

User guide and installation

RSP Tool systems – RobotStudio Add-in

M0726-1

Tool changers | Swivels | Swivels with Tool changers | Grippers | Hose packages | Valve Units | **Tool systems**



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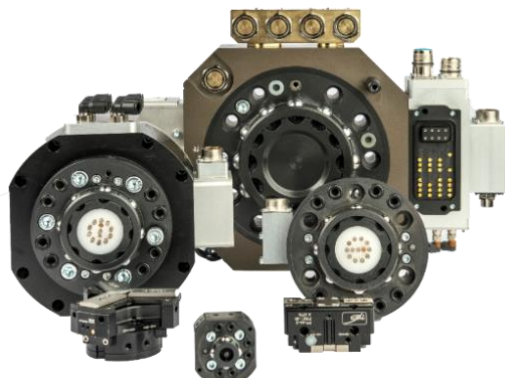
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1 INTRODUCTION

Robot System Products is a front-rank provider of peripheral products for high performance robot applications. We provide complete tool systems solutions for your robot installations, aiming to improve your productivity with the most reliable and cost-effective tooling on the market. Continuously we explore emerging technologies, working with leading edge design.

Robot System Products has a wide range of standard robot peripheral products:



- Tool changers
- Swivels
- Swivel tool changers
- CiRo
- Grippers
- Hose Packages
- Valve units
- Tool systems
- Tool stands

Robot System Products' tool changers are constructed to maximize the flexibility and reliability of your robot fleet. Through our patented locking device TrueConnect™ robustness and high safety are combined with low weight and compactness. With our swivels compressed air, water, electrical and data signals as well as weld and servo power are transferred to your tools with robot motion capabilities fully maintained. Our Swivel tool changers unite the TrueConnect™ mechanism with our swivel technology, combining the best out of the two technologies. With RSPs unique CiRo, cables and hoses can be freely selected with high robot flexibility maintained, and the space requirements reduced. Our integrated Tool systems are delivered as complete plug-and-play solutions designed for quick and simple installation.

Robot System Products' product lines are available for all major robot brands and come with complete documentation. 3D-models for simulation are available for download at: www.rsp.eu.com

1.1 RobotStudio add-in installation guide

This document describes how the Robot System Products' Tool systems are installed in RobotStudio®. RobotStudio is a tool for off-line programming of ABB robots, allowing robot programming to be done without shutting down production. RobotStudio is built on the ABB VirtualController and is an exact copy of the real software that runs the ABB robots in production. It allows tasks as training, programming, and optimization without disturbing production.

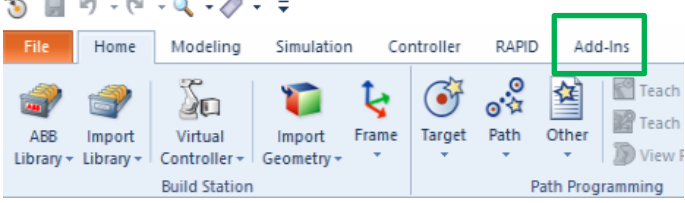

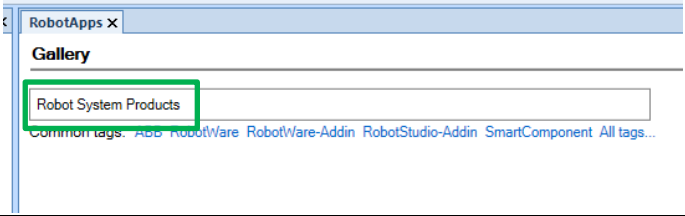
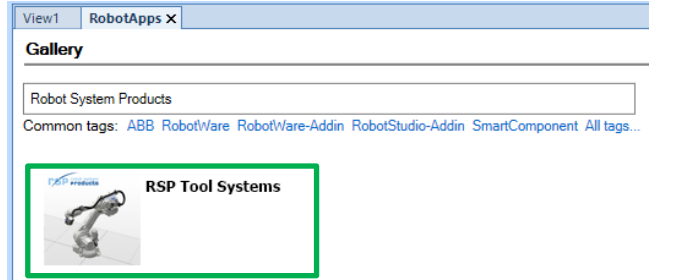
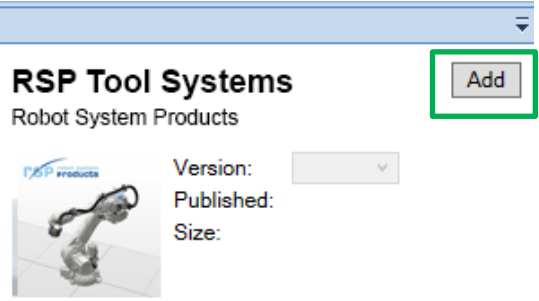

Robot System Products' Tool systems are described in the following documents:

- *Technical description Tool system TS20/10 for ABB IRB (M0114-1)*
- *Technical description Tool system TS100/80 for ABB IRB (M0411-1)*
- *Technical description Tool system TS250/200 for ABB IRB (M0721-1)*

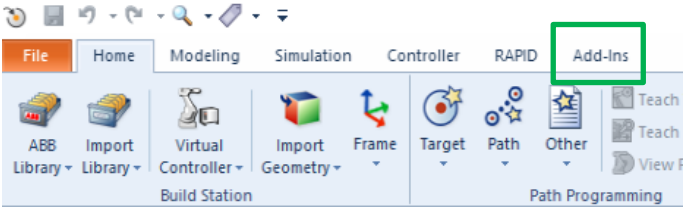

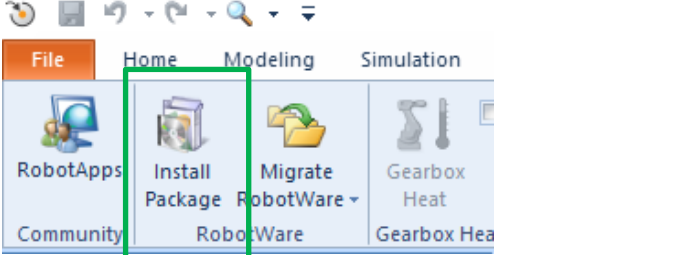
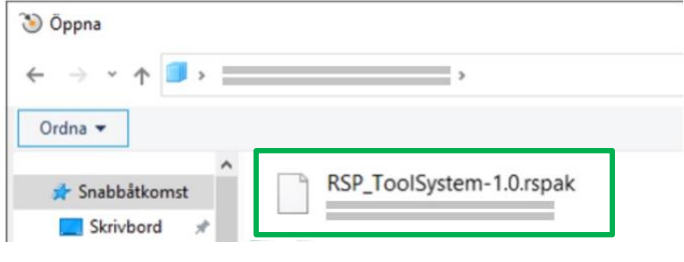


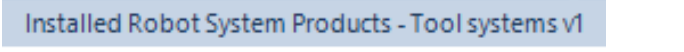
This document is aimed for users knowledgeable in RobotStudio. The RSP add-in (section 2.1) is verified on versions 19.3 and 20.1. For general information on RobotStudio see *Operating manual RobotStudio* available through ABB.

