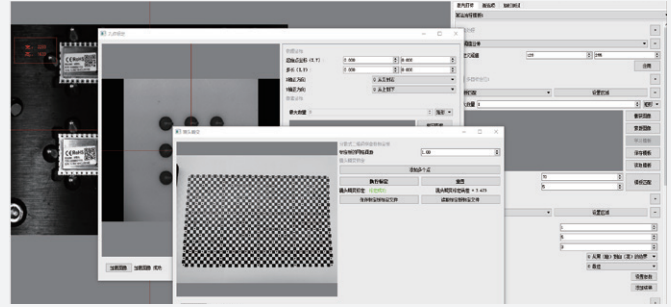




LEAPER Visual Inspection Solutions for Laser

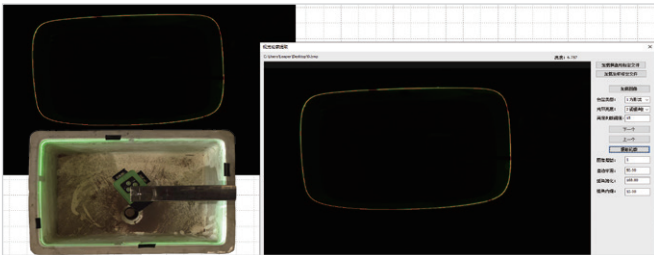
LPVL Laser Galvanometer Control Algorithm Module

LPVL is a visual algorithm software developed based on LPV, which can be applied to laser galvanometer control and servo control.



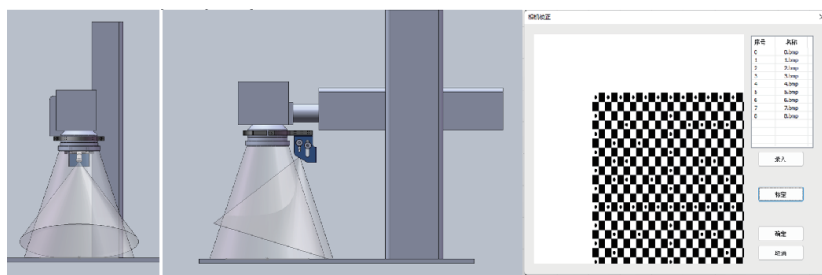
LPVC Contour Recognition Algorithm Module

LPVC is based on the secondary development of LPV and is used to identify the contour features of the target product.



LPL General Laser Precision Machining Software

LPL is developed based on LPV and guided configuration interaction design concepts, and completes task configuration in 4 steps.



MPP Laser Marking Vision System

Camera Pixels (standard): 8MP
Installation Height: 250mm~300mm
Effective Capture Range: $\geq 160\text{mm} \times 160\text{mm}$
Single Pixel Accuracy: $\leq 0.1\text{mm}$
Data Interface: USB2.0

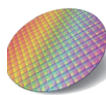
MPP (Manually Position Processing) laser marking vision system contains hardware and algorithmic software modules, including camera imaging control module, galvanometer BOX correction module, camera distortion and tilt correction module, calibration module, ROI presetting and cropping module, Visual based height adjustment module, etc. It can be split and integrated according to users' needs, which is convenient for users to develop efficiently, and realize operation with high precise for laser marking.

Li-ion Battery



- + Tab Cutting
- + Pole Welding
- + Explosion-proof Valve Welding

Semiconductor



- + Wafer Laser Scribing
- + Wafer Laser Marking
- + IC Laser Marking
- + PCB Laser Marking

3C Electronics



- + Sound Film Cutting
- + Motor Welding
- + FCC Cutting

Solar Photovoltaic



- + Junction Box Laser Welding
- + Crystalline Silicon Cell SE

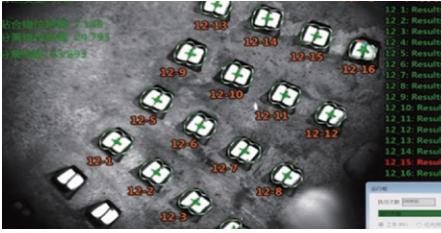
PCB



- + PCBA Sub-board Cutting
- + PCB Laser Marking
- + Laser Drilling

Automotive

Flat Wire Motor Laser Welding



Inspection Content : Defects such as misalignment, angle, clearance, etc.

