RobotStudio 2023.4

Contents

Release Notes for RobotStudio 2023.4

General

The release name is RobotStudio 2023.4 and the build number is 23.4.10603.0. The build date is December 13, 2023.

User documentation

The RobotStudio Operating Manual is available in all languages supported by RobotStudio except Czech, i.e. English, German, French, Italian, Chinese, Japanese, Spanish. RobotWare manuals for IRC5 and OmniCore can be installed from the Add-Ins Gallery.

Tutorials

Tutorials are available at the RobotStudio product pages at https://new.abb.com/products/robotics/robotstudio.

System Requirements

Required Software

Microsoft Windows 10 Anniversary Edition or later, 64-bit edition, is required.

The Windows App Installer is a pre-requisite for the virtual OmniCore FlexPendant software, see https://www.microsoft.com/en-us/p/App-Installer/9NBLGGH4NNS1. The App Installer is a default built-in app in Windows 10 and later, but may have been removed on some PCs.

Sideloading of apps must be enabled on Windows to install the virtual OmniCore FlexPendant.

To enable sideloading follow these steps:

1. Open **Settings**.
2. Click **Update & Security** (Windows 10) or **Privacy & security** (Windows 11) > **For developers**.
3. Ensure **Developer Mode** is set to **On**.

Recommended Hardware

ITEM	REQUIREMENT
CPU	2.0 GHz or faster processor, multiple cores recommended
Memory	8 GB minimum 16 GB or more if working with large CAD models
Disk	10+ GB free space, solid state drive (SSD)
Graphics Card[1]	High-performance, DirectX 11 compatible, gaming graphics card from any of the leading vendors. For the Advanced lightning mode Direct3D feature level 10_1 or higher is required.
Screen Resolution	1920 x 1080 pixels or higher is recommended
Mouse	Three-button mouse
3D Mouse	Any 3D mouse from 3DConnexion, see http://www.3dconnexion.com.

ITEM	REQUIREMENT
Virtual Reality Headset	Meta Quest 2, HTC Vive or any Windows Mixed Reality Headset. Note that special PC hardware requirements apply when using RobotStudio with VR, see https://www.oculus.com/oculus-ready-pcs/, https://www.vive.com/us/vive-ready/, or, https://www.microsoft.com/en-us/mixed-reality/windows-mixed-reality, respectively.

[1] RobotStudio will not benefit from the additional features of so-called 'Professional' or 'Workstation' graphics cards. The price level of these are at a much higher range than gaming graphics cards with comparable performance. High-end gaming PCs are very suitable for offline programming with RobotStudio. Such a PC will provide good performance for a limited budget.

New Functionality

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Exclude occluded geometry when exporting to 2D drawing

Added an option to exclude geometry that is not visible from the selected viewpoint when exporting the station to a 2D drawing in DXF or SVG format.
This can significantly reduce the size of the resulting file and the time to generate it.
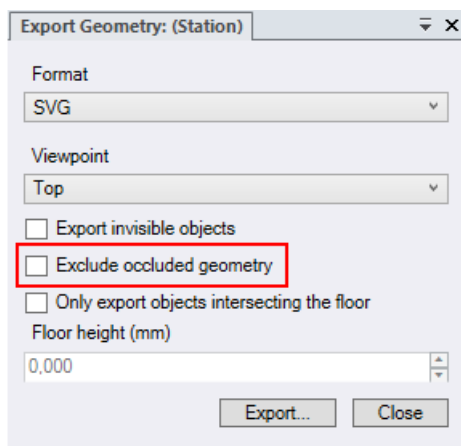
Add-Ins Gallery updated

The appearance of the Add-Ins Gallery has been updated.
There are now different tabs for RobotWare (including Add-Ins), RobotStudio Add-Ins and RobotStudio Models. This replaces the functionality for filtering by Tags.
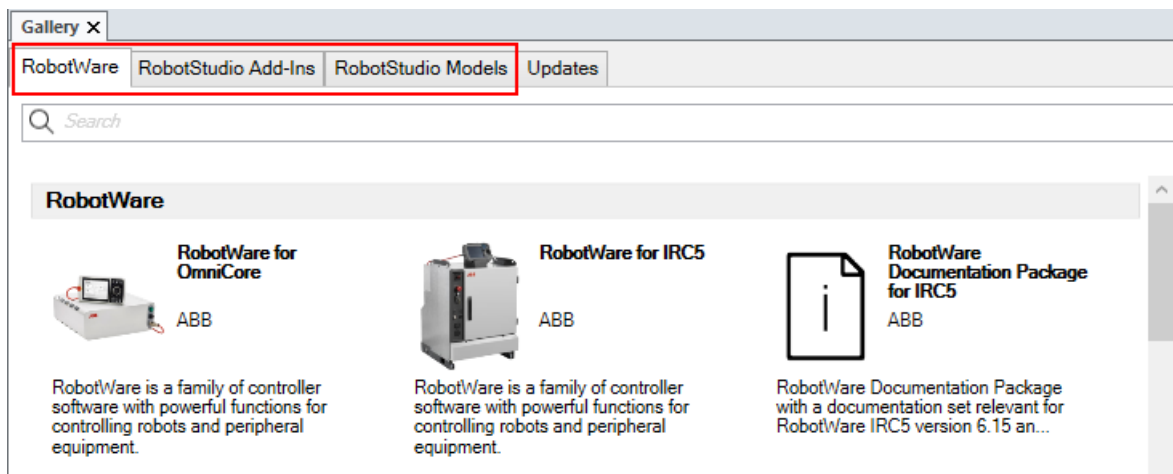
For RobotStudio Models, it is possible to install all or multiple selected packages in one operation.
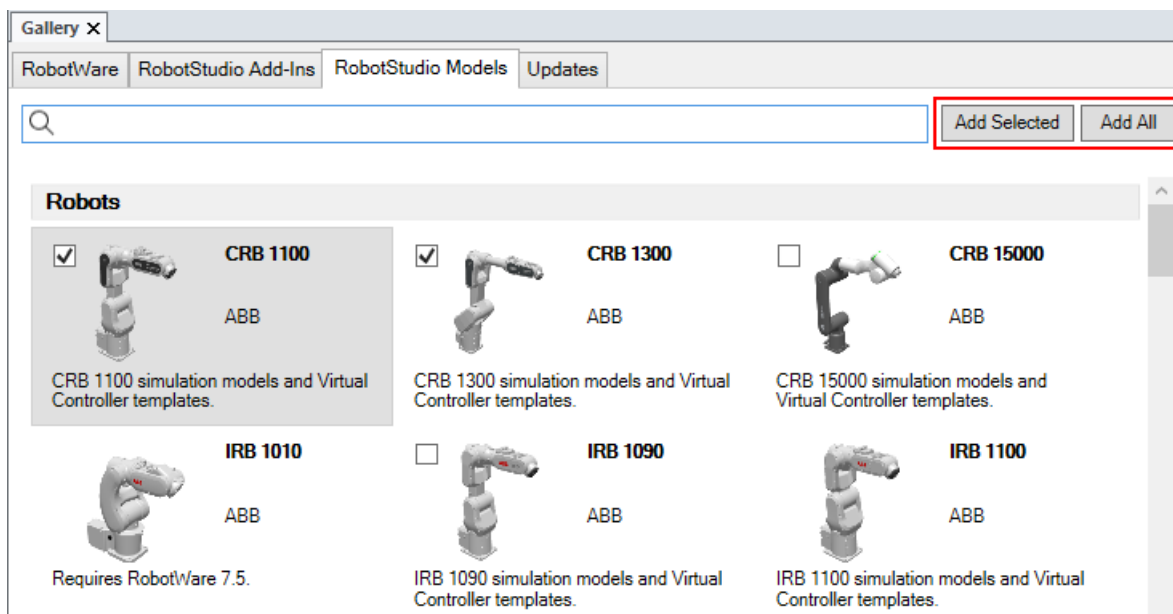
The Add-Ins browser has also been updated with folders instead of headers for the different package categories.
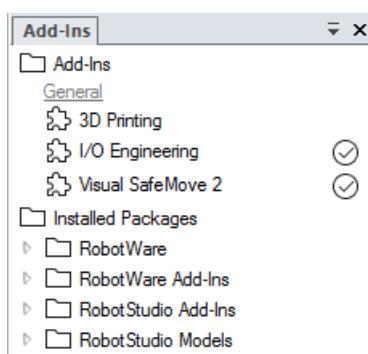
Dedicated Panel for Collision Free Path results

A dedicated panel has been implemented for displaying all results related to collision-free paths. If a path cannot be created due to a collision at the target or if the target is unreachable, users can easily visualize the error by double-clicking on the error item.

Output | Collision Free Path

▲ ❌ JointTarget_1 has (2) collision(s)
   ❌ IRB1660ID_6_155_real collides with 3HKA00000202342 at JointTarget_1
   ❌ IRB1660ID_6_155_real collides with 3HKA00000202342 at JointTarget_1
▲ ❌ JointTarget_4 has (2) collision(s)
   ❌ **IRB1660ID_6_155_real collides with 3HKA00000202342 at JointTarget_4**
   ❌ IRB1660ID_6_155_real collides with 3HKA00000202342 at JointTarget_4

Freehand Move and Rotate combined

The freehand "Move" and "Rotate" modes have been combined into a single "Move and Rotate" mode.
Labels have also been added to the items in the Freehand menu.