2 INSTALLATION

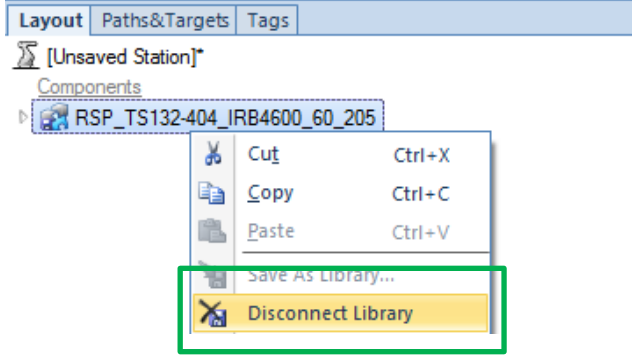

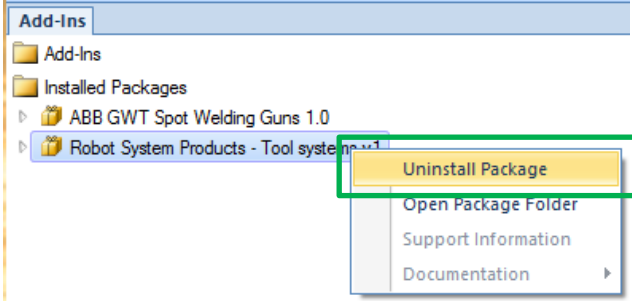
2.1 Installing RSP RobotStudio Add-in using RobotApps

	Action	Note
1	Open RobotStudio	-
2	Add-ins tab 	Click the <i>Add-ins</i> tab located on the top of the window. NOTE! Installation of an Add-in shall only be done once. 
3	Install package 	Inside the RobotApps window, use the search function and type <i>Robot System Products</i>
4	Select Add-in 	Navigate to and click on the RSP Tool Systems Add-in.
5	Start installation 	Locate the RSP Tool Systems Information box on the right side. Make sure the latest version is chosen and click the <i>Add</i> button. Accept the <i>Disclaimer</i> . Wait for installation.
6	Installation completed 	Once the installation is complete a confirmation message will be displayed in the bottom left.
7	Restart RobotStudio	Restart RobotStudio for the changes to take effect.
8	Ready for import	The contents of the installed Add-in can now be imported (see section 3).

2.2 Installing RSP RobotStudio Add-in manually

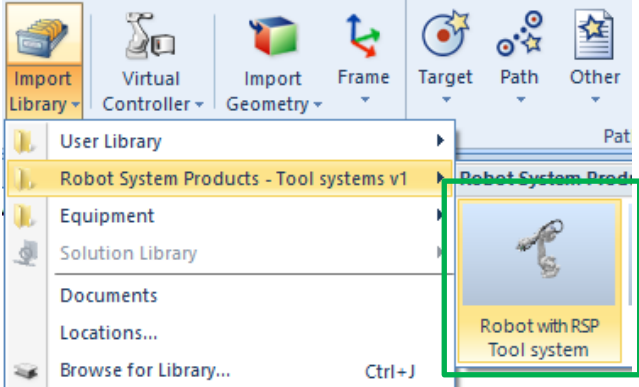
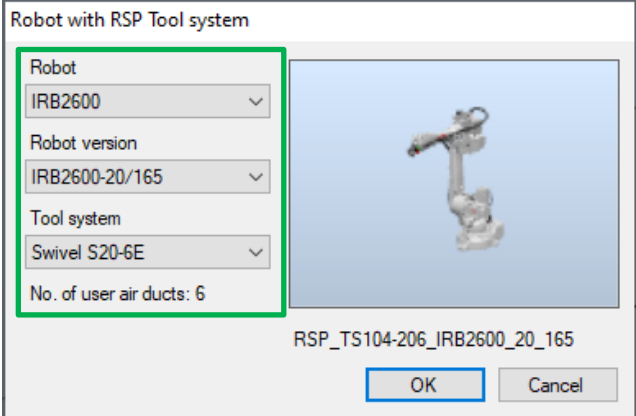

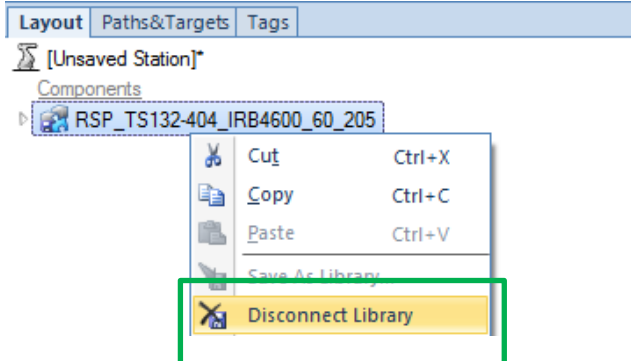
	Action	Note
1	Open RobotStudio	-
2	Add-ins tab 	Click the <i>Add-ins</i> tab located on the top of the window. NOTE! Installation of an Add-in shall only be done once. 
3	Install package 	Click the <i>Install Package</i> button on the <i>Add-ins</i> tab.
4	Select Add-in 	Navigate to the desired Add-in file (.rspak) and open. NOTE! The file filter may need to be selected as <i>All supported file types or Package files</i> . 
5	Wait for installation 	The Add-in will now be installed. The message <i>Downloading package</i> will be displayed in the bottom left corner. Please wait for the installation to finish.
6	Installation completed 	Once the installation is complete a confirmation message will be displayed in the bottom left.
7	Restart RobotStudio	Restart RobotStudio for the changes to take effect.
8	Ready for import	The contents of the installed Add-in can now be imported (see section 2.2 and 3.1).

