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PRODUCT CATALOGUE

Leader In Laser Solutions

КЛЕВЕР ЭЛЕКТРОНИКС
www.clever.ru



ABOUT HYPERTRONICS



ABOUT US

Hypertronics is a Singapore based company founded in 1991. Foreseeing the tremendous potential of the laser technology in many industrial and research arenas, founder Mr Buk Mum Fatt and his dedicated team, have toiled hard to bring the company to where it is today.

Starting out as a laser distributor, we have grown to develop and manufacture our own exceptional range of laser systems and vision inspection /verification systems. Through the years we have built up a strong team of highly capable, experienced and competent engineers, coupled with our relentless effort and investment in R&D, we have been able to come up with some of the most advanced and practical laser solutions in the industry. In addition to that, we have invested in a comprehensive application laboratory where we can make samples and configure prototype setups to test customers' concepts.



RECOGNITION, GRANTS AND FUNDING FROM THE GOVERNMENT

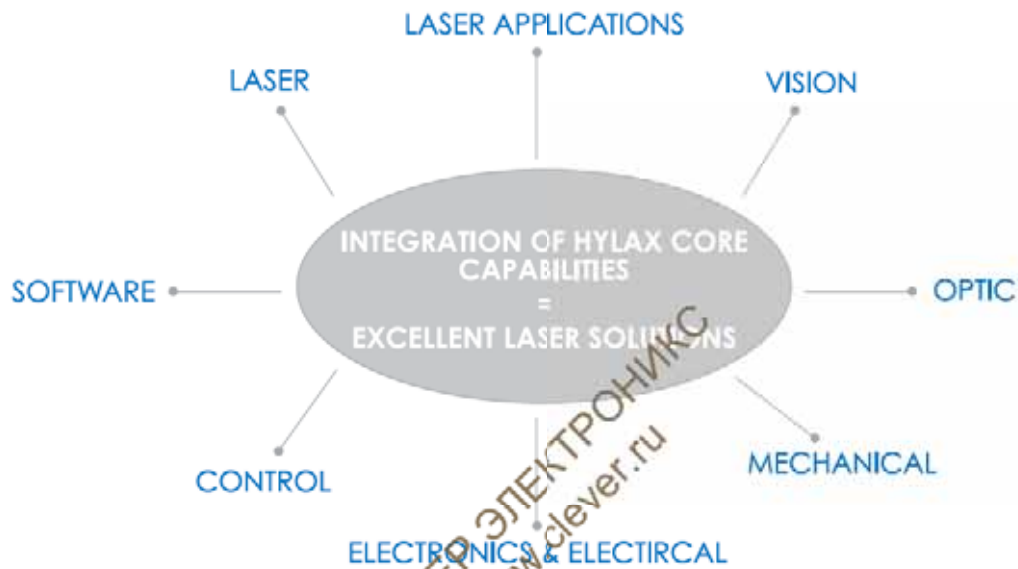
Our efforts are recognized by the Agency of Science, Technology and Research (A-STAR) of Singapore and the Economic Development Board of Singapore (EDB), who have awarded us with grants and funding in our continuing R&D efforts. In recognition of our efforts and contribution to the nation of Singapore, the Government of Singapore have also awarded us the Pioneer Company Certificate.

OUR MARKETS

Our capability to provide quality laser solutions, excellent support and competitive pricing has won us a big market around the World, with over 800 installations worldwide, including Malaysia, China, Thailand, USA, India, Russia, Taiwan and Europe. With our proven experience and capability in laser technology, coupled with a comprehensive application laboratory, we are well equipped to help customers implement laser solutions into their manufacturing process effectively.

OUR CORE CAPABILITIES

Our strength lies in our nimble flexibility in working with customers to come up with innovative, cost effective and practical solutions to meet their requirements. We offer customized laser solutions for marking, trimming, cutting, welding, lapping, soldering and engraving applications. We provide full integration services, including working with established handler builders, or designing and building our own handlers, integrating scanner and vision inspection/verification systems, together with customized software solutions to meet customer's requirements. With our expertise in the laser, laser application, software, vision, optic, electronics & electrical, controls and mechanical arena, we are able to come up with innovative solutions that offer better reliability, reduced machine complexity and simplified man-machine.



