Panasonic

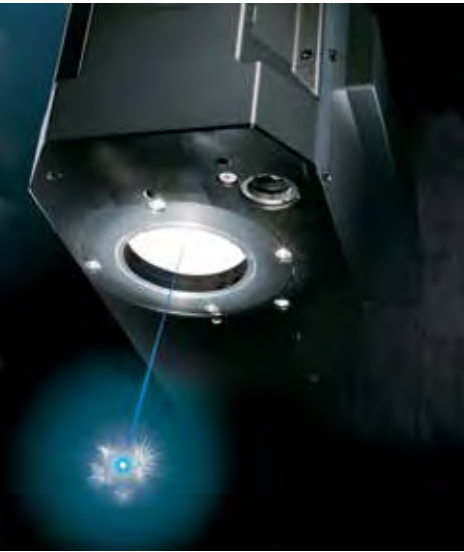**Overview**

LASER MARKING SYSTEMS

With a focus on: Added value for the customer

Our philosophy extends to all areas and industries. Whether for the home, office, department store, car, plane, or production facility: Panasonic powers the things that move people. We develop and design solutions with impressive variety, keeping the customer's requirements as a whole always in view. Panasonic's decades of experience in the area of consumer products and industrial automation lay the perfect foundation for our Laser Markers to succeed. We conduct very careful monitoring to observe customer needs and what type of added value is in demand in which specialty area. Our blend of outstanding technology, outstanding quality and outstanding service is a complete solution, leaving nothing to be desired.

1 Outstanding technology

FAYb

Added value for the customer

Outstanding service

2

Outstanding quality

3

Outstanding technology

Everything we do is based on the deployment of the latest laser marking technologies. The application laboratories at Panasonic' European head office and the worldwide dialogue that our highly qualified engineers engage in enable continuous product improvements. Clear arguments testify for our Laser Marking Systems and their outstanding technology. Their enormous precision and high level of reliability have gained worldwide renown.

Outstanding quality

Panasonic's service network has a broad reach. We respond quickly and are known for our flexibility. Our outstanding service begins long before a Laser Marking System is installed. Customer advice, feasibility analyses and project management are the pillars on which our success concept is based. The Panasonic service team comes to the aid of all customers with expert, reliable service experts – at any time, regardless of the service life of your system.

Outstanding service

The satisfaction of our customers and the trust they have in Panasonic are paramount to us. At our company, every single employee is involved and sensitized, resulting in high-quality products and impressive services. In all areas, our team takes the most varied customer requests into account, and learns from them continuously. Technological know-how and a keen sense for what is important form the basis for our innovative, high-quality products.

Product history

1996	1999	2001	2003	2004
LP-100 CO_2 Laser Marker	**LP-200** CO_2 Laser Marker	**LP-D** Diode Laser Marker	**LP-300** CO_2 Laser Marker	**LP-400** CO_2 Laser Marker
	LP-F FAYb Laser Marker			**LP-V** FAYb Laser Marker

2007	2008	2011	2013	2014
LP-G FAYb Laser Marker	**LP-Z** FAYb Laser Marker	**LP-S** FAYb Laser Marker	**LP-M** FAYb Laser Marker	**LP-GS** CO_2 Laser Marker

Panasonic's LP-V series laser markers utilizes an enhancement of YAG technology called FAYb (Fiber Amplified Ytterbium). These fiber lasers provide several advantages over traditional Nd:YAG systems, such as a better beam quality, smaller housing dimensions, a significantly longer lifetime and lower fixed costs because FAYb systems consume much less power and get by with simple air cooling. Panasonic's LP-V series laser markers can mark nearly all metals using the laser processes of engraving or black marking (annealing). Using the laser processes of internal foaming, carbonization (color change) or bleaching, resins can be marked with outstanding quality.

Panasonic

LP-V series

FAYb LASER MARKER

FDA
Conforming to
FDA regulations
(some models only)

C€
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-V

12W short pulse LP-V series FAYb laser-marker designed for high quality marking on metal and resin

Laser diode

ICs (DIP)

Gear wheel

145×135×115/40P

130×115×90/11PB

Molded resin parts

Bearing

Electronic components

Day/Night design

Drill

Potentiometer

REAR

DVD Navi

HSS6.5
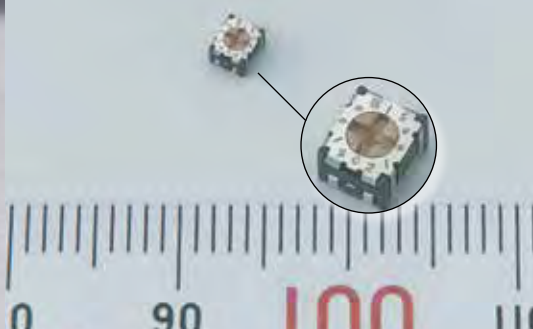
Improved productivity

Outstanding technology

The LP-V series features a high-performance galvano scanner whose acceleration, deceleration, and response speeds exceed those of conventional models by delivering dramatically shorter marking times. Capable of marking up to 700 characters per second and at line speeds of up to 240m/min, the LP-V series improves productivity. The LP-V series automatically determines the most efficient marking order, further reducing marking time. Panasonic's proprietary galvano scanner control technology keeps marking accurate and aligned, even at high speed.

Conventional models	LP-V series
Lines overlap, distorting character shape.	Uniform marking Optimized adjustment prevents excessively deep marking caused by overlapping lines, avoiding distortion of character shapes.

Conventional models	LP-V series
Low-speed marking High-speed marking	Low-speed marking High-speed marking
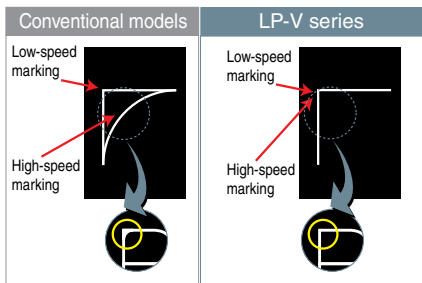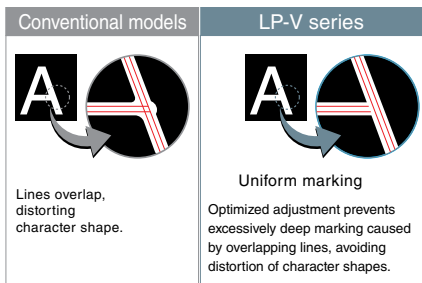
High-quality marking

Technologies behind high-quality marking

The LP-V series takes advantage of a number of new technologies compared to conventional models to deliver high-definition marking. Advanced control functionality automatically adjusts marking strength at locations susceptible to deep marking such as the beginning and ends of lines and areas where straight and curved lines intersect.

Coloring of the target material is controlled by adjusting the laser power, scanning speed, and marking pulse cycle for each set character line, logo or code, giving products a broad range of expression. The result is a beautiful and high-quality mark with uniform line depth even at high speeds.

[Peak power]

20kW

Shorter pulse width means reduced thermal effects.
Thanks to its high peak power, the LP-V series excels at marking metals and coloring resins.

LP-V series

8kW

30ns   300ns   [Pulse width]

Innovative FAYb laser

12W short-pulse laser

The FAYb laser used in the LP-V series features a high peak power of 20kW, enabling it to generate sharp, deep marking and crisp, black output on metals that require high levels of power. Pansonic's LP-V series has it all, delivering high peak power in a short-pulse laser with low thermal effects to enable beautiful, print-like color marking on resins.