Before:
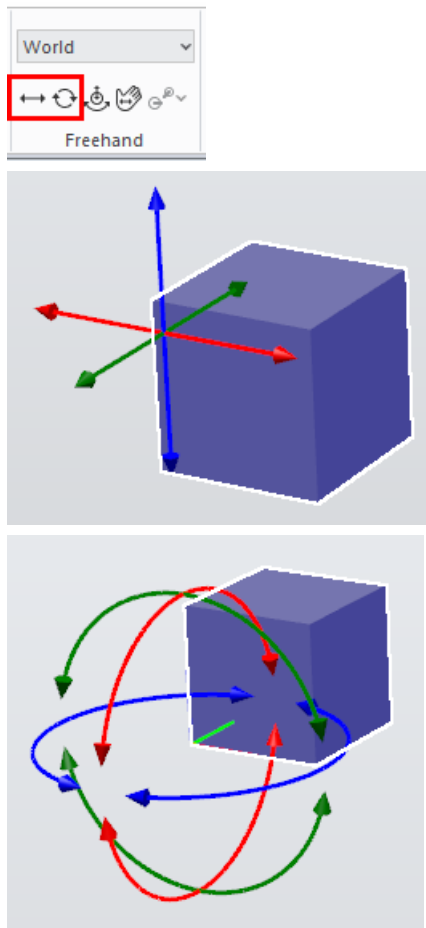
After:
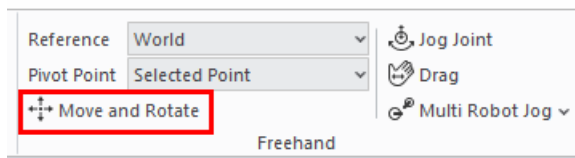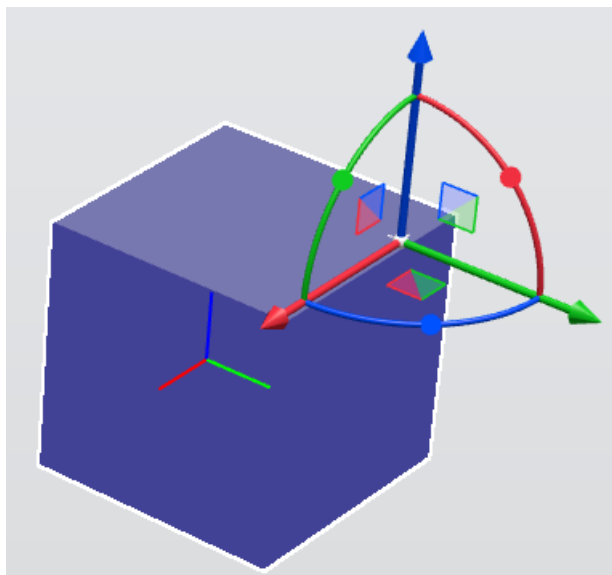
When moving or rotating an object the offset from the start position is displayed next to the axis. It is also possible to manually type in an offset.
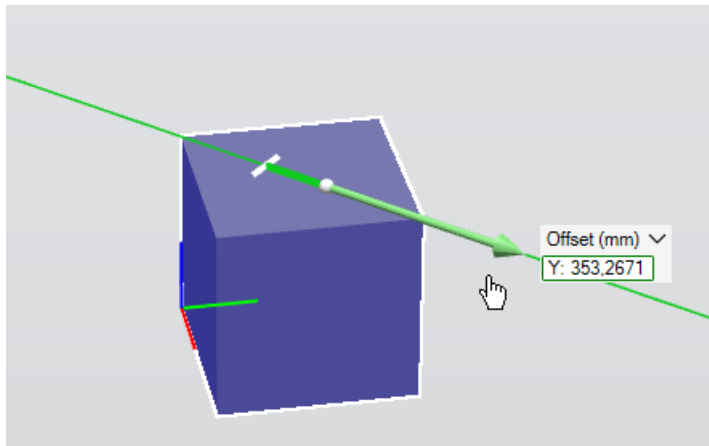
Select the "Reference" option in the dropdown menu to show the position relative to the selected reference coordinate system, instead of the offset from the start position.
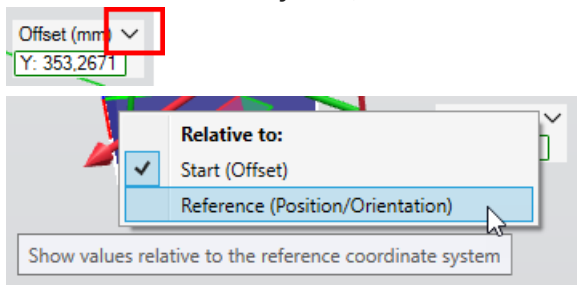
Press the Ctrl key when moving or rotating to snap to increments. Press Ctrl+Shift to snap to fine increments. For linear movement the size of the increments depends on the zoom level. For rotation the increments are 5 degrees and the fine increments are 1 degree.
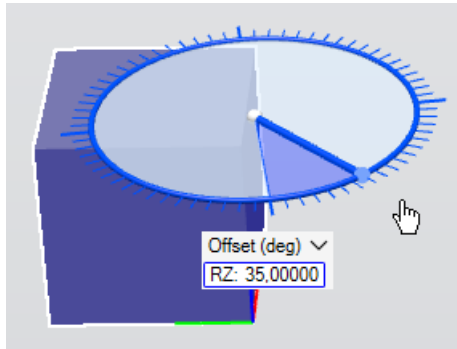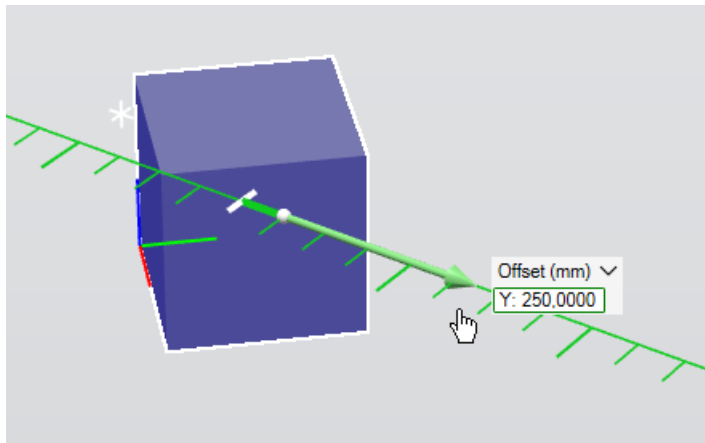
Use the plane handles to move the object along the selected plane.
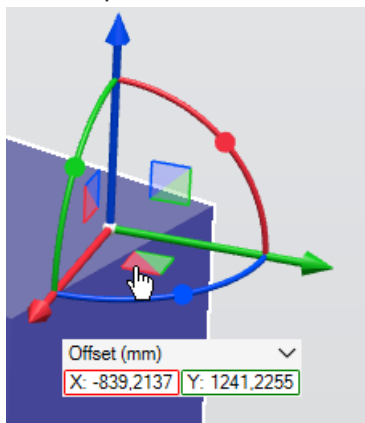
Keyboard shortcuts guide

A guide of available keyboard and mouse actions has been added to the 3D graphics view.

By default, the guide shows the keys used for navigating the 3D view. When using freehand manipulation, the guide shows keys for incremental and precision movement.

The guide can be shown and hidden from the Graphics Tools - Settings menu or with the Ctrl+Space keyboard shortcut.

The default visibility of the guide can be set in Options - Graphics - Appearance.

New unified UI for opening local projects

There is now a new view "This PC" under File > Open > Local for viewing and opening local projects.

The "Recent" view under File > Open has also been redesigned with a similar appearance.
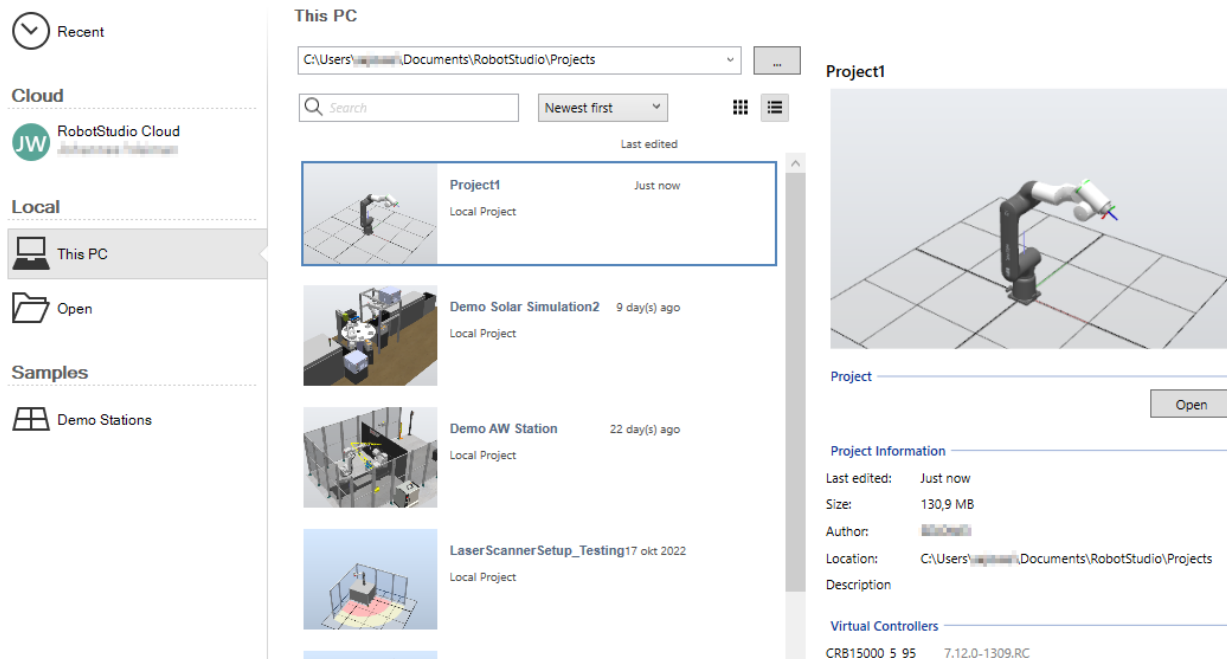
New Virtual Controller updated

The user interface for creating a new Virtual Controller has been updated. This is used when creating a new Project or adding a new Virtual Controller.

