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https://kawasakirobotics.com/

CAUTIONS TO BE TAKEN TO ENSURE SAFETY

- For those persons involved with the operation / service of your system, including Kawasaki Robot, they must strictly observe all safety regulations at all times. They should carefully read the Manuals and other related safety documents.
- Products described in this catalogue are general industrial robots. Therefore, if a customer wishes to use the Robot for special purposes, which might endanger operators or if the Robot has any problems, please contact us. We will be pleased to help you.
- Be careful as Photographs illustrated in this catalogue are frequently taken after removing safety fences and other safety devices stipulated in the safety regulations from the Robot operation system.

* Materials and specifications are subject to change without notice.

Cat. No. 3L2525 Aug '25

Kawasaki
Powering your potential

Kawasaki Robot

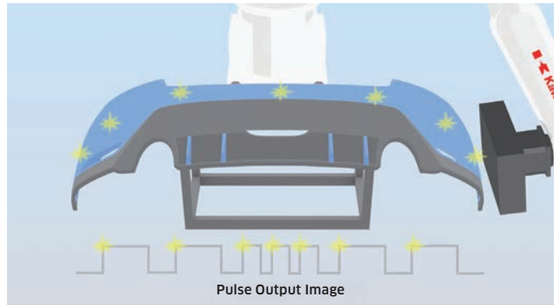
Visual Inspection Robot System

Visual Inspection Robot System

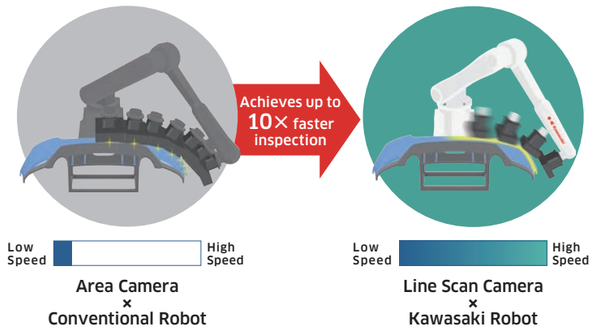
Kawasaki's visual Inspection robot system utilizes the "Tool Tip Displacement Output Function," enabling motion along curved surfaces and maximizing the performance of high-resolution line scan cameras. This allows for high-speed and high-accuracy automated inspection of complex shapes.

By combining line scan cameras with the Tool Tip Displacement Output Function, products with curved surfaces can be inspected quickly and accurately.

