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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.

- **Complete** - 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 5.13.02, 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.
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-xxxx`).

**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
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/](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.
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 5.13.02.

**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](http://www.abb.com/robotics).

**Have the following in mind**

1. Running the latest version of RobotStudio help ensure that it works properly and includes improvements and new product functionality. ABB recommends that you update to the latest version of RobotStudio whenever a new version is available and before contacting ABB for support.

2. Give a brief description of how to reproduce your problem.

3. Create screenshots if applicable. (Use ALT + PRINT SCREEN to get an image of the active window instead of the entire screen.)

4. 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.

5. 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
Release Information

**Release Name**

The release name is RobotStudio 5.13.02
The release contains the following products:

- RobotStudio 5.13.02 build 3989.2039
  (built with RobotWare 5.13.02 build 2039)

**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 2010-Oct-15
RobotStudio 5.13.02

**Supported Operating Systems**

- Microsoft Windows XP Professional Service Pack 3
- Microsoft Windows 7
- Microsoft Windows 7 – 64 bit edition

**Additional components**

Microsoft .NET Framework 3.5 SP1 is optional but required for the Smart Component Viewer. It can be downloaded from [http://www.microsoft.com/net](http://www.microsoft.com/net) if needed.

**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](http://www.microsoft.com).

**Recommended Hardware**

High-performance desktop or laptop workstation:

- **CPU:** 2.0 GHz or faster processor
- **Memory:** 1 GB system memory at minimum, 3 GB if running Windows Windows 7, 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](http://www.microsoft.com) installed.
- **Screen resolution:** 1280 x 1024 pixels or higher
- **DPI:** Normal size (100% / 96 dpi) up to Medium size (125% / 120 dpi)
- **Mouse:** Three-button mouse
- **3D Mouse** Any 3D mouse from 3DConnexion, see [http://www.3dconnexion.com](http://www.3dconnexion.com).
- **DVD-ROM Drive** if installing from a DVD
Supported RobotWare Versions

RobotStudio 5.13.02 is distributed with RobotWare 5.13.02 and works with RobotWare 5.05 up to 5.13.02. 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
- 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.

### RobotWare 5.12 Compatibility

RobotWare 5.12 and its revisions of are supported with the following limitations:

**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 or later

**Workaround:** Add the following parameters to the configuration files

**EIO.CFG:**

```
EIO_SIGNAL:
  # EIO_SIGNAL:
  - Name "doMainIntMC" -SignalType "DO" -Unit "SysComm" -UnitMap "44"
  - Name "AlHVEnErr" -SignalType "GO" -Unit "SysComm" -UnitMap "150-151"
    - Access "ALL"
  - Name "AlHVEn" -SignalType "DO" -Unit "SysComm" -UnitMap "155"
    - Access "ALL"
EIO_CROSS:
  # EIO_CROSS:
  - Res "AlHVEn" -Act1 "SVEnabled"
```

**SYS.CFG:**

```
CAB_TASK_MODULES:
  # File "INTERNAL:/pntrapid/T_ROB1/cycinfo.sys" -ModName "cycinfo",
  -Task "T_BGB1"
  -File "INTERNAL:/pntrapid/csvlkup.sys" -ModName "csvlkup" -AllTask \ 
    -Hidden
```

### RobotWare 5.13 Compatibility

RobotWare 5.13 and its revisions of are supported with the following limitations:
Paint backups from RW 5.12.02, 5.12.03 or RW 5.13 or 5.13.01 not compatible with RW 5.13.02

There are several changes in the configuration database for I/O (EIO.CFG) and Controller (SYS.CFG) that will cause System Failure if an old backup is loaded. There are also changed in installed RAPID modules. To create a compatible configuration, proceed as follows:

1. Create and start a VC with a RobotWare 5.13.02 system containing the same options as your original backup, but do not load the backup.
2. Save the EIO.CFG and SYS.CFG to file.
3. Compare the saved files with the corresponding files of your backup. (You can use a text file comparison tool for simplification.)
4. Add your system-specific configuration to the general configuration files saved from the 5.13.01-system using a text editor.
5. Replace the files of the original backup with the corresponding modified configuration files.
6. Go through the RAPID modules of the backup and remove the default modules (i.e. those that are not changed by the user).
7. Load the backup and restart the system. You are done.

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 5.13.02 supports all future minor revisions of RobotWare, but no future major releases. For example, RobotStudio 5.13.02 will support RobotWare 5.13.03 (if, and when available) but not RobotWare 5.14.

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 six demo stations included in this version.

- Demo Two Robots and Conveyor
• Demo FlexLoader
• Demo Exhaust Pipe
• Demo Palletizer
• *Smart Component Solar Simulation
  o Updated with new logic for randomization of panel positions on infeeder
• SCM_ExampleProject & SCM_ExampleStation
  (see Section ScreenMaker Information for information on where to find it)

