

Laser Types

CO₂ (standard)

CO₂ lasers are the most common laser type used to through-cut, kiss-cut, score, etch or perforate substrates. CO₂ laser are best suited for processing non-metallic materials such as plastics, papers, polymers, textiles, foams and adhesives. Lasers are available in 9.4μ, 10.25μ, and 10.6μ wavelengths. Typical power output range is 40W to 1000W. Common applications include:

- Commercial print: greeting cards, folding cartons, brochures, business cards, stencils, and labels
- Flexible packaging: easy-open and breathable packaging features
- Industrial: gaskets and adhesive spacers
- Medical: adhesive and plastic materials for medical components

Fiber (f)

Fiber lasers are ideally suited for ablating thick conductive coatings that would typically slow a UV laser. They are also capable of metal and plastic welding. Lasers are available in 1070nm laser wavelength in pulsed or continuous wave energy outputs. Typical power output range is 20W to 100W. Common applications include ablating, cutting and welding materials used in electronic and medical markets.



Ultraviolet (uv)

UV laser systems are suitable for the fine ablation of very thin (<1μm) conductive coatings or thin non-conductive coatings which would otherwise be transparent to different laser wavelengths. Lasers are available in 355nm wavelength. Typical power output range is 10W to 20W. Common applications include ablating and cutting electronic components, biosensors, and precise electrode patterns.

How lasers are used in digital converting

Digital converting is a process in which a focused laser beam is directed to cut, kiss-cut, perforate, score or etch patterns into materials as specified in a customer's vector file. This non-contact functionality achieves extremely tight tolerances (approximately 50μm or 0.002") while processing materials at high speeds. Digital laser converting is a fast, clean and cost-effective production solution which consistently delivers an exceptional standard of quality – ideal for applications with feature locations, tolerances, size or material characteristics that are typically difficult or impossible to process using traditional metal dies.



LaserSharp Laser Modules

LasX offers a variety of laser modules with different laser wavelengths and output powers, each designed to be retrofitted into existing industrial equipment or integrated by OEMs into their equipment designs. Integrate one or several module types in one station for maximum flexibility and productivity.

Each module integrates a laser resonator source, power supply, focusing optics, electronic controller and other components into a single package. These fully sealed laser modules require no beam alignment and very little maintenance. Facility power, air, and water supplies plug directly into ports on the housing while integrated I/O interfaces on the controller connect to material handling equipment to monitor web speed and position. Operators set up, monitor and change jobs using LightGuide® control software that controls all components (including multiple-laser modules) in a single user interface.

LaserSharp Laser Module Features

- High-tolerance industrial build quality secures internal components and reduces vibration and the variance it causes while increasing accuracy.
- Integrated chiller and purge air panel maintain the laser module's internal environment to reduce or eliminate condensation and maintenance requirements.
- Internal sensors monitor set points for the laser module's environment and prevent its operation when they are exceeded, preventing equipment damage.
- Robust LightGuide control software maintains consistent processing results with parameter-based processing, extensive entity manipulation tools and comprehensive job file management.
- Dedicated I/O interfaces on the embedded controller simplify integration with web speed encoders, a variety of PLC devices, vision system cameras, registration or eye-mark sensors or barcode readers for superior accuracy and processing flexibility.
- Small footprint allows placement in nearly any orientation or position in the production line.

Laser Downweb Modules (LDM)



Straight-line precision scoring for easy-open features in flexible packaging films. The Laser Downweb Module (LDM) is ideal for straight-line or downweb laser scoring, slitting and perforating of roll-fed or conveyed materials such as flexible films, aluminum foils and paper sheets. The LDM's selective scoring capability enables easy-open packaging features while maintaining package barrier properties.

LDM Unique Features

- Precise, controlled score depths in downweb direction.
- Precision digital display of crossweb positioning.
- Precise align-to-print registration for intermittent scoring.
- Multiple LDM configurations with linear alignment create multiple score lines on wide webs up to 2m (80").

