IO-LINK WIRELESS FOR PACKAGING MACHINERY

Packaging Machine Builders are facing new challenges of mass customization and dynamic customer demands . Flexibility, higher throughput and downtime reduction are key requirements as packaging machine designs drive towards Industry 4.0. Flexible manufacturing systems need the ability of rapid change-over to new product types, operations resequencing and adjustment to significant changes in volume and capacity. Packaging machines, therefore, need to be modular, adaptive and agile more than ever. Tradeoffs between capacity and flexibility are no longer an option.

IO-LINK WIRELESS – CABLE-GRADE CONTROL & MONITORING

A key ingredient that machine builders have been missing is wireless communication that can handle high performance and fast motion applications. Conventional wireless solutions are not suitable for the harsh demands of low latency, scalability to support (hundreds of sensors and actuators within a single machine area), and cable-grade reliability. IO-Link Wireless is designed specifically as a standard for high performance wireless factory automation communication, to address this need.

WIRELESS COMMUNICATION FOR PACKAGING MACHINERY

IO-Link Wireless is designed for real-time control and monitoring on fast moving machine components in harsh factory environments. Therefore, it is leveraged for a variety of solutions throughout the design and development stages of packaging machines:

· Wireless communication for sensors and actuators that are mounted on independent movers on transport track systems

· Wireless communication for end effectors and linear tracks of robots and collaborative robots

· Wireless control and monitoring of sensors & actuators on modular cells, rotary tables, carousels and other dynamically rotating components

· Wireless sensor data collection for predictive maintenance, machine performance optimization and analytics

IO-Link Wireless is enabling packaging machine builders to address the challenging requirements of manufacturers:

· Support a broad range of package variations (size, weight, shape, material) within a single machine

· Reduce and eliminate changeover and setup time between different package types

· Reduce cost and time-to-market of applying new package designs

· Increase machine capacity by performing actions while in motion

· Machine footprint reduction

· Simple upgrade/adaptivity for future products

· Predictive maintenance & downtime reduction

· Reduction of maintenance costs – less mechanical parts, less wear out, preventive maintenance

· Hygienic design – reduction of cables, chains, belts

· Simplify machine onsite tear-down and assembly

WIRELESS AUTOMATION OF INDEPENDENT MOVER TRANSPORT TRACKS

Independent mover transport track systems are becoming a key element in the design of new machines in industries such as consumer packaged goods, food & beverage and automotive. However, these movers are prohibitively limited by the constraints of wired I/O and communication for real-time control and monitoring. For example, for controlling vacuum pumps or grippers that are placed on the movers in order to grab and hold different types of products and to adjust automatically to different weight, size and shape of a product handled while it's in motion. The moving carts also lack the ability to communicate ongoing sensor data for predictive maintenance and analytics on each mover, such as vibration, proximity and weight.

Independent movers can now be integrated with sensors and actuators through IO-Link Wireless communication. This gives the movers the ability to independently manipulate objects with a variety of tools such as grippers or vacuum pumps. Products can be processed while in constant motion in the most agile and synchronized manner. Wireless connectivity also means less mechanical components , reducing machine footprint and maintenance. Changeover and tooling setup time is reduced to a minimum and condition monitoring capabilities are easily added through multiple sensors on each mover.
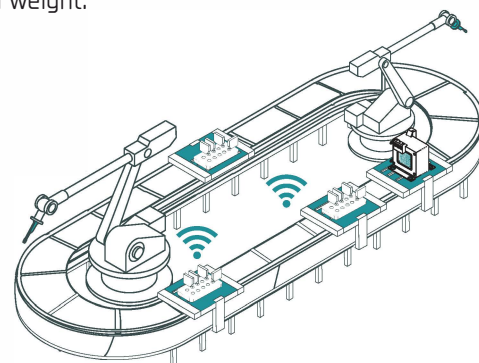
WIRELESS CONTROL & MONITORING OF ROBOTS, COBOTS AND ROTATING COMPONENTS

The packaging process often involves rotary applications with multiple work cells stationed around a rotating platform or carousels (such as filling and capping machines) that require multiple sensors and I/Os. The rotating nature of such platforms makes device connectivity very restrictive, and IO-Link Wireless technology provides the solution for incorporating sensors and I/O directly within the rotating components. The wireless connectivity thus reduces maintenance operations, increases flexibility and enables simple future add-on of multiple I/O's.

Robots and collaborative robots are used across the packaging line for loading, unloading and placement of products/packages. Communication to the end effectors on these robots requires external cabling which can be complex to deploy and costly. Cabling also limits the motion and flexibility of the robotic arm and adds to the total payload. A wireless solution eliminates the cables and accessories running along the robotic arms, thus increasing flexibility, and reducing maintenance costs and unexpected downtime.

RETROFIT FOR PREDICTIVE MAINTENANCE & ANALYTICS

Measuring and analyzing the packaging line performance helps to improve the quality of the product, reduce waste, increase line speed, prevent unplanned downtime and plan future priorities. Such optimization requires collection of meaningful data from numerous sensors in a cost-effective manner on existing and new machines.

IO-Link Wireless solutions enable optimal data collection from packaging machines from hundreds of sensors within a single machine area. It is designed to operate in very harsh environments with interferences, vibrations and noise. This allows for simple and cost effective retrofit and revamp of numerous devices on existing machines, and simplifies relocation and upgrades, and new machine deployments.

SUMMARY

The value of wireless communication for machine builders manifests throughout the numerous stages of the machine design, development, delivery, deployment and ongoing support at the manufacturer's facility. The facilities themselves benefit from the wireless connectivity of the Machines through reduced changeover time, reduced downtime and maintenance, reduced footprint, and full flexibility and modularity.

Innovative and unique wireless communication solutions such as IO-Link Wireless are developed by CoreTigo for packaging machinery through partnerships with machine builders, industrial equipment manufacturers (transport track manufacturers, sensor manufacturers, gripper/pump manufacturers, etc.) and leading manufacturing facilities. These systems are driving operational excellence and adaptive manufacturing while stretching the performance of machines to new levels.