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

**Tutorials**

Robot Libraries

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

**ABB Robot Libraries supported by RobotStudio 5.13.02**

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<tr>
<th>Variant</th>
<th>Library name</th>
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<td>120 3kg/0.58m</td>
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<td>140 5kg/0.8m Type A/B</td>
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<td>IRB1410_5_144.rslib</td>
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<tr>
<td>6620 150kg/2.2m</td>
<td>IRB6620_150.rslib</td>
</tr>
<tr>
<td>6620L 150kg/1.9m</td>
<td>Wizard.rslib</td>
</tr>
<tr>
<td>6640 130kg/3.2m</td>
<td>IRB6640_130.rslib</td>
</tr>
<tr>
<td>6640 180kg/2.55m</td>
<td>IRB6640_180.rslib</td>
</tr>
<tr>
<td>6640 185kg/2.8m</td>
<td>IRB6640_185.rslib</td>
</tr>
<tr>
<td>6640 205kg/2.75m</td>
<td>IRB6640_205.rslib</td>
</tr>
<tr>
<td>6640 235kg/2.55m</td>
<td>IRB6640_235.rslib</td>
</tr>
<tr>
<td>6640D 170kg/2.75m</td>
<td>IRB6640D_170.rslib</td>
</tr>
<tr>
<td>6640D 200kg/2.55m</td>
<td>IRB6640D_200.rslib</td>
</tr>
<tr>
<td>6650 125kg/3.2m</td>
<td>IRB6650_125.rslib</td>
</tr>
<tr>
<td>6650 200kg/2.75m</td>
<td>IRB6650_200.rslib</td>
</tr>
<tr>
<td>6650D 170kg/2.75m</td>
<td>IRB6650D_170.rslib</td>
</tr>
<tr>
<td>6650S 125kg/3.5m</td>
<td>IRB6650S_125.rslib</td>
</tr>
<tr>
<td>6650S 200kg/3.0m</td>
<td>IRB6650S_200.rslib</td>
</tr>
<tr>
<td>6650S 90kg/3.9m</td>
<td>IRB6650S_90.rslib</td>
</tr>
<tr>
<td>6660 130kg/3.1m</td>
<td>IRB6660_130.rslib</td>
</tr>
<tr>
<td>6660 205kg/1.9m</td>
<td>IRB6660_205.rslib</td>
</tr>
<tr>
<td>7500 150kg/3.5m</td>
<td>IRB7500_150.rslib</td>
</tr>
<tr>
<td>7500 325kg/3.1m</td>
<td>IRB7500_325.rslib</td>
</tr>
<tr>
<td>7500 340kg/2.8m</td>
<td>IRB7500_340.rslib</td>
</tr>
<tr>
<td>7600 400kg/2.55m</td>
<td>IRB7600_400.rslib</td>
</tr>
<tr>
<td>7600 500kg/2.3m</td>
<td>IRB7600_500.rslib</td>
</tr>
<tr>
<td>7600 500kg/2.55m</td>
<td>IRB7600_500B.rslib</td>
</tr>
<tr>
<td>940</td>
<td>IRB940.rslib</td>
</tr>
</tbody>
</table>
Robot Libraries Paint

*) Libraries marked with an asterix (*) are new for RobotStudio 5.13.02

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

<table>
<thead>
<tr>
<th>Variant</th>
<th>Library name</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 short vertical arm</td>
<td>IRB52_12_475_1005_01.rslib</td>
</tr>
<tr>
<td>52 std vertical arm</td>
<td>IRB52_12_700_1005_01.rslib</td>
</tr>
<tr>
<td>540-12 std arm</td>
<td>IRB540_12_1000_1620_01.rslib</td>
</tr>
<tr>
<td>580-12 std arm</td>
<td>IRB580_12_1000_1620_02.rslib</td>
</tr>
<tr>
<td>580-12 short arm</td>
<td>IRB580_12_1000_1220_01.rslib</td>
</tr>
<tr>
<td>5400-12 std arm</td>
<td>IRB5400_12_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-13 std arm</td>
<td>IRB5400_13_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-14 std arm</td>
<td>IRB5400_14_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-22 process arm</td>
<td>IRB5400_22_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-23 process arm</td>
<td>IRB5400_23_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-24 process arm</td>
<td>IRB5400_24_1200_1620_02.rslib</td>
</tr>
<tr>
<td>5400-12 std arm axis 2 +60 deg</td>
<td>IRB5400_12_1200_1620_60P_01.rslib</td>
</tr>
<tr>
<td>5400-13 std arm axis 2 +60 deg</td>
<td>IRB5400_13_1200_1620_60P_01.rslib</td>
</tr>
<tr>
<td>5400-14 std arm axis 2 +60 deg</td>
<td>IRB5400_14_1200_1620_60P_01.rslib</td>
</tr>
<tr>
<td>5500 35A b .00 / b .80</td>
<td>IRB5500_35A_1300_1720_01.rslib</td>
</tr>
<tr>
<td>5500 35B b .00 / b .80</td>
<td>IRB5500_35B_1300_1720_01.rslib</td>
</tr>
<tr>
<td>*5500 ProArm 35A b .00 / b .80</td>
<td>IRB5500_ProArm_A_1300_1720_01.rslib</td>
</tr>
<tr>
<td>*5500 ProArm 35B b .00 / b .80</td>
<td>IRB5500_ProArm_B_1300_1720_01.rslib</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Track family</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRBT4003</td>
<td>1.7 m to 10.7 m</td>
</tr>
<tr>
<td>IRBT4004</td>
<td>1.9 m to 19.9 m</td>
</tr>
<tr>
<td>IRBT6003</td>
<td>1.7 m to 10.7 m</td>
</tr>
<tr>
<td>IRBT6004</td>
<td>1.7 m to 19.7 m</td>
</tr>
<tr>
<td>IRBT7003</td>
<td>1.7 m to 10.7 m</td>
</tr>
<tr>
<td>IRBT7004</td>
<td>1.7 m to 19.7 m</td>
</tr>
<tr>
<td>RTT_Bobin</td>
<td>1.7 m to 11.7 m</td>
</tr>
<tr>
<td>RTT_Marathon</td>
<td>1.7 m to 11.7 m</td>
</tr>
<tr>
<td>Paint Rails</td>
<td>2 m to 20 m</td>
</tr>
</tbody>
</table>

Positioner Libraries

RobotStudio 5.13.02 is distributed with the new M2009 generation of positioners of type IRBP A, B, C, D, K, L and R and MTD. This represents the complete product range of the M2009 positioner series. The positioner libraries will be generated when the user selects the library from the menu ‘ABB Library’ gallery of the ‘Home’ tab of RobotStudio.
The imported library will by default be part of the station. A consequence is that part positions can by modified. To prevent the library from being accidentally modified, it should be saved as a library. This can be done using the ‘Save As Library’ command.

