

PICK & PLACE SOLUTION



- » NJ Machine Controller with new robotics algorithms
- » Wide range of Delta robots

Delta vs SCARA solution

With more than 50 years experience in machine automation and with special focus on the Packaging industry, we offer a new wide range of solutions ideal for Pick & Place applications.

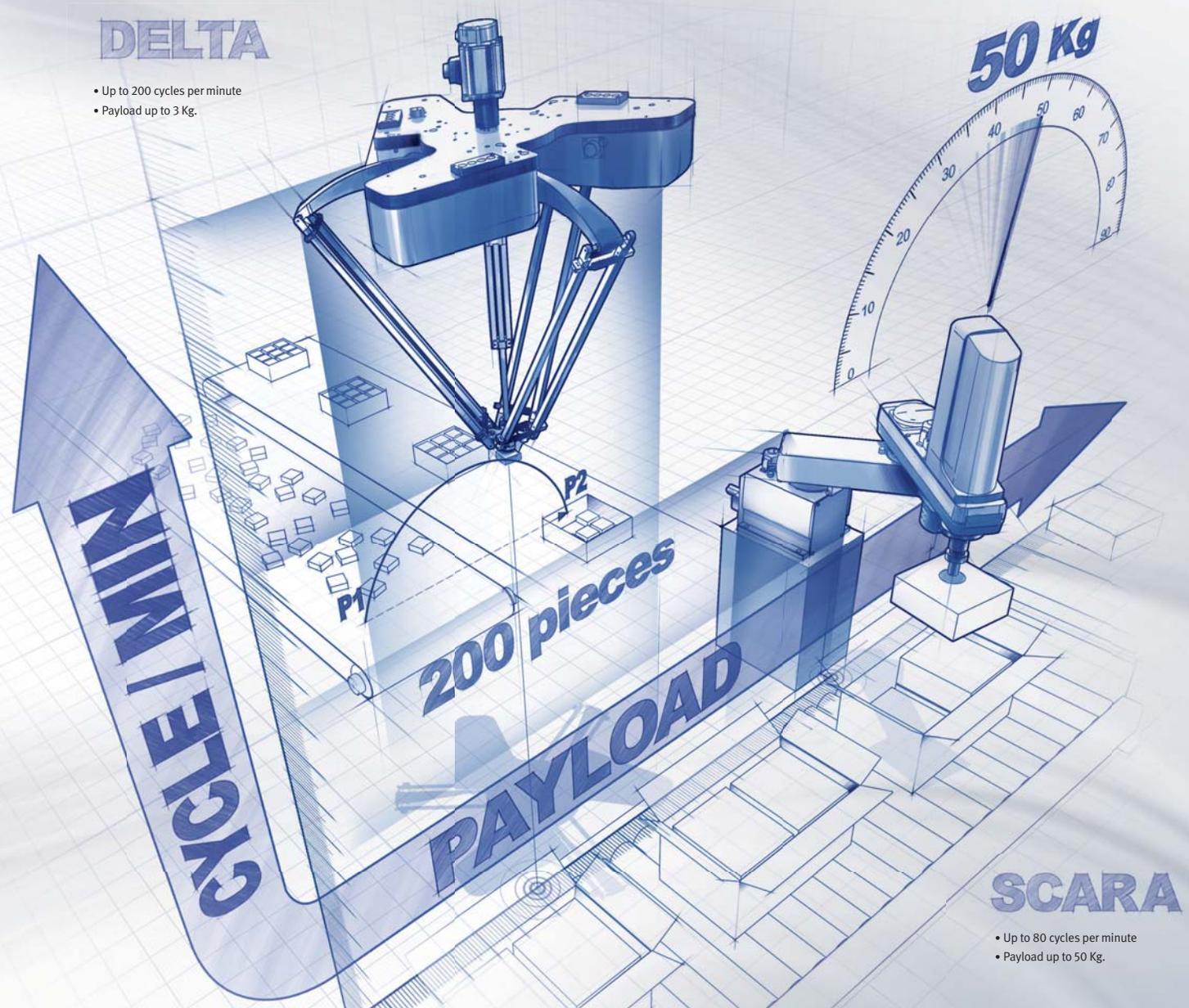
The new solutions centred on Delta robots allow you to build very high through-put machines that handle more than one hundred picking operations per minute.

