LADYBIRD

AOI System for Through Hole Assembly Processes
LADYBIRD Capabilities

• Top Side Part Inspection
  – Polarity
  – Missing
  – Tilted
  – Lifted Leads
  – Color
  – Screw presence
  – Resistor banding
LADYBIRD Capabilities

• Bottom Side Solder Inspection
  – No Solder
  – Pin Hole
  – No fillet
  – No lead
  – Missing
  – Solder Bridge
LADYBIRD Capabilities

- Final Assembly Inspection
  - Wire colors
  - Dial setting
  - Dip Switches
  - FOD
LADYBIRD Capabilities

- Conformal Coating Inspection
  - Presence
  - Absence
  - Keep Out Areas
LADYBIRD Customers

• Some of the Ladybird customers around the world
LADYBIRD Features

- Defect Prevention of through hole parts
  - Eliminate hand insertion or automated through hole insertion defects from being soldered
  - Find and Fix parts before soldering
  - Improve your hand insertion process by finding defects before they happen and push back to the insertion line for process improvements
    - Training
    - Work instruction improvements
    - Kitting validation
LADYBIRD Features

• Defect Detection for Wave or Selective Solder
  – Eliminate manual inspection of solder defects post wave
  – Decrease time to locate and repair defects
  – Link bottom side defects to top side inspections and correlate causes of defects for continuous improvements
LADYBIRD Features

• Final Assembly Inspection
  – Automate final box build inspection processes
    • Confirm screw presence
    • Wiring for terminal blocks
    • Switch position

• Conformal Coating Inspection
  • Confirm coverage and keep out areas
  • Eliminate manual inspection process
LADYBIRD Features

- Fast Cycle Time – typically < 12 seconds
- 80mm Depth of Field
- Images can be stored for statistical review
- Fiducial recognition for repeatable inspections
- *FuzzicalZ* Engine

*SUNZ* newly developed FuzzicalZ (*Fuzzical* = a coined word) logic, and addressed a sensuous judgment close to human eyes. 
* (*Fuzzical = A coined word combining Fuzzy & Physical)

FuzzicalZ Adopts a logic close to human senses newly developed without using the pattern matching method.

Detects the sugar spots within the selected region and judges by the content percentage (%).
LADYBIRD FuzzicalZ Engine
LADYBIRD Inspection Program

Push START to start.  A-SIDE

START  START TIME 00:12:10
STOP   END TIME 00:12:10

FAIL 0008 0010

A-SIDE
BOARD ID: - NONE -

PREV  PASS  FAIL  CLOSE

LADYBIRD - Polarity
LADYBIRD - Polarity
LADYBIRD - Polarity
LADYBIRD - Wrong Color
LADYBIRD - Wrong Color
LADYBIRD - Lifted
LADYBIRD - Polarity
LADYBIRD Operator Screen

Push START to start.  A-SIDE

PASS

BOARD ID: - NONE -

SUNZ.VIS  |  H250G2  |  NUM  |  6/27/2014  |  12:04 AM

Pass 0019  |  0000

Let's make your best Japan

Ladybird  |  Cracovia  |  Rzeszow

SUNZ  |  Stanislaw Staszic  |  30-508

SUNZ  |  Staszic  |  30-508

Ladybird  |  Cracovia  |  Rzeszow

SUNZ  |  Stanislaw Staszic  |  30-508

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SUNZ  |  Stanislaw Staszic  |  30-508

SUNZ  |  Staszic  |  30-508
LADYBIRD - Solder Inspection

Pin Hole
LADYBIRD – Solder Inspection

Solder Bridge
LADYBIRD Software – Blocks and Steps

A Block is the individual inspection FOV

There can be 2048 Blocks in a program
A Step is the inspection routine for the Block.

There can be 64 steps in each Block.
LADYBIRD Software – Blocks and Steps Inspection Step routine

- Step inspections options
  - Color
  - Pattern Matching
  - Binary
  - Logic Function for flexibility
    - AND
    - OR
- Up to 64 Steps per Block
LADYBIRD Software – Blocks and Steps

You can select between box or round shapes for the step window.
LADYBIRD – Operator Screen

Operator has a board counter for the job run

Operator sees top 5 defects in real time for instant process improvement to the slide line
**LADYBIRD - Statistics**

![LADYBIRD Statistics Image]

### Table: Statistics

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<tr>
<th>BLOCK</th>
<th>COMMENT</th>
<th>PASS</th>
<th>FAIL</th>
<th>TOTAL</th>
<th>RATIO (%)</th>
<th>F. REJECT</th>
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**Graph:**

![Bar Graph]

**Print:**

![Print Screen]

**Date and Time:**

- Date: 12/18/2014
- Time: 9:30 AM

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LADYBIRD Programming

Fiducial Set Up
LADYBIRD Programming

Project Set Up

- Set up parameters for the project
- Logging of defect images
- Side A and B selection
- Options
  - Bar Code ID
  - Project Changeover
LADYBIRD Programming
Import of CAD with BOM

First you size the PCB origin and end position.
**LADYBIRD Programming**  
Import of CAD with BOM

Prepare the CAD file in a `.csv` file with Ref Des, Part No, X, Y, Rotation.

Import the `.csv` file and assign the data fields to the program.
LADYBIRD Programming
Import of CAD with BOM

Then the CAD file populates the Block, Comment and Comment 2 with the position for the inspection steps (along with library steps if linked)
LADYBIRD System

- LADYBIRD Inspection Terminal
- Offline Programming Station
- Options
  - I/O Card with Cable
  - Operator Validation Control Box
LADYBIRD Configurations