The reason for not distributing the pre-compiled libraries is to reduce maintenance and footprint as the libraries are sharing many components. The function ‘System From Layout’ supports the new positioner generation and can be used to build a matching system.

**Note:** The M2001 library generation will still be distributed with RobotStudio 5.13.02 in .rslib format and can be imported using the ‘Browse for Library’ command.

**Mediapools**

RobotStudio 5.13.02 is distributed with the mediapools for the M2001 generation that are used also for the M2009 series in RobotStudio. In particular, the kinematics of the two positioner generations are identical. However, the true mediapool of a specific system can be used for offline programming using the virtual controller in RobotStudio, if available. A convenient way to get a new mediapool from a physical controller is to use the feature ‘Go Offline’ that will copy the mediapool off the real controller to the PC and create an identical virtual controller system (including the used mediapool).

Alternatively, the additional options mediapool can be manually copied to the PC. A controller system can then be created using the ‘System Builder’ for use by the virtual controller in RobotStudio.

For each type of positioner there is only one mediapool in RobotStudio (for one payload). Currently, they use the 250 kg variant, which is the fastest one. This means that the cycle time of a program executed in RobotStudio with the standard mediapools may deviate from the true cycle time of a system with higher payload. For accurate cycle times, please use the mediapool that is delivered with the physical controller system of the positioner.

The new drive system (Drive ’09) can be used both with the M2001 and the M2009 mediapools.

RAPID programs are compatible between the M2001 and the M2009 mediapools, i.e. they can be moved between any two systems with the same setup, regardless of the mediapool generation.

**Current limitations:**

The M2009 mediapools have new motors and new trimming/tuning data, but for RobotStudio this should not make any difference.

The arc welding power source is not part of the simulation. In particular, the start and stop times for the welds are not part of the simulation. These may be around one second per weld. This will have an impact on the cycle time.

**Summary**

The purpose of including the mediapools in RobotStudio is for use in virtual controller systems created mainly by the function ‘System from Layout’. Robot systems with positioners are very complex and can be defined in many different configurations (type of positioners, payload, size of positioners, MultiMove, several robots,...). In RobotStudio we have tried to cover the most common configurations. Users who want to have more accurate results should use their specific mediapool for the physical systems that is being programmed.
The *RobotStudio Operating Manual* contains more information about the combinations of robots, track motions and positioners supported by the RobotStudio function *‘System from Layout’*.

**Language Support**

RobotStudio 5.13.02 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.

**New Functionality in RobotStudio 5.13.02**

**PC SDK and FlexPendant SDK 5.13.02 installed with RobotStudio**

Version 5.13.02 of PC-SDK and FlexPendant SDK are installed with the Complete installation of RobotStudio and can optionally be installed with the Custom installation option.

**New generation of positioner libraries**

The M2009 generation of ArcWelding positioners is available in RobotStudio. The M2001 positioners will still be available in the RobotStudio installation. Read more in the section ‘Positioner Libraries’.

**Note:** The new libraries are not saved as libraries by default, they are stored in the station. A consequence is that part positions can be modified. To prevent the library from being accidentally modified, you should save it as a library.

**New paint robot IRB5500 ProcessArm**

A variant of the IRB5500 with process arm is available in RobotStudio 5.13.02.

**Updated demo station for Smart Components**

The demo station for Smart Components named ‘*Smart Component Solar Simulation.rspag*’ has been updated with randomized input positions and a sensor that reads positions and feeds the virtual controller during run-time.
New Functionality in RobotStudio 5.13.01

PC SDK and FlexPendant SDK 5.13.01 installed with RobotStudio

Version 5.13.01 of PC-SDK and FlexPendant SDK are installed with the Complete installation of RobotStudio and can optionally be installed with the Custom installation option.

Smart Components

New base component: MoveAlongCurve
A base component that moves an object along a geometric curve at a specified speed.

Show/Hide available for Queue Components
Some people find it too time consuming for show/hide operations of several object to use SmartComponents. That is why Show/Hide is now available for Queues.

New base component: Simulation Events
To get events for simulation start and stop.

New base component: JointReader
Reads the joint values of a mechanism. Similar to PositionSensor.

Offline

Baseframe values can be copied between mechanical units
A copy function is now available in the System Configuration dialog, so that a baseframe value can be copied to another single mechunit.

New Functionality in RobotStudio 5.13

Smart Components

Smart Components offers a new way of creating simulations by adding behavior to the simulated objects. It brings life to the graphical component libraries by the addition of so-called Base Smart Components for basic motion, signal logic, arithmetic, parametric modeling, sensors etc, etc. Moreover, Smart Component authoring can be separated from its use in a simulation. The internal logic of the user-created, composite Smart Component is hidden to the component user that only needs to know how to connect it to other high-level Smart Components of the simulation. This allows Smart Components for common equipment to be re-used over and over again, thus saving valuable time.
The Base Smart Components available in RobotStudio 5.13 will cover the most cases, which removes the need for customization in e.g. Visual Studio Tools for Applications (VSTA). Advanced users still have the possibility to develop their own customized smart components using Microsoft Visual Studio C# or any other programming language that supports Microsoft .NET Framework.

Smart Components is a replacement to the Event Manager. Instead of adding the simulation logic to the centralized Event Manager, the logic is distributed to the simulation objects themselves. However, the Event Manager will still be available for backwards compatibility.

**Document Manager**

The Document Manager allows you to search and browse RobotStudio documents like libraries, geometries and so on in large numbers and from different locations. Commonly used folders can be added to a gallery such as the standard gallery for ABB Library components. Two modes are supported: Searching and Browsing.