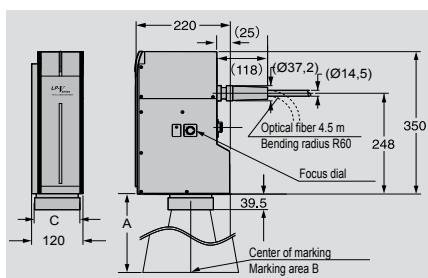| Model / Item	Small spot	Standard	Wide area
	LP-V10U-A55	LP-V10U-C	LP-V15U-C
Work distance (manually adjustable)	127mm (±0.7mm)	190mm (±2mm)	350mm (±7mm)
Marking field	55mm x 55mm	90mm x 90mm	160mm x 160mm
Scanning speed max.	6000mm/s	12,000mm/s	
Line speed max.	120m/min	240m/min	
Average output	12W		
Ambient temperature	0 to +40°C (no condensation or frost), storage: -10 to 60°C		
Ambient humidity	35 to 85% RH (no condensation or frost)		
Marking method	Galvanometer scanning method		
Marking laser	FAYb λ = 1.06µm, laser class 4		
Guide laser	Semiconductor λ = 655nm, laser class 2; 1mW		
Array of character	Straight line, proportional/typewriter, arced, tilted		
Type of characters	Capital & small characters, numerals, katakana, hiragana, kanji (JIS level 1 & level 2), symbols, user-defined characters (up to 50 types)		
Bar codes/2D codes	CODE39, CODE128, ITF2/5, NW-7, JAN/UPC/EAN, RSS 14, RSS limited, RSS expanded (GS1 Databar), GS1 Data Matrix, QR, Micro QR, Data Matrix (ECC200), etc.		
Logos/Graphics	VEC, DXF, BMP, HPGL, JPEG, AI*, EPS*		
Cooling method	Forced-air cooling		
Supply voltage	90 to 132VAC or 180 to 264VAC (auto-changing), 50/60Hz		
Power consumption	420W or less (at 200VAC)		
Inputs	Remote, trigger, encoder (A), encoder (B), shutter control, laser pumping, alarm reset, emergency stop, laser stop, etc.		
Outputs	Power supply (+12V), remote, marking ready, marking, marking finished, laser pumping, warning, alarm, confirmation end, counter finish		
Communication ports	RS232, digital I/Os, Ethernet		
Marking condition	Static and marking on the fly		
Functions	› marking order optimizing › correction of intersection › counter marking › current date/time marking › expiry date marking › lot marking › logos/pictures marking › bold marking › logo data USB transfer	› I/O monitor › system offset › common character setting › font selection › proportional marking › marking image display › operator adjustment › error code log display › work image display	› guide laser › power speed setting per line/logo file › step & repeat › time delay › serial data processing & marking › multilayered marking › backup › various processing functions › dual pointer › marking time measurement › font/logo creation/editing › power check/correction › I/O simulation › focus adjustment › marking on moving objects
Weight of head	9kg		10kg
Weight of controller	22kg		

* Adobe Illustrator® is necessary

Dimensions

LP-V head

Type	Marking distance A (mm)	Marking area B (mm²)	Lens diameter C (mm)
LP-V10-A55	127	55x55	87
LP-V10	190	90x90	87
LP-V15	350	160x160	106

LP-V controller
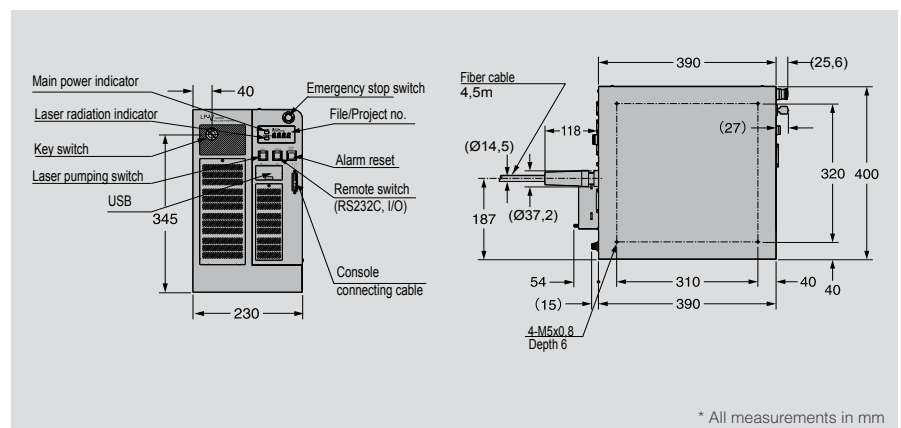
* All measurements in mm

The LP-Z is designed to mark complex 3D surfaces by auto-matically adjusting the laser beam's focal point, guaranteeing stable energy density and hence marking quality. This tech-nology likewise contributes to superior marking on large 2D surfaces of up to 330 x 330mm² where the center is much closer to the beam output than the edges and corners.

The LP-Z series comes equipped with an encoder interface to mark moving objects, e.g. objects on an assembly line. Standard functions include code generation (Data Matrix, various bar codes, etc.), counters, expiration date and lot number generation.

Panasonic

LP-Z series

FDA
Conforming to
FDA regulations
(some models only)

$C \epsilon$
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-Z

3-axis, wide area LP-Z series FAYb laser marker designed for marking complex 3D metal and resin surfaces

Light resin

ICs

Screw terminal

Bearings

Molded resin parts

Crankshafts

Metal plate (sloped)

Resin cap

Battery housing
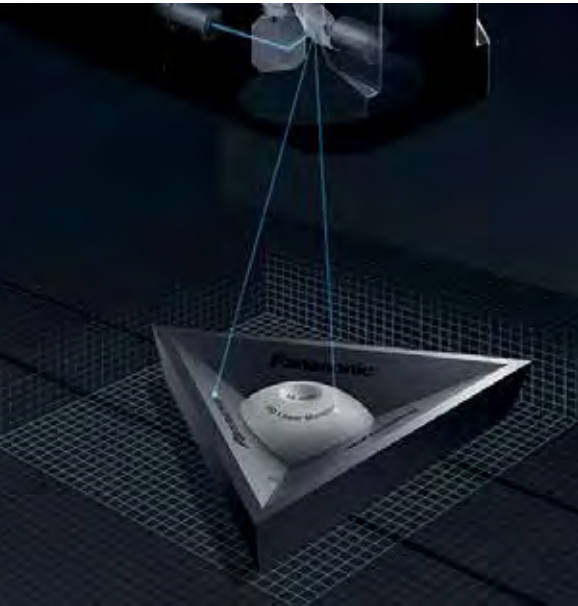
3D control

Flexible, precision marking on complex shapes

Z-axis control within a range of 50mm (±25mm) allows the head to mark curved, sloped and spherical surfaces as well as surfaces with varying heights. Spot size remains stable, ensuring consistent, high-quality marking. It is even possible to mark 2 facing surfaces in 1 step if the laser head or the product is mounted at an angle, e.g. 45°. Interior surfaces where access is limited can now be marked where mirrors normally need to be used, for example to mark fill levels in pots or measuring cups. This feature can dramatically reduce setup, installation and design costs.

Wide marking field

Highly precise marking and improved productivity

The wide marking field of up to 330mm x 330mm means you can mark an even larger range of products, further enhancing productivity.

Moreover, Z-axis control provides a uniform spot size and stable marking quality with high precision across the field of view, regardless of the marking field's width.

High-performance fiber laser

25W fiber laser with selectable pulse width

Applications requiring high energy such as deep engraving or black marking (annealing) on metal are easily achieved. The high output power also shortens marking time, thus improving production efficiency. Moreover, using FAYb technology, heat is simply dissipated regardless of the power used, eliminating the need for hooking up and maintaining water-cooling systems. A selection of 3 pulse-width patterns has been added to the existing pulse cycle setting to make finding suitable marking conditions for your application even easier.

Pulse width image

kW — Peak power

- 30ns (13W)
- 50ns (25W)
- 100ns
- 200ns

Resin coloring
Metal engraving/ Black marking
Shallow marking/ Coating peeling off/ White marking

