OMRON

Robotic infeed module

Machine Case Study

VISION-GUIDED ROBOTIC LOADING CELL OR ASSORTMENT PACKER

- "Do-it-yourself" robotic control with IEC controller
- Automatic format changeover
- Fast detection and reliable inspection

Vision-guided robotic loading cell or assortment packer

Machine description

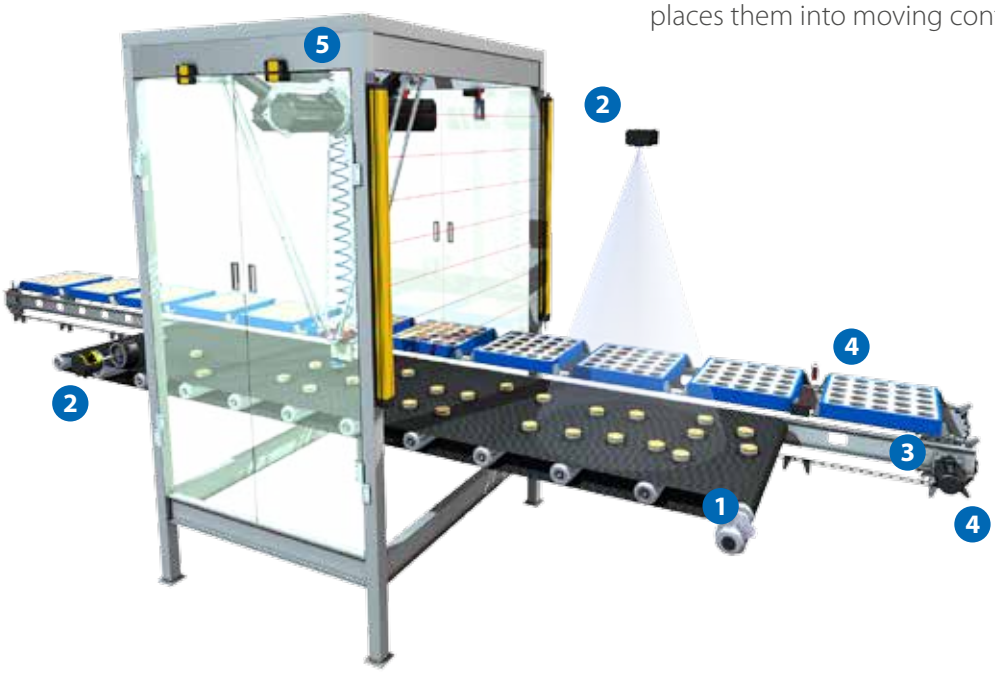
The machine comprises a robot mounted on a frame which overlaps two feeding conveyors running in parallel. One conveyor is feeding the products and another the cartons. The robot picks the products randomly moving on the conveyor belt and places them into the moving cartons. The instantaneous location of moving products is computed by the vision system acquiring images from a stationary camera. Meanwhile a registration sensor is used to track the position of the cartons. This is the accurate tracking of both conveyors which enables the robot to pick and place products from one running conveyor to another.

Robotic control system

Robotic systems can be used efficiently either as a Primary infeed module or as a Secondary or End-of-line loading solution. With the integration of robotic software object libraries into IEC controllers, robots have become easy to deploy and easy to maintain which promotes greatly their use.