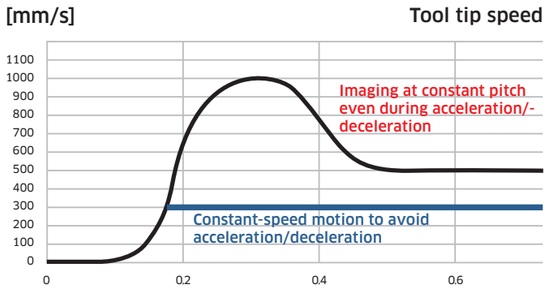
Tool Tip Displacement Output Function

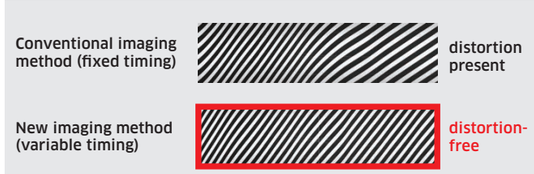


Comparison with Conventional Systems



Features of the Tool Tip Displacement Output Function





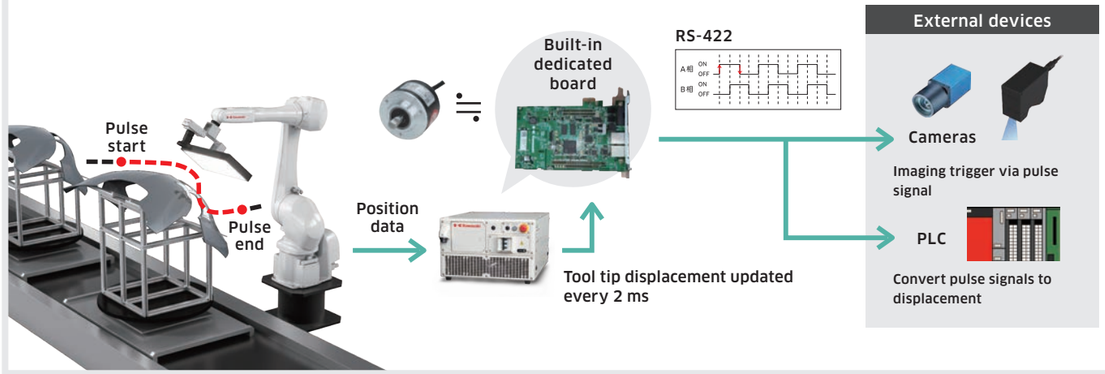
Imaging trigger signals are automatically output in synchronization with the robot's tool tip speed

Enables easy inspection of complex and curved surfaces

Specifications

- Real-time output of A/B phase pulse signals (90° phase difference) to external devices based on robot tip displacement
- Outputs at fixed pitch (e.g., 0.1 mm) with speed-dependent variable frequency (MAX 10 kHz) during command ON
- Displacement of up to three offset points from the registered tool point can be output via up to 3 channels

Built-in board enables ultra-fast imaging trigger output beyond software or communication limits



Supported Robot Lineup

Supported Robots

Model					
Payload	RS007L	RS013N	RS025N	RS030N ～RS080N	BXP series
Max	7kg	13kg	25kg	30kg～80kg	100kg ～300kg
Reach	930mm	1460mm	1885mm	2100mm	1634mm ～2991mm

Supported Controllers

F60

Open type indirect cooling system
:W300 x D320 x H130 mm
／Enclosed type, indirect cooling system
:W300 x D500 x H188 mm
Mass 8.3 kg
IP20 or equivalent

F01,F02,F03,F04

Dimensions W420 x D530 x H278 mm
Mass 20 kg
IP54 or equivalent

Transport Method

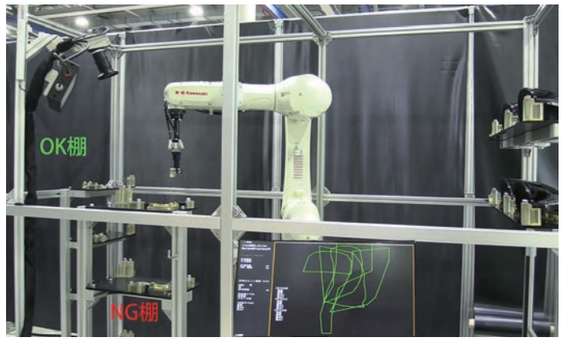
Camera Handling Method

Large workpieces can be inspected by small robots through coordinated motion of travel axes and positioners.

		Robot	
		Fixed	Travel / Rotation Axis
Work piece	Flat / Fixed	●	●
	Travel / Rotation Axis	●	●
	Conveyor Synchronization	●	×

Workpiece Handling Method

A process size suitable for small workpieces is realized, enabling automation including transport to and from adjacent processes.



		Robot	
		Fixed	Travel / Rotation Axis
Work piece	Flat / Fixed	●	●
	Travel / Rotation Axis	×	×
	Conveyor Synchronization		

Note: Coordinated motion of travel/rotation axes requires Kawasaki external axis motors.
Note: Pulse output function for workpiece handling method and conveyor synchronization support are paid license options.

Supports Conveyor Synchronization

1. Can be integrated into existing processes (conveyors) ※1
2. No need for workpiece transfer between upstream/ downstream processes
3. Multi-robot inspection is easy

※1 This function may not be applicable to existing conveyors. Please verify if your system meets the requirements.