Pulse width — ns

30ns   200ns   30ns   200ns

Item \ Model	Standard	Standard	Wide area
	LP-Z130-C	**LP-Z250-C**	**LP-Z256-C**
Work distance (manually adjustable)	190mm (±25mm)		330mm (±25mm)
Marking field	120mm x 120mm		330mm x 330mm
Scanning speed max.	12,000mm/s		8000mm/s
Line speed max.	170m/min		120m/min
Average output	13W	25W	
Ambient temperature	0 to +40°C (no condensation or frost), storage: -10 to 60°C	0 to +35°C (no condensation or frost), storage: -10 to 60°C	
Ambient humidity	35 to 85% RH (no condensation or frost)		
Marking method	Galvanometer scanning method		
Marking laser	FAYb λ = 1.06µm, laser class 4		
Guide laser	Semiconductor λ = 655nm, laser class 2; 1mW		
Array of character	Straight line, proportional/typewriter, arced, tilted		
Type of characters	Capital & small characters, numerals, katakana, hiragana, kanji (JIS level 1 & level 2), symbols, user-defined characters (up to 50 types)		
Bar codes/2D codes	CODE39, CODE128, ITF2/5, NW-7, JAN/UPC/EAN, RSS 14, RSS limited, RSS expanded (GS1 Databar), GS1 Data Matrix, QR, Micro QR, Data Matrix (ECC200), etc.		
Logos/Graphics	VEC, DXF, BMP, HPGL, JPEG, AI*, EPS*		
Cooling method	Forced-air cooling		
Supply voltage	90 to 132VAC or 180 to 264VAC (auto-changing), 50/60Hz		
Power consumption	390W or less (at 100VAC), 420W or less (at 200VAC)		
Inputs	Remote, trigger, encoder (A), encoder (B), shutter control, laser pumping, alarm reset, emergency stop, laser stop, etc.		
Outputs	Power supply (24V), remote, marking ready, marking, marking finished, laser pumping, warning, alarm, confirmation end, counter finish		
Communication ports	RS232, digital I/Os, Ethernet		
Marking condition	Static and marking on the fly		
Functions	› marking order optimizing › correction of intersection › counter marking › current date/time marking › expiry date marking › lot marking › logos/pictures marking › old marking › logo data USB transfer › I/O monitor › system offset › common character setting › font selection › proportional marking › marking image display › operator adjustment › error log display › work image display › guide laser › power speed setting per line/logo file › step & repeat › time delay › serial data processing & marking › multilayered marking › backup › various processing functions › dual pointer › marking time measurement › font/logo creation/editing › power check/correction › I/O simulation › focus adjustment › marking on moving objects › 3D marking		
Weight of head	9.5kg		
Weight of controller	24kg		

* Adobe Illustrator® is necessary

Dimensions

LP-Z head

Type	Marking distance A (mm)	Marking area B (mm²)
LP-ZXX0	190 (±25)	120x120
LP-Z256	330 (±25)	330x330

LP-Z controller

* All measurements in mm

To improve deep marking on metal, the output power has been increased from 12W for the current model to 50W. Now deep marking and black marking can be performed on precision metal parts such as bearings and tools at high speed. A robust body, superior mechanical design and high-quality components provide an IP67G degree of protection, which makes the LP-S series attractive and practical for automotive and metal applications. Moreover, the connector is water-, dust-, and oilproof, and the lens is equipped with protective glass. Also, the unique design allows you to remove the fiber-optic cable from the laser head, simplifying integration and service.

Panasonic

LP-S series
FAYb LASER MARKER

FDA
Conforming to
FDA regulations
(some models only)

CE
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-S

High power and environmentally resistant LP-S series FAYb laser marker designed for metal high-speed marking and deep engraving
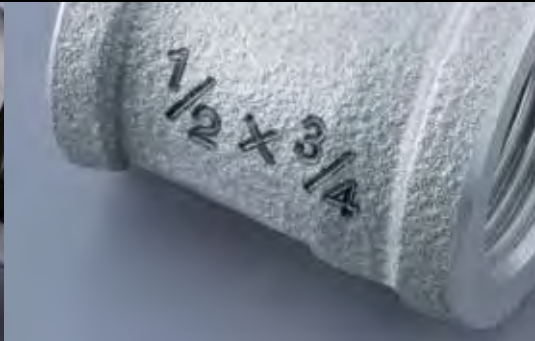
Tools (carbide)

Cylinder blocks

Connecting rods

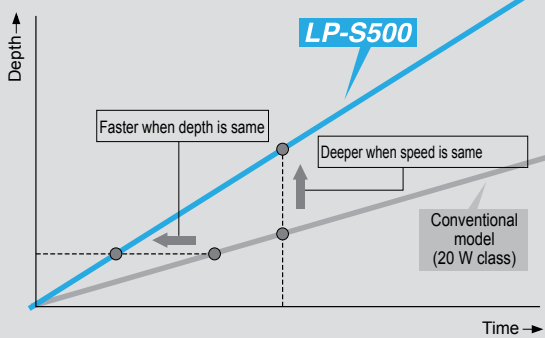Automotive part

Crank shafts

Joint

Engine valves

Chains

Gear wheel

**Simulated characteristics of high-speed deep engraving**

High output power

High output for superior deep engraving performance and high-speed productivity

The 50W high-power output enables high-speed deep engraving and black marking on metal workpieces. This allows quick and accurate marks to be performed on precision metal parts, such as bearings and tools. Faster and deeper marking or processing is possible as more energy is applied to the workpiece. The LP-S500 is equipped with a high-output laser unit. This shortens the marking time, greatly improving productivity. The LP-S series can internally monitor its own laser power. If the laser power deviates from the value specified, the alarm output is set and marking stopped. This preventitive function ensures consistent marking quality no matter when marking takes place.
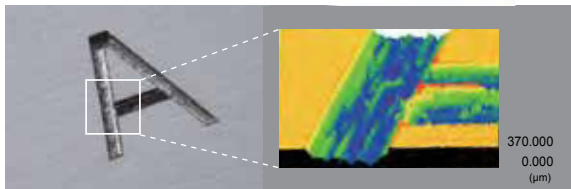
Conventional model (20W class)
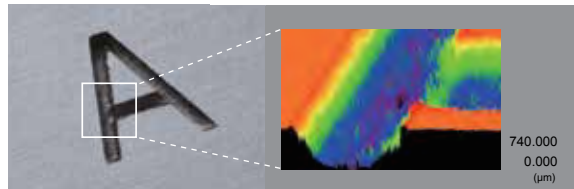
LP-S500: Almost double the depth with the same marking time

Sealed, IP67G rated head

Superior design and high quality protection parts

The LP-S series features minimum frame seams. Minor seams and screw holes are completely sealed, producing high sealing performance. Maximum cooling efficiency is also achieved, allowing the use of a **fanless head** for thorough cooling. Seamless sealing materials are used that have low water absorption and excellent oil resistance properties. Connectors are dust-, water-, and oil-proof.
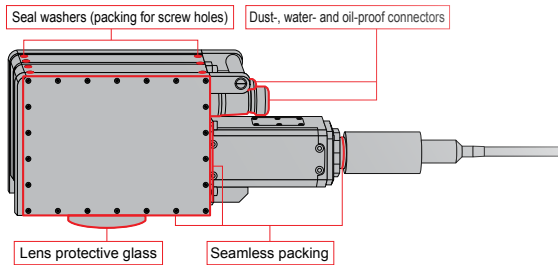
Enhanced flexibility of equipment design

Revolutionary fiber unit release mechanism

Panasonic's revolutionary laser head design allows the fiber unit to be easily removed from the scanner unit. Because the fiber unit is removable, it can be easily incorporated into equipment for easy installation and enhanced flexibility of equipment design.

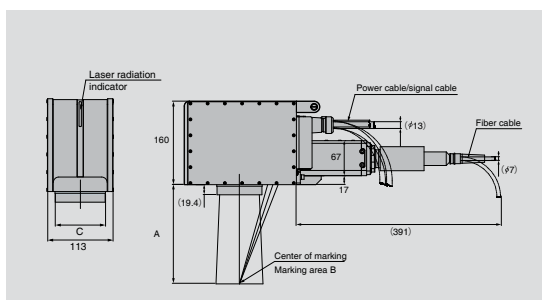| Item / Model	Small spot LP-S202	Standard LP-S200	Wide area LP-S205	Small spot LP-S502	Standard LP-S500	Wide area LP-S505
Work distance (manually adjustable)	130mm (±3mm)	190mm (±7mm)	350mm (±24mm)	130mm (±3mm)	190mm (±7mm)	350mm (±24mm)
Marking field	55mm x 55mm	90mm x 90mm	160mm x 160mm	55mm x 55mm	90mm x 90mm	160mm x 160mm
Scanning speed max.	6000mm/s	12,000mm/s		6000mm/s	12,000mm/s	
Line speed max.	120m/min	240m/min		120m/min	240m/min	
Average output	20W			50W		
Ambient temperature	0 to +40°C (no condensation or frost), storage: -10 to 60°C					
Ambient humidity	35 to 85% RH (no condensation or frost)					
Marking method	Galvanometer scanning method					
Marking laser	FAYb λ = 1.06µm, laser class 4					
Guide laser	Semiconductor λ = 655nm, laser class 2; 1mW					
Array of character	Straight line, proportional/typewriter, arced, tilted					
Type of characters	Capital & small characters, numerals, katakana, hiragana, kanji (JIS level 1 & level 2), symbols, user-defined characters (up to 50 types)					
Bar codes/2D codes	CODE39, CODE128, ITF2/5, NW-7, JAN/UPC/EAN, RSS 14, RSS limited, RSS expanded (GS1 Databar), GS1 Data Matrix, QR, Micro QR, Data Matrix (ECC200), etc.					
Logos/Graphics	VEC, DXF, BMP, HPGL, JPEG, AI*, EPS*					
Cooling method	Head: natural air cooling; Controller: forced-air cooling					
Supply voltage	90 to 132VAC or 180 to 264VAC (auto-changing), 50/60Hz					
Power consumption	330W or less (at 100VAC); 450W or less (at 200VAC)			530W or less (100VAC); 650W or less (at 200VAC)		
Inputs	Remote, trigger, encoder (A), encoder (B), shutter control, laser pumping, alarm reset, emergency stop, laser stop, etc.					
Outputs	Power supply (+24V), remote, marking ready, marking, marking finished, laser pumping, warning, alarm, confirmation end, counter finish					
Communication ports	RS232, digital I/Os, Ethernet					
Marking condition	Static and marking on the fly					
Functions	› marking order optimizing › correction of intersection › counter marking › current date/time marking › expiry date marking › lot marking › logos/pictures marking › bold marking › logo data USB transfer	› I/O monitor › system offset › common character setting › font selection › proportional marking › marking image display › operator adjustment › error log display › work image display	› guide laser › power speed setting per line/logo file › step & repeat › time delay › serial data processing & marking › multilayered marking › backup	› various processing functions › dual pointer › marking time measurement › font/logo creation/editing › power check/correction › I/O simulation › focus adjustment › marking on moving objects › power loop control		
Weight of head	7.5kg		8kg	7.5kg		8kg
Weight of controller	24kg			25kg		

