

# ProVia™ FP-C

Single Laser Drilling System (CO<sub>2</sub>) for Flex and Rigid HDI Board Processing.



## ProVia CO<sub>2</sub> Laser System

- Single laser (CO<sub>2</sub>) system for dielectric and thin copper processing.
- High performance beam positioning for rapid, accurate panel processing.
- Zoom telescope provides continuously variable CO<sub>2</sub> spot sizes
- Optional automatic load/unload and slip sheet handling
- Optional beam homogenizer for flat-top CO<sub>2</sub> spots

## Designed for Next-Generation High Volume Via Drilling Requirements

The system auto-calibration ensures repeatable job quality with minimal effort on the part of the operator. It also offers optional networking software with automatic file retrieval and job creation as well as optional panel automation with slipsheet handling.

## Configured for all Applications

The system is configured for all applications including blind via drilling, cutting, routing, skiving / cavity formation as well as defect repair.

## Advanced ProSys™ Control Software

ProSys software allows for automated drill file conversion and job generation and provides a vision display of the job features and process status. All machine setup and calibration controls, job and process settings, vision and process map, status and diagnostic information is accessible with a single click or tap.

Drill process tools allow precise control over bite size, spiral spacing, cut direction, via size fine adjust, inner diameter, perimeter revolutions and repetitions using a Windows 10 64-bit architecture.

## Applications

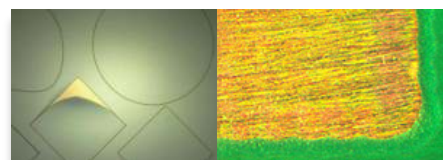
- Blind via drilling
- Routing
- Patterning
- Skiving / cavity formation
- Solder mask removal
- Drilling green tape



HDI Microvia



Flex Circuit Processing

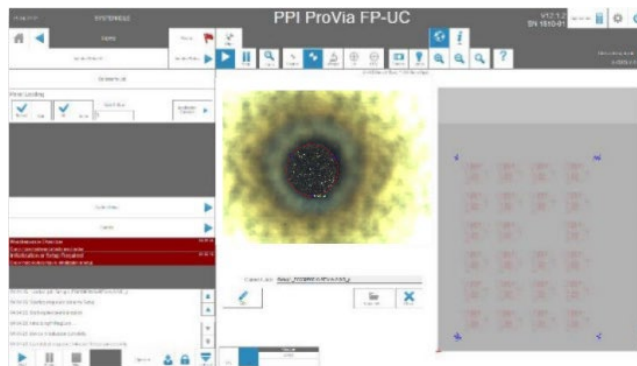


Drilling and cutting green tape (L) and solder mask removal (R).

The ProVia systems are advanced processing workstations for rigid, rigid-flex or flex panels, with high performance beam positioning for rapid point-to-point drilling and routing complex features. Choose a UV-only model, a CO<sub>2</sub>-only model, or the hybrid version with both laser sources.

## ProSys™ Software for ProVia™ Systems

Intuitive graphical user interface that offers unmatched ease of use for both operators and process engineers. All machine setup and calibration controls, job and process settings, vision and process map, status and diagnostic information - accessible with a single click or tap.



### Features

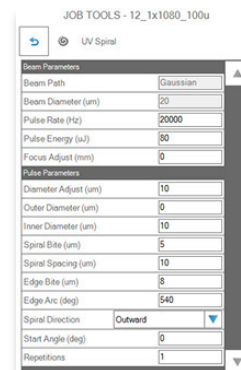
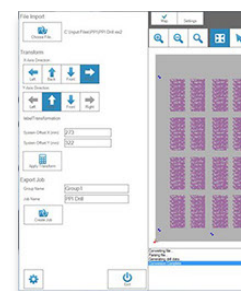
- Simple operator interface - load panels and just press Start.
- Process map - visualize all job features in map or camera overlays. Clearly see at a glance what and where the process is, in real time.
- Fully automatic run-time calibration activates when set to run, ensuring process stability and accuracy.
- Real-time system monitoring for process integrity.
- Touchscreen support for all operator interaction.
- Automated file conversion and job creation without operator intervention.
- Compatible with industry standard file formats.
- File conversion automation with network interface and barcode reading allows unattended job creation.
- Automatic multi step and multi pass processing with performance optimization.
- User type access levels with password protection for visibility and access to configuration, set-up and operating screens.
- Maintenance Tracker logs all system maintenance and history, and provides prompts at maintenance intervals.
- Full system diagnostics and data logging for enhanced product support and predictive maintenance.
- Remote access through the internet allows factory support without the cost of a service visit.
- Multi-language selectable.

### Job Creation

Stand-alone utility performs file conversion and job generation. Provides a graphical map of job features and facilitates panel orientation. Full support of industry standard input file formats including mixed drill and rout tasks within the same job.