The robot model is now selected first, then the robot variant. A thumbnail is shown for the robot model.

When creating a Virtual Controller from a backup, it is now possible to remove RobotWare add-ins from the controller.

Note that this might cause the controller to malfunction, for example if there is RAPID code that depends on the add-in.

Nonstandard datatypes in OPC UA Client

The OPC UA smart component now supports some nonstandard datatypes. If the datatype tree on the OPC UA server contains subtypes of the standard types, they will be recognized by the smart component. For example, arrays of the BYTE datatype with ID 3001 (common on Siemens PLCs) can now be used.

Notification Center

Added a popup for showing different kinds of user notifications.

The popup is opened by clicking the Notification icon in the title bar. The icon has a blue dot if there are any new (unread) notifications.

Notifications include updates for RobotStudio and add-ins, new and updated simulation models and license information.

Rename signals and properties

Station and Smart Component signals and properties can now be renamed by right-clicking the signal or property in the Station Logic Design tab and selecting "Properties". Previously the field for the signal name was read-only.
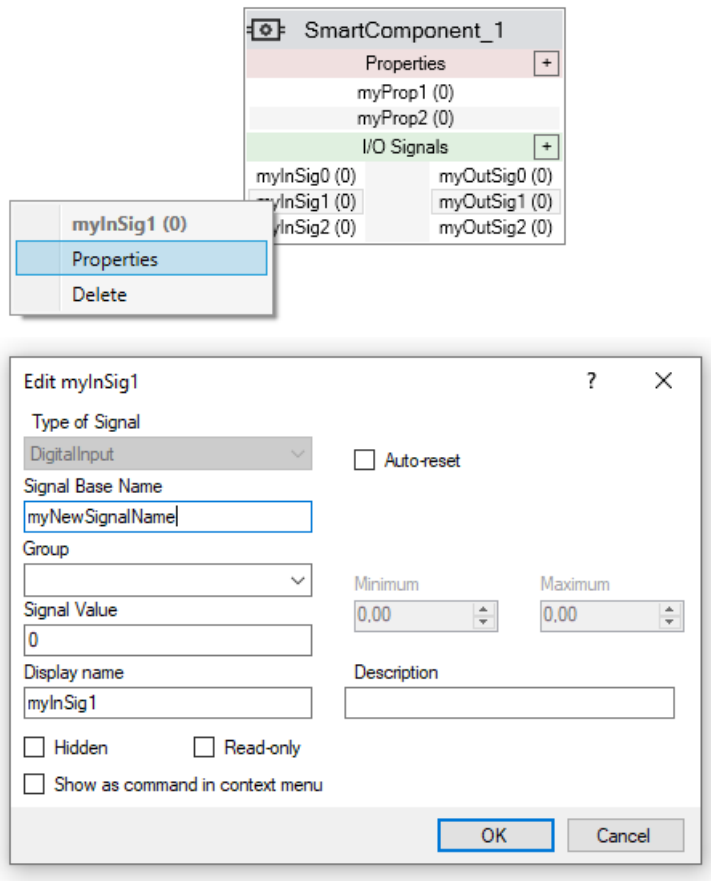
Show virtual network

For RobotWare 7.13 or later, "Virtual" networks are displayed in the controller tree.
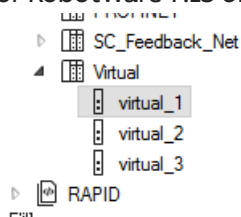
Simulation models distributed separately

Simulation models for robots and other equipment are no longer included in the RobotStudio distribution. This means that the distribution is significantly smaller, and models can be added or updated without having to update RobotStudio. The models are distributed as packages that can be installed from the Add-Ins Gallery.
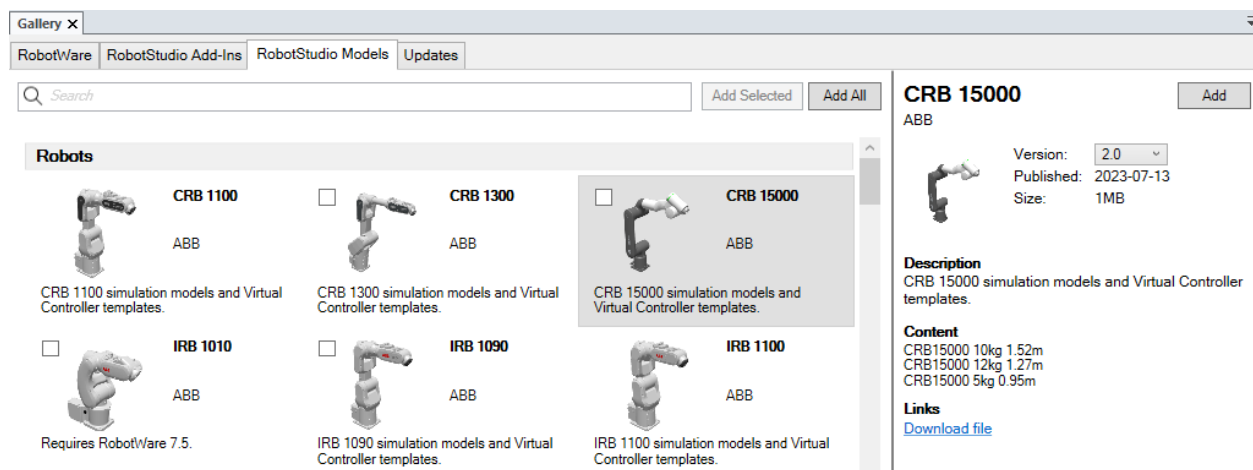
Model packages can also be installed on-demand from the ABB Library menu or when creating a new Virtual Controller. A model that is not installed is indicated by a download symbol.
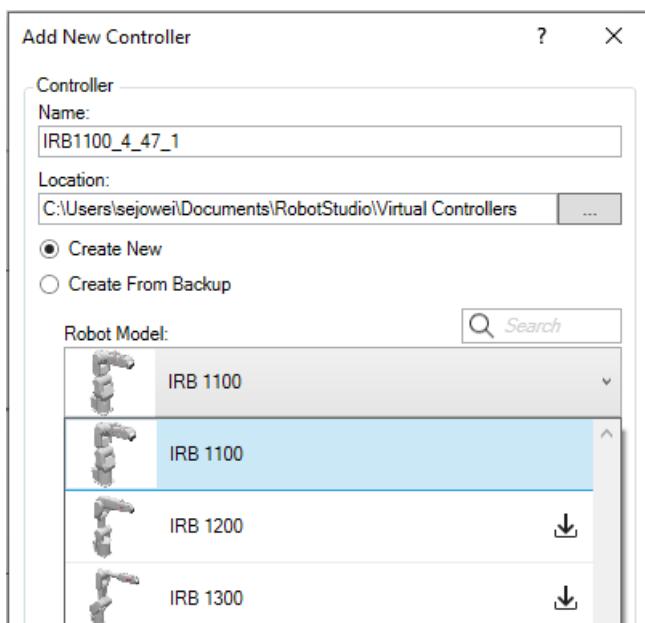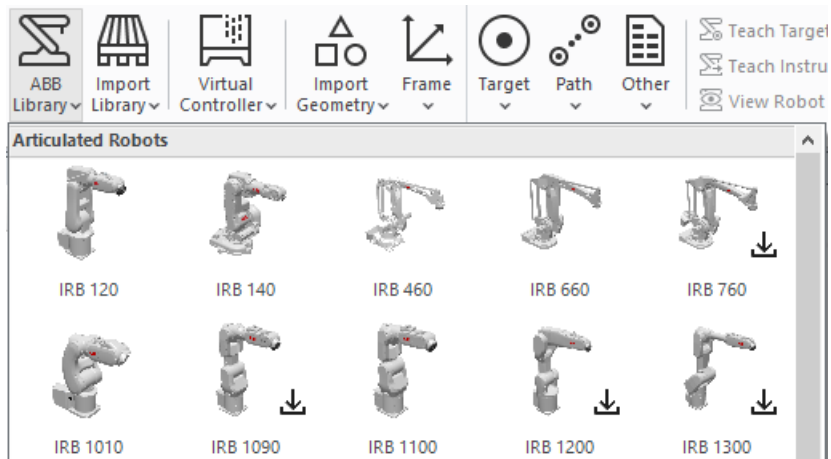
Smart Component Combine/Split

It is now possible to select multiple Smart Components and combine them into a single component. A Smart Component can also be split it into its components.