2.3 Updating to new version

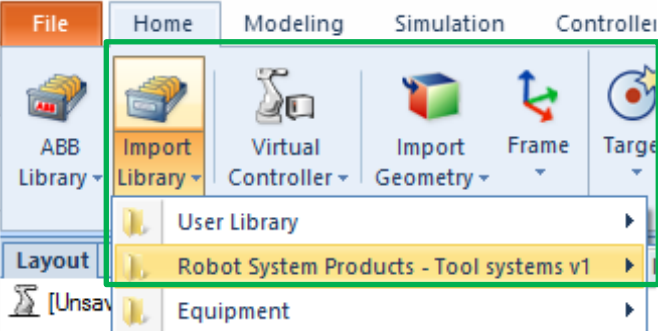
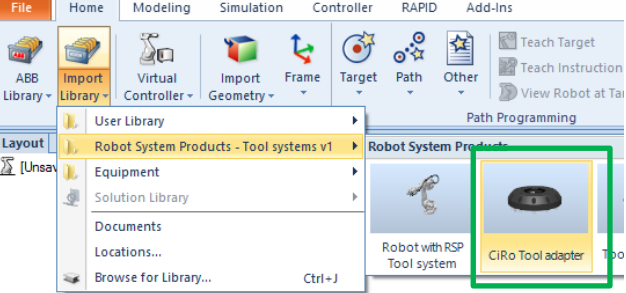
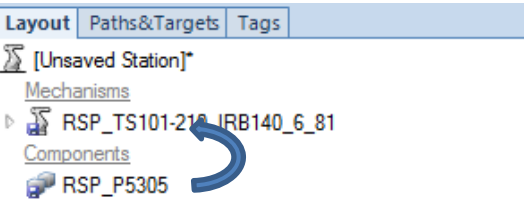

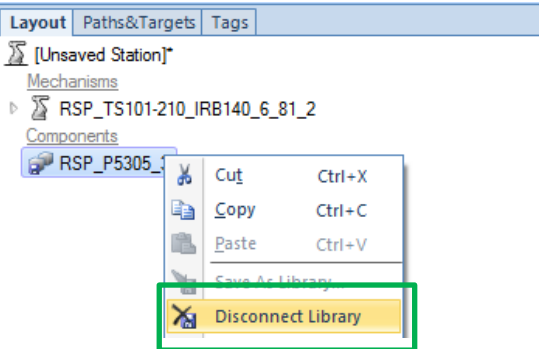
	Action	Note
1	<p>Check for latest version</p>	<p>You can always find information about the latest version of the RSP Tool Systems Add-in on our website: www.robotssystemproducts.com/robotstudio</p> <p>Check for the latest version before proceeding with the update procedure</p>
2	<p>Secure old versions of RobotStudio models</p> 	<p>When importing a model from the add-in it is automatically connected to the add-in. To make sure the models are kept inside your station it is of importance that you break the connection to the add-in.</p> <p>This procedure is described in section 3, when importing models.</p> <p>IMPORTANT! Make sure that your stations are saved after disconnecting the library. This action has to be performed on each station.</p> 
3	<p>Add-ins tab</p>	<p>Click the <i>Add-ins</i> tab located on the top of the window.</p>
4	<p>Uninstall old version</p> 	<p>Locate the Robot Studio Products – Tool Systems Add-in, right click and select <i>Uninstall Package</i>.</p> <p>Once uninstall is completed a confirmation message will be displayed in the bottom left.</p>
5	<p>Install new version</p>	<p>Install the new version of the RSP Tool Systems Add-in according to section 2.1 or 2.2 in this manual.</p>

3. USER GUIDE

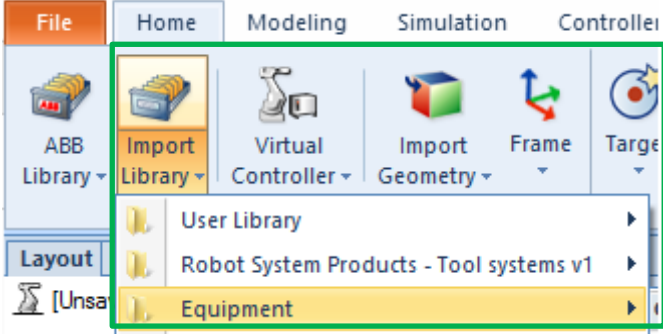
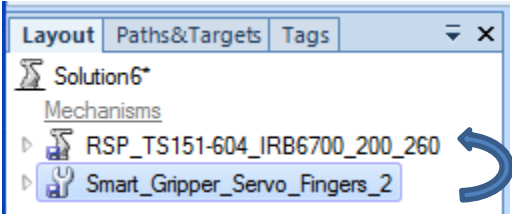

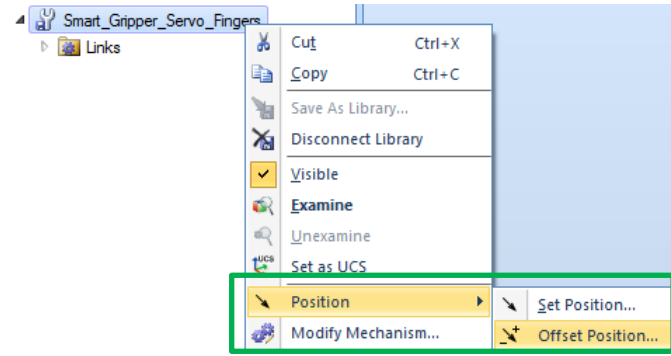
3.1 Importing a robot with complete Tool System

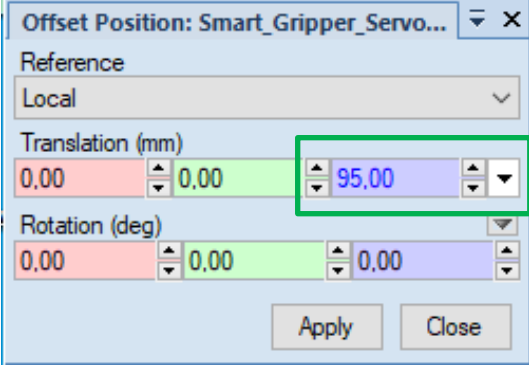

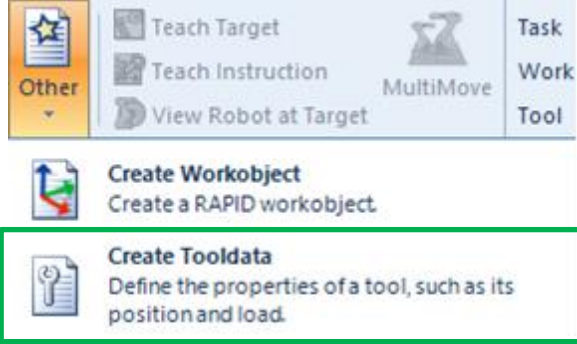
	Action	Note
1	<p>Import Tool System</p> 	<p>Import a tool system using <i>Import Library</i> on the Home tab.</p>
3	<p>Select robot model and Tool System</p> 	<p>Select the desired robot model, and model size using the dropdown menu.</p> <p>Select the type of Tool System, Swivel (S), Swivel Tool Changer (STC) or CiRo</p> <p>NOTE! When unit is selected the features, air ducts and/or electrical signals are displayed under the dropdown menu</p> 
4	<p>Disconnect library</p> 	<p>IMPORTANT! To make sure the complete robot is saved inside your station, you must break the connection to the Tool Systems Add-in.</p> <p>Right click on the robot model inside the Layout tab and select <i>Disconnect Library</i></p>