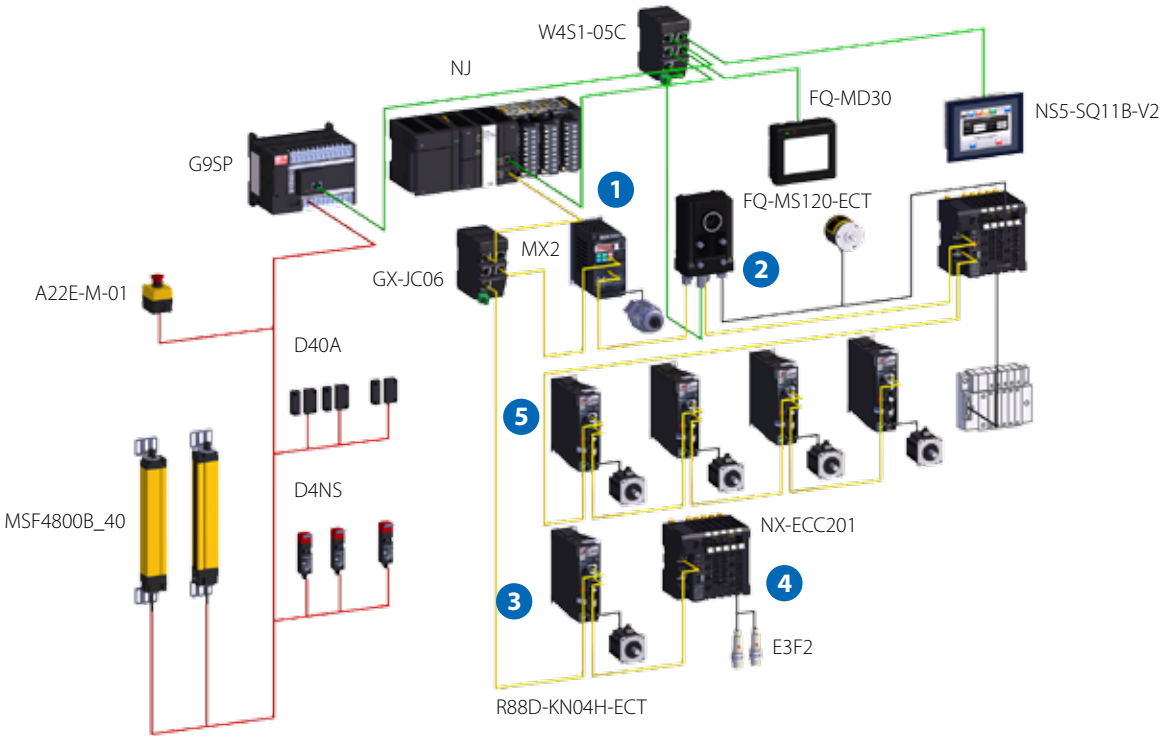
Machine Function

1. **Product infeed conveyor**
   A servo-controlled conveyor belt conveys products which are randomly spaced on its surface.
2. **Product detection and registration**
   A vision camera and an encoder register the positions of the products and store dynamically the values in a FIFO data buffer before being sent to the robot.
3. **Carton infeed conveyor**
   Two servo-controlled lateral chains are provided with indexing lugs which engage the front side and back side of the carton.
4. **Carton detection and registration**
   An encoder and a registration cell register the position of empty slots in the carton and store dynamically the values in a FIFO data buffer before being sent to the robot.
5. **Robotised transfer system**
   The Delta-3 robot picks moving products and places them into moving containers.



Your automation partner in packaging

We Automate Machines! We supply all the automation products for Robotic infeed modules, including the logic and motion or hybrid controller. In addition we provide all motors, drives, position sensors, safety devices, temperature sensors and other panel components. All devices are easy to integrate and carry the Omron mark of quality and reliability.



Fast detection and reliable inspection

By using FQ-M vision system over EtherCAT, you can simultaneously track the product position on a conveyor, detect the positioning angle relative to the conveying direction and sort the product by pattern, colour or surface. Omron vision systems can support most of the high-speed, random product identification and location required in many pick-and-place applications.

Automatic format changeover

With built-in kinematic algorithm, motion command and logic instruction; changeovers can be achieved entirely within the program of the NJ-controller. By communicating over EtherNet/IP with Omron FQ-M vision system, the settings for each product and stacking configuration are saved in the NJ-controller's memory so operators can quickly recall the correct settings during changeovers.

"Do-it-yourself" robotic control with IEC-compliant automation control system

With the Sysmac platform, Omron delivers a complete robotic IEC-compliant development kit which enables you to program Delta-3 robot as easily as you would do for any servo-controlled system. With Sysmac studio, you can enable the Kinematics transformation with a simple instruction and then just reuse a familiar set of motion instructions to program Delta-3 robot. Indeed, by simply programming the motion path of the tool centre point (TCP) in a Cartesian coordinate system, the NJ-controller transforms automatically each points (x, y, z) of the path interpolation into three angle positions (θ1,θ2,θ3). Every time cycle, the angles positions are then forwarded as set points to the three servo-drives which control respectively the motor of each arm.

Would you like to know more?

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