Combine:
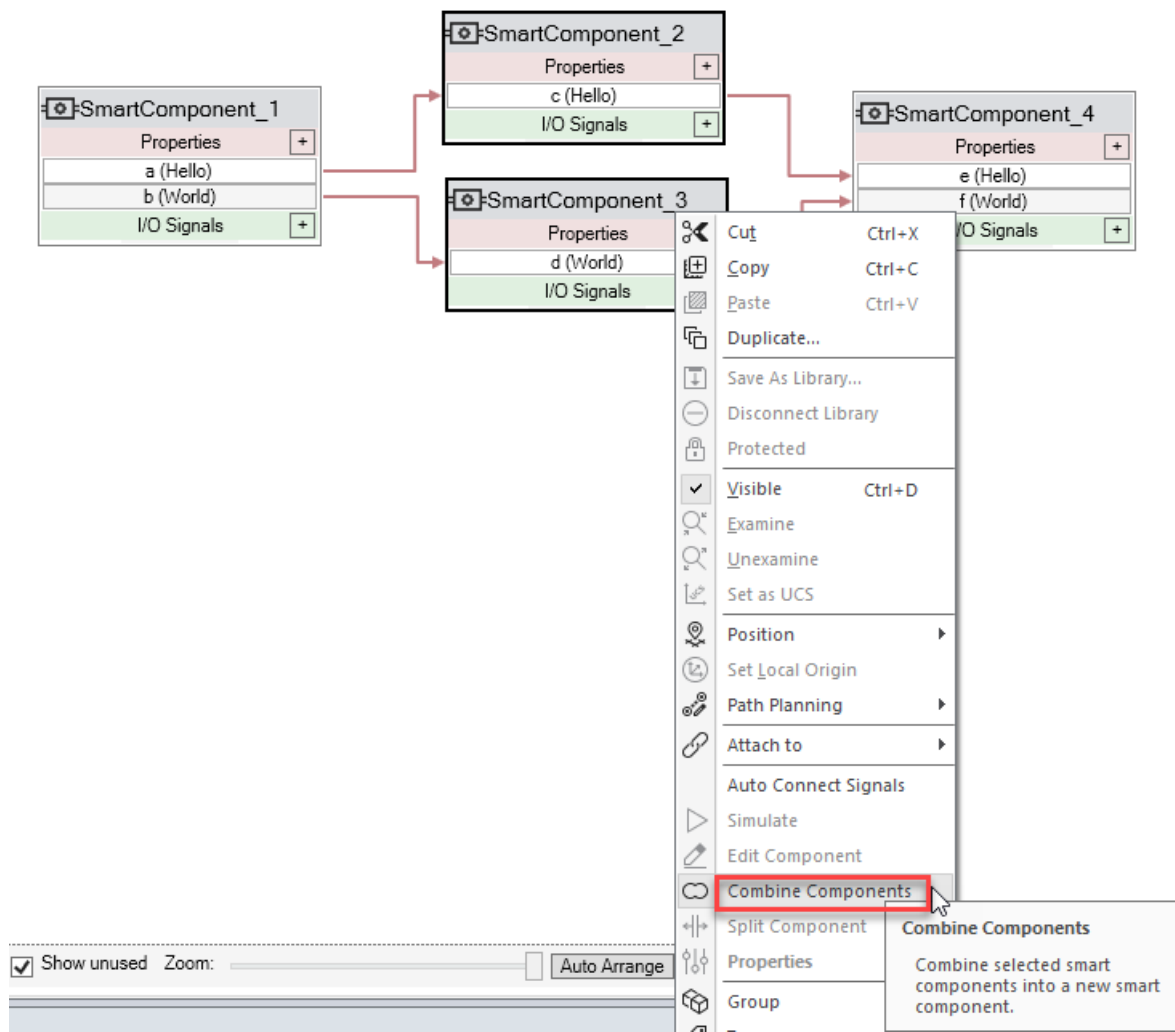
Split:
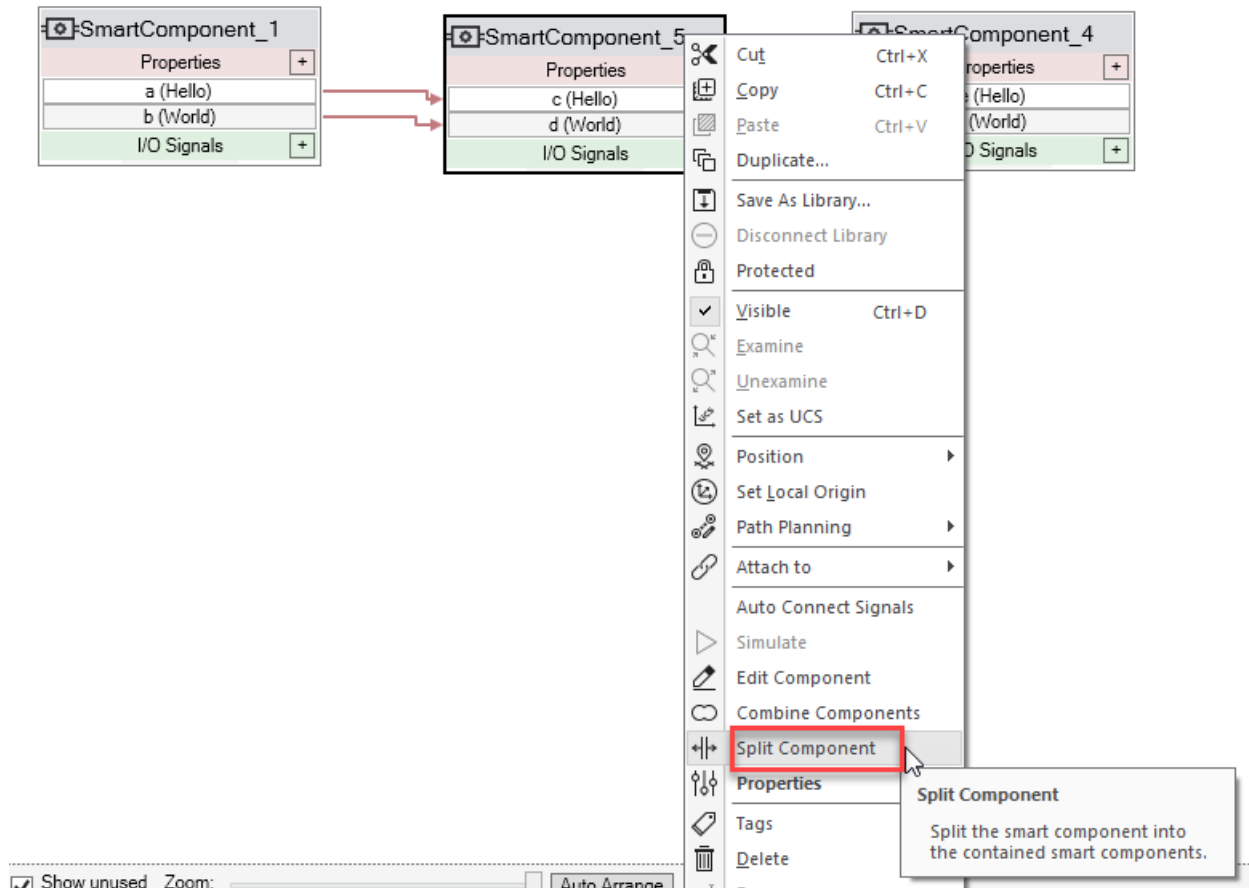
Smart Component multi-selection

Smart Components, I/O connections and property bindings can now be multi-selected by keeping the Shift key pressed down while clicking on the objects in the design view. This makes it easier to move or delete multiple objects at once. Moving Smart Components can now be undone with Ctrl+Z, which also works for "Auto Arrange".
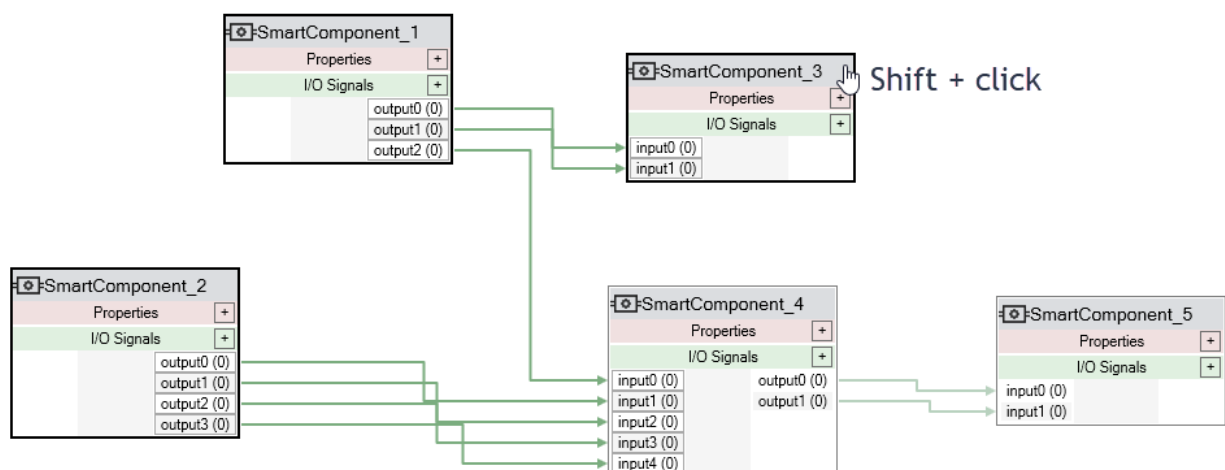
Multiple Smart Components can also be selected by clicking on the background and dragging a selection rectangle around the Smart Components. If the SHIFT key is pressed while rectangle selecting, the selected Smart Components are added to the current selection.

SmartComponent_1
Properties
I/O Signals
output0 (0)
output1 (0)
output2 (0)

SmartComponent_3
Properties
I/O Signals
input0 (0)
input1 (0)

Click + drag

SmartComponent_2
Properties
I/O Signals
output0 (0)
output1 (0)
output2 (0)
output3 (0)

SmartComponent_4
Properties
I/O Signals
input0 (0)
input1 (0)
input2 (0)
input3 (0)
input4 (0)
output0 (0)
output1 (0)

SmartComponent_5
Properties
I/O Signals
input0 (0)
input1 (0)

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Improvements

Connect to Controller: Remember Last Opened Tab

Connect to Controller window will now remember the last opened tab and open that one next time the window is opened.

Safety category in Jobs

It is now possible to select the safety event log category in 'Search Event Logs' and 'Save Event Logs' jobs.

Keep reference coordinate system when switching selection

The reference coordinate system in tool windows is now kept the same when changing the selected object. This applies to "Set Position", "Offset Position", "Rotate", "Place object", "Set Local Origin" and "Duplicate".