3.2 Importing a Tool adapter for CiRo

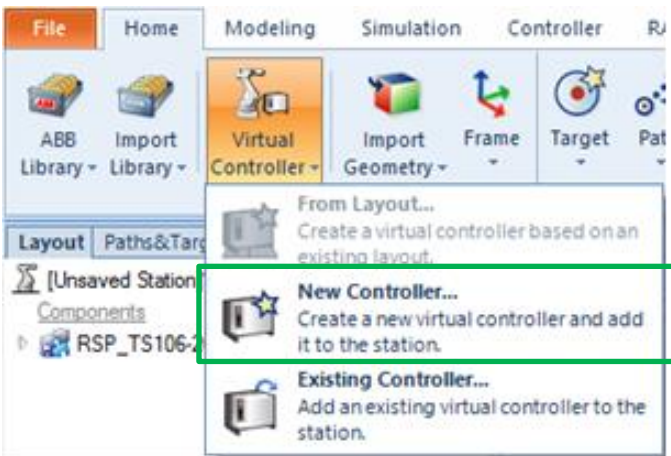
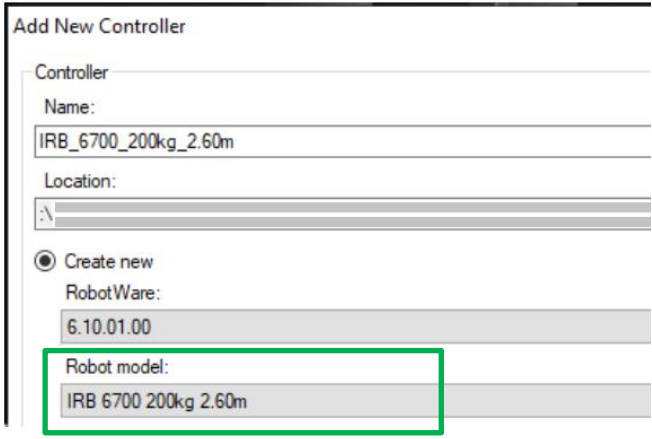

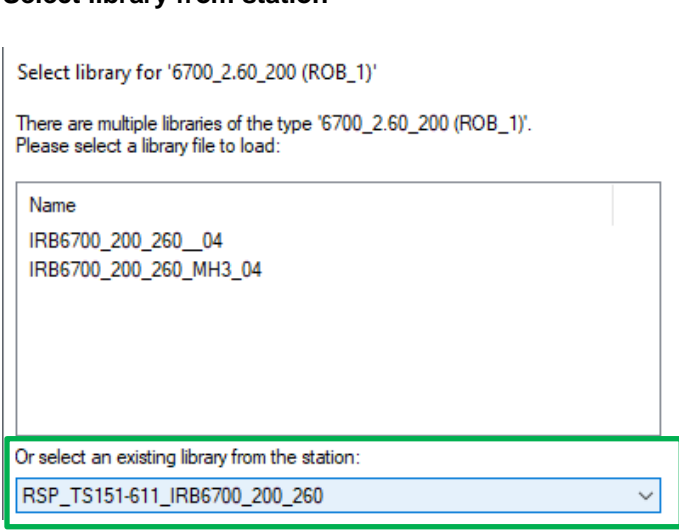
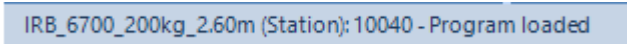
	Action	Note
1	<p>Import tool system</p> 	<p>Import a tool system using <i>Import Library</i> on the Home tab.</p> <p>If CiRo is used and ISO-interface is required, a Tool adapter must be imported. Otherwise go to 3.3.</p>
2	<p>Connect a controller (optional)</p>	<p>If required, connect a controller to the robot (see section 3.4).</p>
3	<p>Import a CiRo Tool adapter</p> 	<p>Import a CiRo Tool adapter using <i>Import Library</i> on the Home tab.</p>
4	<p>Install the tool adapter</p> 	<p>Install the tool on the tool system using drag and drop on the Layout tab.</p> <p>Click "Yes" to update the position.</p> <p>NOTE! The procedure is described in <i>Operating manual RobotStudio</i>.</p> 
4	<p>Disconnect library</p> 	<p>IMPORTANT! To make sure the Tool adapter is saved inside your station, you must break the connection to the Tool Systems Add-in.</p> <p>Right click on the Tool adapter inside the Layout tab and select <i>Disconnect Library</i></p>

3.3 Adding a tool on Swivel/CiRo

	Action	Note
1	Import tool system	<p>A tool system with Swivel (S) or CiRo must have been imported (see section 3.1).</p> <p>If CiRo is used and ISO-interface is required, a Tool adapter must be imported (see section 3.2).</p>
2	Import or Create a tool 	<p>Import a tool using <i>Import Library</i> on the Home tab.</p>
3	Install the tool 	<p>Install the tool on the tool system using drag and drop on the Layout tab.</p> <p>NOTE! The procedure is described in <i>Operating manual RobotStudio</i>. </p>
4	Select the Offset tab 	<p>Select and open the <i>Offset Position</i> tab by right clicking on the tool on the Layout tab.</p>