Omron Pick & Place solution are fully integrated with our wide product portfolio making the modular design of your machines even easier. The high performance and reliability of our products represent the cornerstone of our mechatronics solutions, that can also be provided with advanced vision systems to detect the positions of the products to be handled and to inspect them simultaneously.

The vision systems have been specially designed and optimised for Pick & Place applications. The FQ-M and FH vision systems provide seamless integration with the Omron automation architecture and implement new algorithms that are able to detect the positions of multiple pieces in the field of view in a very short time.

DELTA

- Up to 200 cycles per minute
- Payload up to 3 Kg.



SCARA

- Up to 80 cycles per minute
- Payload up to 50 Kg.

Delta Robot Solution

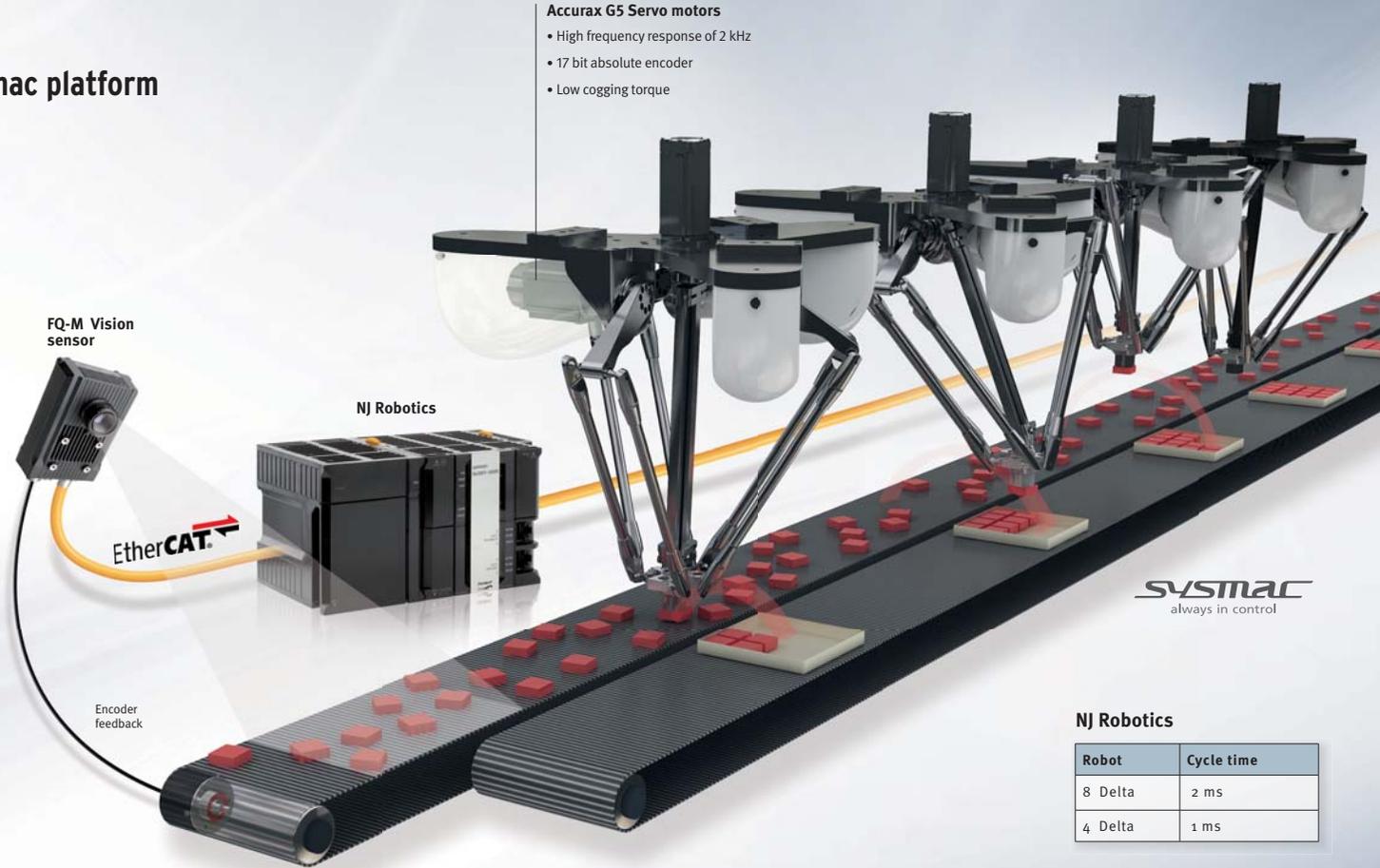
The fastest picking system integrated in the Sysmac platform

The combination of high performance servo motors with the kinematics of Delta robots, allows you to achieve the maximum throughput in your Pick & Place applications. The NJ Robotics controller is able to keep control of all motion devices in the machine, including single axis, simple groups of axes and robot control, by providing independent or synchronized movements.