Production Team



Application Team



Laser R & D Team



Software Team

The **Hylax HT1000** series is a diode pumped Nd: YAG solid-state laser that used diode packaging technologies with features of long life diode bars. It is ideally suited for marking and engraving applications where high pulse energy is required. This series is equipped with an integrated control laser unit and Hypermark control software.

Features:

- High pulse energy
- Superior beam quality and excellent long-term stability
- Water-Cooled
- Windows interface software
- Diode life span > 8000 hours

Applications:

- Marking, Engrave on metal, stainless steel, aluminium, brass, etc
- Ablation on plastic
- Scribing, trimming, drilling, cutting of thin metals



Anodized Aluminium Marking



Gold Seal Lid IC Marking



Marking on Stainless Steel Curve Surface



Gold Marking



ID Card Marking (Plastic, PC-PET)



Barcode Marking On Plastic Security Seal



Keyboard Marking (Plastic)



Plastic Marking

Technical Specifications

HT1000	
Wavelength (nm)	1064
Output Power (W)	50*
Q-Switch Pulse Repetition (kHz)	Up to 60
Pulse to Pulse Stability (%)	<5
Input Power (kW)	2
*Optional at 75W	

Dimension
740 mm (Length) x 150 mm (Width) x 201 mm (Height)

Lens for Field Size (mm)Δ	Working Distance (mm)
60 x 60	100
110 x 110	180
160 x 160	300/311
250 x 250	483

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	110 x 110*
*Optional at 60 x 60, 160 x 160, 250 x 250	

Options
Integrated Vision Inspection System
Auto & Semi-Auto Handlers
Data Matrix and Linear Barcode Verifier
Dust Collector / Fume Extractor
Red Targeting Laser
Auto Power Calibration System
Marking Software Customization

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Notes: Δ The table above indicates one selection only that must be fixed during the purchase. All specifications are subject to change without prior notice.

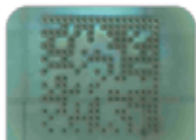
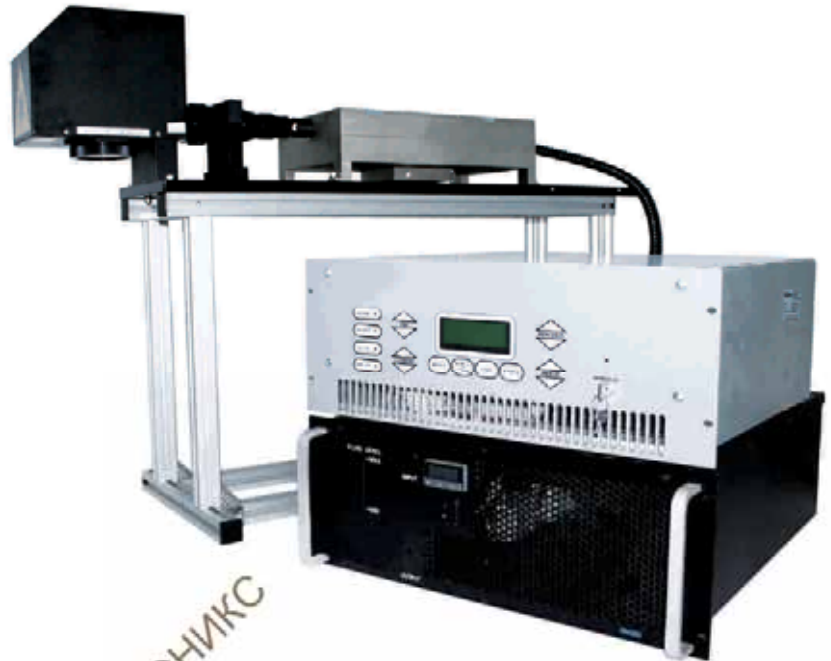
The **Hylax HT2000** series of UV lasers is very effective in micro range clean marking and cutting application. UV laser cutting is becoming a very viable alternative to replace conventional cutting method. This series come with an integrated control laser unit and Hypermark control software.