Remember settings in Connect to Controller dialog

The check box values in the Connect to Controller window are now remembered between sessions.
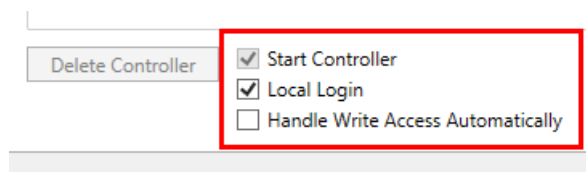
Signal Analyzer: Stress Index signals disabled for non-compact gearboxes

Stress Index signals in Signal Setup will now be disabled for joints that do not have compact gearboxes with a tooltip describing the reason.

Sort tools and workobjects

Tools and workobjects in the ribbon are now sorted in alphabetical order.
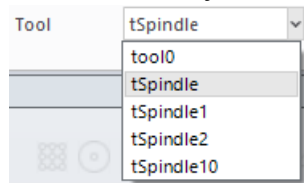
UX improvements in Modify Installation dialog

A number of improvements have been made in Modify Installation dialog in RobotStudio 2023.4 to make it more user friendly.
Examples of such improvements are the following:

- color coding and icons are used to better visualize changes in the summary
- a custom dialog is now used when creating an Installation Package
- confirmation messages are added when exporting/importing option configuration settings files
- it is possible to view a license contents in the license editor, by positioning mouse pointer on a license file
- latest software versions are displayed first when trying to update and add software
- using name "options" instead of "feature" to better align with official terminology
- customizing software installation order is now accessed via a small button in the Included Software dialog

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Information

Calibrate camera and save calibration data to a file

In the procedure of calibrating the camera in RobotStudio, it is possible to save the calibration data to a file on the camera's disk.

From version 2023.4 of RobotStudio, it is necessary to finish the calibration procedure before it is possible to save the calibration data to a file.

Corrections

PDD	
15104	**Fatal error from graphic card related changes** Resolved a critical bug that caused RobotStudio to crash due to graphics card-related errors. These errors could occur in various situations, such as when the graphics card is forcibly disabled or computer entering sleep mode. The update features improved error handling, which allows the software to handle such scenarios more gracefully, preventing crashes and enhancing overall stability.
15188	**Path Editor Exception - "An Item with the same key has already been added"** An exception that could occur when opening the Path Editor will no longer do so.
	Fatal error when moving a window between tab groups Fixed a crash that could occur when moving a document window (for example RAPID editor) between tab groups.
	Exception when unpacking Pack&Go with non-English characters Use of non-English characters sometimes caused exceptions when unpacking a Pack&Go. This is now fixed.
	IRB 5510 base frame not updated to side of the line Fixed an issue when creating an IRB5510 system 'From Layout' and selecting a side of the line, the base frame was not updated accordingly.
	VR: Mouse movement in ApplicationWindowPanel Fixed an issue with simulated mouse movement when using the ApplicationWindowPanel Smart Component in VR.
	VR: Right-click in ApplicationWindowPanel When using the ApplicationWindowPanel Smart Component in VR, mouse right-click can now be simulated by pressing the secondary (grip) trigger on the right-hand VR controller.
	VR: IRC5 Virtual FlexPendant popups removed If an ApplicationWindowPanel Smart Component was used to display the IRC5 Virtual Flexpendant in VR, popups in the FlexPendant (such as Event Log) would not stay open. This issue has been fixed.
	ApplicationWindowPanel scaling issue The ApplicationWindowPanel Smart Component now renders correctly in a multi-monitor environment with different scaling settings on the monitors.
	ApplicationWindowPanel slows down RobotStudio Fixed an issue with the ApplicationWindowPanel Smart Component that could slow down RobotStudio if the specified window was not found.

PDD	
	Physics Cable strange behavior when robot is moved Fixed a bug that could cause a physics cable to become entangled when the object it is attached to is moved a long distance.
	Exception when configuring I/O network on E10 controller The functionality to configure the I/O network is now blocked for controllers that do not have an I/O network, such as the E10 controller.
	Slow response when using Snap Fixed a performance problem that could cause RobotStudio to become unresponsive when "Selection preview" was enabled and "Snap End" or "Snap Mid" was activated.
	System diagnostics from virtual controller It is now possible from RobotWare version 7.6 and onward to create System Diagnostics on virtual controllers.
	System from layout - IRB5510 system failure state Fixed an issue where the controller would go into a system failure state if combined with any non-paint robots. This combination is now not allowed.
	UCS icon not appearing Fixed an issue where the UCS icon would not appear in Paths & Targets tab when setting UCS.
	Issue with SetBrush indicators in Path & Procedures view Fixed a regression introduced in 2023.2 where trigger indicators for SetBrush instructions in the Paths & Procedures browser were missing. They are now displayed as status icons.
	Auto Configuration fails Fixed a an error in Auto Configuration that could occur if a target was very close to the limits of the robot working range.
	Fatal Error in the Create Controller from Layout window Fixed a Fatal Error that happened when a specific set of invalid characters ('<', '>', '"' or '|') where typed into the Name or Location text boxes in the Create Controller from Layout window.
	Error after closing the project Fixed an error that could occur when interacting with a browser window after the project was closed.

PDD	
	Connect to Controller: RobotWare version In 'Connect to Controller > Virtual Controllers' the RobotWare version will now be displayed, rather than the RobotControl version.
	Virtual Controller included in Pack & Go The whole Virtual Controller folder was included when performing Pack & Go, which could make the package unnecessarily large. This has been fixed.
	SmartComponent - Graphic Switch + Highlighter not working together Graphic Switch and Highlighter interacted in the wrong way before. Graphic Switch will no longer toggle a part to become invisible if it's already visible because it is highlighted.
	Collision geometry regenerated when not needed Previously collision geometries were regenerated even when the shape of objects was unchanged, such as for translations. They will now be regenerated only when necessary.
	Crash when installing under drive root Fixed a crash that could occur if RobotStudio was installed directly under the root of a drive, e.g. in C:\RobotStudio.
	VR: ApplicationWindowPanel FlexPendant click issue Fixed an issue when using the ApplicationWindowPanel Smart Component to display the virtual FlexPendant in VR. The issue made it hard to click on lines and buttons in the OmniCore code editor, since a mouse drag operation was started in the FlexPendant instead of a click.
	Linear TCP acceleration in world is not supported in Signal Analyzer Online The signal Linear TCP Acceleration in World was not available for Signal Analyzer Online. It is now available.
	Double popup windows for Output messages Fixed an issue that could cause two popup windows to be shown when double-clicking a message in Output.
	Library files installed under ABB Library not visible Library files installed by other products under ABB Library in the RobotStudio installation folder are now displayed in the "Import Library" menu.
	Incorrect controller name in Connect to Controller In the Connect to Controller dialog, the system name was incorrectly shown under "Controller Name" for IRC5 controllers. This has been fixed.

PDD	
	Custom installation error If performing a custom installation of RobotStudio with only "RobotStudio Online" selected, the application could not be started. This has been fixed.
	Exception when creating Virtual Controller from backup Fixed an error that could occur when creating a new Virtual Controller from a backup of a RobotWare 7.12 controller.
	Exception when using non-default Run Mode Settings Fixed an exception that happened when changing the operating mode if the Run Mode Settings did not have default settings.

Known Limitations

Visual SafeMove

E10 virtual controller not supported

It is not possible to create a valid safety configuration file for a virtual controller where the controller model is E10. The device mapping of signals on the internal feedback device will be incorrect. There is no information about this limitation inside Visual SafeMove because it is currently not possible to know the model of a virtual controller.

Configurations with Basic Joint Supervision disabled can be created

For SCARA robots, like for example IRB 920T, only the limited functionality Basic Joint Supervision is supported by the Safety Controller. Visual SafeMove allows the full set of functionality to be configured even though it is not supported. Writing a safety configuration file with Basic Joint Supervision disabled results in an error since it is invalid. Workaround: Enable the option Basic Joint Supervision on the robot node in Visual SafeMove.

Current joint values cannot be retrieved when external axes are included in the configuration

It is not possible to retrieve the current joint values using the Read current values function on the Synchronization node when external axes are included in the configuration. Workaround: Read the values from the FlexPendant and update manually.

The safety controller is not forwards compatible

When writing a safety configuration file of a later version than the current safety controller image, then RobotStudio will generate an error of type "C00FFFE: Unknown error (0xC004FFFE)LoadSafetyConfigurationFile". (Note that this error may occur for other reasons as well and is thus not unique to this case).

The function Get vectors from active tool reads values from the robot

The idea behind this function is to read the data from the currently active tool of the robot in order to define a corresponding SafeMove Tool in the safety configuration. That is the reason why the tool information is read from the robot and not the safety controller. The tools of the safety configuration are visible the Visual SafeMove itself and does not need a special function to be retrieved.

Protected checksum may change when upgrading RW from 6.04.0x to 6.05 or 6.06

The protected checksum will change if the input and output modules of the internal device is protected. The reason is that two attributes change order.

No visualization of Safe Range for external axes in Visual SafeMove for SafeMove Basic or Pro

When Safe Range is used to limit the axis range of an external axis such as a track motion, there will be no visual indication of the actual range in the graphic view.

Visual SafeMove windows can be re-opened from the Quick Access Toolbar menu

Any windows that are closed can be re-opened using the Quick Access Toolbar menu, as the command Default Layout does not recover these windows.

SafeMove Tool Zone visualization in Online Monitor for robots with external axes

Only TCP robots and track mounted robots will be visualized in the Online Monitor, no other external axes or positioners. As a consequence, the Online Monitor may show the robot in a non-violating position, even though the safety controller has detected a safety violation and stopped the robot.

IO Configurator 6

***Safety configuration problem with PROFIsafe Controller or CIP-Safety scanner**

Changing safety settings in Visual SafeMove or IO Configurator 6 does not always work in conjunction with the "PROFIsafe controller" or "CIP-Safety Scanner" option. Connection with robot controller can be lost during any IO-configuration, sometimes resulting in that the Flex Pendant reboots. Again this is only applicable when the PROFIsafe controller or CIP-Safety scanner option is present in the system. Problem is dependent on how many devices are configured on respective industrial network. I.e. EtherNet/IP or ProfiNet.

