X-ray Inspection System

IX-GN
Series

A certain choice for wide range of products

ISHIDA patented Genetic Algorithm (GA) image processing delivers superior accurate inspection.

High versatility for wide range of packed and unpacked products

GA image processing automatically generates optimal sensitivity achieving the fastest product change-overs

Integrated air cooling system, user-friendly 17" touch screen control

# Seven-Step Image Analysis for High-Sensitivity Inspection

Proprietary 7-step image analysis technology detects foreign objects with high sensitivity. Supports increased sensitivity in foreign object detection with selections from a library and the ability to register up to four GA programs created for a product.

Maps stainless steel, glass, rubber and foreign objects.
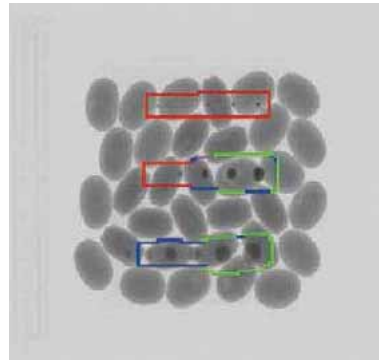
With inspection images from conventional models
Unable to detect some
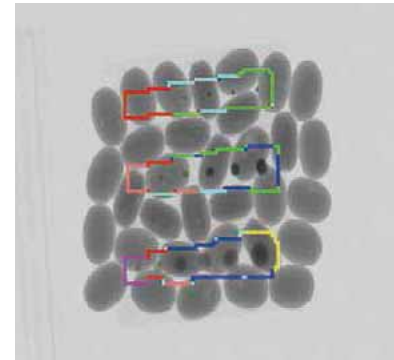
With inspection images from IX-GN
All detected

Easy to Operate

Easy Setting with Auto Set

It only takes a few passes of an item to be inspected for the machine to automatically optimize settings for x-ray output (tube voltage and current), contrast (image enhancement), sensitivity level and other factors. With Auto Set you can achieve a sensitivity setting that meets your objectives by selecting a setting level balance from three patterns.
Increasing the number of settings enables accurate sensitivity design. This improves the validity and reliability of the inspection.
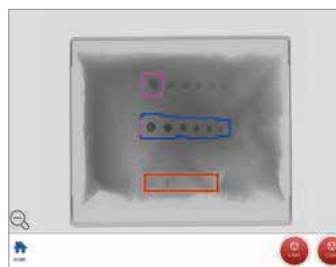

Sensitivity Setting Screen

Auto Set Screen

Full Screen Image Display

Zooms in to fill the screen with the inspection image. This large view of the inspected items and foreign objects is convenient for visual inspection or other activities.

Large **17**-Inch Display

Uses Image Processing Technology to Improve Product Quality

Uses high-level image processing technology to simultaneously detect foreign objects and accurately inspect products.

Standard Features
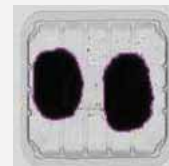

OK

NG
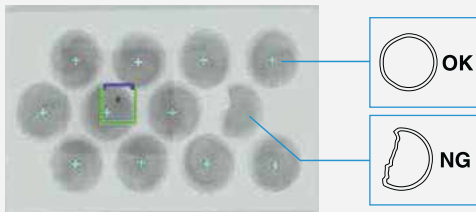
Defect Inspection

Determines whether a product has passed the inspection or not based on factors including the area of an individual product, its perimeter length and its shading.

Mask for Perimeter of Outside Box   Pattern Mask   Brightness Mask   Edgeless Mask

Masking Feature

The sensitivity of foreign object detection is improved by taking into consideration individual product attributes and masking areas that may cause false positives.

### Weight Estimation Feature Comes as Standard

Analyzes x-ray inspection images and accurately estimates the weight of the inspected item. This feature can be useful for example for continuous packaged goods where individual weight inspection is not possible, and for ranking agricultural and marine products.

