

## Product Information

# Rasco Vision System

**Rasco**  
A Cohu Company

May 2009

1. MARK INSPECTION
2. 3D-LEAD INSPECTION FOR LEADED DEVICES (SO)
3. PAD INSPECTION FOR LEADLESS DEVICES (QFN)
4. ORIENTATION CHECK OR INTAPE INSPECTION

**Rasco**  
Vision

The Rasco Vision System provides 4 optical inspection stations to follow the high demands of semiconductor quality assurance.

The operation via OPI (touchscreen) includes process control, setup procedure as well as backup and restore function. The number of vision projects is not limited. Any combination of inspection type is possible.

The most outstanding advantage of the new vision system is its easy, self-explaining and user-friendly operation via operator interface (OPI).

The modular design with one separate computer for each inspection station, integrated in the internal handler network, provides high flexibility according to the customers' requirements. All modules of the vision system can be exchanged separately without any configuration changes ("plug and play"). The inspection identification is easily made by USB stick (licence key).

The high quality components used, e.g. high resolution cameras, guarantee a maximum of precision, speed and reliability. The cameras of each inspection station are identical.

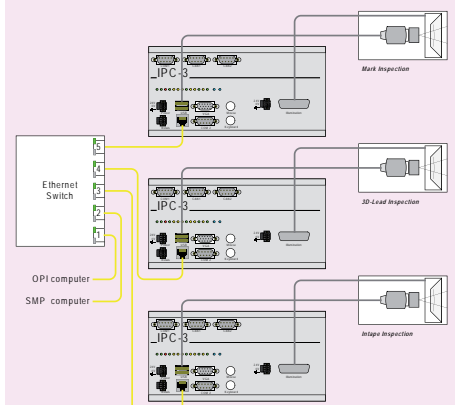
The software of the vision system is completely integrated in the handler software and is automatically updated.



SO2000 with Rasco VisionSystem,  
Bowl Input, Tape&Reel Output

## KEY ADVANTAGES

- User-friendly, self-explaining operation via Operator Interface
- High flexibility due to modular design
- Maximum speed and precision
- Low cost solution
- Complete integration of hardware and software



SO2000 Vision System Schematics: One computer for each inspection station, easy operation via OPI

## TECHNICAL SPECIFICATION

Inspection Type/ Package Type	Mark	3D Lead	Pad	Intape	Orient. Check
SOIC, SOT, SC70, SOP, SSOP, TSSOP, MSOP	X	X		X	X
QFP, QFN MLP, MLF, CSP	X		X		X
Accuracy / Repeatability		+/- 7.5µm (0.3 mil)	+/-11.25 µm (2)	+/- 15.0 µm min. (1)	
Inspection Time (typ.)	50 ms	100 ms	< 200 ms	100 ms	50 ms
Setup Time	< 1 min.	< 2 min.	< 2 min. (3)	< 3 min.	< 1 min.
Image Resolution	1280 x 1024 pixels				
Host System Type	PC-based mobile CPU				
Processor	Pentium 1,5 GHz, 512 MB RAM				
Operating System	Windows XP embedded				
Camera Interface	USB 2.0				
Illumination	Intensity and duration software controlled				
(1) lead dependent (2) pad dependent, for field of view = 15mm x 12mm (3) without calibration					
Subject to technical changes without prior notice.					

# Rasco Vision System

## MARK INSPECTION

The mark inspection identifies the data code of a device, which is engraved, printed or etched on the package.