* Adobe Illustrator® is necessary

Dimensions

LP-S head

Type	Marking distance A (mm)	Marking area B (mm²)	Lens diameter C (mm)
LP-SX02	130	55 x 55	92
LP-SX00	190	90 x 90	87
LP-SX05	350	160 x 160	106

LP-S controller
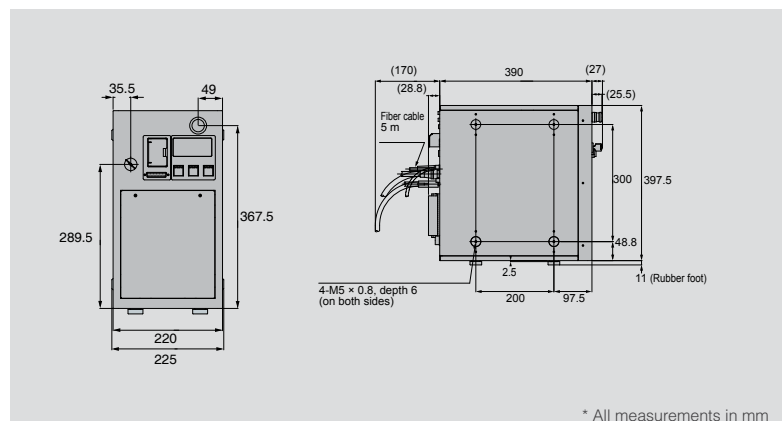
* All measurements in mm

The LP-M series is characterized by phenomenal high power and the ability to mark in 3D. The 50W Laser Marking Systems enable deeper and faster marking, so the takt time will be reduced and the productivity improves significantly. The implementation in production lines is easy.
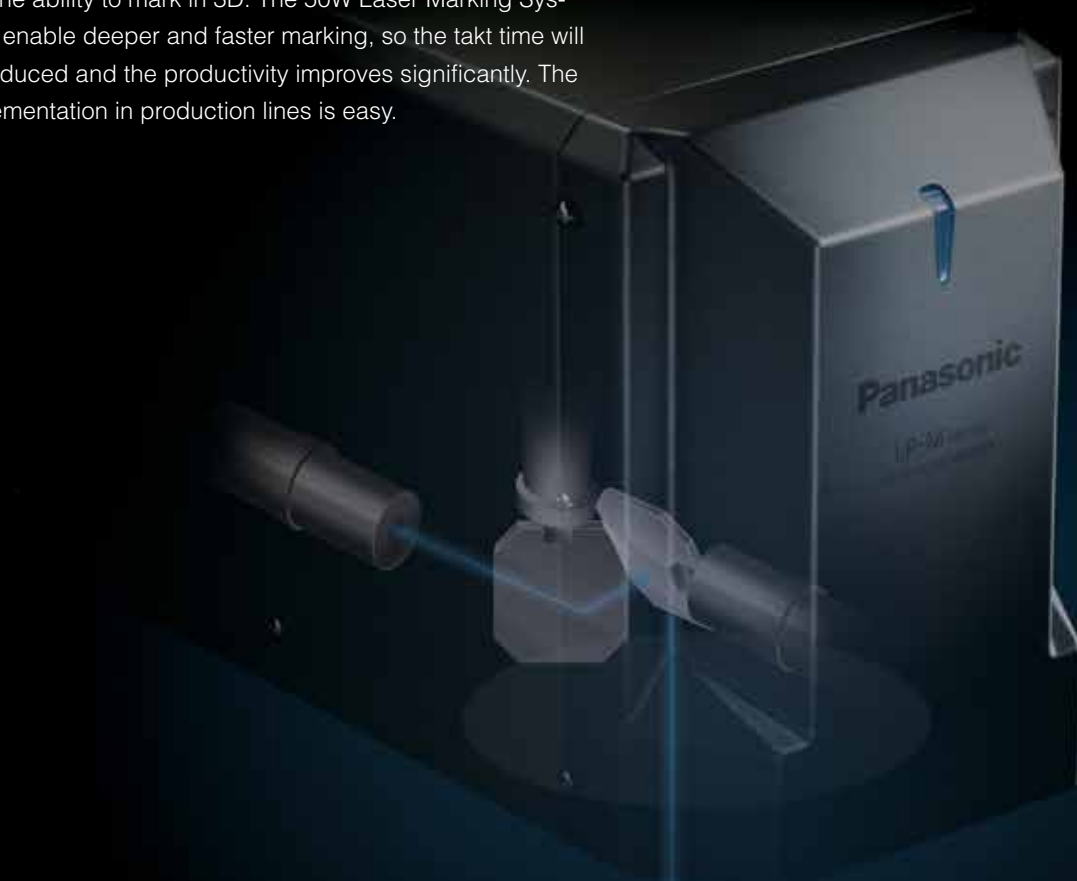
FDA
Conforming to
FDA regulations
(some models only)

$C \epsilon$
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-M

3D fiber Laser Marking System especially suited for metals

Engine block marking

Connecting rod marking

Engine part marking

Gasket coating removal

Cutting

Hoiling

Engraving

Engraving

Tube coupling

Diagram of depth vs. time
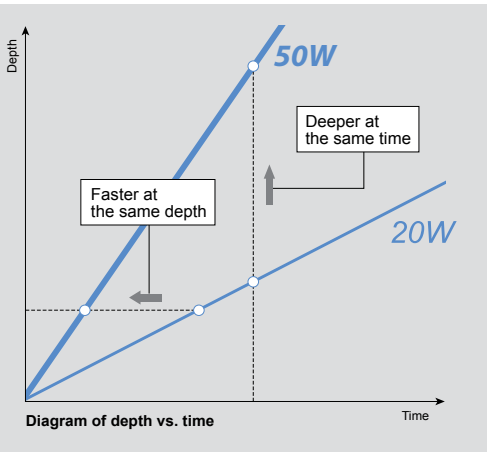
Choose between deep marking or high speed

The high-power laser allows texts to be marked much faster or to engrave deeper than before.

The larger the energy amount sent to the workpiece, the faster and deeper the marking / processing.
Takt time reduction greatly enhances productivity.
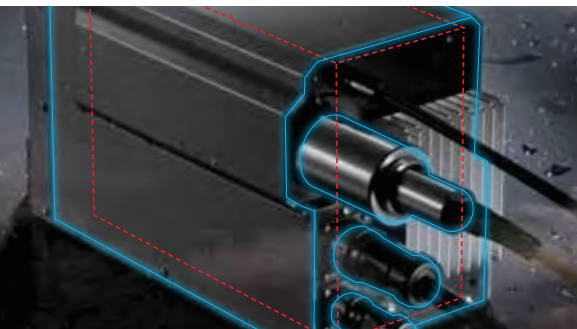
Dual protective IP64 design

Many of our customers have expressed the need to reduce maintenance costs and this is why Panasonic has created the Dual Protective Design (DPD) for the fanless head of their Laser Markers. This means the LP-M series can be used in harsh environments where they are exposed to dust and water.