Features:

- Excellent marking quality and high reliability
- High speed marking
- Optional Air-Cooled and Water-Cooled
- Low utility cost and low maintenance
- Windows base user interface software

Applications:

- Flex-PCB cutting
- PCB hole drilling
- Glass marking
- Plastic marking
- Micro-marking on wafer



Data Matrix
Marking on Glass



PCB Cutting



SiC Wafer



Sapphire Crystal
Wafer Marking

Technical Specifications

HT2000	
Wavelength (nm)	355
Output Power (W)	1*
Q-Switch Pulse Repetition (kHz)	Single shot to 200
Pulse to Pulse Stability (%)	<3
Spatial Mode	TEM ₀₀ (M2<1.2)
*Other output power available up to 10W	

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	110 x 110

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Dimension	
580 mm (Length) x 220 mm (Width) x 200 mm (Height)	

Options	
Auto & Semi-Auto Handlers	
Data Matrix and Linear Barcode Verifier	
Dust Collector / Fume Extractor	
Red Targeting Laser	
Auto Power Calibration System	
Marking Software Customization	

The **Hylax HT4000** series of air-cooled diode-pumped Nd: YAG/ Nd: YVO4 solid state lasers are built such that no chilled water is required and features a hermetically-sealed enclosure. The design is compact, light weight and has been well-proven in rugged industrial environment. The HT4000 offers excellent laser beam mode, small spot size and is ideally suited for applications such as annealing, surface etching & ablation. This series can be configured both as a desktop design with an integrated laser control unit or in a machine mountable form with separated control unit for mounting onto handlers.

Features:

- Excellent laser mode and small spot size
- Superior long term power stability
- Totally Air-Cooled
- Low utility running cost
- Diode Life span > 20,000 hours

Applications:

- Marking and ablation on plastics
- Annealing, etching on metal such as stainless steel, brass & gold
- Scribing on solar cell ITO/TCO layer



Gold Marking



2D Matrix on Brass



Polymer IC Chip Marking



Barcode Marking on Plastic



Precision Micro Circuit Cutting



Security Tag Marking



Keyboard Marking (Plastic)



Metal Can Marking

Technical Specifications

HT4000	
Wavelength (nm)	1064
Output Power (W)	10 to 20
Q-Switch Pulse Repetition (kHz)	5 to 100
Pulse to Pulse Stability (%)	<3
Input Power (kW)	1

Dimension
588.5 mm (Length) x 150 mm (Width) x 164.8 mm (Height)

Lens for Field Size (mm)Δ	Working Distance (mm)
60 x 60	100
110 x 110	180
160 x 160	300/311
250 x 250	483

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	110 x 110*
*Optional: at 60 x 60, 160 x 160, 250 x 250	

Options
Integrated Vision Inspection System
Auto & Semi-Auto Handlers
Data Matrix and Linear Barcode Verifier
Dust Collector / Fume Extractor
Red Targeting Laser
Auto Power Calibration System
Marking Software Customization

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Notes: Δ The table above indicates one selection only that must be fixed during the purchase. All specifications are subject to change without prior notice.

The **Hylax HT5000** series of fiber lasers is famous for its low cost maintenance with long operating life span of up to 100,000 hours. With long lifespan and affordable price, fiber laser system has become the best laser solution in manufacturing industries. This series come with an integrated control laser unit and Hypermark control software.

Features:

- Excellent marking quality and high reliability
- High speed marking
- Optional Air-Cooled and Water-Cooled
- Low utility cost and low maintenance
- Windows base user interface software
- Long operating life > 100,000 hours

Applications:

- Marking on plastic
- Annealing, etching on metal, stainless steel
- Ablation on plastic
- Scribing on solar cell ITO/TCO
- Cutting/Drilling



IC Marking



LeadFrame Marking



Metal Marking



Solar Wafer Cutting



Solar Wafer Marking



Barcode Marking On Plastic Security Seal

Technical Specifications

HT5000	
Wavelength (nm)	1060 to 1070
Output Power (W)	20*
Output Power Tenability (%)	10 to 100
Q-Switch Pulse Repetition (kHz)	2 to 80*
Output Fiber Delivery Length (m)	1 to 3
Emission Bandwidth (nm)	<5
Typical Beam Quality (m ²)	1.4
Pulse Width (nm)	100
Long Term Power Stability (%)	<5
Operating Voltage (V)	24 VAC
Typical Power Consumption (W)	0.18
*Optional at 10W, 30W, 50W, 100W	

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	110 x 110*
*Optional at 60 x 60, 160 x 160, 250 x 250	

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Lens for Field Size (mm) Δ	Working Distance (mm)
60 x 60	100
110 x 110	180
160 x 160	300/311*
250 x 250	483

Options
Integrated Vision Inspection System
Auto & Semi-Auto Handlers
Data Matrix and Linear Barcode Verifier
Dust Collector / Fume Extractor
Red Targeting Laser
Auto Power Calibration System
Marking Software Customization
Dual Heads Configuration

Notes Δ The table above indicates one selection only that must be fixed during the purchase.
 * Other repetition rate available.
 All specifications are subject to change without prior notice.

