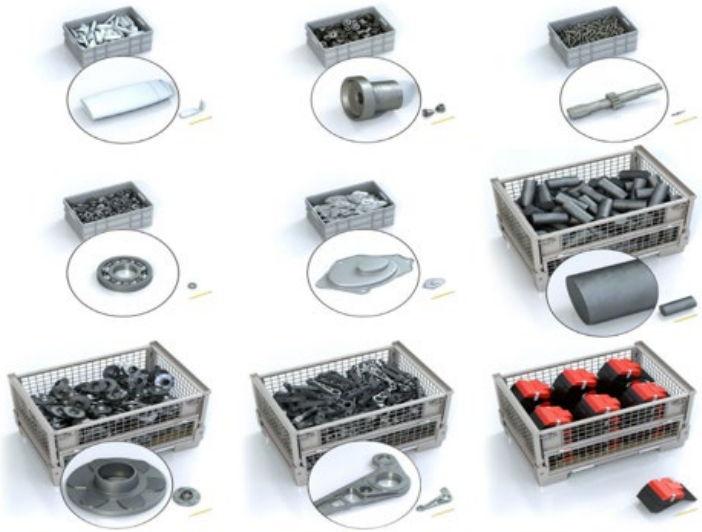

Vision-Guided Pick & Place System

Skeans and Horner's X7 All-in-One

HORNER AUTOMATION GROUP

skeans Pneumatic & Automation Solutions

Horner's Micro X7 All-in-One and the Kawasaki RS007L Robot

Kawasaki Robotics

Robot Tooling Vision Project

Surrey, British Columbia, Canada

BACKGROUND

Skeans has been a distributor for Pneumatic automation components for over 50 years. They pride themselves on a diversified portfolio of both componentry, as well as solutions. As part of their electric automation solutions initiative, they offer distribution of both collaborative and industrial robots. This application came about in pursuit of a cohesive demo featuring flagship products from their catalogue.

Previously, Skeans had utilized Omron and IDEC components. However, Omron solutions often proved cost-prohibitive for smaller projects due to high hardware costs and recurring software licensing fees. Although cost effective, IDEC offerings lacked the user friendliness required for customers working on one-off projects.

Horner Automation provides an ideal fit for Skeans by delivering intuitive operation, zero recurring software licensing costs, and a versatile product range tailored to their machinery applications.

CHALLENGE

The plan was to develop a vision-guided pick-and-place demo featuring operator selectable target objects. All I/O on the system was to run over an EtherNet/IP fieldbus network. The system needed to be adaptable to on-the-fly changes, quick to program, and easy to operate. As this was an interactive demo system, a large interface was a must.

SOLUTION

The Horner X7 met all the key requirements for this application. The seamless transition between HMI configuration and PLC programming streamlined the setup process. While the option for usage of multiple IEC languages ensured flexibility for later additions to the system.

The Cscape programming environment was easy to navigate. Register configuration, fieldbus communication, and programming proved intuitive, even for those used to other PLC manufacturers. The perpetual license was also a significant bonus, given the nature of the application.

Mech-Eye PRO M-GL 3D Vision System

SYSTEM DETAILS

Horner X7 All-in-One Controller:
The Micro X7 serves both as an HMI and a PLC in this deployment. Operator selections were made via the large display, and underlying PLC logic ensured singular product selections were sent to the Kawasaki robot, and subsequently the Mech-Mind camera.

Mech-Mind 3D Camera:
The system is centered around a Mech-Mind Pro M-GL camera. Both object identification and pick path planning were offloaded to the Mech-Mind software, cutting down on robot programming.

The Mech-Mind system offered a few key benefits that synergized with the overall system objective, and other products in the Skeans portfolio:

- **Graphical Programming environment:** Offers an intuitive approach to programming vision applications
- **Easy communication:** A vast library of over 1000 compatible robot models
- **Rapid Deployment:** Train new part models in minutes
- **Robust Recognition Capabilities:** A wide range of camera offerings to deal with a variety of product dimensions and characteristics, such as reflective, thin, or transparent objects
- **Flexible Functionality:** Capable of inspection, object location, and measurement applications

Kawasaki Robot System:

Robot -
The Kawasaki RS007L robot was chosen for this application due to its comfortable 930mm of reach, and best-in-class operating speeds.

I/O -
Murrelektronik Impact67: Serving as the primary I/O interface of the system, communicating over EtherNet/IP.
Murrelektronik Mico Pro Power Supply: Configurable power supply with downstream circuit protection. Powering all IO except for the remote drive motor.
PHD Remote Drive: compressor-free solution for generating vacuum for pick-and-place, or for pneumatic actuator operation.
Piab Pico Vacuum Switch: IO-Link enabled variable vacuum switch for pick confirmation
Leuze MLC 500 Light Curtains: High resolution light curtains serving to prevent access to the robot while in motion.

APPLICATIONS

This system highlights what's possible with 3D vision technology. Other common applications include:

- **Depalletizing & Material Handling:** To handle varying incoming product shapes, sizes and orientations.
- **Assembly:** Orienting featureless or circular components that otherwise could not be accurately positioned via fixturing
- **Sorting & Packaging:** Identifying and separating different categories of object, based on shape or colour
- **Quality Inspection:** Detecting surface defects and reading embossed text or 3D markings (e.g., tire codes).

TESTIMONIAL

"Horner products offer an approachable and intuitive solution well suited to integrators and end users alike. The ease of moving between HMI configuration and PLC programming heavily streamlines the integration process. The perpetual license for Cscape blends well with its ease of use, allowing for improvements to made on the fly."

~ Nabil Alphin, Skeans Pneumatic and Automation Inc., Surrey, BC

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