High-performance z-axis stroke mechanis

Due to the z-axis stroke mechanism it is possible to mark even the most complex shapes with great accuracy. Thanks to the uniform beam thickness, shapes with a height difference of up to 44mm can be marked with excellent precision.

Automatic distance measuring with displacement sensors

Customers no longer need to position the workpiece exactly for marking as the displacement sensor detects the product reliably and ensures stable marking quality.

Sample marked at a position 2mm away from the correct height

Uncorrected   Corrected

Item \ Model	LP-M500				LP-M200			
	LP-M500	LP-M500-S	LP-M505	LP-M505-S	LP-M200	LP-M200-S	LP-M205	LP-M205-S
Work distance	190 ± 22mm		220 ± 22mm		190 ± 22mm		220 ± 22mm	
Marking range	120 × 120mm		220 × 220mm		120 × 120mm		220 × 220mm	
Marking laser	Class 4 Yb fiber laser; λ = 1,064nm laser							
Average oscillator output at product processing edge	50W ± 5% (pulse oscillation)				20W ± 5% (pulse oscillation)			
Guide laser / pointer	Red semiconductor laser; λ = 655nm; Class 2 laser: max. output 1mW							
Scanning method	x-, y- and z-axis directions; 3D scanning method							
Scan speed	Max. 12,000mm/second							
Character settings (character height, width)	0.1 to 120mm (configurable in 0.001mm steps)		0.1 to 220mm (configurable in 0.001mm steps)		0.1 to 120mm (configurable in 0.001mm steps)		0.1 to 220mm (configurable in 0.001mm steps)	
Setting range (linear, proportional, monospaced) — Character spacing and line pitch	0 to 120mm		0 to 220mm		0 to 120mm		0 to 220mm	
Setting range (arced) — Radius	0 to 999.999mm (configurable in 0.001mm steps)							
Setting range (arced) — Angle	-180° to +180° (configurable in 0.01° steps)							
Setting range (arced) — Line pitch radius	0 to 120mm (configurable in 0.001mm steps)		0 to 220mm (configurable in 0.001mm steps)		0 to 120mm (configurable in 0.001mm steps)		0 to 220mm (configurable in 0.001mm steps)	
File format for logo data	VEC, DXF, BMP, HPGL, JPEG, AI, EPS							
Marking shape	Linear, proportional, monospaced, arced							
Character types	English uppercase and lowercase letters, numerals, symbols, user-registered characters (up to 50), Japanese katakana, hiragana, kanji characters (JIS No. 1 and No. 2 standards),							
Barcodes	Code 39, Code 128, ITF, NW-7, JAN / UPC, RSS-14 (GS1 DataBar), RSS (GS1 DataBar) Limited, RSS (GS1 DataBar) Expanded							
2D codes	QR Code, Micro QR Code, Data Matrix, GS1 Data Matrix							
Composite codes	RSS-14 (GS1 DataBar) CC-A, RSS (GS1 DataBar) Limited CC-A, RSS (GS1 DataBar) Expanded CC-A, UCC / EAN COMPOSITE, etc.							
Interfaces	VGA port, USB connector A, I/O input and output, RS232C, Ethernet, input-output terminal, INTERLOCK, displacement sensor, laser gate I/O (-S type only)							
Displacement sensor input	Analog current input (4 to 20mA)							
Cooling method	Head: natural air cooling, controller: forced air cooling							
Power supply	90 to 132V AC, or 180 to 264V AC, 50 / 60Hz (auto switching)							
Power consumption	Max. 580VA (100V AC), max. 720VA (200V AC)				Max. 390VA (100V AC), max. 510VA (200V AC)			
Laser gate	Not available	Yes, in head	Not available	Yes, in head	Not available	Yes, in head	Not available	Yes, in head
Ambient temperature	0 to +40°C (controller, head). No dew condensation or icing allowed.							
Storage temperature	-10 to +60°C (controller, head). No dew condensation or icing allowed.							
Ambient humidity	35% to 85% RH (controller, head). No dew condensation or icing allowed.							
Protective structure	IP64							
Net weight — Head	12kg							
Net weight — Controller	28kg							
OS for Laser Marker Utility								
OS for NAVILINK-3D (sold separately)	Microsoft Windows® 7 Professional (32 bit / 64 bit) / Sp1 Vista Business (32 bit) SP2 / XP Professional (32 bit) SP3							

* Adobe Illustrator® is necessary

Dimensions

LP-M head

Type	Marking distance A (mm)	Marking area B (mm²)
LP-MX00	190	120 x 120
LP-MX05	220	220 x 220

LP-M controller

* All measurements in mm

The LP-S500W series is a culmination of technologies that have been developed over many years. With its high power output and newly developed optical system, the LP-S500W series not only delivers clear, black laser annealing, but it is also easy to set up. This FAYb laser marking system has revolutionized black laser annealing.

FDA
Conforming to FDA regulations (some models only)

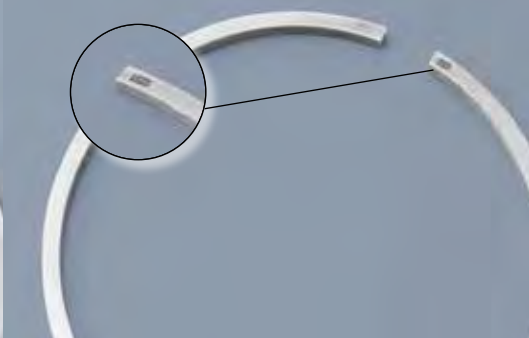$C \in$
Conforming to Low Voltage and EMC Directive (some models only)

LP-SW

High power, continuous wave laser with special designed optic for easy black marking on metals

Ball bearing

Piston rings

End mills

Mechanical joint

Drills

Medical instruments

Tweezer

Automotive sensor

Connecting rods

Marking with pulsed laser

LP-S500W
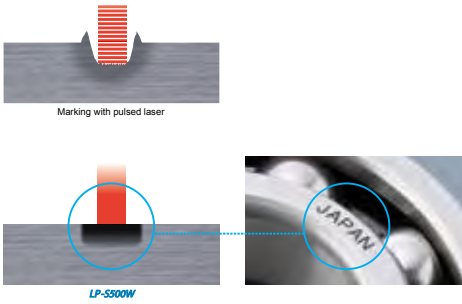
What is black laser annealing

Black laser annealing is a marking technique that uses laser irradiation to heat up metal surfaces and form oxide layers that appear as black letters. In contrast to traditional techniques that etch the metal surface, annealing produces no depressions or burrs. This makes black laser annealing the best marking technique for objects such as bearings that require absolutely smooth surfaces.

Conventional laser marker   LP-S500W

Marking range

10 times

Wide marking range

Reliable black laser annealing used to require strict management of the target's work distance. With the LP-S500W series, you now have ±30mm more flexibility in work distance thanks to a new optics design. Process changeovers for lines producing products of different sizes are no longer necessary.

Input example
173mm   A B C D E F G
193mm   A B C D E F G
213mm   A B C D E F G

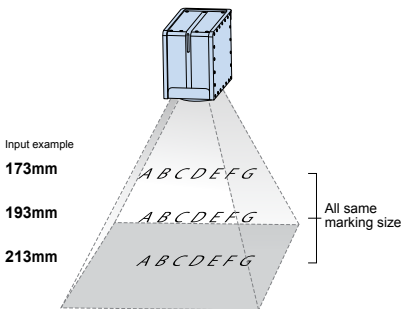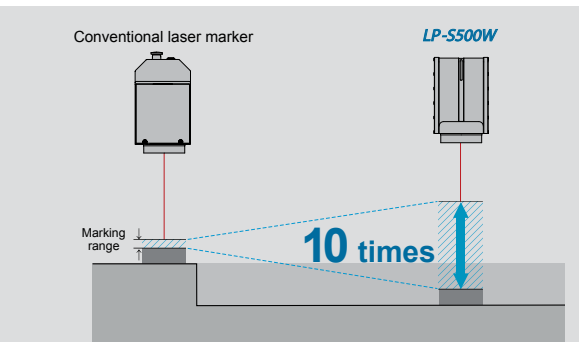All same marking size

High precision marking made simple

The LP-S500W series is ideal for accurate marking on workpieces with different heights, marking sizes, positions, etc.. Marking size and position are corrected automatically by entering the distances to each target object.