HT6000 | CO2 LASER SYSTEM

The **Hylax HT6000** series of CO2 lasers have a all-metal sealed tube design and proprietary manufacturing process to ensure high gas purity, essential for long operating life. It is economically priced, low utility cost and ideally suited for use in industrial manufacturing applications. This series come with an integrated control laser unit and Hypermark control software.

Features:

- Excellent marking quality and high reliability
- High speed marking
- Low utility cost and low maintenance
- Optional Air-Cooled and Water-Cooled
- Windows base user interface software
- Long operating life > 45,000 hours

Applications:

- Marking on IC, PCB or electronic components
- Trimming
- Cutting on plastic
- Drilling on polymer



Barcode & Alphanumeric Marking on PCB



Transparent IC Marking



Ceramics Marking



Wood Marking

Technical Specifications

HT6000	
Wavelength (nm)	10,600
Output Power (W)	10*
Q-Switch Pulse Repetition (kHz)	5 to 20
Pulse to Pulse Stability (%)	<5
Input Power (kW)	1

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	50 x 50*
*Optional at 35 x 35, 70 x 70, 110 x 110, 140 x 140	

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Dimension
264.2 mm (Length) x 130 mm (Width) x 604 mm (Height)

Lens for Field Size (mm) Δ	Working Distance (mm)
35 x 35	141
50 x 50	65
70 x 70	127 / 146
110 x 110	165
140 x 140	215 / 277

Options
Power Feedback
Auto & Semi-Auto Handlers
Data Matrix and Linear Barcode Verifier
Dust Collector / Fume Extractor
Red Targeting Laser
Auto Power Calibration System
Marking Software Customization

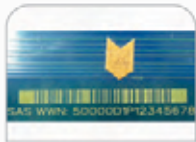
Notes: ΔThe table above indicates one selection only that must be fixed during the purchase. All specifications are subject to change without prior notice.

The **Hylax HT7010** PCB Laser Marking System is a cost-effective tool to replace printed labels and other methods of having unique numerical codes on PCBs by marking serial numbers, barcode, 2D matrix (e.g. for tracking purpose) and other text and even logos directly onto the PCB surface.

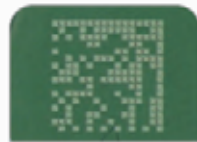
We are the pioneer in this application with more than 14 years experience, and hold a patent for 'Using laser to mark on Printed Circuit Boards (PCBs)'.

Features:

- Vision positioning and inspection
- Marked data verification
- High speed marking
- User friendly software
- Customizable for different board size and process flow
- IN-LINE and OFF-LINE configurable
- Auto serialization
- Group serialization
- Multi-position and orientation marking
- Integrated barcode reader
- Compact size
- Low maintenance



Barcode & Alphanumeric Marking on PCB



Data Matrix Marking on PCB



Advantages:

- Cost saving - no consumables and minimal manpower involvement
- Permanent mark – Temper prevention
- Automated labeling – No manual labeling by operator
- Accurate label position
- Heat resistant – Withstand high temperature
- Excellent mark quality – No smudging of mark
- Highly reliable mark quality

Technical Specifications

HT7010	
Wavelength (nm)	10,600
Output Power (W)	10*
Q-Switch Pulse Repetition (kHz)	5 to 20
Pulse to Pulse Stability (%)	<5
Input Power (kW)	1

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	70 x 70*
*Optional at 35 x 35, 70 x 70, 110 x 110, 140 x 140	

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Dimension	
810 mm (Length) x 1600 mm (Width) x 1460 mm (Height)	

XY Positioning System	
Linear Slide Stages with Limit Switches and Covers	
Motorised X-Y Stage+ Power Supplies	
PC to motor interface card	