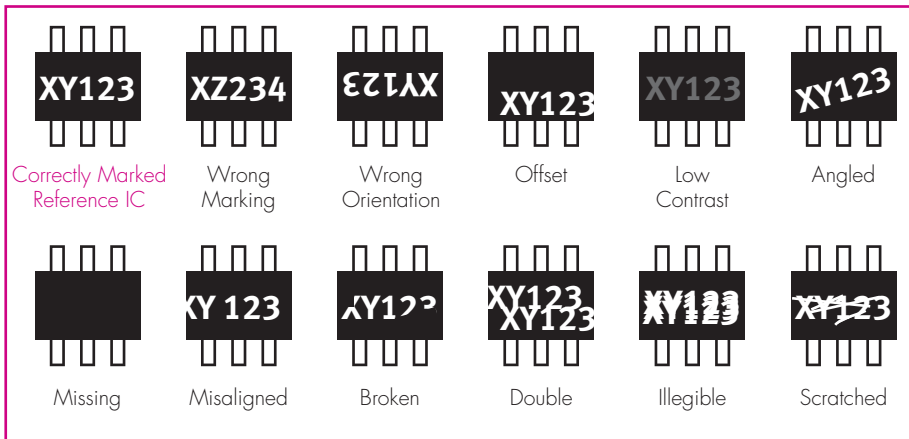
A defective marking can be caused e.g. by missing or wrong data, scratches or cracks (examples as shown below).

The mark inspection system compares the marking of each device with the determined correct reference marking. If the marking of the tested device does not correspond to the reference marking it is recognized as defective.

A special advantage of the Rasco mark inspection is the multiple marking (more than 4 markings possible). The inspection time is very short (typical: 50 ms for one marking).

The setup procedure is self-explaining, extremely fast (< 1 minute) and very easy to operate; no limitation of setups.

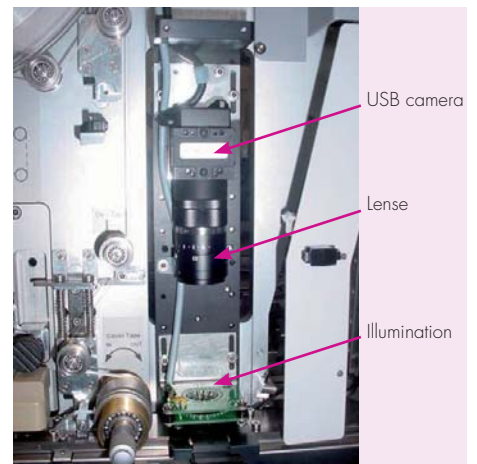
A training for the complete mark inspection and orientation check takes not more than 1 hour.



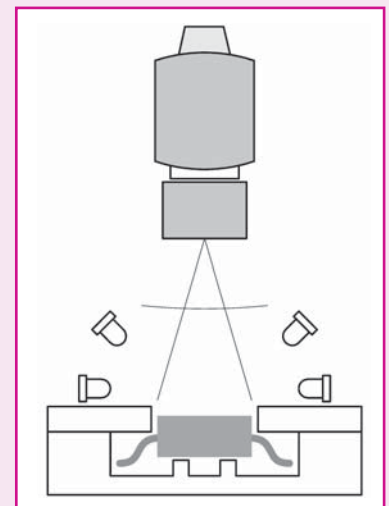
Examples of defective marking and mark inspection criteria

### Setup procedure:

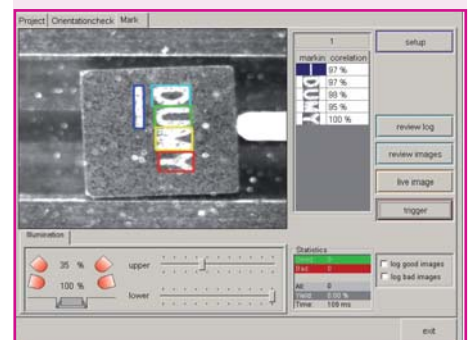
- Set mark area (AOI = area of interest); equivalent procedure as for orientation check
- Set threshold "min greyvalue" and press "extract marking"
- Press "apply" to accept marking
- Every pattern is displayed in tab "1"
- Set correlation threshold » setup complete!
- Press "add new marking" to teach a second marking procedure