Work distance reference position

Distance to the workpiece is …

← **Nearer**

Reference position

← **Further**

Workpiece

Focus pointer

Focus pointer
Guide laser

New focus pointer

The LP-S500W series allows the operator to visualize the markable range based on the relationship between the positions of the guide laser and the focus pointer. Now you can check target object position and height based on the laser pointer's marker positions. Deviation amounts can also be checked. With this feature, equipment setup and maintenance are much easier.

JAPAN

Conventional laser marker

JAPAN

LP-S500W

Mark darkness

LP-S500W

Conventional laser marker

Time

High-speed black marking

Due to its high 50W output power, the new optical design and the fact that the beam is a continuous wave, the marking is much darker than that produced by a conventional laser. Moreover, marking time can be reduced to increase production speed.
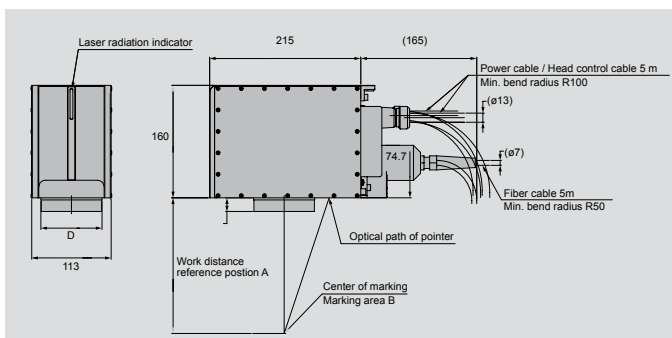
Model Item	Standard type LP-S500W	Wide area type LP-S505W
Work distance (marking range)	193mm (±20mm)	357mm (±30mm)
Marking field	90mm x 90mm	160mm x 160mm
Average output	50W cw oscillation	
Ambient temperature	0 to +40°C (no condensation or frost), storage: -10 to 60°C	
Ambient humidity	35 to 85%RH (no condensation or frost)	
Marking method	Galvanometer scanning method	
Marking laser	FAYb λ = 1.07µm, laser class 4	
Guide laser	Semiconductor laser λ = 655nm, laser class 2; 1mW	
Array of character	Straight line, fan-like, proportional and typewriter fonts, tilted straight lines	
Type of characters	Capital & small characters, figures, katakana, hiragana, kanji (JIS level 1 & level 2), symbols, user-defined characters (up to 50 types)	
Bar codes, 2D codes	CODE39, CODE128, ITF2/5, NW-7, JAN/UPC/EAN, RSS 14, RSS limited, RSS expanded (GS1 DataBar),	
	GS1 Data Matrix, QR, Micro QR, Data Matrix (ECC200), etc.	
Logos/Graphics	VEC, DXF, BMP, HPGL, JPEG, AI*, EPS*	
Cooling method	Head: natural air cooling; Controller: forced-air cooling	
Supply voltage	90 to 132VAC or 180 to 264VAC (automatic switching), 50/60Hz	
Power consumption	Max. 470W (at 100VAC); max. 650W (at 200VAC)	
Inputs	Remote, trigger, shutter control, laser pumping, alarm reset, emergency stop, laser stop, etc.	
Outputs	Power supply (+24V), remote, marking ready, marking, marking finish, laser pumping, warning, alarm, confirmation end, counter finish	
Communication ports	RS232, digital I/Os, Ethernet	
Marking condition	Static	
Functions	› marking order optimizing › I/O monitor › guide laser › various processing functions › correction of intersection › system offset › power speed setting per › dual pointer › counter marking › common character setting › line/logo file › marking time measurement › current date/time marking › font selection › step & repeat › font/logo creation/editing › expiry date marking › proportional marking › time delay › power check/correction › lot marking › marking image display › serial data processing & marking › I/O simulation › logos/pictures marking › operator adjustment › focus adjustment › bold marking › error log display › multilayered marking › power monitoring › logo data USB transfer › work image display › backup		
Weight of head	6.5 kg	7kg
Weight of controller	24kg	

* Adobe Illustrator® is necessary

Dimensions

LP-S500W head

LP-S500W controller

* All measurements in mm

| Type	Marking distance A (mm)	Marking area B (mm²)	Lens diameter C (mm)
LP-S500W	193 (±20)	90 x 90	87
LP-S505W	357 (±30)	160 x 160	106
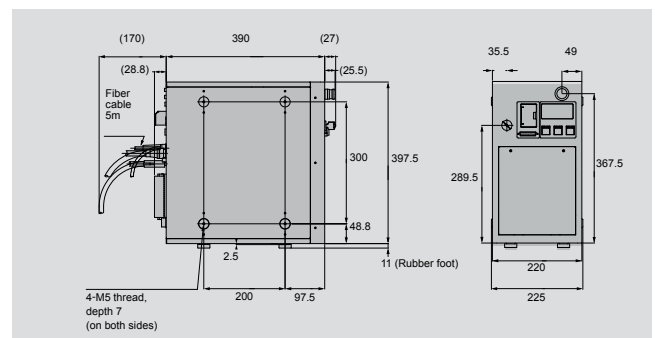
The new LP-GS is a small miracle, it is one of the smallest CO$_2$ lasers and still has an extremely high performance. It enables marking on organic materials, such as leather, paper, wood, and on electronic components.

Due to its compact size, it can be used in all positions, thus combining freedom in design with the low cost and planning security of a standard system. The user can easily operate and control the system via a Tablet PC and Bluetooth.

FDA
Conforming to
FDA regulations
(some models only)

$C \epsilon$
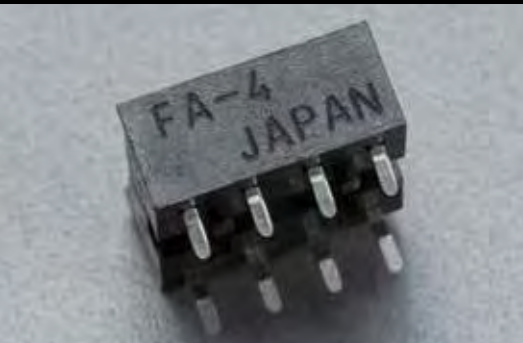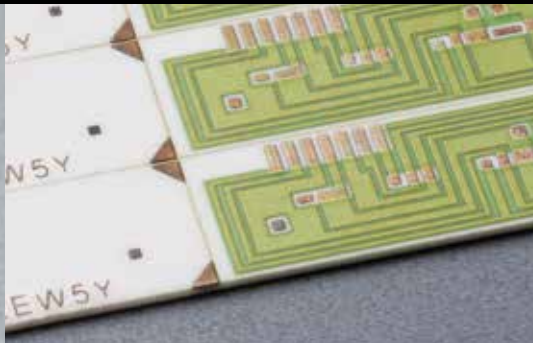Conforming to Low Voltage
and EMC Directive
(some models only)
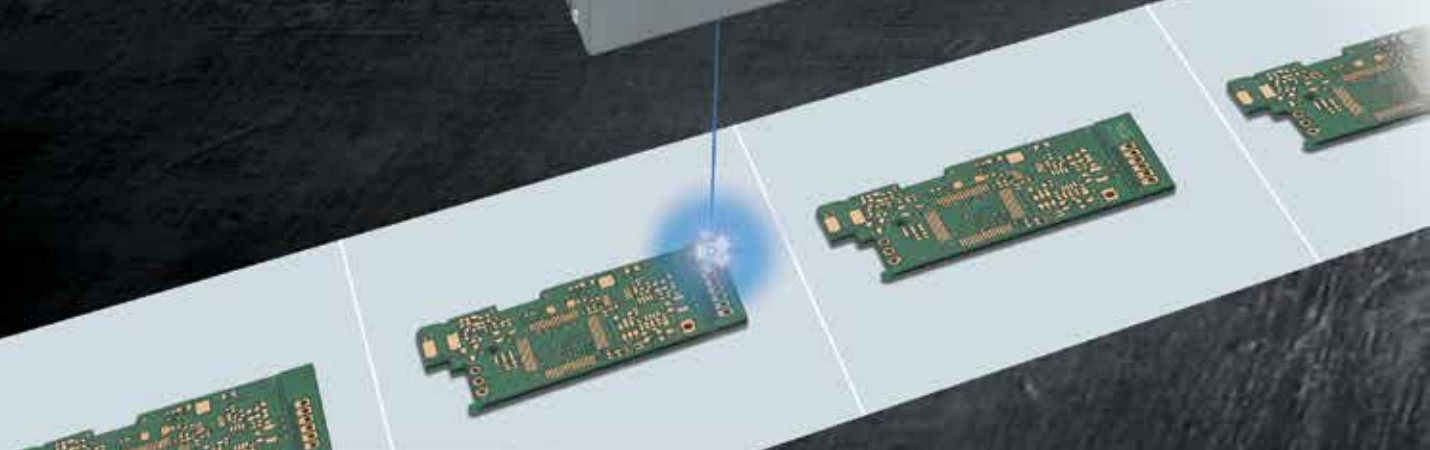
LP-GS

The revolutionary size of the LP-GS series CO_2 Laser Marker is topped by its high output power.