**ScreenMaker**

ScreenMaker is fully integrated with RobotStudio and need no longer be installed as a separate product. It allows easy creation of FlexPendant operator panels.
Developer Tools
PC-SDK and FlexPendant SDK are now integrated in the RobotStudio installer and can be installed with the Complete or Custom installation option.

Targets on Edge
Support for target creation using geometry.
Start and Stop of Tasks in Offline browser

Tasks (both motion tasks and background tasks) can be selectively started and stopped from the Offline browser.

Improved support for task frame alignment

It is easier to define and modify the task frame in RobotStudio 5.13. By default, the task frame is aligned with the robot base frame in ‘System From Layout’. This corresponds to setting the base frame translation and rotation equal to zero in the Motion Configuration database of the controller (MOC.CFG).

When moving the task frame, the user gets the options to move or keep the base frame location. Correspondingly, when adjusting the base frame using the Set Position tool, the user gets the option to adjust the task frame.
<table>
<thead>
<tr>
<th>Place by Two Frames</th>
</tr>
</thead>
<tbody>
<tr>
<td>New place option</td>
</tr>
</tbody>
</table>

Support for LOCAL procedures in RAPID
RobotStudio now supports RAPID procedures declared as LOCAL.

Mirror function
Geometric entities such as parts, bodies, and curves can now be mirrored around its local origin.

Solved Limitations in RobotStudio 5.13.02

**Smart Component Graphic Switch problem**
There was a problem with the internal state of the Graphic Switch first time it was used in a station. This has been fixed.

Solved Limitations in RobotStudio 5.13.01

**The RobotStudio Operating Manual incorrected tagged as Draft**
This has been fixed.

**RobotStudio supports DPI up to 120 dpi**
The previous dpi limitation for the screen resolution has been removed.

**Ensure that the calibration frame and the workobject coincide for positioners**

**Incorrect display in Chinese manual**
Insert Action Instruction/Modify Instruction: Bool argument not possible to set to TRUE or FALSE
IRB 360 L: Axis 4 is faulty values while doing jogging.
Joint values for linear axis of IRB540 (J4, J5) not updated in VFP
Tasks window: Checkboxes disappear after restart
Timer Component does not reset itself to zero when starting a simulation
Type A, B and D positioners not placed correctly in station

**Solved Limitations in RobotStudio 5.13**

**AutoConfig performance improvement for MoveJ instructions**
The performance for the **AutoConfiguration** function, which can be used to set robot configurations (confdata) automatically, has been improved for MoveJ instructions (WorkItem2552).

**AutoConfiguration does not select optimal configuration for MoveJ**
The **AutoConfiguration** function did not select the optimal configuration (from the robot point of view) for MoveJ instructions (WorkItem2556).

**Configurations returned invalid configuration in certain cases**
The **Configuration** functions returned invalid configurations for robots with parallel beams as it failed to take the dynamic joint limits of axis 2 and 3 into account for certain special cases (WorkItem2317).

**WorkEnvelope improvements**
The function **Show Workenvelope** has been improved in two aspects, (i) it showed too large work envelope when mounted on a track, and, (ii) it assumes that axis one for the robot was zero when activated.

**Error message ‘Position out of Reach’ when simulating with Conveyor Tracking**
The error message ‘Position out of Reach’ sometimes appeared when working with conveyor tracking. The reason was that the value of the parameter c1Position changed value. This has been fixed in RobotWare 5.13.

**Multimove: Unhandled exception while playing station**

**Controllers in the Online browser can now be collapsed**
The controllers in Online browser can now be collapsed. This will enable more space when working with several controllers

The error message ‘Could not change motor state’ will no longer appear
The error message ‘Could not change motor state’ that occurred during start of a virtual controller will no longer appear

**Service routines previously installed in each task are now installed as SHARED**
This means that the program pointer cannot be shown while the service routine is executed

Hard to distinguish highlighted curves
When the RobotStudio Option **Graphics → Behaviour → Selection → Outline** was active and a curve was selected, a wire frame box surrounding the curve was displayed in the graphics view. This has been changed to use the same outline technique for curves as for solids.

**RobotStudio treated tooldata names as case sensitive**
RobotStudio treated tooldata names as case sensitive whereas they are in fact case insensitive in RAPID. This could give rise to unexpected behavior for **Configurations, AutoConfiguration, and Jump to Target/MoveInstruction**

**Incorrect dialog box in SafeMove Configurator**
A dialog box saying **'Failed download'** sometimes appeared after download of a safety configuration from SafeMove Configurator to a controller, even though the download succeeded. The dialog message will not be shown if the download succeeds.

**Workobject wobj0 incorrectly placed at wrong mechanical unit**
For stations with external axis, the workobject wobj0 was incorrectly located under certain circumstances. This has been fixed.

**LinearJog error for RobotWare 5.11 when passing a 90 degree limit with axis 1**
When jogging a robot linearly connected to a RobotWare system of version 5.11.00 an error could occur, causing the robot to stop at +/- 90 degrees for axis one. This limitation has been removed in RobotStudio 5.13. The problem has never occurred for controller systems of RobotWare version 5.11.01 or later.

**Unpack of station with multiple conveyors not well supported**
Running Unpack&Work on a Pack&Go file (.rspag) containing a station with several conveyors was not working as expected. This has been fixed.

**Error when synchronizing two LOCAL RAPID procedures with the same name**
Synchronizing two RAPID procedures declared as LOCAL caused an error in RobotStudio. This has been changed. Now, RobotStudio will only synchronize the first procedure and ignore the second one.

**Robot Configuration for IRB5500**
RobotStudio now calculates the robot configuration (confdata) for the IRB5500 correctly.