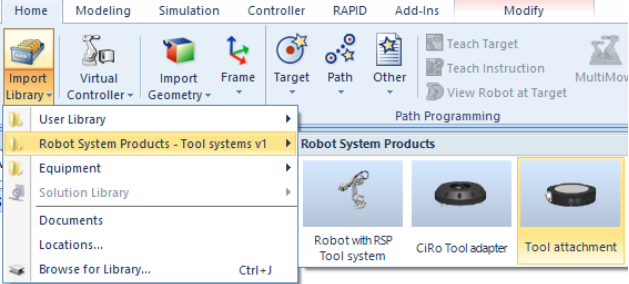

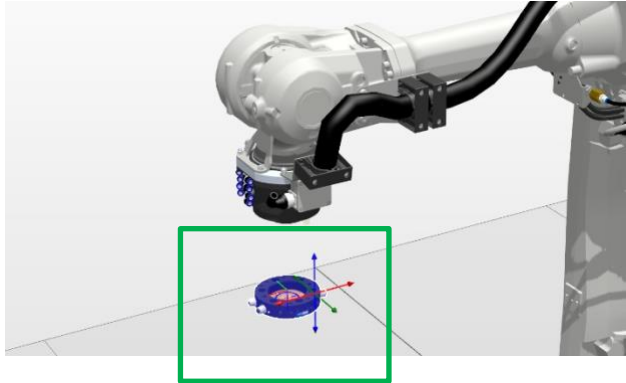

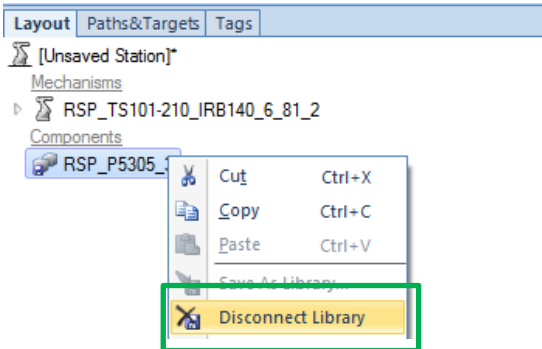
5	<p>Offset the tool</p> 	<p>Select <i>Local</i> as reference system and add an offset in the +Z-direction. (See table 6.1). Click <i>Apply</i>.</p> <p>NOTE! Offsets from the robot flange are available in the Technical description of respective tool system in the section <i>Robot programming data</i>.</p> 
6	<p>Create new tooldata</p> 	<p>Create new tooldata using <i>Other</i> → <i>Create Tooldata</i> in the Home tab and click <i>Create</i>.</p> <p>The tool is now installed</p>

3.4 Connecting a virtual controller to RSP tool system

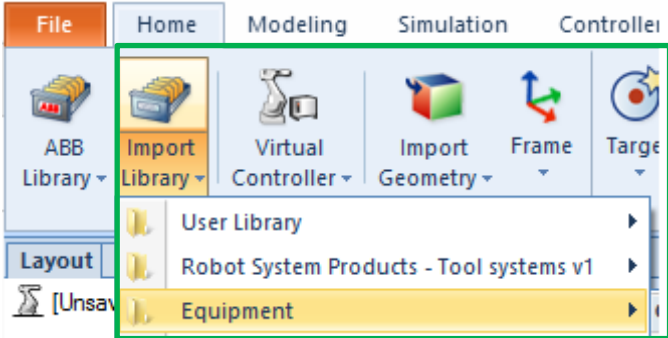
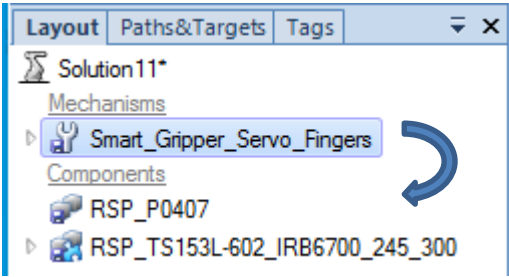

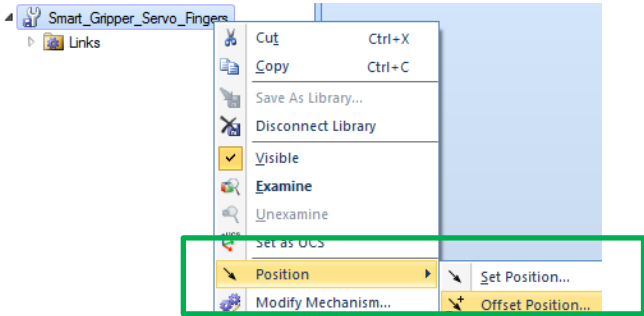
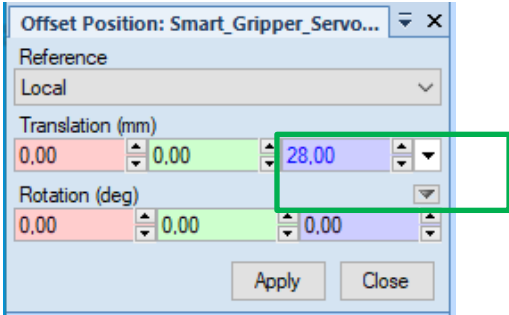

	Action	Note
1	Import tool system	A tool system must have been imported (see section 3.1).
2	<p>Add a controller</p> 	Add a new virtual controller using <i>Virtual Controller</i> → <i>New controller</i> on the Home tab.
3	<p>Select robot model</p> 	<p>Select the same robot model as in the tool system. Once the correct robot model is selected, press OK.</p> <p>NOTE! The robot model is specified in the default library name of the tool system. </p>
4	<p>Select library from station</p> 	<p>In the process of creating the virtual controller, the window <i>Select library</i> will appear.</p> <p>Select the library (a tool system with robot) from the station using the dropdown menu. Press OK to continue.</p>
5	<p>The virtual controller is now connected.</p> 	A confirmation message will be displayed in the bottom left.

4 TOOL CHANGE FUNCTION

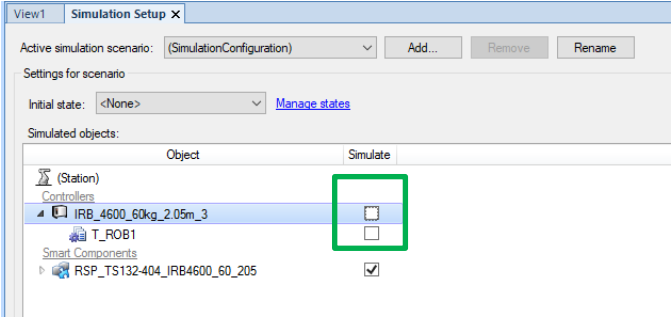

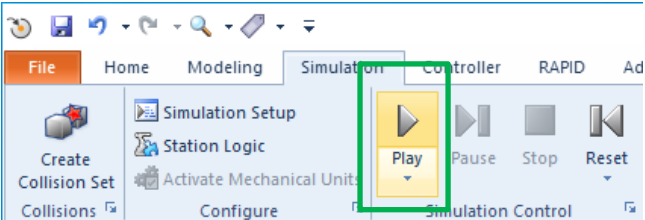
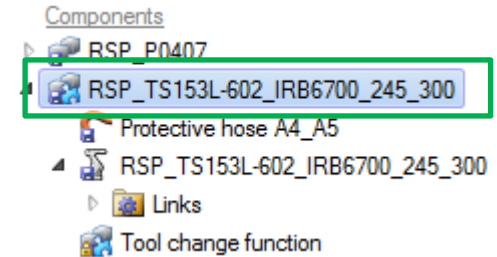
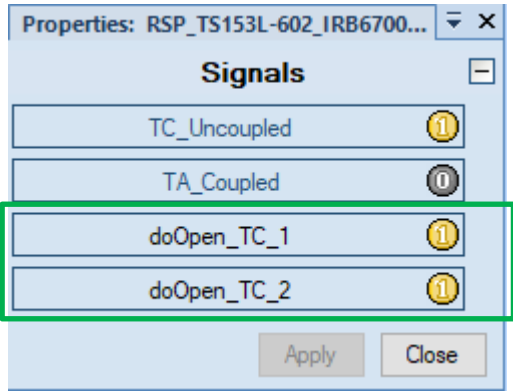