Laser Modules & Configurations

Laser Type	Power	LDM	LPM		
			Dual Mode	Standard	Flex
CO₂ (standard)	40W	LDM40	LPM ^{dm} 40	LPM40	LPM ^{flex} 40
	70W	LDM70	LPM ^{dm} 70	LPM70	LPM ^{flex} 70
	100W	LDM100	LPM ^{dm} 100	LPM100	LPM ^{flex} 100
	250W	LDM250	LPM ^{dm} 250	LPM250	LPM ^{flex} 250
	400W			LPM400	LPM ^{flex} 400
	1000W			LPM1000	LPM ^{flex} 1000
Fiber (f)	40W	LDM40 ^f	LPM ^{dm} 40 ^f	LPM40 ^f	
	100W	LDM100 ^f	LPM ^{dm} 100 ^f	LPM100 ^f	
Ultraviolet (uv)	10W		LPM ^{dm} 10uv		
	20W		LPM ^{dm} 20uv		

dm = Dual Mode; flex = Flex Mode

Laser Processing Modules (LPM)



Laser score and micro-perforate flexible packaging films at high speeds. The versatile LaserSharp LPM Series offers all the advantages of the LDM but adds crossweb laser cutting, scoring, perforating, etching or ablating any pattern or shape into the material. Several LPMs can be configured in a single system for multiple line processing.

LPM Unique Features

- Laser power outlet range: 40W to 1000W
- Multiple pattern processing with high speed crossweb and downweb contour patterns.
- Run intermittent patterns by print registration or distance.

LPMs are available as standard modules or in the following options:

- **Dual-Mode** (LPM^{dm}) – combines the best of the LDM with the best of the LPM. This module excels at precise, accurate, contoured downweb scores and slits as well as the high speed processing of small crossweb patterns less than 170mm (6.7") in size.
- **Flex*** (LPM^{flex}) – increases processing options with the ability to automatically adjust the processing area of view between two different sizes ranging from 140mm x 140mm (5.5" x 5.5") to 600mm x 600mm (23.5" x 23.5").
- **GT Option** – uses optimized beam steering motors with lighter mirrors for faster processing speeds. The GT option can be applied to any LPM.
- **LPM^{sd}** – Designed for high-performance laser drilling or micro-perforating – ideal for breathable packaging in the flexible packaging industry at rates 3x higher than standard LPM modules.

LPM^{flex} Modules



Designed for versatility. The LPM^{flex} module combines variable laser process areas with automated optics to increase your processing options while minimizing setup. The modules offer the advantages of localized laser processing, including patterned micro-perforation, as well as crossweb and downweb straight line and contour processing. Continue to build your business with a laser system flexible enough to produce various products for differing markets.

To create this flexibility, an adjustable roller assembly allows operators to quickly switch from one field of view to another. After switching to a different field of view, the system automatically refocuses the laser beam to a precise spot size for the new process. Process areas as small as 140mm x 140mm (5.5" x 5.5") to as large as 600mm x 600mm (23.6" x 23.6") are available. The system's auto-focus and adjustable work support eliminate costly downtime required to refocus the laser beam and calibrate variable process areas.

Process Method	Process Area	Description
Full Crossweb	600mm x 600mm (23.62" x 23.62")	Large, detailed patterns across the entire web width at high production speeds.
Small Patterns	140mm x 140mm (5.51" x 5.51")	Highly accurate small feature or pattern processing and micro-hole drilling.
Downweb	Straight line	High-speed, downweb scoring. Narrow, consistent score depths are maintained through the entire range of speeds during production.

LPM^{flex} combines up to three different processing modes into one.

LASER MODULES

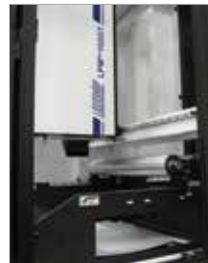
LPM^{flex} Features

Using the power of LasX's industry-leading, patented laser digital processing, the LPM^{flex} delivers both pattern mode (LPM) and downweb mode (LDM) to suit varying applications.

- The LPM mode excels at crossweb processing of larger patterns or packaging features in precise registration to printed features. Additional advantages include:
 - Crossweb scores across wide webs for easy-open packaging applications.
 - Larger depth of focus to better track and minimize web "flutter" or lateral movement.
 - Faster process speed for higher production rates.
- The LPM mode also adds flexibility in feature sizes. Operating at the smaller process area excels at high-speed drilling and pattern perforating with tight tolerances. Benefits include:
 - Smaller laser beam spot sizes for smaller micro-holes and score widths that prevent leakage or bacterial spoilage in breathable packaging applications.
 - Superior accuracy.
 - More efficient processing of small features.
 - Higher production speeds for greater throughput.

- The LDM mode fixes the laser module's motion system in place, effectively turning the LPM module into an LDM by creating a narrow beam optimized for downweb scoring.
- Increases processing options with the ability to automatically adjust the processing area of view between two sizes ranging from 130mm to 600mm (5.1" to 23.6").
- Automated focus assembly.

Crossweb



600mm (23.6") field of view processing

Small Pattern



140mm (5.5") field of view processing

Downweb



Optional Unicorn™ Assembly



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