**RAPID Procedures not sorted in the synchronization dialogs**
The RAPID procedures was not sorted in the synchronization dialogs in previous versions of RobotStudio. This has been changed. Procedures are now sorted in alphabetic order by default. In addition, the user has the possibility to sort the modules according to which module they are defined in.

**Graphics Clipping in Station Viewer**
When having a large station in terms of length, the graphics viewer of the Station Viewer could cause the graphics to be clipped when zooming in on objects far from ‘View Center’

**Typical use of PC-SDK events in a VSTA-AddIn causes callback on random thread**
When subscribing to a PC-SDK event, the event handler was called from a thread pool thread. Typically VSTA-AddIns that subscribed to PC-SDK events called the RS-API from the event handler. Just doing that will call into the RobotStudio API from another call than the RobotStudio main STA thread. This is not supported and may cause
unexpected behaviour. Now, a new method has been added to solve this problem:
RobotStudioAPI.SynchronizeInvoke

**Problem using PC-SDK event handlers from VSTA**
The PC-SDK events were raised on a separate thread. When running a VSTA Add-In from RobotStudio it was not possible to call back to the RobotStudio API from a PC-SDK event handler directly as the call was then made from another thread.

To solve this problem a new method has been added to the RobotStudio API:
RobotStudioAPI.SynchronizeInvoke

