

Robot controller plug-ins for Grasshopper

State of the art (August 1 , 2015)

Subjective comparative analysis based on my use of these plug-ins.

	Crane	Kuka PRC Old version	Kuka PRC-v2 Registered version	Hal 5.0	Robots.IO
	http://cranerobotics.com/	http://www.robotsinarchitecture.org/		http://hal.thibaultschwartz.com/	http://robots.io/wp/
Post processor for robots	Stäubli	KUKA	KUKA	ABB KUKA UR	ABB KUKA UR
Custom robots	No	Yes	Yes	Yes	Yes
Preload tools	Yes	Yes	Yes	Yes	Yes
Multiple robots in one program	No	No	No	Synchronous and asynchronous	Synchronous and asynchronous
Custom tool	Yes	Yes	Yes	Yes	Yes
Multiple tools in one program	No	Yes	Yes	Yes	Yes
Collision detection	No	Yes (manual detection)	Yes	Yes - multiple methods	Yes
Reachability detection	Yes	Yes (manual detection)	Yes	Yes	Yes
Singularity detection	No	No	Yes	Yes	Yes
Graph of axis movements	No	No	Yes	Can be plotted from the IK solver	Yes
Movement interpolation	MoveL, MoveJ	PTP, Lin, Cir, Spline	PTP, Lin, Cir, Spline	MoveL, MoveJ, Move absJ	MoveL, MoveJ, Move absJ
Output/input command	Output	Output	Output	Input and Output and many other features	Input and Output
Possibility to customize program	No	direct KRL command Expert only	direct KRL command Expert only	Multiple components for all robots (ABB allows more features)	Yes
Split large program	No	Yes	Yes	Yes	No
Streaming	Yes with special python script	No	No	Yes	No
Sending program to robot through ..	Usb stick	Usb stick and LAN	Usb stick and LAN	Usb stick and IP address and streaming	Usb stick and IP address
Milling components	No	No	No	Yes	Yes
Hot wire tool components	No	No	No	Yes	No
Pick and place components	No	No	No	Yes	No
Time to compute 4000 planes for simulation (in my computer of course)	1,7 s	0,37 s (but generate program)	0,05 s	0,01s	0,085 s
Future improvements			Streaming, realtime position, multirobots	Post processors for all type of robots, online tool library, Movecir, Move Spline, kinematics solver for all machine (3d printer, laserc cutters, milling machines, scara, etc...), Rhino and Autodesk Dynamo integration..., realtime position	Stäubli and Fanuc post processors. Streaming, sensor control.
Ease of use (very subjective : depends on number of components and time it's takes to me to generate code from scratch) xxx= easy	x	xx	xx	x	xxx
Price	Free	Free	350€/year Unlimited (staff and student)	PRO R&D : 800€/year/computer PRO Ind : 1200€/year/computer Edu : 250€/year	PRO : 3999€ / year EDU : 999€/year Lab 10x : 1999€/year Monthly pricing available
Subjective comments	Generate code for your Stäubli robot without any fee at your own risk :-) I had never encountered any problems at this time. (i am a lucky guy)	Generate code for your Kuka robot without any fee.	Powerful tool, easier to use than the earlier version (especially the custom tool component), more quicker, more reliable.	Very powerful tool, lots of features, tons of components, very complete. Going to be an universal tool ?	Very easy to use, with the "all in one" Timeline component. I like the "flip plane" component.