Fume Extractor	
Centrifugal Fan Blower	
Cylindrical Paper	
Cartridge Filter - Consumable	

PCB Transport Conveyor	
Bell conveyor driven by motor	
Input and output sensors	
PCB clasper with sensor	
PCB size; 3" x 3" (min) & 20" x 20" (max)*	
Manual or auto width adjustment	

Vision System	
PC based with camera and Vision Card	
Light illumination	
Vision PC controller	

Lens for Field Size (mm) Δ	Working Distance
35 x 35	141
50 x 50	65
70 x 70	127 / 146
110 x 110	165
140 x 140	215 / 277

Options	
Dust Collector / Fume Extractor	
Red Targeting Laser	
Auto Power Calibration System	
Marking Software Customization	

Note: Δ The table above indicates one selection only that must be fixed during the purchase.
 * Other size can be customised
 All specifications are subject to change without prior notice.

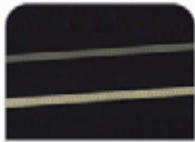
The **Hylax HT9000** series of Green Diode Pumped solid-state laser is ideally suited for micro range applications where small spot size and excellent mark quality are the most important process requirements. This series offers superior long-term stability, low utility running costs, easy to operate and maintain. This series come with an integrated control laser unit and Hypermark control software.

Features:

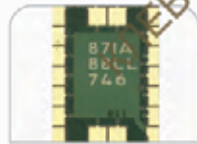
- Available in output power levels of 5W, 10W at 532nm
- Excellent laser mode and smaller spot size
- Diode life span > 8000 hours
- Integrated Air-Cooled
- Low utility running cost
- Windows interface software
- Scribing speeds of up to 1000mm/s

Applications:

- Micro-marking on wafer
- Grooving or edge deletion for silicon wafer
- Scribing on thin-film without damage to the underlying substrate.
- Ablation on plastic without burning material
- Cutting/Drilling



Scribing on Solar Panel



Substrate Marking



Wafer Marking



Medical Device Marking

Technical Specifications

HT9000		
Wavelength (nm)	532	
Output Power (W)	5	10
Q-Switch Pulse Repetition (kHz)	Up to 80	Up to 100
Pulse to Pulse Stability (%)	<5	<5
Input Power (kW)	1	2

HyScan™ 200: Scanhead System	
Laser Beam Delivery	Galvanometer Scanhead System
F-Theta Lens Marking Area (mm)	110 x 110*
*Optional at 35 x 35, 70 x 70, 110 x 110, 140 x 140	

Utilities	
Power Supply	230 VAC, Single Phase, 13 Amp

Lens for Field Size (mm) Δ	Working Distance (mm)
35 x 35	141
50 x 50	65
70 x 70	127 / 146
110 x 110	165
140 x 140	215 / 277

Options
Integrated Vision Inspection System
Auto & Semi-Auto Handlers
Data Matrix and Linear Barcode Verifier
Dust Collector / Fume Extractor
Red Targeting Laser
Auto Power Calibration System
Marking Software Customization

Notes: Δ The table above indicates one selection only that must be fixed during the purchase. All specifications are subject to change without prior notice.

DIODE LASER SYSTEM



The **Hylax Diode Laser** series is a popular choice in replacing glue dispensers in plastic joining with little or no consumables involved. Diode laser welding allows users to do selective area welding with a clean seal and no discoloration. Laser welding can also be enhanced by using additives to increase bond strength. This series comes with a laser control unit and the Hypermark laser control software.

Features:

- Available in output power levels of 30W onwards at 808nm, 915nm, 940nm or 980nm
- Available in wavelength from 808nm to 1980nm
- Achievable beam spot size 0.1mm-5.0mm
- Excellent welding quality and high reliability
- Totally Air-Cooled
- Low utility cost and low maintenance
- Windows-base user interface software

Applications:

- Plastic welding
- Soldering PVC, PC welding
- Biomedical welding

Transparent Plastic welding



Front View



Side View



The **Laser Scribing** or patterning is performed on solar glass panel to divide the panel into individual solar cells. Being a non-contact process and by choosing the correct wavelength, we can perform all P1, P2 and P3 scribing without harming the underlying layers. We are able to integrate the laser into our machine to provide a total solution for you.