**Baseframe coordination Robot with Mechunit**
RobotStudio did not handle baseframe coordination correctly, if the robot’s “Baseframe moved by” MechUnit name differed 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
```

A configuration like this caused RobotStudio to miss the target positions by the amount of the external axis motion. This is now fixed.

**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.

**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.

---

**Solved PDDs in RobotStudio 5.13.02**

<table>
<thead>
<tr>
<th>PDD Nr</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDD08609</td>
<td>MTC positioners not fully supported</td>
</tr>
<tr>
<td>PDD09457</td>
<td>Program state not always updated in Task Manager.</td>
</tr>
<tr>
<td>PDD10012</td>
<td>ScreenMaker buttons are not responding correctly</td>
</tr>
<tr>
<td>PDD10155</td>
<td>AutoConfig not working, when using fix and moved work objects</td>
</tr>
<tr>
<td>PDD10157</td>
<td>Removing geometry of library within a component group library makes it impossible to reload in a station</td>
</tr>
<tr>
<td>PDD10165</td>
<td>Work envelope not correct for IRB6640 all versions</td>
</tr>
<tr>
<td>PDD10167</td>
<td>SmartComponent LogicGate Output not updated when using delay time</td>
</tr>
</tbody>
</table>
Solved PDDs in RobotStudio 5.13.01

<table>
<thead>
<tr>
<th>PDD Nr</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDD7618</td>
<td>PROC domain not shown in Configuration Editor</td>
</tr>
<tr>
<td>PDD9445</td>
<td>Simulation/Monitor/TCP trace does not handle stationary tools</td>
</tr>
<tr>
<td>PDD9446</td>
<td>Wrong location of some dialogs when using multiple screens</td>
</tr>
<tr>
<td>PDD9454</td>
<td>Error in VC configuration file causes missing browser content</td>
</tr>
<tr>
<td>PDD9472</td>
<td>All motion tasks not restored after the 'Unpack&amp;Work' of a multimove station/system</td>
</tr>
<tr>
<td>PDD9477</td>
<td>Configuration Editor table has confusing behavior</td>
</tr>
<tr>
<td>PDD9549</td>
<td>Failed to Set PP without message box in Rapid Editor</td>
</tr>
<tr>
<td>PDD9570</td>
<td>Functions 'Attach To' &amp; 'Detach' not enabled in context menu while multiple parts selected</td>
</tr>
<tr>
<td>PDD9572</td>
<td>Run Mode in task window not updated properly</td>
</tr>
<tr>
<td>PDD9573</td>
<td>No message when action not possible in task window</td>
</tr>
<tr>
<td>PDD9626</td>
<td>Screen Resolution problem in Windows XP</td>
</tr>
<tr>
<td>PDD9651</td>
<td>OK button grayed in RS options</td>
</tr>
<tr>
<td>PDD9685</td>
<td>ScreenMaker project corrupted, when using additional referenced assemblies</td>
</tr>
<tr>
<td>PDD9763</td>
<td>Back from Full Screen fails in RobotStudio Viewer</td>
</tr>
<tr>
<td>PDD9786</td>
<td>Screenmaker: Unexpected interference of editing controls when enable property of other controls is bound to a rapid variable</td>
</tr>
<tr>
<td>PDD9851</td>
<td>Errors when programming a robot on a track using conveyor tracking</td>
</tr>
<tr>
<td>PDD9853</td>
<td>Detach failed</td>
</tr>
<tr>
<td>PDD9855</td>
<td>File Transfer overwrites file without warning</td>
</tr>
<tr>
<td>PDD9970</td>
<td>ScreenMaker: add custom action doesn't work and fatal error happen</td>
</tr>
<tr>
<td>PDD9997</td>
<td>RobotStudio 5.13.01 does not install FP SDK template for Visual Studio</td>
</tr>
</tbody>
</table>

Solved PDDs in RobotStudio 5.13

<table>
<thead>
<tr>
<th>PDD Nr</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDD8094</td>
<td>RAPID Sync does not sync tooldata and workobject not used in path</td>
</tr>
<tr>
<td>PDD8159</td>
<td>Baseframe incorrect for track mounted robot on a pedestal</td>
</tr>
<tr>
<td>PDD8354</td>
<td>Contextual tab for Modify Part not working as expected</td>
</tr>
<tr>
<td>PDD8382</td>
<td>Cannot modify RAPID modules with NOVIEW, READONLY, VIEWONLY attributes</td>
</tr>
<tr>
<td>PDD8428</td>
<td>Not possible to use keyboard in some RS windows</td>
</tr>
<tr>
<td>PDD8513</td>
<td>No response when requesting C-Start</td>
</tr>
<tr>
<td>PDD8522</td>
<td>RS cannot find 'My Documents' on computer with non-standard setup</td>
</tr>
<tr>
<td>PDD8583</td>
<td>AutoConfiguration tool does not support ActUnit instructions (solution improved since 5.12)</td>
</tr>
<tr>
<td>PDD8659</td>
<td>Create Path from Curve function not available if instruction template set to 'MoveAbsJ' or 'MoveJ'</td>
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<tr>
<td>PDD8694</td>
<td>Cannot create attachment to Part that is member of Component Group</td>
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<td>PDD8708</td>
<td>Event Manager action 'Attach Object - &lt;find closest object&gt;' does not select the correct object</td>
</tr>
<tr>
<td>PDD8768</td>
<td>Default PointType should be set automatically in Instruction Template Manager when creating a new template</td>
</tr>
<tr>
<td>PDD</td>
<td>Description</td>
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<tr>
<td>PDD8773</td>
<td>Bad performance in I/O Viewer for systems with many signals</td>
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<td>PDD8775</td>
<td>Value of group signal not shown</td>
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<td>Context lost in tab windows after switching full screen</td>
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<td>No meaningfull error when max number of client connections reached</td>
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<td>PDD8847</td>
<td>Refresh funcion of RAPID Watch Window is not documented</td>
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<td>Description for Fence library of length 2500 is incorrect</td>
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<td>UCS grid not displayed correctly if ‘Show Floor’ enabled</td>
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<td>PDD9047</td>
<td>Reachability check not working for joint targets with 4 axes robots (IRB260/660)</td>
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<td>Internal EventLog not correctly updated</td>
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<td>PDD9305</td>
<td>Operating Manual not updated after ConnectionType column removed from Controller Status Window</td>
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<td>PDD9335</td>
<td>Not able to cancel modification of Conveyor Mechanism</td>
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<td>PDD9336</td>
<td>AutoConfiguration failed for certain path</td>
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<td>PDD9340</td>
<td>Unable to find configurations for paint robots</td>
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<td>PDD9370</td>
<td>Floating browser window not updated after restart of RS</td>
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<td>PDD9374</td>
<td>Grid lines disappear when zooming in</td>
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<td>PDD9375</td>
<td>Browsing for stations or UAS editing generates exception</td>
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<td>RobotStudio installs multiple old versions if TrackMediaPools</td>
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<td>Crash on controller restart</td>
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<td>PDD9462</td>
<td>Not possible to distinguish for which mechanical unit RobotStudio is requesting a library</td>
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<tr>
<td>PDD9471</td>
<td>Deleting a Component Group that is connected to a library hangs RS.</td>
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</table>
### Changes in RobotStudio 5.13

#### Track mediapool not preinstalled anymore

If stations are created using any of the mediapools Track 5.10.0003, 5.10.0004, 5.10.0005, 5.11.0001, then RobotStudio 5.12 should not be uninstalled when installing RobotStudio 5.13. Otherwise, the mediapools will be uninstalled.

**Workaround:**

Alt 1: Install the missing mediapool separately. They are available on the RobotStudio forum.

Alt 2: Install the Track mediapool of the RobotStudio DVD image and edit the file `program.id` of the system to point to the installed Track mediapool. The system must be cold-started for the changes to take effect.

**RAPID Modules can be edited regardless of attribute**

All modules, except for encoded ones, are always editable in RobotStudio, no matter if it is on an Offline or Online controller.

**Use Record to Viewer when playing simulation to include in Station Viewer**

The new Simulation Play option ‘Record to Viewer’ has been introduced in RobotStudio 5.13, see picture below. The reason for the introduction of this option is the need for a special recording mode to allow simulations created with the SmartComponent Source to be shown in the Station Viewer.