The synchronization with the multiple conveyors can be fully programmed thanks to a powerful command developed specially for Pick & Place applications that use a Delta robot.

Benefits

- Robot control integrated in the NJ Robotics controller
- Control of up to 8 robots by one controller
- High through-put can be achieved by using the Delta robot, more than 200 cycle/min per robot



- Accurax G5 Servo motors**
- High frequency response of 2 kHz
 - 17 bit absolute encoder
 - Low cogging torque

NJ Robotics

Robot	Cycle time
8 Delta	2 ms
4 Delta	1 ms

Washdown Delta Robot Series



Washdown Delta robot

- Rated working range: Ø 1100 x 450 mm
- Max. Payload: 3 Kg
- Cycle time 25/305/25 mm (0.1Kg): Up to 150 cycle/min



Washdown Mini Delta robot

- Rated working range: Ø 500 x 155mm / Ø 450 x 135mm (with rotational axis)
- Max. Payload: 1Kg
- Cycle time 25/305/25mm (0.1Kg): Up to 200 cycle/min.

Delta Robot Series



Delta robot XL

- Rated Working range: ø 1300 x 400 mm
- Max. Payload: 2Kg
- Cycle time 25/305/25 mm (0.1Kg): Up to 120 cycle/min.
- IP65



Delta robot

- Rated working range: Ø 1100 x 400 mm
- Max. Payload: 2Kg
- Cycle time 25/305/25mm (0.1Kg): Up to 150 cycle/min.



Mini Delta robot

- Rated working range: Ø 500 x 155mm / Ø 450 x 135mm (with rotational axis)
- Max. Payload: 1Kg
- Cycle time 25/305/25mm (0.1Kg): Up to 200 cycle/min.

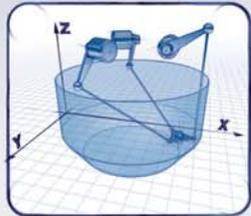
Delta Robot Solution

The NJ Machine Controller enhanced with robotics functionality

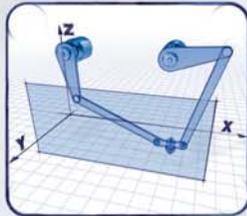
Advanced robotics functionality integrated in the NJ machine controller fully operates up to 8 robots within 2 msec. This system responds to the most demanding Pick & Place applications even at variable conveyor speed conditions. The latest control algorithms developed in the NJ reduce vibrations. These ensure the smoothest TCP trajectories when handling the required products at higher through-put.

Delta Robot Kinematics

- Delta-3/3R and Delta-2 kinematics supported
- Rotational axis for Delta-3R can be controlled separately or embedded into the Delta kinematics (4 x 4 matrix)
- Automatic workspace check
- Ability to control Omron's robots as well as 3rd party mechanics