4.1 Adding a Tool attachment for Swivel with tool changer

	Action	Note
1	Import tool system	<p>A tool system must have been imported (see section 3.1).</p> <p>NOTE! To be able to use the tool changing function, a Tool System with (STC) Swivel Tool Changer must be imported.</p> 
3	Import a Tool attachment 	<p>Import a Tool attachment using <i>Import Library</i> on the Home tab.</p> <p>NOTE! Selectable tool attachments are described in the Technical description of respective tool system in the section <i>Specification of parts and options</i>.</p> 
4	Position the Tool attachment 	<p>Position the Tool attachment to the desired coordinates.</p> <p>NOTE! The procedure is described in <i>Operating manual RobotStudio</i>.</p> 
4	Disconnect library 	<p>IMPORTANT! To make sure the Tool attachment is saved inside your station, you must break the connection to the Tool Systems Add-in.</p> <p>Right click on the Tool adapter inside the Layout tab and select <i>Disconnect Library</i></p>

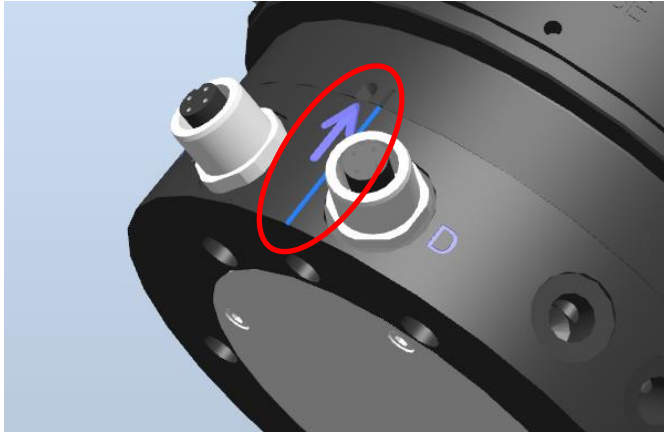
4.2 Adding a tool to the Tool attachment

	Action	Note
1	Import tool attachment	Import a tool attachment using <i>Import Library</i> in the Home tab. (see section 4.1).
2	<p>Create or import a tool</p> 	Import a tool using <i>Import Library</i> on the Home tab.
3	<p>Install the tool</p> 	<p>Install the tool on the Tool attachment using drag and drop in the Layout tab.</p> <p>NOTE! The procedure is described in <i>Operating manual RobotStudio</i>. </p>
5	<p>Select the Offset tab</p> 	Select and open the <i>Offset Position</i> tab by right clicking on the tool on the Layout tab.
4	<p>Offset the tool</p> 	<p>Select <i>Local</i> as reference system and add an offset in +Z-direction. (This offset is the same as the thickness of the tool attachment). Click <i>Apply</i>.</p> <p>NOTE! Offsets of the tool attachments are available in the Technical description of respective tool system in the section <i>Specification of parts and options</i>. </p>
5	The tool is now installed on the Tool attachment	

4.3 Docking the tool attachment to the tool changer

	Action	Note
1	Import needed libraries	Ensure that the libraries, where required tool changer and tool attachment, are available and imported.
2	Attach tool to tool attachment (optional)	See section 4.2 <i>Adding a tool to the Tool attachment.</i>
3	Check simulation setup 	<p>NOTE! The simulation must be running for tool changer components to function properly.</p> <p>IMPORTANT! If the robot is connected to a program it must be deactivated inside simulation setup to prevent the robot program from running. </p> <p>Open <i>Simulation setup</i> inside the Simulation tab. Uncheck the box under <i>Simulate</i> for the robot.</p>
4	Start simulation 	Start the simulation.
5	Open tool changer properties 	Open <i>Properties</i> for the tool changer by right clicking on the tool system on the Layout tab.
6	Open the tool changer 	<p>Make sure the tool changer is in open state before docking the tool attachment. The tool changer can be controlled using one or two input signals, depending on TC model.</p> <p>NOTE! The simulation will be halted, and an error message displayed when the distance between a tool attachment and a tool changer in closed state becomes short. </p> <p>To continue, make sure that the tool changer is opened and restart the simulation</p>

7 **Move robot to docking position**

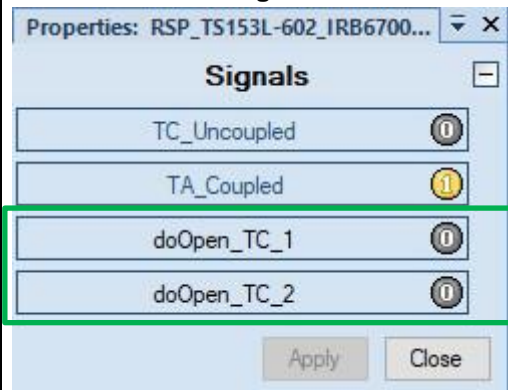


Move the robot to docking position. Ensure that the tool attachment is correctly orientated and positioned as close as possible to the tool changer. Most tool changers and tool attachments have indicators to show proper docking orientation.

NOTE! The model of the tool changer cannot identify that a tool attachment is incorrectly orientated.



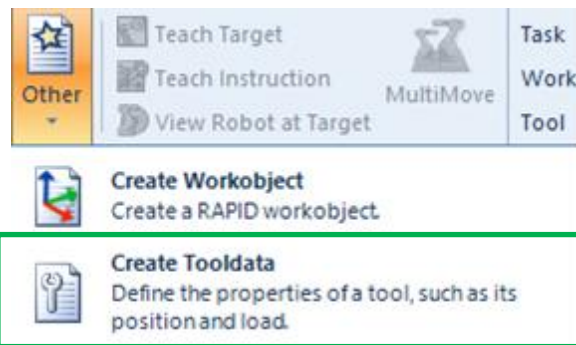
8 **Close the tool changer**



Close the tool changer by changing the status of the input signal or signals (*DoOpen*) to low. The tool attachment is now attached to the tool changer.