Inspection System



Schematic Mark Inspection



Mark Inspection, controlled via OPI

# Rasco Vision System

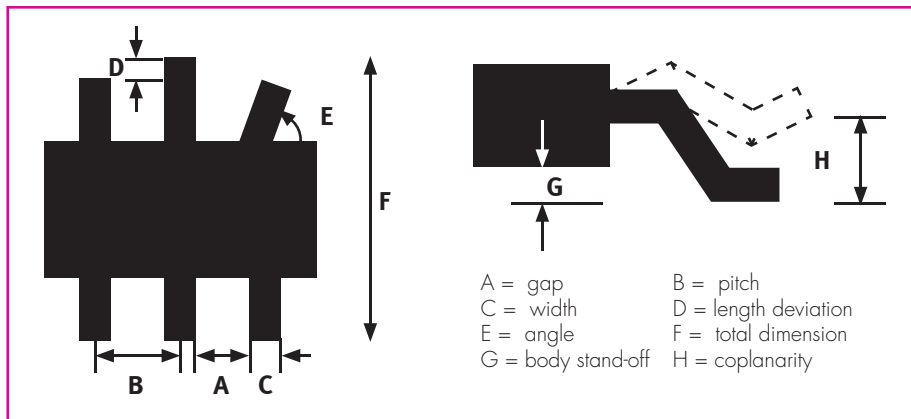
## 3D-LEAD INSPECTION

The 3D Lead Inspection is used for lead measurement to identify bent leads and coplanarity of the devices.

For the 3D lead inspection procedure all lead characteristics are checked, such as length, width, pitch, angle to body, coplanarity and body stand-off.

The Rasco lead inspection combines high precision and speed, providing an accuracy of +/- 7.5µm (0.3 mil) and an inspection time of 100 ms (typical for SOT). The setup time is < 2 minutes.

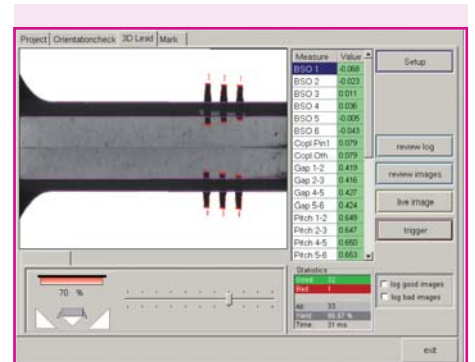
The controlled illumination increases the lifetime and guarantees a perfect light setup. To teach a 3D-Lead Inspection you only have to enter the new "target values".



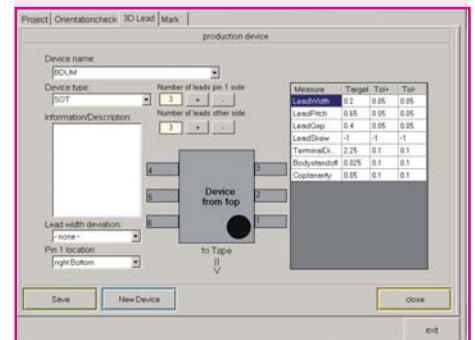
3D-Lead Inspection criteria

### Setup procedure:

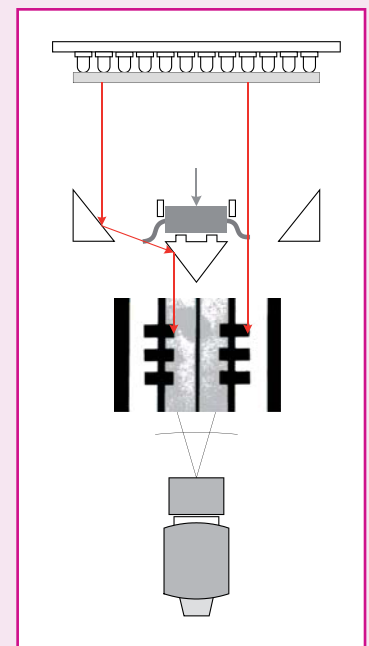
- Check calibration ( in case of mechanic modification)
- Enter device values
- Check requested measurements
- Insert calibration tool into lead inspection buffer
- Check illumination adjustment
- Start calibration (AOI (area of interest) setup and all other adjustments are made automatically)
- Select device type, pin count and target values
- Select requested measurement