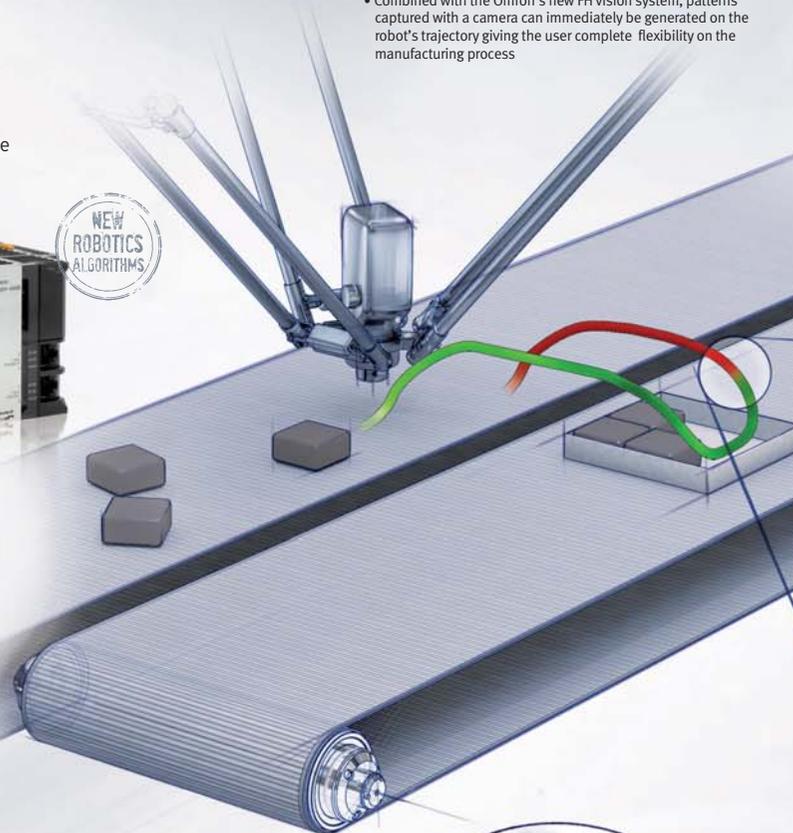
Delta -3



Delta -2



NJ Robotics CPU

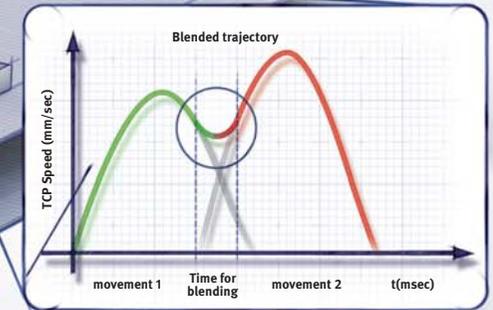


Conveyor tracking function with position offset option

- Possibility of overriding the robot's trajectory while already synchronized with the conveyor
- This function allows pre-defined patterns (as shown by the figure on the right) to be reproduced on the robot's trajectory and applied to the desired product
- Combined with the Omron's new FH vision system, patterns captured with a camera can immediately be generated on the robot's trajectory giving the user complete flexibility on the manufacturing process

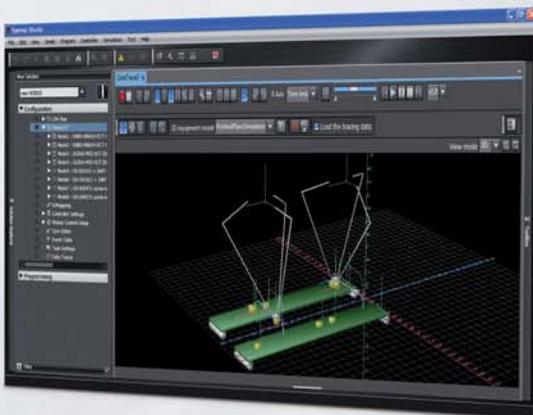


PATENT PENDING



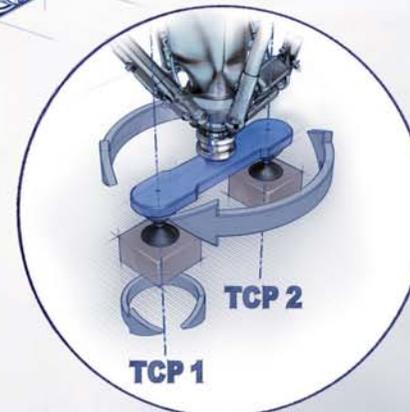
Smoothness transition modes

- Smoother transition modes achieved by merging the robotics commands to ensure a non-stop Pick & Place application
- The system calculates the smoothest overlap to increase through-put and efficiency according to the distance or time set by user
- Up to 8 commands can be buffered



Sysmac Studio 3D simulation

- Reducing commissioning time has never been easier... with the 3D simulator integrated in the Sysmac Studio, visualizing and reproducing the Delta robot trajectory is possible through the offline programming tool



Multiple TCP's Managements

- Possibility to manage up to 16 different tools per robot
- Rotation around the TCP - Tool Center Point - varies from a range of diverse easily programmable options adjusting to the application... i.e. shortest path, fixed directions, etc.

Delta Robot Solution

The NJ Robotics controller represents the core of this system architecture and is based on the EtherCAT bus, providing the highest motion performance for demanding picking applications. The Delta robot arms use the G5 servo motors to reduce the settling time thanks in part to the high frequency response of 2KHz of this high-end servo model, representing the best choice for positioning tasks. The FQ-M vision sensor is designed for motion applications and is able to detect the position of several pieces moving on a conveyor, in a very short time in order to increase the overall through-put of the machine.



