list of Code Snippets. The Code Snippets adhere to the Code Snippet format of Visual Studio 2005. Code Snippets can be edited in any XML editor such as Visual Studio 2005 Express, which can be downloaded free of charge from Microsoft at <http://msdn.microsoft.com/vstudio/express/>. Read more about creating your own Code Snippets in the MSDN article 'How to: Create a Basic Code Snippet' at <http://msdn.microsoft.com/en-us/library/ms165394.aspx>

The RobotStudio .snippet files are stored per user and located in the folder
C:\<Documents and Settings>\<user name>\RobotStudio\Code Snippets,

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where the folder *<Documents and Settings>* may be configured to have different names, e.g. *Data*. It may also be translated on localized versions of Windows.

Note: *The language specified in the .snippet file to be used in the RobotStudio RAPID Editor must be RAPID, whereas the Microsoft examples are targeted towards other programming languages. However, the structure and format are the same. See also the pre-defined .snippet files installed with RobotStudio 5.12.02.*

Instruction Templates

The *'Instruction Template Manager'* can be used to add support for instructions other than the pre-defined set that comes with RobotStudio by default. For example, a robot controller system with the RobotWare Dispense option comes with specialized move instructions related to glueing, e.g. DispL and DispC. The user can manually define instruction templates for these using the *'Instruction Template Manager'*. The instruction templates can be exported to XML format for later reuse.

For some common processes RobotStudio 5.12.03 comes with pre-defined XML files that can be imported and used for robot controller systems with the appropriate RobotWare options. The instruction templates provided add support for the following RobotWare options:

- Cap (Continuous Application Process)
- Disp (Dispense)
- Trigg (Fixed Position Events)
- Spot Pneumatic
- Spot Servo
- Spot Servo Equalizing
- Paint

The XML files provided contain both Move and Action instructions.

The instruction template files can be found in the *'Instruction Templates'* folder of the users RobotStudio folder.

Note: *RobotStudio ArcWelding PowerPac is recommended when using RobotWare Arc.*