Features:

- High positioning accuracy of +/- 5 um
- Granite base design to prevent vibration and ensure panel flatness
- Linear stage with encoder for high accuracy stage movement
- 3 points adjustable alignment pins
- Scribing speeds of up to 1000mm/s
- Integration with either 1064nm or 532nm laser
- Multiply beams to reduce processing time

ROTARY TABLE LASER SYSTEM

Our laser systems can be configured with a multi-station rotary table handling system. The advantages of a rotary table for laser processing includes as below:-

- Faster cycle time – Laser marking and loading/unloading done concurrently
- Class One safety enclosure – Laser beam fully enclosed within marking compartment
- Possible to configure from 2 to 6 stations



The **CO2 laser** has been used widely in the processing of polymer especially for transparent polymer due its economical pricing and ability of the wavelength to be absorbed by the material. Some polymers, being soft, tend to get distorted during handling together with the miniaturisation of products; conventional method of simply placing the workpiece into the holder for processing will not be able to meet the accuracy needed. Taking these into consideration, Hypertronics came up with a high precision system to counter this problem.

Features:

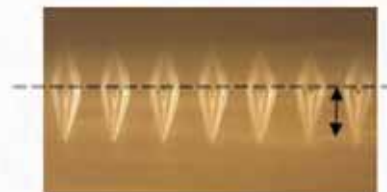
- Excellent marking quality and high reliability
- High speed marking
- Low utility cost and low maintenance
- Optional Air-Cooled and Water-Cooled
- Windows base user interface software
- Long operating life > 45,000 hours

Power Feedback System

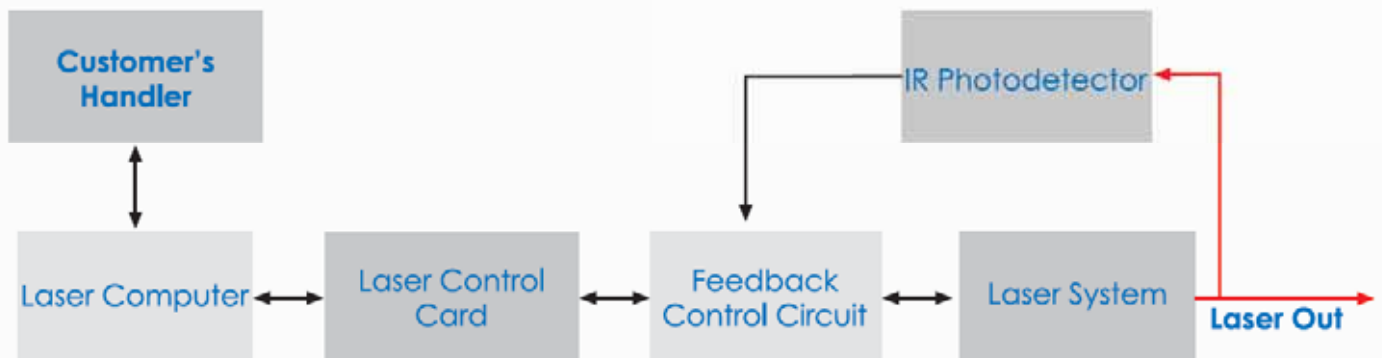
Real time feedback system with a photo detector allows continuous monitoring of the output power. By integrating this system into application like drilling or marking of data matrix, holes or dots with consistent size and depth can be achieved.



Data Matrix on Flex Circuit



Cross sectional view of the drilling result in polymer. The dotted line is the surface of the polymer.