Equipment Requirements for Function Application

- CV Encoder Specification: 90° phase A/B signals, open collector output 0–4 kHz, input 10 mA
- CV Encoder Resolution : 1000 P/R or higher, 1 mm/pulse or less
- Workpiece Positioning Accuracy on CV: Final position must remain within the camera' s depth of field in both travel and sway directions, including mechanical components
- CV Conveyor Speed: 500 mm/s or less

Laser-based visual Inspection is also optimized using the Tool Tip Displacement Output Function

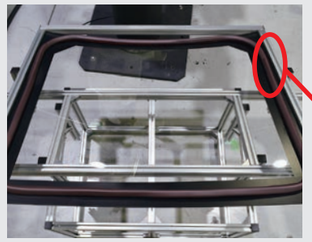
×

Paint irregularities and weld beads are inspected quickly and accurately

Combining with 3D profile sensors enables optimized inspection of linear targets

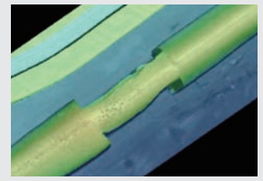
- High-speed and accurate inspection even during acceleration/deceleration
- Accurate position identification via pulse signals

Simulated seal material workpiece: imaging performed in a single stroke (approx. 3200 mm imaging distance)



Height

20.50mm 0mm 20.50mm



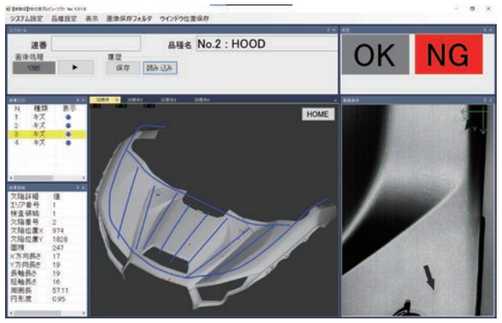
Defect detection result: judged as defective due to exceeding threshold

Data Collection and Analysis for Visual Inspection

Efficiency improved using BI tools

- Instant identification of defect location and cause upon detection
- Helps identify problematic processes and trends

Note: BI Tool is software for aggregating, analyzing, and visualizing data.



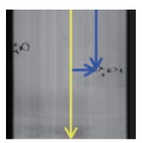
Data Acquired from the Visual Inspection System

Product Info	Serial Number | Production Lot | Production Date
Appearance	Product Type | Part | Color
Defect Info	Location | Type | Size

Note: Data depends on the output and judgment of the camera and image processing software.

Mapping Principle

Output of position data from inspection trajectory



1pix=0.1mm

Pixel-level defect location information

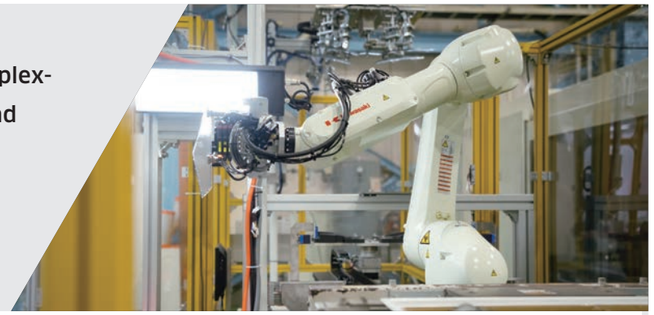
Defect Mapping Function (linked display of inspection trajectory)

Inspection is not only for preventing defect outflow but also for identifying defect trends to improve processes and yield.
Kawasaki provides software that links robot inspection trajectory data with image data to 3D map defect positions on the product.
Thanks to the high-speed pulse output function, image pixels and robot movement are precisely synchronized, enabling high-accuracy mapping.
Mapped defect data can be used for rework, traceability, and advanced quality control.

Case Study

Automation of visual Inspection for complex-shaped parts, achieving labor savings and improved inspection accuracy

From the case study of
Yamaguchi Manufacturing Co., Ltd.



Background of Implementation

With the start of mass production of the new product “Inner Lens,” high appearance quality was required.
Conventional visual inspection was no longer sufficient.
In addition to the complexity of curved shapes and the large number of inspection items, securing and training inspectors was also a challenge.
Establishing a stable inspection system through automation became an urgent need.