Weight of an Individual Bell Pepper

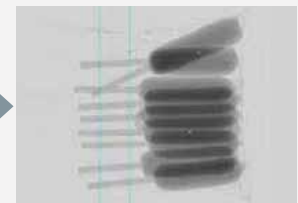Inspection with X-Ray Inspection Device
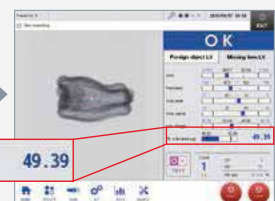
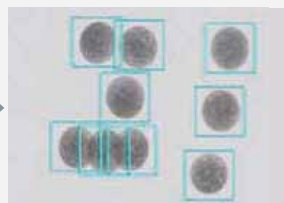## A Variety of Image Processing Features

Defect Inspection for Loose Products

Inspects for defects such as cracks even for loose products.

Multiple Cylindrical Object Inspection

Specifies the count area, and counts the number of skewers. Prevents missing and broken skewers.

Multiple Flat Object Inspection

Counts the number of pieces of overlapping flat products.

Individual Weight Inspection

Simultaneously measures the weight of each specified area.

# Using GA for Highly Sensitive Foreign Object Detection

Employs Ishida's unmatched, proprietary image processing technology to detect foreign objects with high sensitivity. We have assimilated our technical expertise and past experiences, and have made a system that has advanced easier usage with GA programs that support multiple inspection types.

GA Evolutionary Image Processing

*GA Evolutionary Image Processing is a registered trademark of National University Corporation, Yokohama National University.

Employs the latest image processing technology of GA Evolutionary Image Processing. The computer automatically creates the optimum image processing program for differentiating between foreign objects and food products.

Principle of the X-Ray Inspection Device

Cooling Fan — X-Ray Generator — Cathode — Anode — Line Sensor
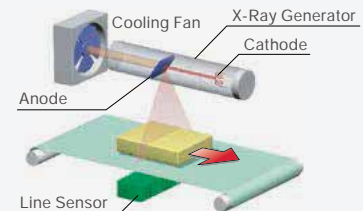
X-rays irradiate items to be inspected that are traveling on the conveyor. A proprietary 5-level image analysis technique is applied to the x-rays that pass through the object and are received by the line sensor, making it possible to detect and eject mixed-in foreign objects, defects, etc.

Sausages

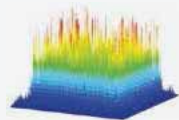**Example: Detecting Foreign Objects mixed in with Sausages**

Gen1	Gen10	Gen100
Image Processing Before Evolution	Image Processing during Evolution	Image Processing after Evolution
Foreign object extraction in the first generation	**Foreign object extraction around the 10th generations**	**Foreign object extraction around 100th generations**
There is no foreign object extraction, only the unevenness of the sausages.	The three foreign objects are largely extracted from the sausages.	The foreign objects are more comprehensively extracted.

## It Is Easy to Create GA to Meet Work Requirements

GA is easy to create. With programs optimized for each inspection object, anyone can inspect with high sensitivity.


Map a provisional foreign object
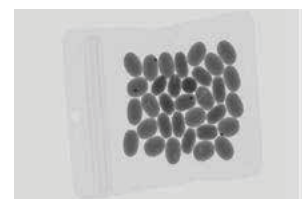
GA Can be Easily Created to Meet Work Requirements

We support high-sensitivity foreign object detection. All you have to do is select the program that matches your requirements from our abundant selection of pre-registered programs. You select by viewing actual detection images, so you will be able to select the optimum program for your objective.