### Process Control

Independently control laser pulse energy and repetition rate. Drilling process tools allow precise control over bite size, spiral spacing, cut direction, via size fine adjust, inner diameter, perimeter revolutions, and repetitions. Hole sizes are not limited by the laser spot size. Punch, spiral or rout with both UV and CO<sub>2</sub> laser process tools. Multi-step and multi-pass processing provide unlimited combinations of operations for ultimate flexibility and process optimization. Quick tool process parameter evaluation using the process Test Array functions for both drilling and routing tools.



## A complete range of features and options to make your production more productive.

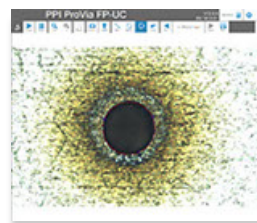
### Autoloader

- Complete automation allows for trays of panels to be loaded into the system. Panels are loaded by vacuum pickup.
- Alternate compact autoloader within the core system footprint.
- Both schemes have configurable pickup vacuum zones.
- Slipsheet pass-through handling for both autoloader styles.
- Configurable for large panel and continuous web processing.
- Compatible with roll-to-roll web handlers.



### Integrated inspection microscope

A 2.3MP HD color camera can inspect microvias after processing. Zoom optics are designed for viewing microvias in the 50 - 200  $\mu\text{m}$  diameter range. On-screen measurements can be created, and images saved for later use. Powerful white LED light sources provide both coaxial and low angle ring illumination.



### Flat-top beam homogenizer

As an alternative to the normal Gaussian intensity profile, flat-top  $\text{CO}_2$  spots permit drilling and pocketing operations with a very consistent process and less risk of damage to sensitive inner layers. The user can even switch between Gaussian and flat-top spots within the same job.



### Dual-head, dual-panel drilling

The single-laser systems (UV-only,  $\text{CO}_2$ -only) can be configured with two independent galvo stations and two vacuum tables for dual-panel operation. The ProVia software is highly adaptable, able to process different jobs independently on two panels through two galvo heads.



### Panel thickness measurement probe

An ultra-reliable electro-mechanical height probe is available to measure / verify the panel thickness prior to processing. This helps prevent drilling the wrong panels or with the wrong job.

### Networking software with automatic file retrieval and job creation

The system can even accommodate a tray of mixed panels, using optional OCR or barcode to read panel ID and load the appropriate job from files on the system or network.

## ProVia Specifications\*

### System Hardware

- High peak power RF-excited CO<sub>2</sub> laser
- Configured with high performance beam positioning for high speed via drilling, skiving and cutting
- Single drilling modes: conformal mask CO<sub>2</sub>, direct CO<sub>2</sub>
- Galvanometer scanning field: 50x50 mm (approx. 2"x2")
- Maximum process area: 610x660 mm (24"x26")
- Vacuum platen for panel hold-down
- Integrated power meter for accurate process control
- Precision linear motor XY stages with linear encoder feedback
- High performance motion and laser control
- CDRH Class 1 enclosure
- Large process viewing window
- Automated vision system for precision alignment, scaling, offset, trapezoidal and rotation compensation
- Beam placement accuracy: 20µm for CO<sub>2</sub> over panel process area
- Ultra-stable steel weldment frame with resonance dampening
- Compliant with CE and North American regulations
- Optional panel thickness probe
- Optional integrated microvia inspection microscope
- Optional panel automation (full size or compact) with slipsheet

### Utilities

- Electrical: 208 VAC, 3Ø, 50A, 60HZ or 400 VAC, 3Ø, 30A, 50HZ
- Exhaust: ablation debris removal through 75mm duct
- Dimensions (HxWxD): 2620 x 1620 x 2372 mm (103 x 64 x 93") central unit, service door open
- Weight: 3200 kg (7000 lbs) net, 3740 kg (8230 lbs) shipping without autoloader
- Water: 8 l/min or optional closed cycle water chiller

### System Control

- Windows 10® based user interface
- User friendly operator screens
- Compatible with industry standard file formats
- Rapid drill file conversion and path optimization utility
- Full system diagnostics available remotely through internet port
- Password protection for access to configuration, set-up and operating screen
- Real-time system monitoring for process integrity
- Optional networking software with automatic file retrieval and job creation
- Optional barcode reader software

### Process Parameters

- High peak power laser sources to minimize heat affected zone and produce clean edges with little process residue
- Point-to-point moves, continuous line and area scanning, and circuit excising
- Programmable laser energy, pulse rate, pulse overlap and scanning area
- Advanced tool and job editing functions
- Automatically process stepped vias and buried fiducials
- Via sizes and cut widths down to 50µm using the CO<sub>2</sub> beam
- Zoom telescope provides continuously variable spot sizes for the CO<sub>2</sub> beam
- Optional beam homogenizer for flat-top CO<sub>2</sub> spots

\*Consult PPI for processing rates in your material



Photo of manual load version

## System Configurations