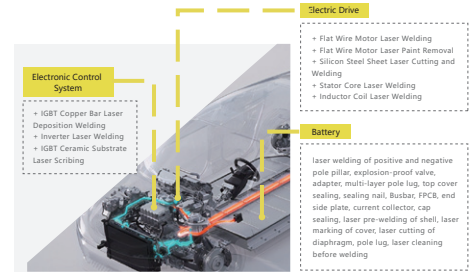
Static Repetitive Positioning Precision : $\leq 0.5\text{pixels}$

Overall Processing Positional Accuracy : $\leq 15\mu\text{m}$

Overall Processing Yield Rate : $\geq 99.5\%$

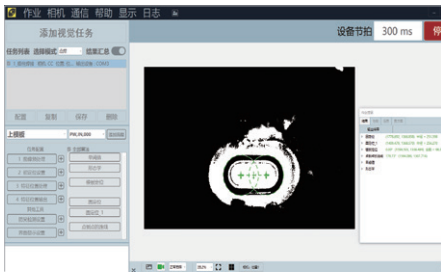
Visual One-shot Positioning Beats : $\leq 200\text{ms}$ (Without Processing)

Total Beats (Vision + Welding) : $\leq 35\text{s}$



Li-ion Battery

Cover Plate Assembly Laser Welding



Static Repetitive Positioning Precision : $\leq 0.5\text{pixels}$

Overall Processing Positional Accuracy : $\leq 15\mu\text{m}$

Overall Processing Yield Rate : $\geq 99.5\%$

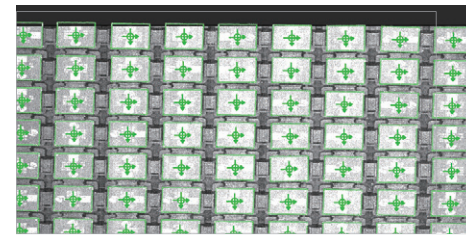
Visual One-shot Positioning Beats : $\leq 200\text{ms}$ (Without Processing)

Visual IPC Configuration : I5-6200U, 8G

Overall Laser Processing Cycle : Cathode&Anode < 1.8s, Explosion-proof Valve < 2.5s, Battery contacts < 1.2s

Semiconductor

IC Chip Laser Marking



Frame Width : $\geq 135\text{mm}$

Product Size : $\leq 320\text{mm} \times 135\text{mm}$

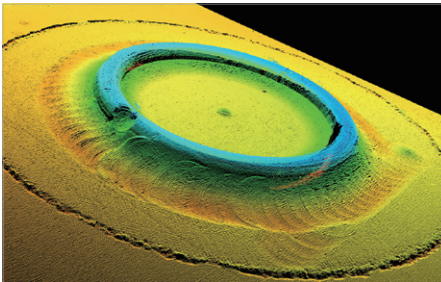
Chip Size : Minimum $3\text{mm} \times 3\text{mm}$, Maximum $65\text{mm} \times 65\text{mm}$

Image Acquisition Time : $\leq 3\text{s}$

Image Processing Time : $\leq 30\text{ms}$ / Single Chip

Visual Positioning Accuracy : $\leq \pm 0.02\text{mm}$

Sealing Nail Laser Welding



Inspection Content : Defects such as pinholes, partial welding, broken welding, missed welding, warped nails, no nails, etc.

Detection Accuracy : 0.2mm

Visual Detection Range : $\leq 9\text{mm}$

Overkill Rate : $\leq 1.0\%$

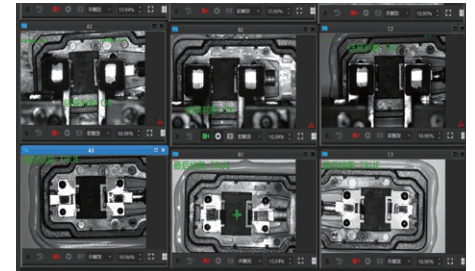
Omission Ratio : 0

Equipment Beats : $\leq 6.3\text{PPM}$

Visual Beats : $\leq 1.5\text{s}/\text{PCS}$

Solar Photovoltaic

PV Module Junction Box Laser Welding



Inspection Content : Defects such as bursting point, partial welding, insufficient welding wire, etc.

FOV : $\geq 60\text{mm} \times 40\text{mm}$

XY Positioning Accuracy : $\leq \pm 0.15\text{mm}$

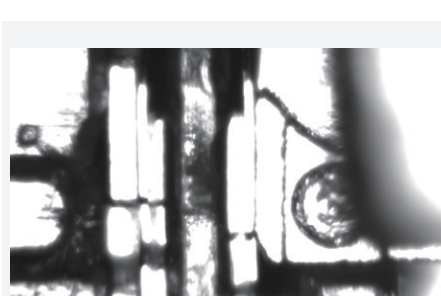
Visual Positioning : $\geq 99.8\%$

False Positive Rate after Welding : $\leq 0.5\%$

Omission Ratio after Welding : 0

3C Electronics

Acoustic Engine Laser Welding




Difficulties : Coaxial laser processing imaging system has poor image quality, few positioning features and serious interference.

Solution : Algorithms such as linear caliper, blob, kerf, etc., the positioning robustness is better than conventional linear positioning.

Overall Accuracy : $\leq 20\mu\text{m}$

Static Repeatability : $\leq 0.5\text{pixels}$

Dynamic Repeatability : $\leq 3\text{pixels}$

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Leaper Official Website



Official Accounts