Ⓐ Minute, high-density foreign objects

Ⓑ Minute, low-density foreign objects
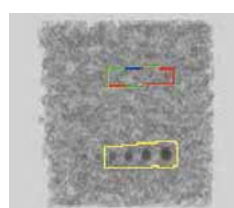
Without GA
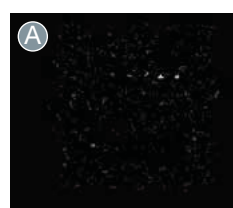
Ⓐ Select a program that targets Ⓐ
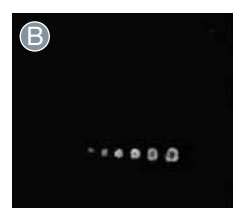
Ⓑ Select a program that targets Ⓑ

Using GA

Many types of data management are possible

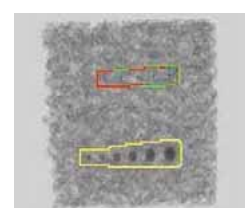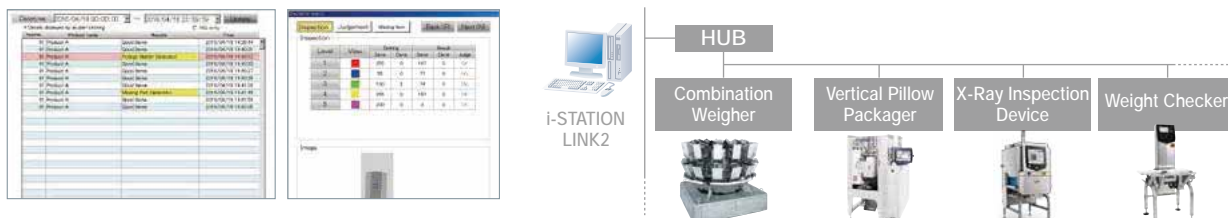## Data Collection Software **i-STATION LINK 2** Option

This application allows you to check—by using the PC—x-ray images, inspection data and the operating status for machines that are working together.

i-STATION LINK2

HUB

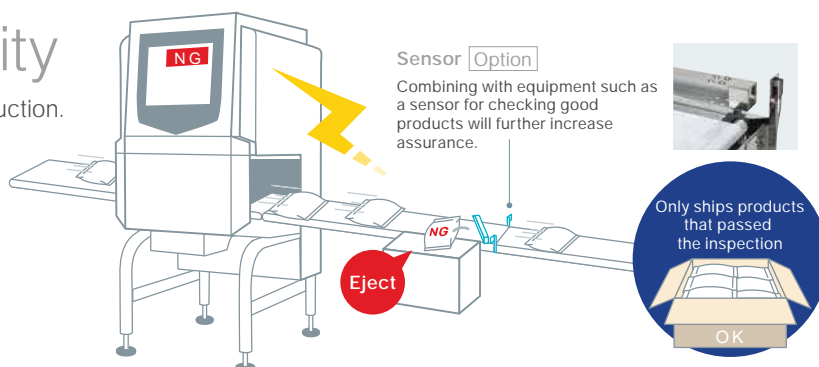| Combination Weigher | Vertical Pillow Packager | X-Ray Inspection Device | Weight Checker |

Comes with a USB Port Option

You can export inspection data via the USB port. Use a PC for more convenient data management.

Safety and Security

Failsafe design. Supports safe, secure production.

Only Ships Products that Passed Inspection

Products that did not pass the inspection will not be mixed in with shipped products, even if the connected sorting device malfunctions.

NG

Sensor Option

Combining with equipment such as a sensor for checking good products will further increase assurance.

Eject

NG

Only ships products that passed the inspection

OK

Ease of Cleaning

This model supports the general requirement for easy cleaning. It is made of entirely stainless steel construction and the inspection chamber is of a water-proof construction.
The protective curtain and conveyor can be easily removed without tools.