3D-Lead Inspection via OPI



3D-Lead Inspection: Input „target values“



Schematic 3D-Lead Inspection

# Rasco Vision System

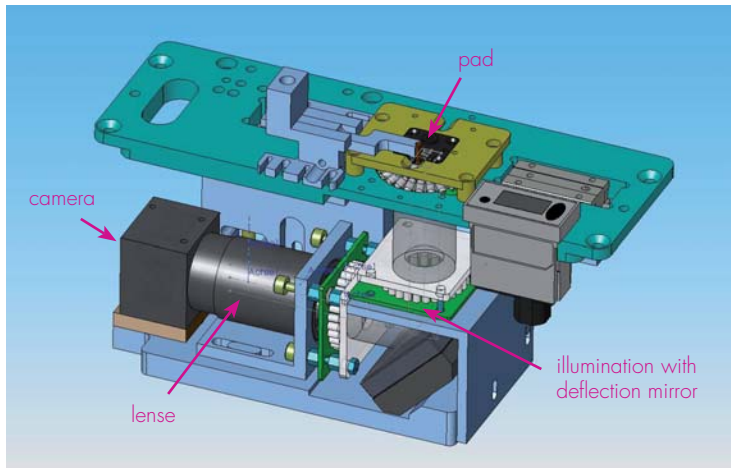
## PAD INSPECTION FOR LEADLESS DEVICES

The pad inspection is used for the measurement of all pad dimensions and for the detection of defective pads, e.g. scratches.

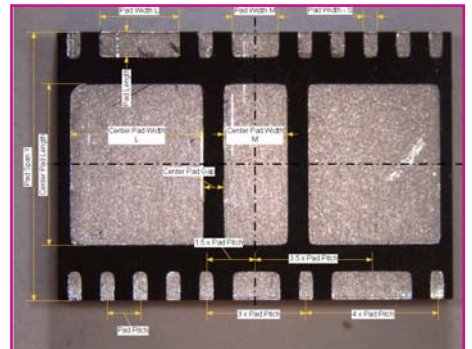
The measurement of pad dimensions, e.g. length, width, pitch, position (see picture right side), is made for all types of pads, center pads, corner pads and all other pads. The inspection of pad defects includes the detection scratches and various lead defects (minimum detectable lead defect size is 60 x 60 µm).

As for all other inspection procedures of the Rasco Vision System, the operation is very user-friendly and self-explaining. With an inspection time < 200 ms and a setup time < 2 min the pad inspection is extremely fast.

The picture aside shows a specific pad inspection application for a dedicated package type, others can be provided on request.

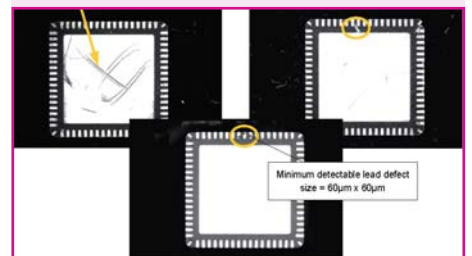


Pad Inspection Taper



Example pad measurement:

pad length	pad width	center pad length
pad pitch	pad spam	center pad width
(measurement parameters pad dependent)		center pad gap



Detection of defective pads

## S A L E S

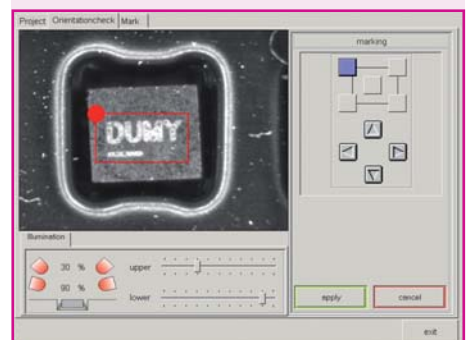
For more information please ask your local Rasco sales team or contact [sales@rasco.de](mailto:sales@rasco.de)

## TAPE INSPECTION / ORIENTATION CHECK

The Rasco Vision System provides two different versions of Tape Inspection:

1. Orientation Check (basic version), for identification, empty and orientation check of the device.
2. Intape Inspection (extended version) for Orientation Check and additional 2D Lead Inspection.

For setup the area of interest (AOI) can be adjusted by finger touch or by arrows. The operation is user-friendly and very fast, providing a setup time < 1 minute and an inspection time of 50 ms (typ.).



Orientation check via OPI