Online

Signal Analyzer Online recordings not saved

When recording signals from a real controller with RobotWare 6.13.03 and later, or RobotWare 7.6.1 and later, there is a sporadic issue which causes the signal changes to not be recorded.

Routine variables can't be displayed in RAPID Watch with RobotWare 6.12

A limitation in RobotWare 6.12 prevents variables declared in a routine from being displayed in the RAPID Watch window.

Port speed cannot be set at the same time as 'Obtain IP address automatically'

In the Public Network settings dialog the Port speed drop down menu is disabled when 'Obtain IP address automatically' is selected.

Workaround:

1. Select 'Use the following IP address' and specify any valid IP address.
2. Select the desired port speed and press OK.
3. Select 'Obtain IP address automatically' and press OK.

Individual RAPID tasks cannot be stopped for RobotWare 5.60 and later

When running multitasking systems, it is not possible to start and stop individual tasks with the dropdown menu of the task node in the Controller browser. This is due a restriction introduced with RobotWare 5.60 and later. However, from RobotWare 6.03 onwards, then RAPID tasks to execute or to stop can be selected from RobotStudio RAPID tab.

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.

Online – Paint

Backup for Paint systems does not create backup of the PIB for IRC5P with RobotWare 5.xx

The Backup function of RobotStudio does not create a backup of the PIB board of the IRC5P system when running RobotWare 5.xx. 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.

Online – Integrated Vision

Installation error when having previous versions of RobotStudio or Insight Explorer

If you have a previous version of RobotStudio or Cognex In-Sight software installed, installing a new version of RobotStudio may result in the following error message

Module C:\Program Files (x86)\Common Files\Cognex\InSight\5.7.1674.0\CvsInSightDisplay.ocx failed to register. HRESULT -2147220472. Contact your support personnel.

Workaround: To correct the issue, open Windows Settings -> Apps -> Apps & features, select the current ABB RobotStudio 2019.x, select Modify, and step through the installation wizard and select Repair. Alternatively, uninstall and reinstall RobotStudio.

Note: Only one version of the In-Sight Display Control can be registered at a time, and this is always the latest version installed. Although older versions of RobotStudio or In-Sight may seem to function with this version installed, their compatibility with this version is not guaranteed.

RobotStudio may hang for up to 60 seconds when configuring jobs with PatMax 1-50

The user interface of RobotStudio may freeze for up to 60 seconds when configuration Integrated Vision jobs with the tool PatMax 1-50.

Workaround: Use PatMax 1-10 instead

Remaining error – New Emulators

New camera models have been added to the camera emulator option in RobotStudio 6.04.01. Some of these new models are not yet fully compatible. Our recommendation is to choose a camera model from the 7000 series which is fully compatible with Firmware version 4.10.2.

Emulated cameras not discovered when controller in Motors On

For RobotWare 5.61 onwards, the camera discovery mechanism is disabled when the controller is in Motors On. As a consequence, the camera nodes will not appear in the controller browser.

Workaround: Switch to Manual Reduced Speed and use the Refresh command on the Integrated Vision node in the browser to make the cameras appear.

Information – Camera firmware version and update

The minimum firmware version to be used with Integrated Vision is 4.08. If this version is not available for a specific camera model, then the newest version available shall be used. There are two important things to know before upgrading a sensor:

- The user must make sure to first backup the files on the camera. This can be done using the Rapid snippets for camera backup/restore, or the FlexPendant Explorer.
- The latest available firmware version may vary across sensor types. However, when the firmware update utility presents the latest available version it shows the firmware with the highest version number which may not apply to the sensor to be updated. However, the appropriate firmware will be applied.

Information – The spreadsheet view

The spreadsheet view is not enabled when editing in the in the following modes "Add part location tool", "Add part inspection tool". Before entering the spreadsheet mode click for example "Setup Image" or Output to Rapid.

Information – Calibration board without fiducial

When using the calibration boards, checkerboard or board with dots, the user must select the preferred origin by clicking and accepting (press enter) three points on the board. Only after these three points have been selected it is possible to click "calibrate" to execute the calibration.

Information - Use default camera settings

If the camera is not using default communication settings the result may be that RAPID instructions return error code "Communication Error". The safest method to get default settings is to go to Connect->Add Sensor Right click and select "Show all sensors". Select the device to reset and click "Apply factory settings" in the lower right corner. The most important settings are:

```
Telnet port: 23
User: "admin"
Password: ""
```

Information – User Credentials

It is now possible to create user profiles with different access levels on the camera. For detailed information about this, please refer to the Integrated Vision User Manual.

Remaining error – Save image on camera

It is not possible to save an image on the camera using "Save Image". This is by design, but the dialog still allows the user to try to do this. The result is that the image is not saved and no error message is given.

Remaining error - Connect button greyed out for no reason

It may sometimes happen that the "Connect" button is greyed out, with the tooltip saying the camera is not on the correct subnet although the IP settings are OK.

Workaround: Restart the Integrated Vision Add-In

Remaining error – VC started from Controller->Add controller does not detect cameras

A VC that is started from Controller->Add controller does not detect cameras on the network, even if the VC_network_definition.xml is correctly configured and the firewall is turned off. The reason is that the controller is not able to detect new cameras on the network when it is in "Motors On" state. When the VC is started stand-alone in RobotStudio it is automatically set to "Motors On" when started.

Workaround: To allow it to discover cameras, turn the control panel key to manual mode or launch the VC as part of a station.

User tip - Removing cameras from configuration

To remove a configured camera from the list of configured cameras, use the configuration editor. Enter Configuration->Communication->Application Protocols and remove the desired camera. Perform a warm start to complete the operation.

User tip – Viewing all cameras present on the network

Connect->Add Sensor is normally used for setting the IP addresses of sensors that are not currently on the correct subnet (192.168.125.X). Since the dialog shows all cameras "seen" by the PC, this dialog is useful when error tracing camera network problems. If a camera does not appear on the network using the "Add sensor" dialog as suggested above, it is advisable to cycle the power of the camera. If the camera receives power from the controller, then cycle power by turning the mains switch.

User tip – Warm start the controller after changing network settings

Whenever changing the network settings of the camera, either from Connect->Add Sensor or Connect->Network settings, it is important to warm start the controller. If this is not done, RAPID instructions will give the error "Communication Error" and the FTP-mounted camera disk is not accessible. If DHCP address is used and persist, please try a static address instead.

Offline

Point cloud data in JT files can't be imported

Point cloud data in JT files is not imported by RobotStudio.

Issue with collision avoidance for palletizer robots

When configuring collision avoidance for a palletizer robot using RobotWare 6.11, attaching an object to a mechanism link can result in an error and the configuration will not be loaded.

The YuMi library revision 1 cannot be successfully updated to YuMi revision 2

When opening a Pack&Go file with a station that has a reference to `IRB14000_0.5_0.5__01.rslib` you get the option to update it to the newer `IRB14000_0.5_0.5__02.rslib`.

The following issues occurs if you select 'Yes' and update the model:

- The attached parts, for example Smart Grippers, are detached.
- The new YuMi robot is not connected to the virtual Controller.
- The old YuMi mechanism is converted to a component.

Answer 'No' to this question to keep the original revision 1 model and avoid the problems mentioned above.

RobotStudio needs to be restarted to update a modified library instance

When editing a library file (.rslib) that is used in a currently open station, then RobotStudio needs to be restarted to update the library. Simply re-opening the station is not enough to update the content of the station. Unless RobotStudio is restarted, the old library instance will remain in memory and be loaded even though the underlying file has been updated. This is a known limitation and is expensive to fix. There is a workaround to the problem, which is to restart RobotStudio.

The robot IRB 1600ID 1.55 m / 6kg replaced by IRB 1660ID 1.55 m / 6 kg in RobotWare 6.04

The robot IRB 1600ID 1.55 m / 6 kg is not available in RobotWare 6.04 and later. It has been renamed to IRB 1660ID 1.55 m / 6 kg. Virtual controller systems for IRB 1600ID 1.55 m / 6 kg based on RobotWare 6.03 cannot upgraded to RobotWare 6.04 and later. This means that Pack&Go files for this robot based on RobotWare 6.03 cannot be upgraded to RobotWare 6.04 automatically

Workaround: Re-build or modify the virtual controller system to use IRB 1660ID 1.55 m / 6 kg instead when using RobotWare 6.04 or later.