Easy to Attach and Remove Parts

Protective Curtain

Non-Contact Switch

An optional non-contact interlock switch for the protective curtain simplifies attachment and removal from the main body, reducing the risk of damage to the switch.
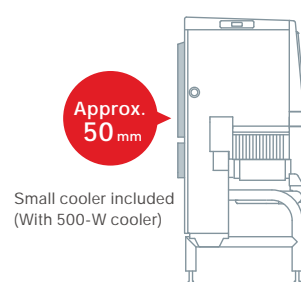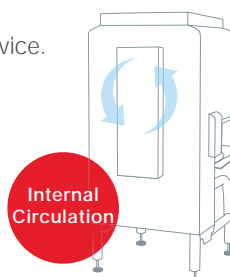
Belt

Conveyor Frame

Sealed Construction Reduces Risk

The sealed construction reduces internal problems by preventing fine particles, etc. in the air from entering the device. A small cooler makes for a clean exterior appearance.

Water receptacle is optional

Internal Circulation

Approx. **50** mm

Small cooler included (With 500-W cooler)

Comes in Various Models

Support for Heavy Products [-S model]

Used to inspect heavy products. Higher sensitivity inspection is even possible for products that are unstable because of the time it takes for them to stabilize after loading.
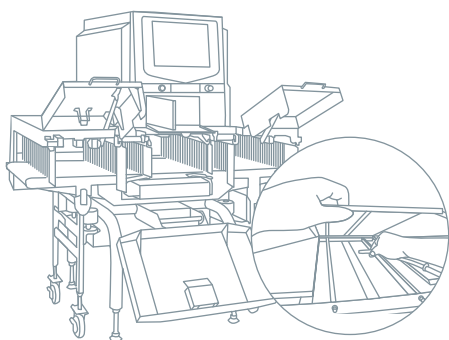
For Loose Products [-H model]

Targeted for unwrapped products like meat and loose products such as solid spices. With a trapezoidal conveyor even a short protective cover will prevent x-ray leakage, shortening the machine.

Shorter Machine Length!

1400mm
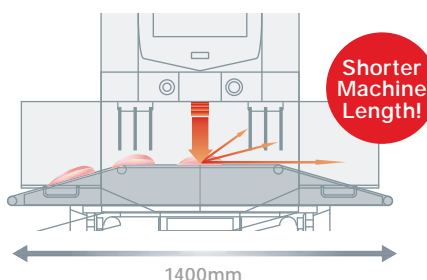
For Tall Products [-A model]

Taller opening for high-sensitivity inspection of tall products.

150mm   220mm

Standard   -A Type
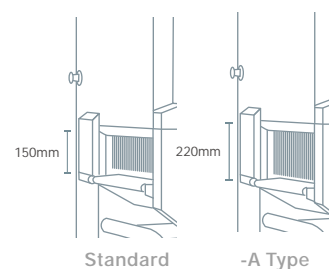
Fast Rank Selection

Widely used at production sites for oysters, scallops, bell peppers, etc. To match production volume, you can select the two-line inspection type, or the high-speed inspection type. Capable of a maximum of 16 selection ranks. Foreign object detection can be done simultaneously with rank selection, contributing to quality improvement.
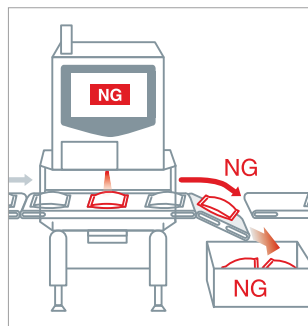
Can select up to **600** pieces/min* *For two-line inspection type

S M L
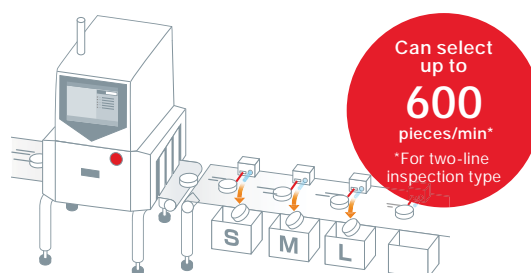
Rejector lineup

A variety of rejection systems are available to suit different products and production lines.
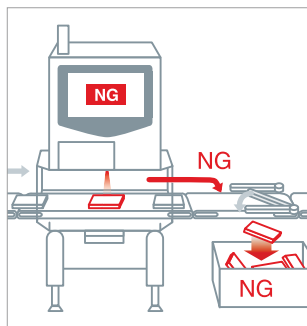
Arm rejector

Arm rejector is a general-purpose system, appropriate for thick products.

