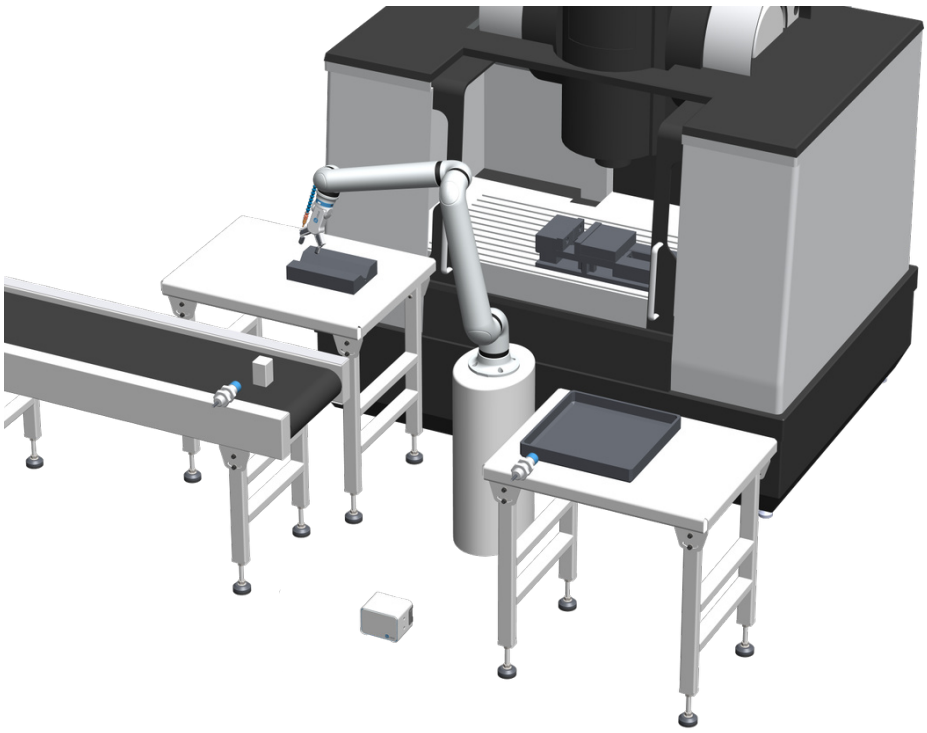
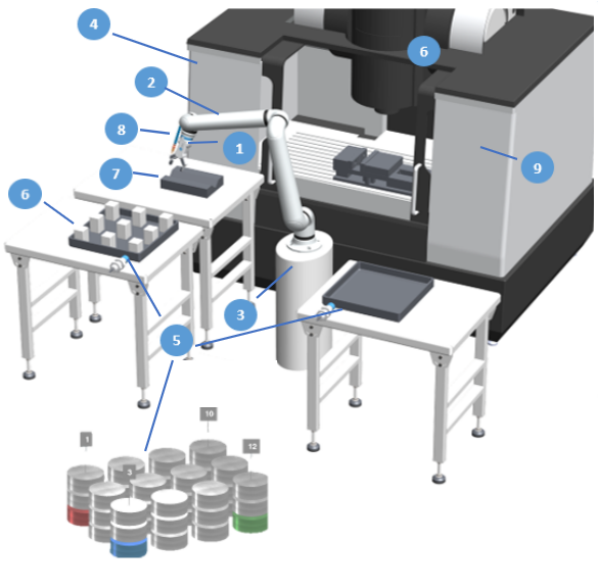


DATASHEET

D:PLOY - CNC MACHINE TENDING APPLICATION

v1.1.200

CNC Machine Tending Application



1/ a.	**Grippers**	2FG7		2FG14		3FG15			3FG25		
		RG2		RG6		VGC10	G2FG		G3FG	GVG	
1/ b.	**Tool mounting**	Quick Changer or Dual Quick Changer			Angle Bracket 45°				Angle Bracket 90°		
2.	**Robot brands**	ABB	Denso	Doosan	Elite	FANUC	FANUC CRX			Jaka	
		Kawasaki	Omron TM		Schneider		Techman		UR	Yaskawa	
3.	**Robot mounting**	Can be mounted at any height, can be tilted 0°, 30°, 45° or 90°									
4.	**CNC machine types**	CNC Milling	CNC Lathe	Communicating via **Digital I/O** or **EtherNet/IP** fieldbus			Only **Automatic door** is supported (robot cannot be used to open/close door)				
5.	**In/ Outfeed options**	**Grid** (set row and/or column) or **Honeycomb** (for cylindrical parts), and **can be stacked** (parts on top of each other). Up to three infeed/outfeed containers can be used. If one uses a presence sensor, all must use a presence sensor.									
		Fixed - only one part at the in/ outfeed (requires conveyor belt or turn table)				**Pattern** and **Fixed** can be combined (Pattern as infeed and Fixed as outfeed or the other way around)					
6.	**Part size/ weight/ type**	**Any size** (the gripper/ machine can handle)			**Any weight** (the gripper/ machine can handle)		**Cuboid** or **Cylindrical** (both may not available on a given gripper)				

7.	**Re-alignment**	Optional steps **before load** and/or **after unload**		It can be used either to make sure the **part is gripped properly** (aligned) or to **change the gripping** (re-grip at a different angle, as **picking angle can be defined** or change the orientation before placed)	
8.	**Cleaning**	Optional step **before load** (to make sure the workholding is clean)	And/or optionally **before unload** (make sure part is clean)	Both support: **Fixed point** (waiting time) or **movement** (via multiple waypoints)	**Robot (mounted) Machine Cleaning** output device needs to be added to the cell setup

Additional Information

1/a. Grippers

Grippers can be customized with any OnRobot accessory or custom fingertip/vacuum accesory.

