

HL-770 Automated Tray IC Lead / Mark Inspection System

A Professional Pick & Place Lead Scanner for ICs on Tray

HL-770 system performs efficient and precised lead inspection, ball inspection, mark inspection and surface inspection with accurate 3D optical measurements for ICs on tray.

System operates two sets of Tray I/O alternatively with two independent pick & place motion mechanisms. The lead scanning mechanism performs multi-unit pick & place lead / ball scanning while the mark scanning / sorting mechanism performs column-by-column mark / surface scanning as well as sorting and binning of pass and fail units. This multi-task design makes system throughput up to around 15K ~ 35K UPH for Tray In – Tray Out operation and around 8K ~ 13K UPH for Tray In – Tape Out operation depending on IC package size.



Key features

System function

System performs lead and mark inspection for ICs on tray. Two sets of Tray I/O load trays onto lead scanning area alternatively to perform multi-unit pick & place lead / ball scanning. Trays are then moved to mark scanning / sorting area to perform column-by-column mark / surface scanning, failures are then sorted to lead / mark failure trays while the vacancies are fed with spare passes and then moved to Tray Out stack or optional Tape Out device via multi-unit pick & place tray-tape conversion.

Lead / Ball inspection

System provides 3D measurements of lead pitch, lead width, lead co-planarity, lead span, lead skew, terminal dimension, standoff ...etc. for TSOP, QFP... packages.

System also provides 3D measurements of ball pitch, ball diameter, ball co-planarity, ball offset, ball height, ball shape, ball quality...etc. for BGA package.

Mark / Surface inspection

Either single marking criteria can be set for all characters or 3 different criteria can be individually set for small, medium and large characters to screen out defects of double marking, low contrast marking, voids or bleeds in the mark, broken or smeared characters...etc.

System also provides surface inspection to screen out body defects such as scratch, crack, chipout...etc.

3D optical measurement

The 3DX, accommodated with 3 high resolution digital cameras plus working with powerful I-Cite vision software, provides the algorithms for high speed, accurate 3D image acquiring and measurement. Sub-pixel algorithms maximize accuracy of measurements to 1/4 pixel.

High throughput

Parallel scanning and sorting, up to a third or a quarter of tray units each pick & place for scanning and 10 units each pick & place for sorting / binning, visual scanning on the fly without having to stop and position as well as extremely high speed image processing contribute system throughput up to 15K~35K UPH depending on IC package size.

Statistical report

System provides data collection report including yield summary, rejects summary and overall statistical summary with detailed CPK data for Process and QA engineering.

Specification

■ Motion

- X-Y drive : High performance servo drive system
- Transmission : Ball screw & linear guide mechanism
- Resolution : X axis: $\pm 0.02\text{mm}$, Y axis: $\pm 0.03\text{mm}$, Z axis: $\pm 0.02\text{mm}$
- Max. stroke : Mark / Lead scanning X axis: 203mm, Y axis: 910mm, Z axis: 20mm
Sorting / Binning motion X axis: 513mm, Y axis: 918mm, Z axis: 12mm
- Pick & Place : Scanning: Tool-free replaceable nozzle module.
Nozzle matrix: 25 x 3 nozzles max.
- Sorting / binning: 10 nozzles with 12mm ~ 16mm variable pitch



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