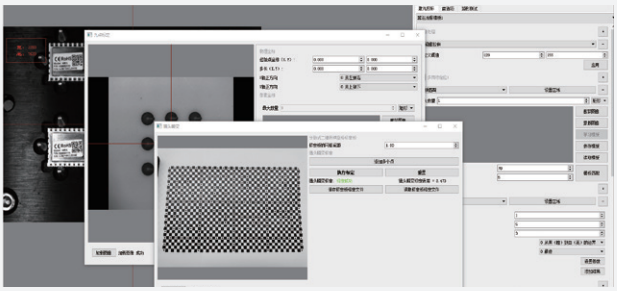
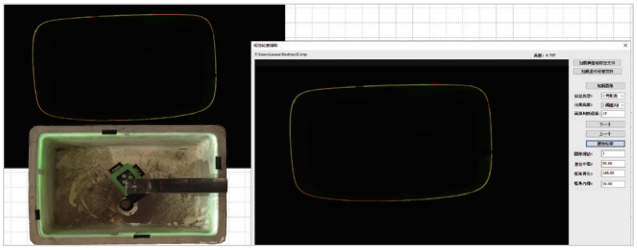
LEAPER Visual Inspection Solutions for Laser

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.



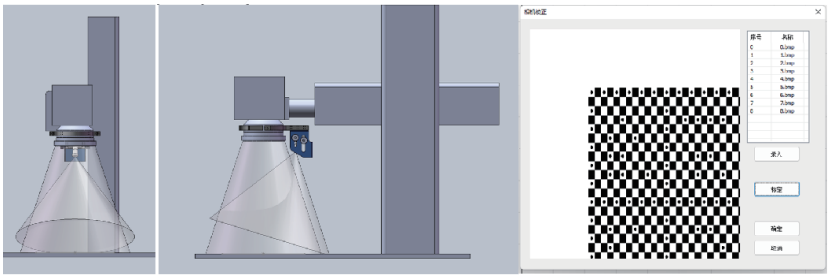


LPVC Contour Recognition Algorithm Module

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: ≥160mm×160mm

Single Pixel Accuracy: ≤ 0.1mm

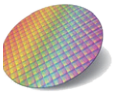
Data Interface: USB2.0

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
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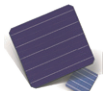
3C Electronics

+ Sound Film Cutting
+ Motor Welding
+ FPC Cutting
.....

Solar Photovoltaic



+ Junction Box Laser Welding
+ Crystalline Silicon Cell SE
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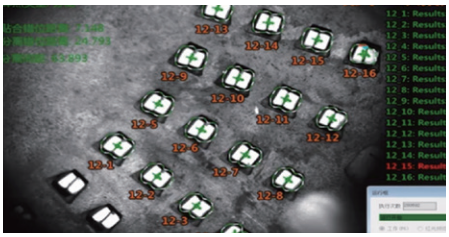
PCB

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

Automotive

Flat Wire Motor Laser Welding



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

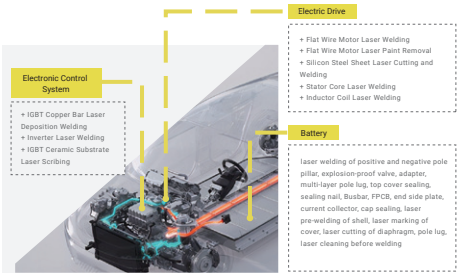
Static Repetitive Positioning Precision : ≤ 0.5pixels

Overall Processing Positional Accuracy : ≤ 15μm

Overall Processing Yield Rate : ≥ 99.5%

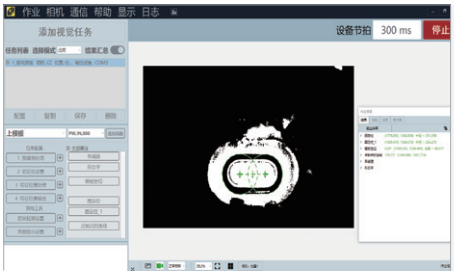
Visual One-shot Positioning Beats : ≤ 200ms (Without Processing)

Total Beats (Vision + Welding) : ≤ 35s



Li-ion Battery

Cover Plate Assembly Laser Welding



Static Repetitive Positioning Precision : ≤ 0.5pixels

Overall Processing Positional Accuracy : ≤ 15μm

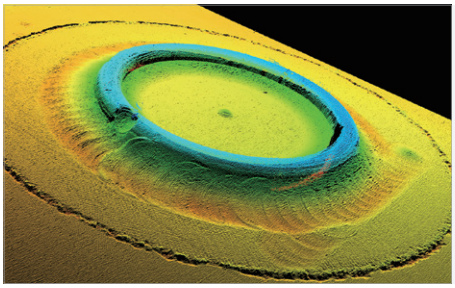
Overall Processing Yield Rate : ≥ 99.5%

Visual One-shot Positioning Beats : ≤ 200ms (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

Sealing Nail Laser Welding



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

Detection Accuracy : 0.2mm

Visual Detection Range : ≤ 9mm

Overkill Rate : ≤ 1.0%

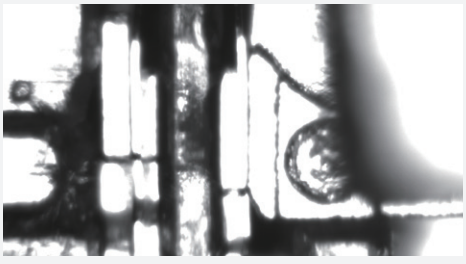
Omission Ratio : 0

Equipment Beats : ≤ 6.3PPM

Visual Beats : ≤ 1.5s/PCS

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.

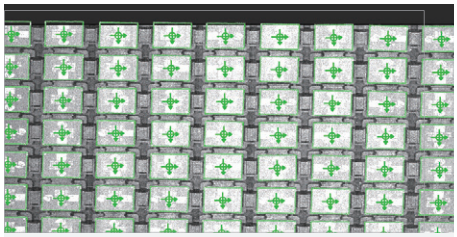
Overall Accuracy: ≤ 20μm

Static Repeatability: ≤ 0.5pixels

Dynamic Repeatability: ≤ 3pixles

Semiconductor

IC Chip Laser Marking



Frame Width : ≥ 135mm

Product Size : ≤ 320mm×135mm

Chip Size : Minimum 3mm×3mm, Maximum 65mm×65mm

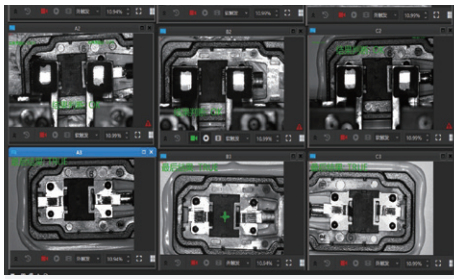
Image Acquisition Time : ≤ 3s

Image Processing Time : ≤ 30ms / Single Chip

Visual Positioning Accuracy : ≤ ±0.02mm

Solar Photovoltaic

PV Module Junction Box Laser Welding



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

FOV : ≥ 60mm×40mm

XY Positioning Accuracy : ≤ ±0.15mm

Visual Positioning : ≥ 99.8%

False Positive Rate after Welding : ≤ 0.5%

Omission Ratio after Welding : 0

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