Product overview

Robot		<p>Delta Robot Series</p> <p>Specifications</p> <ul style="list-style-type: none"> • Up to 200 cycles per minute • Model Range from 450 to 1300 mm • Payload range: 1 to 3 Kg • IP class range: IP65, IP67 hygienic design 																							
		<table border="1"> <thead> <tr> <th>Reference list</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>R6Y3110H03067N15</td> <td>Washdown Delta robot 3 axes + 1 rot. axis with high inertia</td> </tr> <tr> <td>R6Y3110L03067N15</td> <td>Washdown Delta robot 3 axes + 1 rot. axis</td> </tr> <tr> <td>R6Y3010S03067N15</td> <td>Washdown Delta robot 3 axes</td> </tr> <tr> <td>CR_UGD4MINI_R_TS</td> <td>Washdown Mini Delta robot 3 axes + 1 rot. axis</td> </tr> <tr> <td>CR_UGD4MINI_NR_TS</td> <td>Washdown Mini Delta robot 3 axes</td> </tr> <tr> <td>CR_UGD4_XL_R</td> <td>Delta robot XL 3 axes + 1 rot. axis</td> </tr> <tr> <td>CR_UGD4_XL_NR</td> <td>Delta robot XL 3 axes</td> </tr> <tr> <td>CR_UGD4_R</td> <td>Delta robot 3 axes + 1 rot. axis</td> </tr> <tr> <td>CR_UGD4_NR</td> <td>Delta robot 3 axes</td> </tr> <tr> <td>CR_UGD4MINI_R</td> <td>Mini Delta robot 3 axes + 1 rot. axis</td> </tr> <tr> <td>CR_UGD4MINI_NR</td> <td>Mini Delta robot 3 axes</td> </tr> </tbody> </table>	Reference list	Description	R6Y3110H03067N15	Washdown Delta robot 3 axes + 1 rot. axis with high inertia	R6Y3110L03067N15	Washdown Delta robot 3 axes + 1 rot. axis	R6Y3010S03067N15	Washdown Delta robot 3 axes	CR_UGD4MINI_R_TS	Washdown Mini Delta robot 3 axes + 1 rot. axis	CR_UGD4MINI_NR_TS	Washdown Mini Delta robot 3 axes	CR_UGD4_XL_R	Delta robot XL 3 axes + 1 rot. axis	CR_UGD4_XL_NR	Delta robot XL 3 axes	CR_UGD4_R	Delta robot 3 axes + 1 rot. axis	CR_UGD4_NR	Delta robot 3 axes	CR_UGD4MINI_R	Mini Delta robot 3 axes + 1 rot. axis	CR_UGD4MINI_NR
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Controller		<p>NJ Robotics</p> <ul style="list-style-type: none"> • Up to 64 axes motion control • Scalable control: CPUs for 16, 32 and 64 axes • Up to 8 Delta robots • EtherCAT and EtherNet/IP ports embedded • Conforms to IEC 61131-3 standards 																							
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Servo system		<p>Accurax G5 servo system</p> <ul style="list-style-type: none"> • High frequency response of 2 kHz • Safety conforming to ISO13849-1 • Advanced tuning algorithm • Delta robot: 1.5 kW servo drive • Mini Delta robot: 400 W servo drive 																							
		<p>Accurax G5 servo motor</p> <p>Mini Delta</p> <ul style="list-style-type: none"> • 17 bit absolute encoder • 230 VAC 400W servo motor with brake • Low cogging torque <p>Delta</p> <ul style="list-style-type: none"> • 17 bit absolute encoder • 230 VAC 1 kW servo motor with brake for the arms • 230 VAC 50, 100 or 1000 W servo motors for the rotational axis • Low cogging torque 																							
Vision		<p>FQ-M</p> <ul style="list-style-type: none"> • Camera, vision and connectivity in one • Compact vision sensor • Designed for high speed pick and place • Encoder tracking and smart calibration function • Fast and powerful object recognition 																							
		<p>FH</p> <ul style="list-style-type: none"> • Powerful 4-core i7 parallel processor • High speed CMOS camera • Up to 8 high resolution cameras • Advanced shape search technology 																							

*Note: Please contact your OMRON representative for detailed specs and ordering information.



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