Connector

Circuit board

Electronic parts

Resin molded products

Outer boxes

Aluminum wrapping mat

Laser label marking

Film (processing)

Optical fiber (processing)

Conventional tower-type head size

Conventional side-type head size

Height Approx. 2/3

Depth Approx. 1/3

Width Approx. 2/3
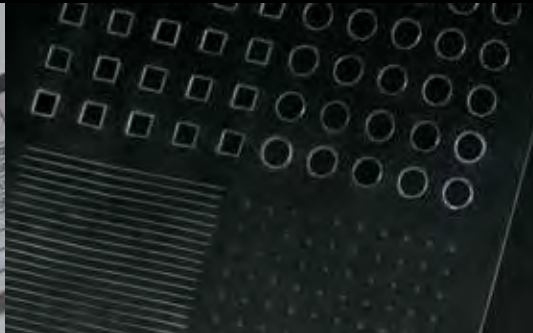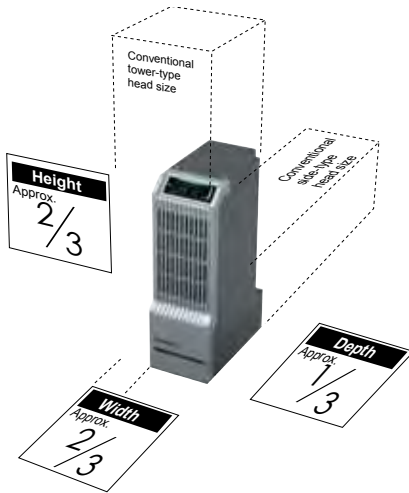
Revolutionary size & wide marking area

The LP-GS series Laser Marker heads have considerably decreased in size and weight. The controller is also miniaturized so this downsized unit contributes to reduce floor space cost. Heads can be installed in any direction (top, bottom, left or right), allowing users more freedom when designing the unit. Moving the head to the marking position ensures high-quality marking over a wide area. The cable between head and controller is flex-resistant. (Please note that excess force should not be applied when moving the head).

6mm

Z-axis control

Previously the head height had to be adjusted each time the circuit board thickness was changed. The LP-GS series is fitted with a Z-direction control mechanism that can adjust the work distance based on circuit board thickness. The mechanism both eliminates man-hours to change setup and maintains marking quality uniformity.

Thick circuit board

Thin circuit board

With Z-axis adjustment   Without adjustment

New dedicated software: Laser Marker NAVI smart

Includes the new dedicated PC configuration software Laser Marker NAVI smart. It is compatible with Windows® 8. When used with a tablet PC, touch panel operation becomes possible. Also wireless access via Bluetooth is available. Troublesome cables will not be required and configuration after installation is simple.

Model / Item	LP-GS	
	LP-GS051	**LP-GS051-L**
Work distance	111mm	
Marking range	55 × 55mm	
Marking laser	CO_2 laser, wavelength: 10600nm, class 4 laser (CW oscillation)	
Average oscillator output at product processing edge	6.5W	
Marking condition	Stationary	
Guide laser / laser pointer	Red semiconductor laser, wavelength: 655nm, class 2 laser, maximum output: 1 mW	
Scanning method	Galvano-scanning method	
Scan speed	Maximum 3000mm/s	Maximum 2000mm/s
Character settings (character height, width)	0.1 to 55mm	
File format for logo data	VEC, DXF, BMP, HPGL, JPEG	
Marking shape	Straight line, arc, proportional, justify	
Character types	English uppercase and lowercase letters, numerals, Japanese katakana, hiragana, kanji characters (JIS No. 1 and No. 2 standards), symbols, user-registered characters (up to 50)	
Barcodes	Code 39, Code 128, ITF, NW-7, JAN (EAN) / UPC	
2D codes	QR Code, Micro QR Code, iQR Code, Data Matrix, GS1 Data Matrix	
Interfaces	I/O terminal, I/O connector, RS232C, Ethernet	
Cooling method	Forced air cooling (head and controller)	
Power supply	90 to 132 V AC or 180 to 264V AC (±10%), frequency 50 / 60Hz	
Power consumption	Max. 370VA (100V AC), max. 500VA (200V AC)	
Ambient temperature	0 to +40°C	
Storage temperature	−10 to +60°C	
Ambient humidity	35 to 85% RH	
Net weight — Head	11 kg	
Net weight — Controller	8 kg	
Included software	Laser Marker NAVI smart, logo data conversion software, logo data editing software, Font Maker	
Laser Marker NAVI smart connection method	USB, Ethernet, Bluetooth	

* Adobe Illustrator® is necessary

Dimensions

LP-GS head

LP-GS controller

* All measurements in mm

Due to the midrange infrared wavelength spectrum, Panasonic's LP-310-C laser marker is perfectly suited to permanently mark resins, enamel surfaces, glass and organic materials such as paper, wood, rubber or leather.

In comparison to conventional printing processes such as inkjet printing or tampon printing, the laser marker system is a purely optical tool that does not come into direct contact with the material it is marking. Hence it is not subject to wear and tear and requires no additional consumables such as toner, ink or solvents.

In addition to its superior marking quality with clear contours, the LP-310-C is nearly maintenance-free and hence produces few service or follow-up costs.

FDA
Conforming to
FDA regulations
(some models only)

CE
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-300

The LP-300 series CO_2 laser marker is an "entry-level" device designed for accurate and distinct marking applications on various materials.

Cable

IC

Switch (resin part)

Laser labels (marking & half cutting)

Connector

Retort pouches

Terminal block (resin part)

Connector

Wooden brush

Simple to operate

The LP-300 laser marker series is the result of manufacturing experience accumulated over years and the knowhow from Panasonic. The laser markers are designed to be as easy to use as a normal printer. With the user-intuitive setting software, which runs on any Windows PC, you are able to configure your marking layout according to your requirements. You simply enter the marking content, i.e. text or dates, add the logos, and define the marking conditions as well as the marking position. Then save the settings in a file for easy re-use. The laser marker can store up to 120 marking files to allow you to save the marking settings for various products.

Guide laser simulation

The well visible, red guide laser indicates the marking position in advance. This marking simulation offers the possibility to check and adjust the marking position prior to executing the real marking process.

Compared to inkjet printers

Environment	Maintenance	Running cost	Productivity	Marking quality
Environmentally friendly because no ink is used and no industrial waste is generated from solvent, filters, etc.	Filling and replacing ink and replacing filters is not required at all. No stoppages for maintenance are needed. No specialist training is required, either.	Running costs consist of electricity costs only. No costs are incurred for ink, solvents, filters or pumps.	Marking details can be created easily on a computer and sent to the laser marker. Dates and serial numbers can also be generated automatically.	Because marking characters along a line is possible, visibility is excellent. A wide range of variations such as fan-shaped and sloped-line characters are possible. Logos and model indicators can also be marked.

Many marking variations

Marking the current date

Manufacturing date 15. 01. 13
↓
Use-by date: 15. 03. 01

Manufacturing date: 15. 08. 08
↓
Use-by date: 15. 09. 05

Counter

Lot marking

Manufactured on Oct 5th → 2004A

Manufactured on Oct 5th → 2004B

Manufactured on Oct 5th → 2004C

Arced and tilted

Various fonts

ABCDEFGH

Various settings

Standard Characters
Note:
The LP-300 series are CO_2 laser markers.

Logo marking

Panasonic

Bold characters
Note:
The LP-300 series are CO_2 laser markers.