Known Limitations

General

Only possible to open one SafeMove Configurator at the time

Only one SafeMove Configurator may be open at the time, even though several controllers may be connected. If the SafeMove Configurator is opened for one controller, the icon will become disabled for the other controller. This limitation also includes Offline, i.e. if SafeMove Configurator is opened in Offline, then it cannot be opened in Online for another controller and vice versa.

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 (30 days).

Compatibility of RobotStudio Library and Stations with older RobotStudio versions

RobotStudio is not upward compatible, i.e. it is not possible to load RobotStudio 5.13 into an earlier version of RobotStudio such as e.g. RobotStudio 5.11.

Online

Error message ‘You are denied write access. Access is granted to Unknown’

If the connection to the real controller has been lost for some reason (one reason could be that the PC has awakened again after being in sleep mode) the message “You are denied write access. Access to "<system name> is granted to Unknown (user location unknown).” may be displayed when trying to get mastership.

Workaround: The workaround is to log off the controller and then log on the controller again using the UAS system in the Online tab of RobotStudio.

Switching Network cable

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.

Offline

Error 50091 Restart not possible after warm start of a system with external axis
When restarting a system with activated mechanical units the activation state is lost. Then the program can no longer be started from the Virtual FlexPendant, the RAPID Editor or the RAPID Tasks window.

Workaround: Reset the program pointer (‘Program Pointer to Main’) before starting the program from the Virtual FlexPendant, the RAPID Editor or the RAPID Tasks window, or, start the program from the Simulation Play button.

Limited support for VRML 1
The VRML 1 import of RobotStudio does not support 2D layouts embedded in the VRML 1 file.

Workaround: Remove the embedded 2D layout before import, or use VRML 2.

No ‘save needed’ detection when modifying Graphics Appearance properties
RobotStudio does not recognize that the station needs to be saved after modifying graphics appearance properties such as color, texture and rendering

**Workaround:** Save the station manually before closing.

**Set ACCESS LEVEL to ALL for VC signals to be modified from RobotStudio**

The **Access Level** for a signal defined the configuration database (EIO.CFG) of the controller must be set to **ALL** to allow signal values to be modified from RobotStudio during e.g. a simulation.

**Include MultiMove option for system with several TCP robots**

When creating a system for several manipulators (up to four) with SystemBuilder, either of the RobotWare options MultiMove Independent, or MultiMove Coordinated must be included for all of the related motion tasks to start.

**Note:** It is recommended to use the function “System From Layout” if applicable when creating robot systems for RobotStudio. Then the MultiMove option will automatically be added whenever required.

**The FlexPendant Option “Non Motion Execution” is not supported**

The FlexPendant has the option “Non-motion Execution” that can be set to prevent the real controller from moving even though the program is executing. RobotStudio will ignore this option and move the robot anyhow.

**MultiMove error: “Object reference not set to an instance of an object”**

When the Test Play button is pressed in the MultiMove tool, the following error message may be displayed: ‘Object reference not set to an instance of an object’, but the robot moves and the Status ‘Calculation OK’ is displayed. In addition, when ‘Create Paths’ is pressed the following message is displayed: ‘Can't create paths : Value cannot be null’, and no paths are created. In the ‘Create Paths Settings’, is the WP TCP drop down empty.

**Reason:** wobj is not set for the current task

**Workaround needed for old stations:** For each task in the station, set as Active. This will automatically "refresh" active tool/workobject/path/process definition for specified task. Save the station to persist the changes.

**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 VirtualFlexpендant

**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
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.

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.

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.

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.

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.

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 robtarget is selected. This behavior is by design but is not documented.

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.

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.

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.

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.

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 joint targets. The functions will leave the joint targets 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.

**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 Pendent: 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.

**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.


**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.

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.

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/](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.
ScreenMaker information

Introduction

The purpose of this section is to provide information on the new features and improvements in the release.

Installation

This chapter contains instructions for installing ScreenMaker. ScreenMaker has been integrated in RobotStudio. The following installation options related to ScreenMaker are available for RobotStudio.

- **Complete Installation.** ScreenMaker and its dependencies (FlexPendant SDK and PC SDK) get installed.
- **Custom Installation.** ScreenMaker can be unselected if it is not required. If ScreenMaker is unselected, ScreenMaker ribbon button will be disabled.
- **Minimal Installation.** ScreenMaker will not be installed and ScreenMaker ribbon button will be disabled.

Demonstration and Tutorials

There is one demonstration station and associated ScreenMaker project included with this version. These files are found under the "My ScreenMaker Projects" directory in the user’s RobotStudio directory after installation.

- SCM_ExampleProject
- SCM_ExampleStation (found in the SCM_ExampleProject directory)

This demonstration includes a complete station, project, and a multi screen ScreenMaker project.

Compatibility

RobotWare

It is possible to use older RobotWare versions, but with some limitations. ActionTrigger has been redesigned and will work only on RobotWare 5.12.02 or later.

Button, TpsLabel, PictureBox controls have been modified for 5.13 release. Allow MultipleStates property of these controls can be accessed based on this change. Hence RobotWare versions less than 5.13 will not work for these controls for that specific property.

Memory Leak issue has been fixed in RunRoutine button.

FlexPendant SDK

ScreenMaker should be used with FlexPendant SDK 5.12.02 or later. There is an option to select which of the versions of FlexPendant SDK versions installed on the computer to use when ScreenMaker is launched.
Language Support

ScreenMaker supports only English when building the application in RobotStudio. ScreenMaker Designer does not provide a localization tool. Therefore, applications created with ScreenMaker will display the same text specified at design time, regardless of the choice of language on the FlexPendant.

If Asian languages are used (Chinese, Japanese, Korean) then these screens will display correctly only when the FlexPendant language matches the ScreenMaker language. Otherwise empty markers will appear where the text characters should be.

Documentation

Application manual for ScreenMaker 5.13 is integrated into RobotStudio manual.

Limitations fixed in 5.13.02

Switch – Led – Controls not updated correctly when Enabled property is set to true / false.
This has been fixed

Text Alignment property of TpsLabel throws build error
Supports TopLeft, TopRight and TopBottom values to be set.

Memory Leak when RAPID bool is used during binding
This has been fixed

Recently added controls not visible in Add Custom action
This has been fixed. The controls are visible even if the project is saved.

Real Controller connected in ScreenMaker throws error when disconnected from RS Online.
This has been fixed.

Possibility to bind to properties of Integer type to Dnum Application variables