NOTE! When correctly docked the signals *TC_Uncoupled* will be low and *TA_Coupled* will be high. STC20 does not support *TC_Uncoupled*. STC without electrical signals (E) does not support *TC_Uncoupled* or *TA_Coupled*.

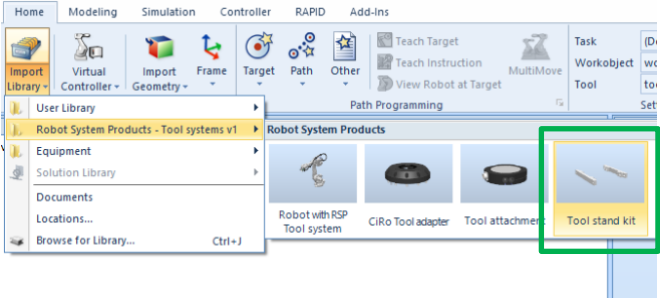
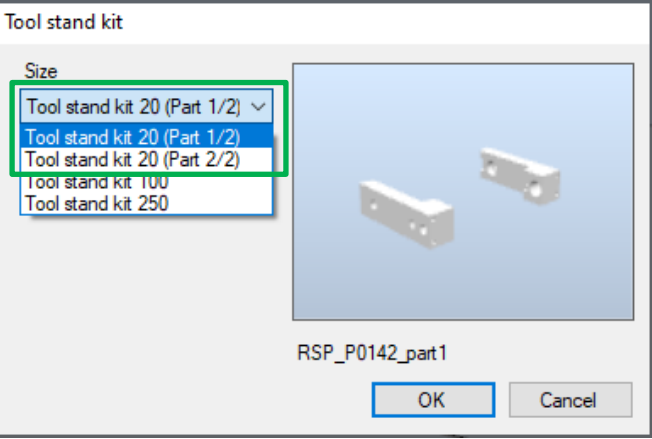

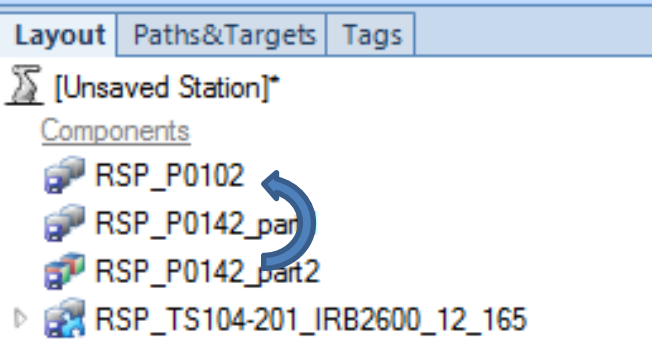
9 **Create new tooldata**



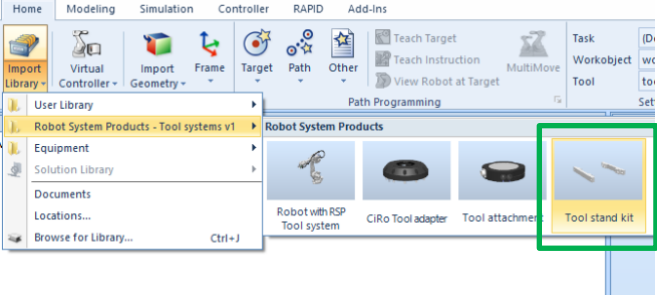
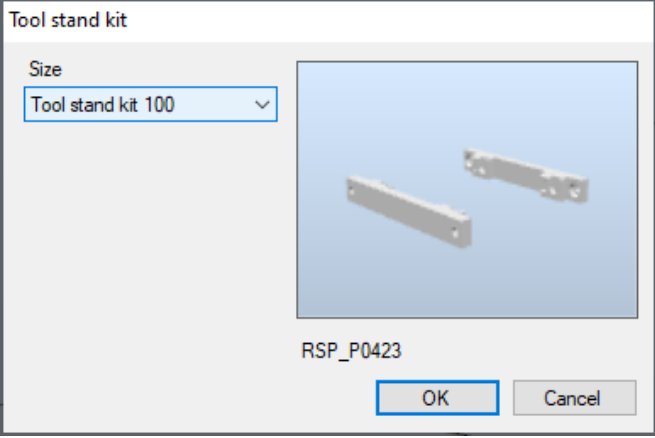

Create new tooldata for the combination tool changer + tool attachment + tool using *Other* → *Create Tooldata* in the Home tab and click *Create*.

5. TOOL STAND KIT

5.1 Import Tool Stand kit for TA20

	Action	Note
1	Import needed libraries	Ensure that the libraries, where required robot, tool changer and tool attachment, are available and imported.
2	Import Tool stand kit 	Import a Tool stand kit using <i>Import Library</i> on the Home tab
3	Select Tool stand kit part 1 	Select the Tool stand kit (Part 1/2) and click OK. Position the Tool stand kit to the desired coordinates NOTE! For TA20 you must load two different parts. Part 1 which is the Tool Stand kit and part 2 which is to be mounted on the Tool attachment. 
4	Select Tool stand kit part 2	Select the Tool stand kit (Part 2/2) and click OK.
5	Install part 2 to Tool attachment 	Install the Tool stand kit part 2 on the Tool attachment using drag and drop in the Layout tab.

5.2 Import Tool Stand kit for TA100 and TA250

	Action	Note
1	Import needed libraries	Ensure that the libraries, where required robot, tool changer and tool attachment, are available and imported.
2	Import Tool stand kit 	Import a Tool stand kit using <i>Import Library</i> on the Home tab
3	Select desired Tool stand kit 	Select the desired Tool stand kit and click OK.
4	Position the Tool stand kit	Position the Tool stand kit to the desired coordinates. <p>NOTE! The procedure is described in <i>Operating manual RobotStudio</i>.</p> 

6. APPENDIX

6.1 Offset table for tool data

Robot model (art.no prefix)	Functionality (art.no suffix)	Weight	Centre of gravity (Z-direction)	Offset (Z-direction)	Tool Attachment thickness
IRB140 (TS101)	S20-2 (-203)	0.5 kg	13 mm	36.6 mm	-
	S20-2E (-204)	0.8 kg	20 mm	48.5 mm	-
	CiRo S2 (-211)	1.3 kg	25 mm	58 mm	-
	CiRo S2 (-211) with option P5305	1.5 kg	32 mm	98 mm	-

IRB1600 (TS102)	S20-2 (-203)	0.5 kg	13 mm	36.6 mm	-
	S20-2E (-204)	0.8 kg	20 mm	48.5 mm	-
	CiRo S2 (-211)	1.3 kg	25 mm	58 mm	-
	CiRo S2 (-211) with option P5305	1.5 kg	32 mm	98 mm	-