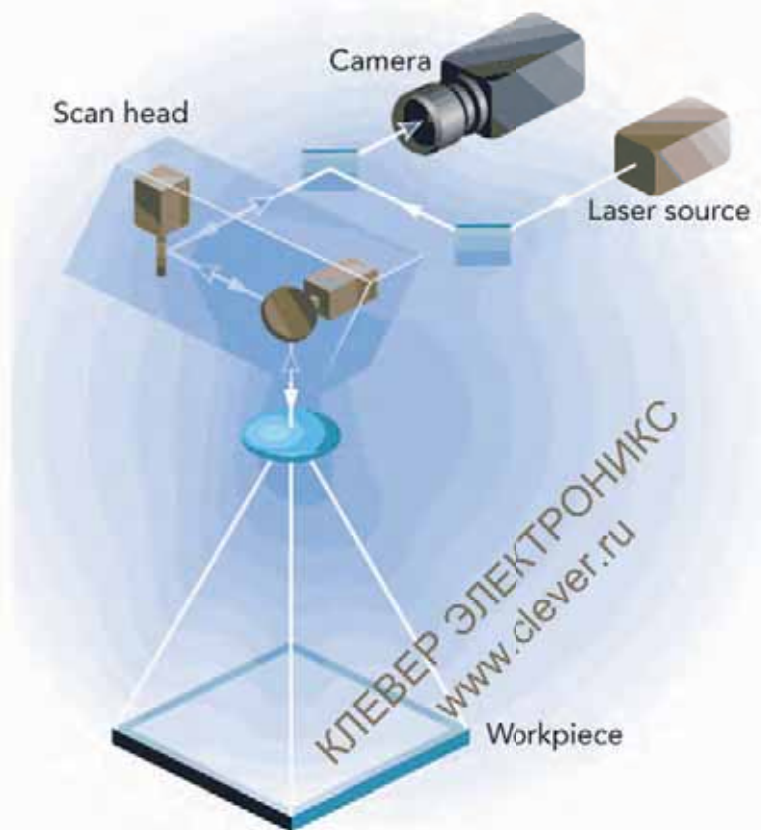


Power Feedback System

SCANVISION™ LASER SYSTEM

IN-LINE VISION LASER TECHNOLOGY

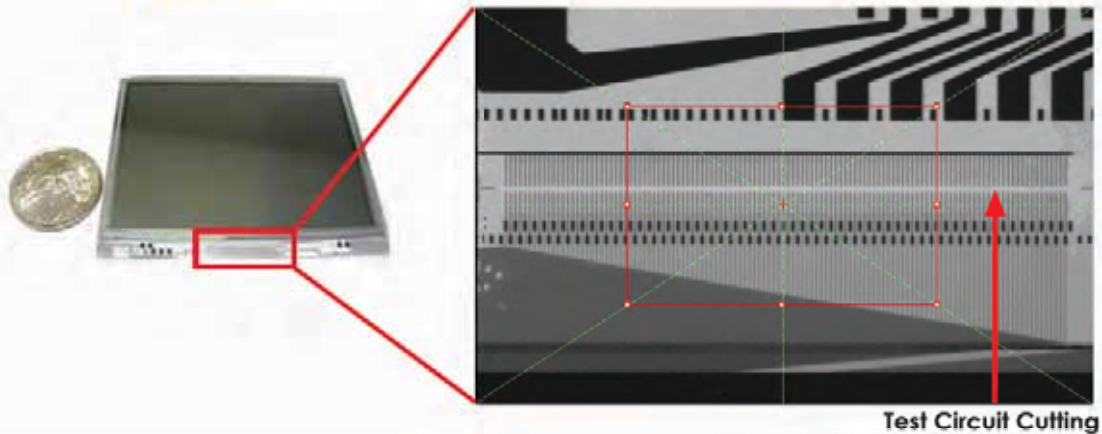
The HYLAX proprietary ScanVision™ Laser System incorporates vision camera system, In-line with laser beam path, through the galvanometers beam positioning system. Real-time vision compensation for work piece drift or fiducial find accurate to a few microns tolerance can be achieved at blinding speed of a few milliseconds in laser processing application (welding, marking, cutting, drilling etc.)



Features of ScanVision™ :

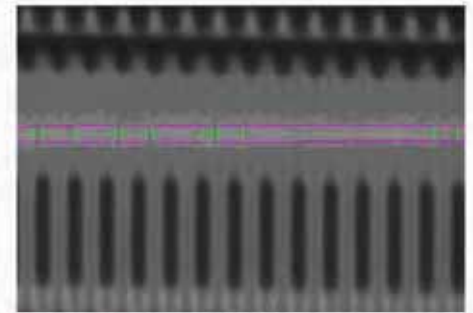
- In-line visible and laser light near perfect coincident to each other
- Active work piece misalignment compensation in situ at high speed.
No need for expensive jig and fixturing of work pieces to achieve accurate laser processing
- Micron level positioning accuracy
- Large scanning area of up to 160mm x 160mm
- Pre/post marking inspection by movement of galvanometer
- Compact design with only moving galvanometers for long term operation.
No need to move work piece or camera resulting in small work envelop requirement
- Proven Software interfaces in Visual Basic, 'C', Ethernet and RS232 to link with 3rd party software for complex solutions and customisation