This has been fixed

Saving project as another project not copying the images
This has been fixed

Throws error System.TypeLoadException while opening existing project
This has been fixed,

Argument Exception thrown from FlexPendant on closing ScreenMaker application
This has been fixed

Virtual FlexPendant was closed when ScreenMaker was deploying to real controller
This has been fixed

Transparent Background on LED no longer selectable
Transparent background can no longer be selected for a LED.
Unexpected interference of editing controls when enable property of other controls is bound to a RAPID variable

When an editing control (NumEditor, DataEditor) is included in a screen, clicking in the associated field opened a NumPad or an AlphaPad control. At the same moment, all other controls in the screen were automatically disabled. The same state was retained as it was before opening Numpad. This has been fixed (already in 5.13.01).

**Limitations fixed in 5.13.01**

ScreenMaker Databinding for the screen title does not work
This has been fixed.

Binding problem in RunRoutineButton of ScreenMaker
The control "RunRoutineButton" is allowing to bind and call all the routine in a module including main routine. In 5.13.01 it can also be bound to user defined service routines.

Binaries deployed to HOME folder
The resulting binaries of the ScreenMaker project are deployed to the HOME folder of the controller system. The reason is to have it included in a system backup.

Background of LED control shows previous screen
The background of the LED control it no longer transparent

FlexPendant Project Conversion (Invalid Class String)
The error message Invalid Class String that appeared in certain cases when saving a project as FlexPendant project has been fixed.

Call .NET Method
The limitation in ScreenMaker with respect to deleting of references that have been added using Call .NET method action. The effect was the screen from the ScreenMaker Project was not getting opened. This has been changed.

Unexpected interference of editing controls when enable property of other controls is bound to a RAPID variable
When an editing control (NumEditor, DataEditor) is included in a screen, clicking in the associated field opens a NumPad or an AlphaPad control. At the same moment, all other controls in the screen are automatically disabled. The same state is retained as it was before opening Numpad.

Visual Studio FlexPendant project created from ScreenMaker project throws error when designer form is opened
Value cannot be null. Parameter name: instance warning is seen when designer form is opened in Visual Studio 2008 after conversion. This has been changed and user can see the designer.

**Limitations fixed in 5.13**

Action Trigger Compatibility
In 5.12 CTP release, ActionTrigger Control triggers an event when setting non-default value. The fix not to trigger an action on non-default value is available in released
version of RobotWare(5.12.02) or later. Enabled property can be used to set the state of action trigger.

If the desired RobotWare is not present and action trigger is used in the screenmaker applications first screen, the message as shown below appears.

![Message Image]

If action trigger is present in screens other than first screen, the following gtpuMessageBox appears.

![Message Image]

**New Features in 5.13.02**

**ScreenMaker Doctor**

A utility similar to PC Doctor. It analyzes the project for dangling pointer, unwanted events and warns the user or fixes. See separate document `Operating Manual Screen Maker Doctor` available in the root folder of the DVD image, next to the RobotStudio Release Notes.

**Hide application from ABB Menu**

Allows user an option to hide ScreenMaker application from ABB Menu. If there are a lot of applications in the ABB menu, user can decide to hide them or place it on right or left ABB menu.

**Build Progress bar**

Indication of Build progress in ScreenMaker

**New Features in 5.13.01**

No new features were added in RobotStudio 5.13.01
New Features in 5.13

Integration into Robot Studio
ScreenMaker is now a part of RobotStudio installation. The ScreenMaker folder structure from where it refers to the components has changed and is now under Addins folder of RobotStudio.

User can launch ScreenMaker from Offline and Online tabs respectively. Different installation (custom, minimal, complete) are described in the installation section of this document.

Offline/Online
User can switch between Offline controllers and Online controllers. Only controllers connected through RobotStudio can be seen in ScreenMaker.

Connect / Disconnect
User can connect to a controller and disconnect from a controller by right-clicking on the context menu at the project level.

Close Project Removed and Close ScreenMaker included
Close Project is replaced with “Close ScreenMaker” button on the ribbon. Users can still Close the project explicitly from the context menu.

Making ScreenMaker Application as Default Application at startup
ScreenMaker application can be made as the default application at startup. This option is available from the Properties ribbon in ScreenMaker.

Support for DNUM
DNUM data type is supported in ScreenMaker.

SaveAsFlexpendant Project
User can save a ScreenMaker project as FlexPendant project. Advanced users and .NET developers can program using VisualStudio 2008.

Not allowed to add action if controller is not connected
If controller is not connected to ScreenMaker application, user is not allowed to define actions.

Deploy Binaries to HOME folder instead of SYSTEM folder
Binaries of ScreenMaker Project after building is being deployed to HOME folder to facilitate backup. So any binaries which are present in System folder of the same application can be deleted manually.

Known Limitations
*) Libraries marked with an asterix (*) are new for RobotStudio 5.13.02

‘System From Layout’ may fail to create system for previous RobotWare versions
RobotStudio uses a so-called system key to create a system using the function ‘System From Layout’. The version of the key is called signature. If the key signature is not supported by the selected RobotWare version, the function will fail.

Workaround: Use RobotWare 5.13.02.

*Data Binding to an index of array item
The data can be bound to index of array item, but the binding mechanism does not work at run time for the index.

**Error on FlexPendant when using Turkish Language Settings**

When user tries to perform a RAPID read operation, error is thrown from the FlexPendant as shown below.

![Unexpected Error in button_Click](image)

The error is noticed if system has Turkish or Azerbaijan language settings.

**Workaround:** If the error as shown in the screenshot is encountered and the language being used is either Turkish or Azerbaijan, change the language settings to English.

**Supports only I/O defined signals and not RAPID defined signals**

Signals defined by RAPID declarations are not supported. Only signals defined by IO.cfg are supported.

**Not Possible to access RAPID data from Shared Modules**

RAPID data present in modules that are shared across tasks cannot be accessed.

**Not possible to add sub menu items on Command Bars**

The FlexPendant controls have the ability to have sub menu items when a command bar button is pressed. This is not supported.

**Not possible to add signals to ListBox / ComboBox**

When adding items to the ListBox/ComboBox control, it is not possible to add I/O signals.

**Graph functionality is limited**

There is a limitation in Graph functionality in terms of the property values not getting updated once it has been set by the user.

Example: User decides to plot a line graph, sets all the properties and sees it on the FlexPendant. But when he tries to modify the properties previously set, properties don’t have the new value and still hold the previous value.

**Visual Studio FlexPendant project created from ScreenMaker project displays error when modified**

When a ScreenMaker project is saved as a FlexPendant project, an error message may be displayed when the controls are modified in Visual Studio.
Solution: Open the source code whose designer form needs to be modified. Consider for example that we have a screen named Navigate. Start by opening the class definition of Navigate:

**Initial State:**
```java
{
}
```


**Modified State:**
```java
{
}
```

This change will also enable the toolbox with FlexPendant specific GUI controls.

**Note:** There may be some errors in the output log window. When the form has been designed according to the needs, revert back to the previous state and rebuild the project. The state of the class definition should be:

```java
{
}
```