

Robotic Input-Output Buffer



Ecoclean RIO



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Portable robotic buffer cell




Portable RIO can be transported to the work area via a forklift truck—deployable into many areas

Overview

When a machine breaks down, it can hamper the production rate of an entire line. How can you keep a line running when there is no buffer system and when the system is fully blocked or starved?

Dürr Ecoclean's RIO Robotic Input-Output Buffer offers a portable solution to reduce system downtime and to keep an automation line running. The portable cell is designed for easy redeployment. Whether facing an upstream blockage or a downstream equipment failure, the RIO cell can help to alleviate the bottleneck. The RIO injects parts into a line or offloads parts from it. In this way, the cell functions as a robotic pack-in and pack-out system. Parts are packed into dunnage trays and stacked. When several layers of trays are stacked, the roller conveyor delivers the stack to a forklift truck interface zone. Stacks of parts can be stored anywhere with open floor space, which allows the RIO to function as an infinite buffer system. 

Vision guided robot

Standard RIO includes a vision guidance system that lets the robot detect and manipulate parts in a more intelligent way. With the vision system, parts do not need to be positioned precisely for the robot to find them and pick them up. This eliminates the need for numerous proximity switches, part sensors, and locating pins. The vision guided robot also eliminates the need for a pneumatic crowder mechanism. (Crowder mechanisms are typically supplied on non-vision systems to force the dunnage trays into proper alignment.) A vision guided robot can automatically locate parts in dunnage trays accurately without additional movements or engineering. 



RIO's vision guided robot eliminates the need for proximity switches, part sensors, and locating pins

Automated pack-in and pack-out

Pack-in application

RIO pack-in applications can eliminate a system starved condition, typically found when an upstream machine or operation has broken down. The RIO is delivered to an area where the system has been starved for any reason. Once in place, forklift trucks deliver trays of parts to the RIO's incoming conveyor lane, and the trays of parts flow to the robot. The RIO robot unloads parts from the incoming trays and loads them onto the existing conveyor or automation. This allows the downstream automation to continue functioning. Once a dunnage tray has been emptied, the robot transfers the tray itself to the RIO's outgoing conveyor, which delivers a full stack of empty trays to the forklift truck interface zone.



Ecoclean RIO loads and unloads parts, clears system bottlenecks, and processes parts when an operation is down or starved

Pack-out application

RIO pack-out applications provide in-line buffering and a possible detour route when a system is blocked, typically when a downstream machine or operation has broken down. Pack-out scenarios function like pack-in scenarios, except that parts are unloaded from the system instead of loaded into it. Forklift trucks deposit empty dunnage trays onto the RIO's incoming conveyor lane, and the trays flow to the robot. The RIO robot transfers an empty tray onto the RIO's outgoing conveyor lane. The robot then unloads parts from the system, depositing them into the tray. This unblocks the line and allows upstream automation to resume functioning. Once a tray has been filled, the robot can stack another empty tray on top of it. With several trays stacked and filled, the entire stack transfers out on the RIO's outgoing conveyor to the forklift truck interface zone.

RIO base unit includes a standard robot and pair of live roller conveyors. Because there are no pneumatic components on the standard RIO, only an electrical power connection is required. Robot mounted on the portable base provides consistent datum point recovery when the assembly is moved.

Technical Details	
Part weight with tooling:	up to 363 Lbs (165 Kg)
Cycle time:	22 seconds
RIO Base:	Length 214" (5436mm) Width 82" (2083mm) Height 118" (2997mm)
CLDR Conveyor:	Length 72" (1829mm) Width 50" (1270mm) Height 14.5" (368mm)

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Standard features

- Vision system part location
- Servo-driven gripper motions
- No pneumatics
- Minimal proximity switches
- Safety light curtain

Customizations available

- End-of-Arm-Tooling (EOAT)
- Pneumatic crowders for stacked pallets (as alternative to Vision system)
- Dunnage trays
- Part nests and tooling engineering
- Mechanical engineering services
- Controls programming services

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