FlexPendant and RAPID applications run with logged in user rights

A FlexPendant or RAPID application running on the virtual controller runs with the rights of the logged-in Windows user. RAPID applications running in a background task will start to execute when the Pack&Go file is opened and FlexPendant applications will start to execute when the user starts the Virtual FlexPendant. A warning message has been added to the Unpack&Work wizard to make the user aware that only Pack&Go files (.rspag) from trusted sources shall be opened.
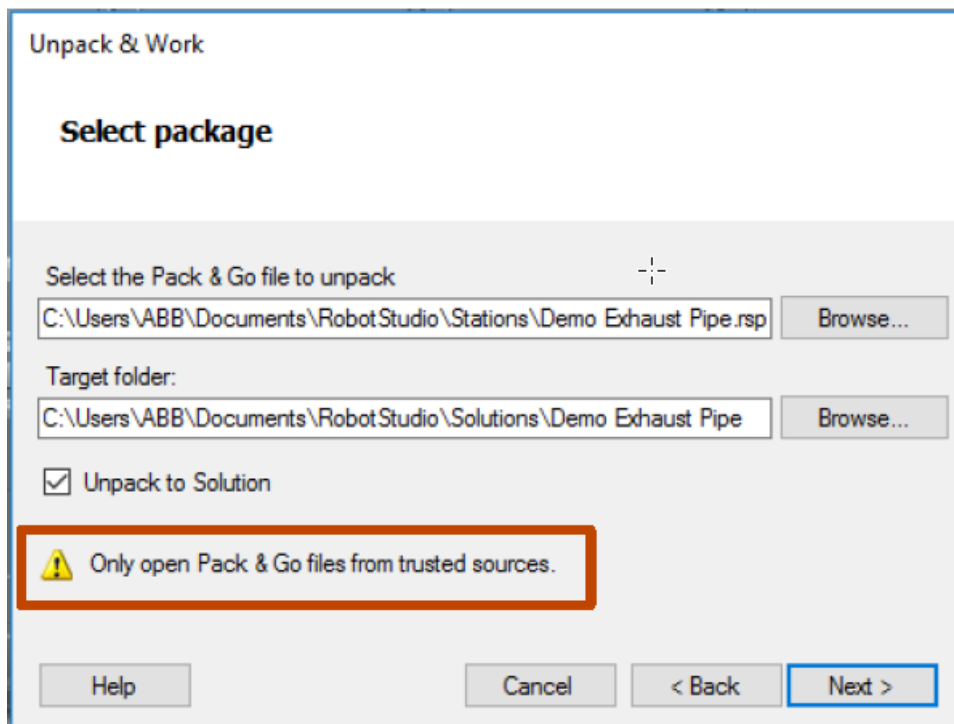
Compatibility of RobotStudio Library and Stations with older RobotStudio versions

RobotStudio is generally not forwards compatible, i.e. it is not possible to load stations or libraries created in RobotStudio 6.04 into an earlier version of RobotStudio such as e.g. RobotStudio 5.x, 6.03.02 or earlier. However, RobotStudio is backwards compatible, which means stations and libraries created in versions 5.x, 6.03.02 or earlier can be opened in RobotStudio 6.04

TrueMove path visualization fails for customized zone data

The TrueMove path visualization function only supports predefined zonedata. It will not work for user defined zonedata.

Backup fails for RobotStudio solutions with SafeMove or Electronic Position Switches

Backups are automatically created for virtual controller systems that are part of a RobotStudio solution when saving the station. For virtual controller systems with the RobotWare options SafeMove or Electronic Positioning Switches the backup will fail since these systems contain files that are read-only. As a result, an error message is presented in the output window: `<System name>: Backup failed`. The station will be successfully saved but there will be no backup created. Workaround: Ignore the error message `<System name>: Backup failed` and create a manual backup whenever needed. The RobotStudio Option "Enable automatic backup of controllers in solution" that is available in "RobotStudio Options -> Robotics -> Virtual Controller" can be de-selected to disable the backup function.

IRB 14000 cannot be combined with any other robot

The function system from layout fails if trying to create a MultiMove system where one robot is an IRB 14000. The reason is that the IRB 14000 cannot be combined with any other robot.

Workaround: Create a separate system for the IRB 14000.

The Work Envelope function does not support IRB 14000

The function is disabled for the IRB 14000 and cannot be activated.

The 2D work envelope fails for certain robot models

As a result, the generated work envelop may appear distorted.

Update of current selection in the 3D graphics window may be delayed

A problem related to the graphics driver has been observed on certain PCs. The problem is that the update of the current selection in the 3D graphics is delayed until the next redraw.

Workaround: Add or uncomment the following line in the file RobotStudio.exe.config

```
<add key="DoublePresentWorkaround" value="true" />
```

Failure to open Pack&Go file to same folder the second time

RobotStudio will prevent Pack&Go files to be opened to the same folder a second time if the station contains VC systems with the EPS or SafeMove option. This is by design to prevent the safety controller configuration file to be accidentally overwritten.

Workaround: Remove the write protection manually using Windows Explorer.

Updates of instruction template and code snippets

RobotStudio will not automatically update the user files for instruction templates and code snippets files in the folders:

…\My Documents\RobotStudio\Instruction Templates
…\My Documents\RobotStudio\Code snippets

Workaround: The user has to manually copy the latest files from

%ProgramFiles%\ABB Industrial IT\Robotics IT\RobotStudio 5.xx\Instruction Templates

and

%ProgramFiles%\ABB Industrial IT\Robotics IT\RobotStudio 5.xx\Code Snippets

to the data folder.

I/O signals configured with access level 'DEFAULT'

When IO signals are configured with access level 'DEFAULT', only input signals are possible to set/reset from the I/O Simulator and I/O Window. To be able to affect also output signals, set the access level to 'ALL' for them in the Configuration Editor.

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

The VC will hang when started with a system containing the RobotWare option RRI (Robot Reference Interface) if the GSI folder structure is missing.

Workaround: Create GSI Folder before starting the VC inside the *HOME* directory of the system. See the Application Manual for Robot Reference interface for more information.

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.

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.

Event Manager: Simulation cannot be triggered by analog system signals

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

Conveyor Tracking

*Conveyor objects must be re-added for stations created prior to RS 6.05

When opening stations with conveyor tracking created prior to RobotStudio 6.05, conveyor objects must be re-added.

Incorrect default values for c1Position and c1Speed for RobotWare 5 with the PaintWare option

The default values for the parameters c1Position and c1Speed may become incorrect for a virtual controller system. The symptom is that its attribute values are all zero, see snapshot below.

Workaround: Save the following lines to a CFG file named 'TEMP.CFG' or similar and load in the virtual controller followed by a restart.

```
EIO:CFG_1.0:5:0::
#
EIO_SIGNAL:
 -Name "c1Position" -SignalType "AI" -Unit "CnvIf"\
 -SignalLabel "ctPosition" -UnitMap "0-31" -Access "ALL"\
 -MaxLog 21474.8 -MaxPhys 1 -MaxPhysLimit 1\
 -MaxBitVal 2147483647 -MinLog -21474.8 -MinPhys -1 -MinPhysLimit -1\
 -MinBitVal -2147483647
 -Name "c1Speed" -SignalType "AI" -Unit "CnvIf" -SignalLabel "ctSpeed"\
 -UnitMap "32-63" -Access "ALL"\
 -MaxLog 21474.8 -MaxPhys 1 -MaxPhysLimit 1\
 -MaxBitVal 2147483647 -MinLog -21474.8 -MinPhys -1 -MinPhysLimit -1\
 -MinBitVal -2147483647
```

MultiMove

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: Workobject is not set for the current task.

External Axis

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.

Network Drives and UNC Paths

RobotStudio on computers with roaming user profiles

RobotStudio may fail on PC configurations with roaming user profiles, i.e. when the users' documents folder resides on a server and not on the local disk.

Workaround: Redefine the 'User Project Folder' to a folder on the local disk (File → Options → General → Files&Folders → User Project Folder).

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 Virtual FlexPendant

Cause: By default, the .NET Framework 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 the file *Virtual FlexPendant.exe.config* located in *C:\Program Files (x86)\ABB Industrial IT\Robotics IT\RobotStudio 5.61\Bin*

2. Add the following lines:

```xml
<?xml version="1.0"?>
<configuration>
    <startup useLegacyV2RuntimeActivationPolicy="true">
        <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.0"/>
    </startup>
    <runtime> <!-- THIS IS ONE OF THE NEW LINES!!! -->
        <loadFromRemoteSources enabled="true"/> <!-- THIS IS ONE OF THE NEW LINES!!! -->
    </runtime> <!-- THIS IS ONE OF THE NEW LINES!!! -->
</configuration>
```

The Virtual FlexPendant must be restarted for the changes to take effect. For further information, see http://msdn.microsoft.com/en-us/library/dd409252(v=vs.100).aspx

RAPID

Robtargets that are LOCAL to a PROCEDURE cannot be synchronized with RobotStudio

The RobotStudio synchronization engine that translates 3D data of the station to RAPID code and vice versa does not support robtargets that are declared locally to a procedure.

Workaround: Declare the robtargets as global or local to a module instead.

Robtarget names must be unique in RAPID even if they are LOCAL

RobotStudio requires that robtarget names are unique for the RAPID synchronization to work properly, i.e. you cannot have a global robtarget named pMyTarget1 in module A and a local robtarget with the same name in Module B.

Global robtargets cannot be made local through Synchronization to VC

Global robtargets cannot be changed to local through Synchronization to VC, the option is disabled (PDD 3140).

Workaround: Change the robtargets to module local in the RAPID Editor and Synchronize to station.

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 mix-up 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.

Paint

The new conveyor tracking module DSQC2000 is not supported for paint robots.

The new conveyor tracking module DSQC2000 is not supported for paint robots.

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.

Graphics and Geometry

*Display of working range optimized for furthest reach

The current algorithm uses a fixed value for joint five which gives the furthest reach for a given tool. The sweep is not optimized to get the shortest reach on the "inside" of the working area.
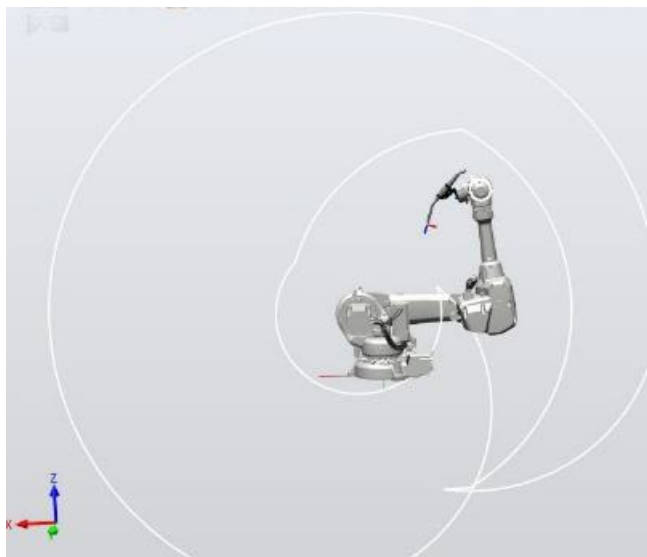
Enforce selected graphics device for PCs with multiple graphics cards

For best performance when running RobotStudio on a PC with multiple graphics cards, RobotStudio can be configured to use a specified device. By this option you can ensure maximum performance. This is useful for e.g. Lenovo W540 that has both an integrated Intel graphics device and a discrete NVIDIA card.