		Finger grippers								**Vacuum grippers**	
		2FG7	2FG14	3FG15	3FG25	RG2	RG6	G2FG	G3FG	VGC10**	GVG
Can grip	**Cuboid**	✓	✓	X	X	✓	✓	✓	X	✓	✓
	Cylindrical	✓ *	✓	✓	✓	✓ *	✓ *	✓	✓	✓	✓
Pick with an angle		✓	✓	X	X	✓	✓	✓	X	X	X

* With special fingertips.

** Do not use vacuum grippers in wet or damp conditions, particularly in CNC applications with moisture or cutting fluids. It can damage the gripper.

1/b. Tool mounting

HEX-E/H QC is not supported.

2. Robot brands

Supported robot models and controllers

Robot Type	ABB	Denso	Doosan	Elite	FANUC	FANUC CRX	Jaka
Robot Model	CRB 1100 -4/0.58 CRB 15000 -5/0.95 CRB 15000 -10/1.52 CRB 15000 -12/1.27 IRB 1100 -4/0.58 IRB 1100 -4/0.47 IRB 120 IRB 1200 -5/0.9 IRB 1200 -7/0.7 IRB 1300 -7/1.4 IRB 1300 -10/1.15 IRB 1300 -11/0.9 IRB 1300 -12/1.4 IRB 1600 -6/1.2 IRB 1600 -6/1.45 IRB 1600 -10/1.2 IRB 1600-10/1.45	VM-6083 VM-60B1 VP-6242 VS050A3 VS087A4 VP-5243 VS-050-S2 VS-087A4 VS-6577 VS-6556 VS-087	A0509 A0509s A0912 A0912s H2017 H2515 M0609 M0617 M1013 M1509 E0509 P3020	CS63 CS66 CS612 CS620 CS625	CR-7iA CR-7iA/L CR-14iA/L CR-15iA CR-35iB LR Mate 200iD LR Mate 200iD/4S LR Mate 200iD/7L LR Mate 200iD/14L	CRX-5iA CRX-10iA CRX-10iA/L CRX-20iA/L CRX-25iA CRX-30iA	Zu3 Zu3S Zu5 Zu5S Zu7 Zu7S Zu12 Zu12S Zu18 Zu18S Zu20 Pro5 Pro12 Pro16
Robot Controller	IRC5 OmniCore	RC8	CS-01P CS-02 CS-03 CS-04 CS-05 CS-06 CS-11/12P	EliRobot + EliServer	R-30iB R-30iB Plus R-30iB Mini Plus	R-30iB Mini Plus	Electrical cabinet

Robot Type	Kawasaki	Omron TM	Schneider	Techman	UR	Yaskawa
Robot Model	RS003N RS005L RS005N RS006L RS007N RS007L RS010L RS010N RS013N RS015X RS020N RS025N RS030N RS050N RS080N CL103N CL105N CL108N CL110N	TM5-700 TM5X-700 TM5-900 TM5X-900 TM5S TM5S-X TM7S TM7S-X TM12 TM12X TM12S TM12S-X TM14 TMX14 TM14S TM14S-X TM16 TM16X TM20 TM20X TM25S TM25S-X TM30S TM30S-X	RL03 RL05 RL07 RL12 RL18	TM5-700 TM5X-700 TM5-900 TM5X-900 TM5S TM5S-X TM7S TM7S-X TM12 TM12X TM12S TM12S-X TM14 TMX14 TM14S TM14S-X TM16 TM16X TM20 TM20X TM25S TM25S-X TM30S TM30S-X	UR3 UR3e UR5 UR5e UR7e UR10 UR10e UR12e UR15 UR16e UR20 UR30	GP4, GP4FGG GP7, GP7FGG GP8, GP8FGG, GP8FGG HS GP8L GP12, GP12FGG GP20 GP20HL GP25, GP25FGG GP25-12 GP35L HC10 HC10DT HC10DTP, HC10DTFP, HC10DTP Classic HC20 HC20DT HC20DTP HC30PL
Robot Controller	E01 E02 F01 F02 F60	TM	LXMRL03S000 LXMRL05S000 LXMRL05S000 LXMRL12S000 LXMRL12S000	TM	CB3 e-Series CB5.3+	YRC1000 YRC1000 Micro

3. Robot mounting

The robot cannot be facing downward (ceiling mounted).

4. CNC machine types

Supported communication protocols between D:PLOY and the CNC machine

- Digital Inputs and Outputs
- EtherNet/IP

Using the OR:MACHINE module (with relays) the front panel push buttons can be used to operate it.

5. In/Outfeed options

Pattern requires in/outfeed container, **Fixed** requires in/outfeed sensor. Both can be ultrasonic, laser/infra or any other type 24V digital sensor.

6. Part type/size/weight

Part parameter can be changed at unloading. For complex shapes use a bounding box.

7. Re-alignment

Two or more side machining is not supported (but can can be done by having a complete run finished on one side and then do the rest).

8. Cleaning

Integrator needs to take care of nozzle, air supply and a 24V controllable valve to activate the air pressure. After-unload cleaning is not supported.

Layout configuration

- Using CNC Milling or Lathe machine
- Without or with 1 or 2 cleaning steps
- Without or with 1 or 2 re-alignment steps
- Using Single or Dual QC
- Pattern as infeed and Pattern as outfeed
- Fixed as infeed and Pattern as outfeed
- Pattern as infeed and Fixed as outfeed
- Fixed as infeed and Fixed as outfeed

Examples