IRB 1300 (TS103)	S20-2 (-201) with P0102 (TA20-4)	1.1 kg	36 mm	81.7 mm	16 mm
	S20-2 (-201) with P0123 (TA20-4, Steel)	1.3 kg	42 mm	81.7 mm	16 mm
	STC20-4E (-202) with P0109 (STA20-4E)	1.5 kg	39 mm	93.6 mm	16 mm
	STC20-4E (-202) with P0125 (STA20-4E, Steel)	1.7 kg	44 mm	93.6 mm	16 mm
	S20-2 (-203)	0.6 kg	11 mm	36.6 mm	-
	S20-2E (-204)	1.0 kg	18 mm	48.5 mm	-
	S20-6 (-205)	0.9 kg	26 mm	68.6 mm	-
	S20-6E (-206)	1.3 kg	30 mm	80.5 mm	-
	CiRo S1 (-211)	1.3 kg	23 mm	58 mm	-
CiRo S1 (-211) with option P5305	1.5 kg	31 mm	98 mm	-	

IRB2600 (TS104)	STC20-4 (-201) with P0102 (TA20-4)	1.3 kg	41 mm	97.3 mm	16 mm
	STC20-4 (-201) with P0123 (TA20-4, Steel)	1.5 kg	47 mm	97.3 mm	16 mm
	STC20-4E (-202) with P0109 (STA20-4E)	1.6 kg	45 mm	105.6 mm	16 mm
	STC20-4E (-202) with P0125 (STA20-4E, Steel)	1.8 kg	51 mm	105.6 mm	16 mm
	S20-2 (-203)	0.8 kg	17 mm	48.6 mm	-
	S20-2E (-204)	1.1 kg	24 mm	60.5 mm	-
	S20-6 (-205)	1.1 kg	30 mm	80.6 mm	-
	S20-6E (-206)	1.4 kg	36 mm	92.5 mm	-
	CiRo S1 (-211)	1.3 kg	24 mm	58 mm	-
CiRo S1 (-211) with option P5305	1.5 kg	32 mm	98 mm	-	

Robot model (art.no prefix)	Functionality (art.no suffix)	Weight	Centre of gravity (Z-direction)	Offset (Z-direction)	Tool Attachment thickness
IRB4600-20/2,5 (TS106)	STC20-4 (-201) with P0102 (TA20-4)	1.3 kg	41 mm	97.3 mm	16 mm
	STC20-4 (-201) with P0123 (TA20-4, Steel)	1.5 kg	47 mm	97.3 mm	16 mm
	STC20-4E (-202) with P0109 (STA20-4E)	1.6 kg	45 mm	105.6 mm	16 mm
	STC20-4E (-202) with P0125 (STA20-4E, Steel)	1.8 kg	51 mm	105.6 mm	16 mm
	S20-2 (-203)	0.8 kg	17 mm	48.6 mm	-
	S20-2E (-204)	1.1 kg	24 mm	60.5 mm	-
	S20-6 (-205)	1.1 kg	30 mm	80.6 mm	-
	S20-6E (-206)	1.4 kg	36 mm	92.5 mm	-
	CiRo S1 (-211)	1.3 kg	24 mm	58 mm	-
	CiRo S1 (-211) with option P5305	1.5 kg	32 mm	98 mm	-

IRB4600-40 (TS131)	STC100-2E (-402) with P0409/P0418	7.5 kg	50 mm	111 mm	28 mm
	STC100-2E (-402) with P0404/P0474	8.2 kg	55 mm	127 mm	44mm
	STC100-6E (-404) with P0409/P0418	8.4 kg	66 mm	140 mm	28 mm
	STC100-6E (-404) with P0404/P0474	9.2 kg	71 mm	156 mm	44mm
	S100-4E (-406)	5.5 kg	34 mm	105 mm	-
	S100-8E (-408)	6 kg	47 mm	134 mm	-
	CiRo MHD1 (-411)	6 kg	37 mm	95 mm	-
	CiRo MHD1 (-411) with P5205	7 kg	52 mm	170 mm	-

IRB4600-45/60 (TS132)	STC100-2E (-402) with P0409/P0418	7.5 kg	50 mm	111 mm	28 mm
	STC100-2E (-402) with P0404/P0474	8.2 kg	55 mm	127 mm	44mm
	STC100-6E (-404) with P0409/P0418	8.4 kg	66 mm	140 mm	28 mm
	STC100-6E (-404) with P0404/P0474	9.2 kg	71 mm	156 mm	44mm
	S100-4E (-406)	5.5 kg	34 mm	105 mm	-
	S100-8E (-408)	6 kg	47 mm	134 mm	-
	CiRo MHD1 (-411)	6 kg	37 mm	95 mm	-
	CiRo MHD1 (-411) with P5205	7 kg	52 mm	170 mm	-

Robot model (art.no prefix)	Functionality (art.no suffix)	Weight	Centre of gravity (Z-direction)	Offset (Z-direction)	Tool Attachment thickness
IRB4600-40 (TS131)	STC100-2E (-402) with P0409/P0418	7.5 kg	50 mm	111 mm	28 mm
	STC100-2E (-402) with P0404/P0474	8.2 kg	55 mm	127 mm	44mm
	STC100-6E (-404) with P0409/P0418	8.4 kg	66 mm	140 mm	28 mm
	STC100-6E (-404) with P0404/P0474	9.2 kg	71 mm	156 mm	44mm

IRB6700 Higher line (TS152, TS152L)	STC250-6E (-602) with P6431/P6418	22.4 kg	91 mm	209 mm	35 mm
	STC250-6E (-602) with P6473	23.5 kg	96 mm	219 mm	45 mm
	S250-8E (-604)	17.4 kg	66 mm	192 mm	-
	CiRo XL1 (-611) with P5501	18.8 kg	56 mm	120 mm	-
	CiRo XL1 (-611) with P5501	21.7 kg	69 mm	175 mm	-
	STC250-6E (-602) with P6431/P6418	22.4 kg	91 mm	209 mm	35 mm

IRB6700 Power line (TS153, TS153L)	STC250-6E (-602) with P6431/P6418	23.4 kg	86 mm	209 mm	35 mm
	STC250-6E (-602) with P6473	24.4 kg	91 mm	219 mm	45 mm
	S250-8E (-604)	18.3 kg	61 mm	192 mm	-
	CiRo XL1 (-611) with P5501	18.8 kg	56 mm	120 mm	-
	CiRo XL1 (-611) with P5501	21.7 kg	69 mm	175 mm	-