Open the file *RobotStudio.exe.config* that is located in the folders

C:\Program Files (x86)\ABB Industrial IT\Robotics IT\RobotStudio x.y\Bin64

and

C:\Program Files (x86)\ABB Industrial IT\Robotics IT\RobotStudio x.y\Bin

and uncomment the line:

```
<add key="GraphicsDeviceType" value="Discrete"/>
```

Valid values are 'Discrete', 'Integrated' and 'Warp' (software renderer). Note that there are two different files, one for the 32-bit version, and another for the 64-bit version.

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.

ScreenMaker

Numeric controls and decimal separators

To use numeric controls in ScreenMaker on the PC set the decimal symbol to a single period ('.'). Other decimal symbols are not supported and binding values will not work in the Virtual FlexPendant. The behavior on the real FlexPendant is not affected by this PC setting.

Graphs on secondary screens

To use a Graph on a secondary screen (not the main screen) a custom action is needed. Otherwise, the Graph will not be updated properly. In the ScreenForm that contains the Graph add a Load event. In this event add an action using Add Action->Advanced->Call Custom Action. Select the Graph control and the UpdateValues action.
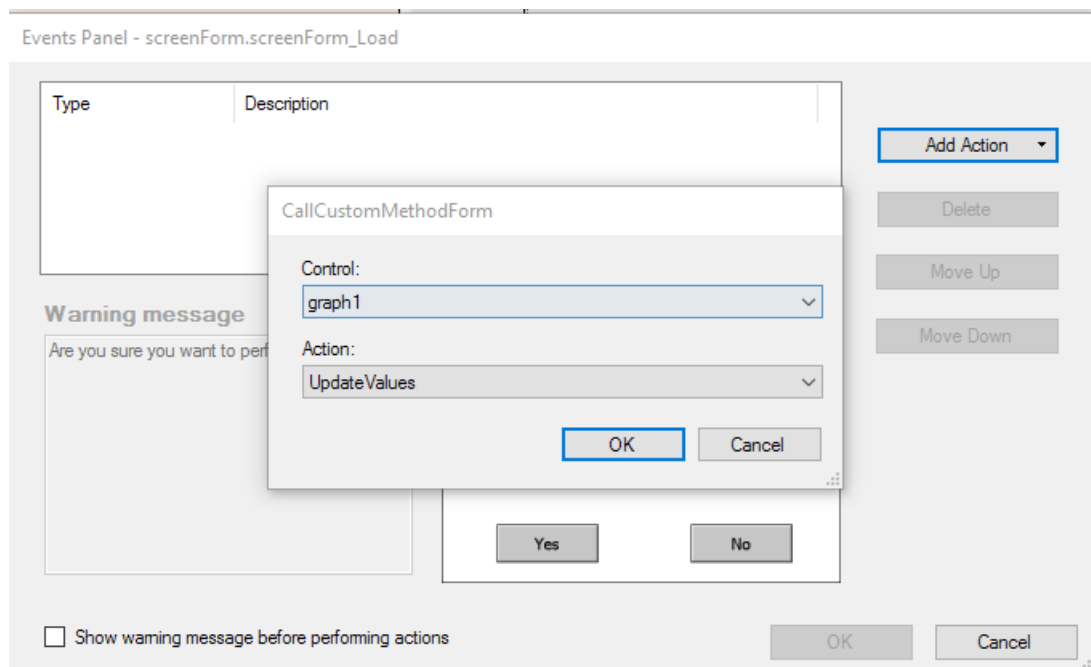
Binding to the Enabled property

Connecting the *Enabled* property of any control to a BOOL variable or IO signal may not work as expected. The variable or signal may be inadvertently changed leading to unexpected behavior. Instead, bind to a digital output where the *Access Level* is set to *ReadOnly*

A ScreenMaker cannot be deployed a controller with disabled Default User

Workaround: Enable the Default User.

NumEditor in ScreenMaker disables the controls in a group box or panel

If you are using the NumEditor control in a group box or a panel, and that box or panel is enabled by an input signal, then all other controls of that group or panel will become disabled if the editor is opened and closed.

Button with multiple states in ScreenMaker app do not update the images if button is disabled

For an app which uses Buttons with multiple states connected to images that change depending on the value of a RAPID variable, then if the button is disabled, the button shows the greyed image of the state which was active when the disabled state was shown the first time.

ScreenMaker fails for RobotWare 5.12

ScreenMaker fails to build applications for RobotWare 5.12.
Workaround: Update to a later RobotWare version.

A ScreenMaker application may fail to build if the DPI setting is not set to 100%

Certain UI controls in ScreenMaker may fail to build correctly if the DPI setting is not set to 'Smaller – 100%'.
Symptom: The error message caused by this problem will read 'System.Drawing.Font' does not contain a constructor that takes 2 arguments.
Workaround: Set DPI to 100% on your PC.

File changes to FlexPendant applications does not load the changes until a FlexPendant reset

With RobotWare 6.0x the controller's restart will no longer reset the FlexPendant memory. This was part of an effort to improve the restart time of the controller. This means that after placing a new

FlexPendant application file(s) on the FlexPendant unit, you need to manually reset the FlexPendant for it to reload its assets.

To manually reset the FlexPendant you need to use the reset button on the FlexPendant's backside. (See Operating Manual – IRC5 with FlexPendant, 3HAC16590)

Running Routine with Movement

RunRoutine Button control does not always work correct when a routine with movements is called. As a workaround use instructions like StopMove, StorePath, RestorePath and StartMove to control the movements of the robot. A Trap routine could be called with a normal button control and in the Trap the above instructions can be used to control the movements of the robot.

PictureBox control as a Widget

If a Picture Box control is created as a widget from a Windows 8 operating system, the control is not shown on the FlexPendant. The behavior is fine with any other operating system like Windows 7.

RobotWare Compatibility

Supported RobotWare versions

RobotStudio works with RobotWare 5.07 and later. Please check details below. The latest supported RobotWare version for IRC5 and OmniCore controllers is stated under Help/About in RobotStudio. RobotWare packages can be added to RobotStudio from the Add-Ins Gallery window.

RobotWare 5.05 and 5.06 Compatibility

RobotWare 5.05 and 5.06 including revisions thereof are not supported by RobotStudio 5.15 and later versions. Please use the corresponding version of RobotStudio for managing robot controllers with any of these RobotWare versions.

RobotWare 5.07 Compatibility

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. The virtual controller does not support RobotWare 5.07.08 and RobotWare 5.07.07.

Online

FlexPendant Viewer does not work RobotWare 5.07.

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

Paint backups from RW 5.12.01 are 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:
-Name "doMainInMC" -SignalType "DO" -Unit "SysComm" -UnitMap "44"
-Name "A1HVErrNo" -SignalType "GO" -Unit "SysComm" -UnitMap "150-151"\
-Access "ALL"
-Name "A1HVEn" -SignalType "DO" -Unit "SysComm" -UnitMap "155"\
-Access "ALL"

EIO_CROSS:
-Res "A1HVEn" -Act1 "HVEnabled"
```

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
```

RobotWare 5.13 Compatibility

RobotWare 5.13 and its revisions of are supported with the following limitations:

Paint

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 or RW 5.13.03. 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 5.13.03 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.

RobotWare 5.15 Compatibility

Signal Analyzer Online

The feature Signal Analyzer Online requires RobotWare 5.15.03 or later.

RobotWare 6 Compatibility

Overview

RobotWare 6.00 and 6.00.01 systems cannot be directly upgraded to RobotWare 6.01. To upgrade a system, you need to create backup and migrate it using the tool 'Migrate Backup or Folder', then recreate the system and finally, restore the backup. For this reason, the functions 'Unpack&Work', 'Go Offline' and 'New Solution with Station and Robot Controller – From backup' are blocked to prevent upgrade from RobotWare 6.00 or 6.00.01 to RobotWare 6.01. RobotStudio, however, is compatible with both RobotWare 6.00 / 6.00.01 and 6.01.

General Compatibility Limitations

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 RobotWare 5.11.01 or later. Encrypted parameters needed by the safety controller will be automatically read by EPS Wizard and SafeMove Configurator, respectively.

Configurations

The feature *Configurations* for selecting the robot arm configuration (confdata) may fail, or not present all solutions, in some specific circumstances even when the target is reachable if RobotWare 5.14 or earlier is used.

Workaround: Upgrade to RW5.14.01 or later

Compatibility

Modify Installation dialog and Add-Ins incompatibilities

"Modify Installation dialog" is a new dialog in RobotStudio 2023.3 and 2023.4 that replaces Installation Manager 7, which is now deprecated. It has a new way to visualize Options selections and handle dependencies between options.

Add-In Packaging Tool is used to define Add-Ins metadata and package them. It currently allows more freedom than recommended and supported by "Modify Installation dialog" . The result can be that some Add-ins may not be handled as expected. The main constructs that should be avoided when defining your RobotWare Add-Ins are the following:

- circular dependencies between options
- dependencies between options that have parent <--> child relationships in the view (not necessary any more, since child nodes are never visible or selected until their parent is selected)

For full list of recommendations, please refer to appendix B in Application manual - RobotWare add-ins 3HAC070207.

Add-In Packaging Tool shall be updated in the coming releases to follow the new guidelines for defining Add-Ins.