Drop belt rejector

Drop belt rejector sorts products with a vertically movable belt. It is suitable for rejecting thin products.
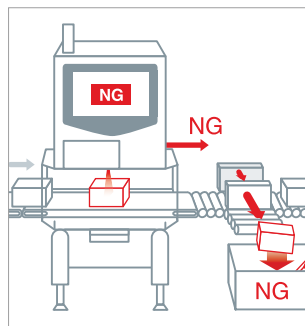
Push plate rejector

Push plate rejector sorts products on a conveyor using an air-driven device. It is suitable for rejecting heavy items such as cardboard and kraft paper products.
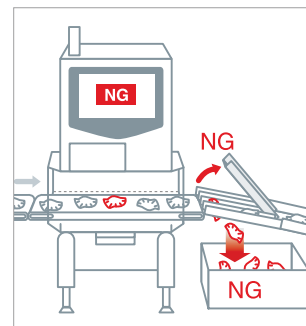
Up flap rejector

Up flap rejector has a vertically movable flap that allows product to drop below it. It is suitable for separating small bulk items.

ISHIDA CO., LTD. www.ishida.com

44,SANNO-CHO, SHOGOIN SAKYO-KU,
KYOTO 606-8392 JAPAN
Phone : 81-75-771-4141 Facsimile : 81-75-751-1634

ISHIDA

IP69K rated model

IX-GN-2444/2443-K
IX-GN-4044/4043-K

Product size

● IX-GN-2444/2443-K
(Unit: mm)

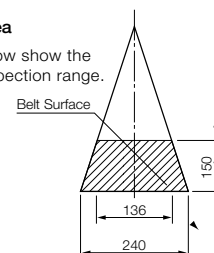| Height	Width	Height	Width
0	240	80	184
10	233	90	178
20	226	100	171
30	219	110	164
40	212	120	157
50	205	130	150
60	198	140	143
70	191	150	136

Inspection Area

The figures below show the permissible inspection range.

Belt Surface
150
136
240

● IX-GN-4044/4043-K
(Unit: mm)

Height	Width	Height	Width
0	400	80	334
10	391	90	326
20	383	100	318
30	375	110	310
40	367	120	302
50	359	130	294
60	351	140	285
70	342	150	277

Inspection Area

The figures below show the permissible inspection range.

Belt Surface
150
277
400

Dimensions

1,870±50
1,595±50
750±50 (TO THE BELT SURFACE)
(335)
(705)
330
705
(865)
270
(430)
(BELT WIDTH)
720
800
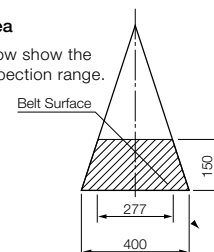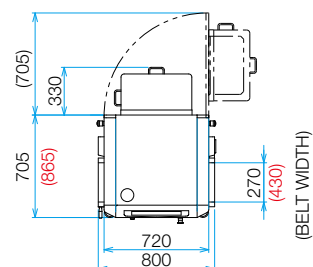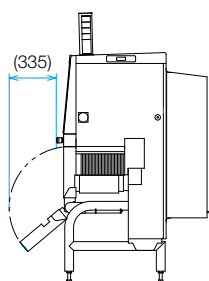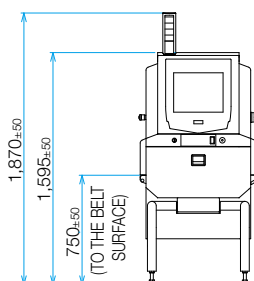
* Dimensions in red are for IX-GN-40XX.   (Unit: mm)