Application: Flat Panel Display (FPD) Panel Test Circuit Cutting



Features:

- Cut line accuracy +/- 10um
- Improved accuracy enable smaller and more flexible FPD design
- Throughput improved by 5 fold compare to conventional X-T stage
- Ultra high speed Post Inspection feature: for automated QC inspection process, eliminating labour intensive QC check and human error



Post Cut Inspection: A few unclean cuts due to incorrect laser power settings are detected

ScanVision™ Application: Flat Panel Display (FPD) Panel Test Circuit Cutting

Features:

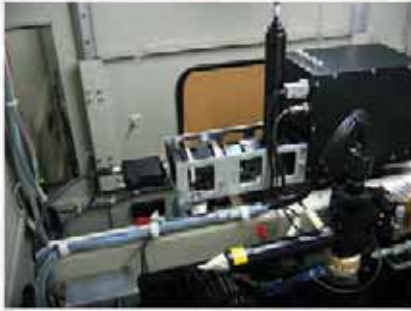
- Marking IDs on an array of sub panels in a big glass panel
- Marking various 2D codes and human readable characters with height 0.8mm
- Marking tolerance down to +/-15um
- Post mark verification of every markings
- G6 (1.5m x 1.9m) panel machine successfully implemented
- CIM communication (SECs GEM)
- Interface with robotics & AGC-RFID load/unload systems
- Fast tact time



Inside of a 7-Heads ScanVision™ Laser FPD Marking Machine

SCANVISION™ LASER SYSTEM

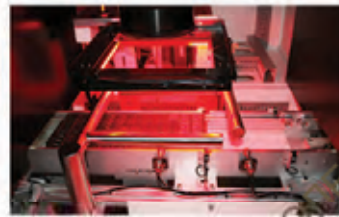
ScanVision™ Application: High Accuracy Laser Welding of HDD suspension



Features:

- Ultra high speed welding – 4 x faster compare to conventional welder with X-Y table
- Microns level welds location accuracy

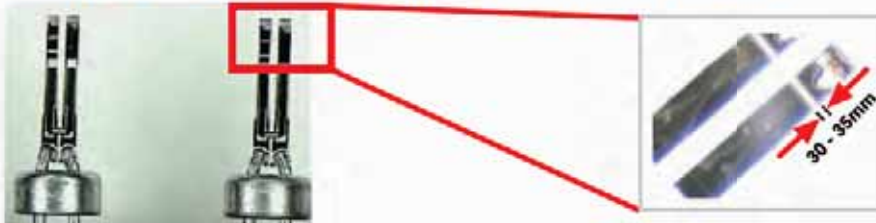
ScanVision™ Laser Application: JEDAC Tray IC Marking



Features:

- Pre mark Orientation check before marking
- Miss-orientation chip should be removed upon ScanVision™ detection and alarm
- It is desired to have add on laser marks to their originally marked IC chips with the add-on well aligned which gives a look that the ICs are marked in one time
- ScanVision™ Laser marker can do a registration of the original mark and adjust the new markings to keep in line with the old

ScanVision™ Application: Trimming of Crystal Oscillator



Features:

- Laser trimming, with a real time measurement feedback module is used to trim crystals to have an accurate, specified resonant frequency
- ScanVision™ Laser is used to find the individual fork, which is arranged in a row
- +/-10um accuracy on trimming position
- Improve overall UPH greatly (by more then 50% compare to the conventional X-Y stage trimming machine)



PC Controller

- Windows-based PC Controller
- Marking Software
 - Hypermark (CAD-Based)
 - GUI marking software for creating & editing :-
 - Text
 - Barcode
 - Data Matrix
 - Polygon

Optional Features Include:

- Windows True Type Font
- Font Editor
- PLT, AutoCAD format import
- RS-232 Serial Comm
- TCP/ IP comm. via Win Socket
- BMP/ Tiff marking
- Other Data Codes: Pdf417, Vericode etc.



PCI Version



DSP Version



ISA Version

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