Key Factors for Implementation

- High versatility that supports multi-product inspection
- High-speed operation that completes inspection within the molding cycle
- High-speed pulse output function compatible with line scan cameras

Effects of Implementation

- Labor cost reduction: equivalent to 3 inspectors (approx. ¥13 million/year)
- Inspection workload reduction: approx. 297 hours/month
- Immediate feedback on defects reduces production loss
- Improved detection accuracy for fine particles and dust

Case study article and video available here

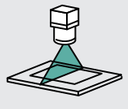
Implementation Process

Contact Us

Please contact Kawasaki Heavy Industries sales directly or via the website form.

Proposal of Optimal Plan

We will listen to your situation and propose a robot implementation plan.



Imaging Trial

We will conduct a simple imaging test to confirm whether your inspection requirements can be met.

Robot Vision Trial

We will perform an imaging test using the robot and your product to verify the cycle time.

Robot Equipment Proposal

We will introduce a partner integrator (SIer) to propose optimal peripheral equipment.

After-Sales Support

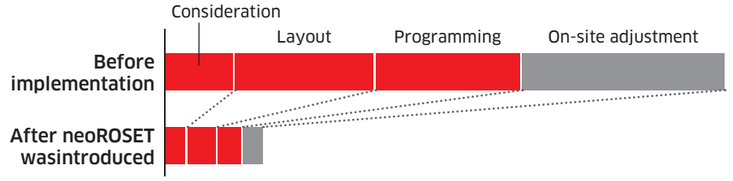
Our robot service team will support you to ensure safe and reliable use of the robot after implementation.

neoROSET is a PC-based programming support tool developed by Kawasaki that enables intuitive robot programming and accurate simulation.By performing offline verification in advance, it helps reduce risks associated with robot system implementation and shortens setup time significantly.

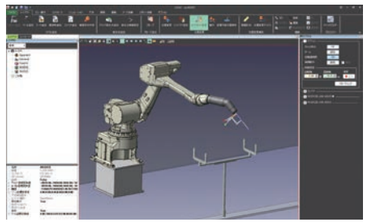
neoROSET

Key Features of neoROSET

- Dramatically reduces teaching time
- Supports import of various 3D CAD formats
- Backward compatibility with legacy software K-ROSET
- Simple and intuitive operation



By using neoROSET, the time required for conventional offline teaching and adjustment can be reduced to a fraction or even up to one-tenth.



Its intuitive graphical user interface allows users to visually create robot programs, even without specialized programming knowledge.

neoROSET Optional Function Specialized for Visual Inspection

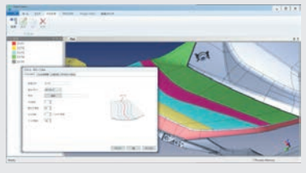
Previously, it was difficult to teach the robot tool to be perpendicular to complex curved surfaces, and checking the lighting reflection range with line cameras was also challenging. Kawasaki’s “neoROSET VI Planner” supports perpendicular teaching based on the target shape and automatic generation of optimal inspection paths.This enables anyone to easily and efficiently teach high-accuracy visual Inspection robots.

Note: Additional optional license is required in addition to the standard neoROSET license.

neoROSET Visual Inspection VI Planner

Three Key Features

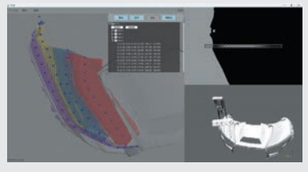
1 Generation of Optimal Teaching Points by Area



Path Creator

PathCreator is a function that automatically divides the inspection target into areas and generates the optimal inspection path for each area.
Even for complex shapes or wide inspection targets, efficient paths can be constructed based on CAD data, significantly reducing the workload of teaching operations.

2 Inspection of lighting reflection zones and confirmation of completeness



SLiM

SLiM is a function that allows visual confirmation of the lighting reflection range and missed areas in the inspection paths created by PathCreator.
Since it enables verification of lighting reflections in the inspection paths generated by PathCreator, it helps reduce trial-and-error on-site and shortens startup time.

3 Robot Motion Verification and Program Generation

Path Editor

PathEditor is a function that allows editing of inspection paths created by PathCreator and verified by SLiM, and automatically generates robot programs.
From the verified motion, robot programs that can be used on actual machines are automatically generated.

Offline creation and validation of inspection programs is fully supported.