Specifications

		IX-GN-2444-K	IX-GN-2443-K	IX-GN-4044-K	IX-GN-4043-K
Inspection area	Maximum width	240mm		400mm	
	Maximum height	150mm		150mm	
Conveyor dimensions		800mm(L) x 270mm(W)		800mm(L) x 430mm(W)	
Conveyor speed and loaded weight		10-60m/min, 5kg		10-60m/min, 5kg	
Product length		20-450mm [*1]		20-450mm [*1]	
Minimum spacing between products		30mm [*1]		30mm [*1]	
Power supply [*2]		Single phase: AC200-240V 50/60Hz 6.0A 1,150W	Single phase: AC200-240V 50/60Hz 5.5A 1,000W	Single phase: AC200-240V 50/60Hz 6.0A 1,150W	
X-ray	Tube voltage	300W	150W	300W	150W
	Tube current	25-75kV		25-75kV	
	Output	1-8mA	1-5mA	1-8mA	1-5mA
X-ray emissions		1micro Sv/h or less			
Touch screen display (HMI)		17" color LCD display			
Machine weight		Approx. 325kg		Aprox.360kg	
IP rate		IP69K			
Working environment	Temperature	0 - 35℃ [*3]			
	Humidity	30 - 85%RH			

Design and specifications are subject to change without notice.
(*1) This dimension should be followed under Snap-Mode only. Do not apply under Bulk-Mode.
(*2) There are cases that input voltage is fixed depending on integrated rejector unit or optional unit.wattage value is applied where there is no specific ancillary.
(*3) If the room is hotter than 35℃, an air conditioner will be arranged subject to an additional charge. The maximum temperature permitted is 40℃.

ISHIDA Global standard X-ray series

ISHIDA works closely with food manufacturers and processors to ensure that they can meet the strictest guidelines set by quality-conscious retailers. ISHIDA X-ray inspection systems provide vital information with the greatest accuracy and reliability to alert you when foreign bodies are contaminating your product.

Precise and reliable inspection

IISHIDA patented Genetic Algorithm (GA) image processing delivers superior inspection accuracy. In addition to the flexible customization options for GA setting creation, many typical GA settings are already stored on the machine. Up to two (4) different GA settings can exist at the same time.

User-friendly operation with Fail-safe feature

The 17" color touch display with 3D icons enables intuitive machine operation in addition to well-organized production data output. Also, even if the Rejector breaks down, Fail-safe rejects all products in the system so that NG products do not get mixed with OK products.
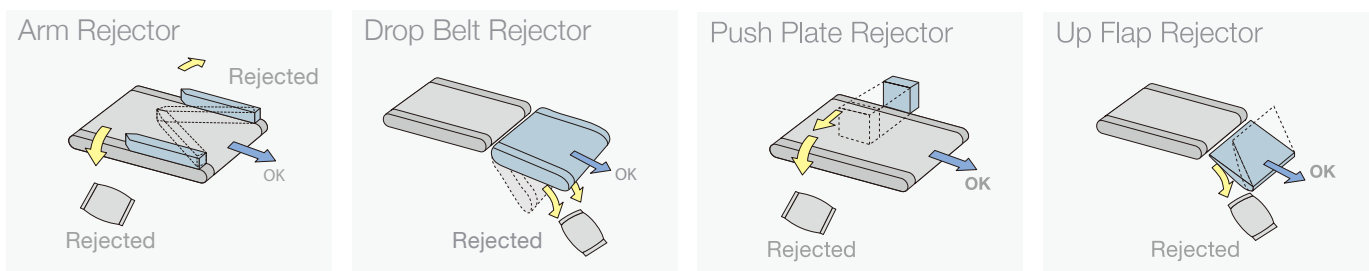
17"
sized color
touch display

Simple machinery maintenance

Water-proof stainless steel body construction with IP69K fits in any environments.
Open framework provides easy access for sanitation and improves efficiency by simplifying product changeover.

Rejector lineup

Arm Rejector	Drop Belt Rejector	Push Plate Rejector	Up Flap Rejector
Rejected / OK / Rejected	Rejected / OK / Rejected	OK / Rejected	OK / Rejected