Item \ Model	LP-310-C
Work distance	145mm
Marking field	50mm x 50mm
Scanning speed max.	2000mm/s
Average output	12W
Ambient temperature	0 to +40°C (no condensation or frost), storage: -10 to 50°C
Ambient humidity	35 to 85% RH (no condensation or frost)
Marking method	Galvanometer scanning method
Marking laser	CO2 laser λ = 10.6μm, laser class 4
Guide laser	Semiconductor λ = 655nm, laser class 2; 1mW
Array of character	Straight line, proportional/typewriter, arced, tilted
Type of characters	Capital & small characters, numerals, katakana, hiragana, kanji (JIS level 1 & level 2), symbols, user-defined characters (up to 50 types)
Logos/Graphics	DXF
Cooling method	Forced-air cooling
Supply voltage	90 to 132VAC or 180 to 264VAC (auto-changing), 50/60Hz
Power consumption	700W or less
Inputs	Laser stop, file no., trigger, counter reset, emergency stop
Outputs	Alarm, marking ready, counter end
Communication ports	RS232, digital I/Os
Marking condition	Static
Functions	› correction of intersection › test marking › current date/time marking › lot marking › guide laser › file transfer/file reading › expiration date/time marking › bold marking › error history display › counter marking › marking image display › CAD marking › saved file list › serial data communication
Weight of head	13kg
Weight of controller	5kg (Power supply)

Dimensions

LP-300 head

File no. / error code indication

175

151

141   14

Laser radiation indicator

710

100   3

145   (36)   78

Shutter lever (guide indication laser select lever)

Marking center point

Marking area 50 x 50

LP-300 controller

Main power supply indicator

95   Key switch

LP-300

315   4

210
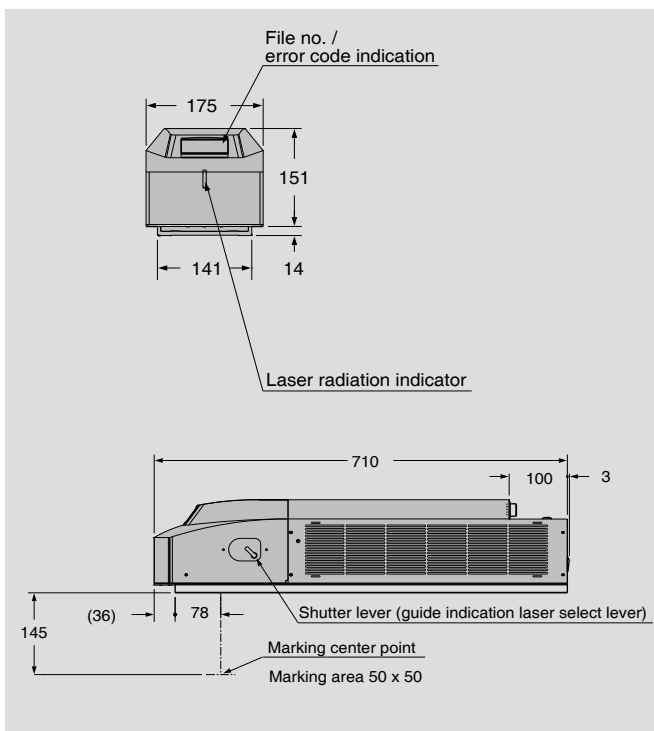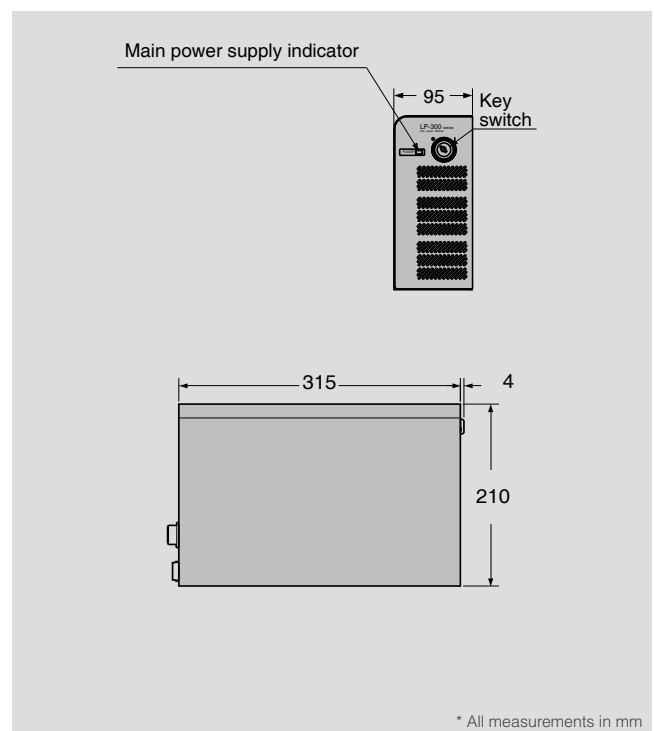
* All measurements in mm

Panasonic conceived the LP-400 series laser markers especially for industries with particularly high demands on speed and functionality. LP-400 series laser markers are CO$_2$ laser marker systems with an output power of 10W, 20W or 30W that, due to an ultra fast galvano-scanner, can mark moving objects on-the-fly at a line speed of up to 240m/min.! The incorporation of an encoder interface permits optimization of marking and flying speed.

Due to their small laser beam diameter of down to 95μm, certain models are especially well suited to mark very small characters on difficult materials. Due to their somewhat shorter wavelength of 9.3μm, some versions of the laser markers are ideal for marking clear plastics such as PET or PC.

FDA
Conforming to
FDA regulations
(some models only)

$C \in$
Conforming to Low Voltage
and EMC Directive
(some models only)

LP-400

The high-grade LP-400 series CO_2 laser marker is designed for high-quality marking and processing applications on various materials.

Removing cable insulation

PET bottles

Pouch packaging

Ceramic capacitors

Printed circuit boards
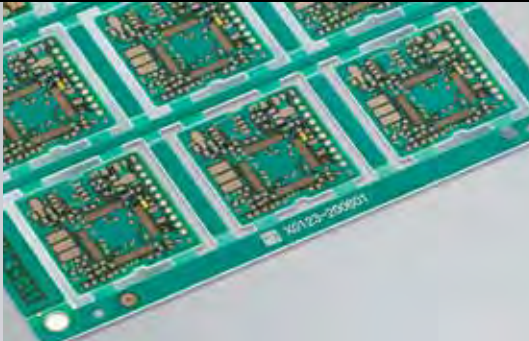
Glass

Ceramic circuit boards

Rubber gaskets (processing)

Transistor
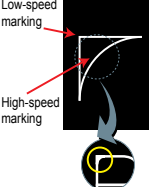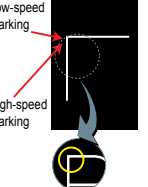
Improved productivity

High-speed marking

The LP-400 series features a high-performance galvano scanner whose acceleration, deceleration, and response speeds exceed those of conventional models by delivering dramatically shorter marking times. Capable of marking up to 700 characters per second and at line speeds of up to 240m/min, the LP-400 series can deliver an improved productivity. The LP-400 series automatically determine the most efficient marking order, further reducing marking time. Panasonic's proprietary galvano scanner control technology keeps marking accurate and aligned, even at high speeds.

High-quality marking

Technologies behind high-quality marking

Conventional models	LP-400 series
A	A
Lines overlap, distorting character shape.	Uniform marking Optimized adjustment prevents excessively deep marking caused by overlapping lines, avoiding distortion of character shapes.
Conventional models	LP-400 series
Low-speed marking High-speed marking	Low-speed marking High-speed marking

The LP-400 series takes advantage of a number of new technologies compared to conventional models to deliver high-definition marking. Advanced control functionality automatically adjusts marking strength at locations susceptible to deep marking such as the beginning and ends of lines and areas where straight and curved lines intersect. The result is a beautiful, high-quality mark with uniform line depth, even at high speeds.

High-stability laser

Extensive lineup

Laser output stability of within ±3% (typical) ensures consistent marking and high-quality processing over the full output range. The extensive lineup of laser output and wavelength options (three available laser output levels: 10W, 20W, 30W and two available laser wavelengths: 10.6μm and 9.3μm) accommodate more applications.

The proprietary rotating head found on standard models and the additional freedom of installation provided by a selection of tower head models provide the performance to meet a variety of needs.

Standard model

Tower model

Item	Model	Small spot			Standard			Wide area	
	Standard	LP-431U-C	LP-421S9U-C	LP-411U-C	LP-430U-C	LP-420S9U-C	LP-410U-C	LP-425S9U-C	LP-435U-C
	Tower	LP-431TU-C	LP-421S9TU-C	LP-411TU-C	LP-430TU-C	LP-420S9TU-C	LP-410TU-C	LP-425S9TU-C	LP-435TU-C
Work distance (manually adjustable)		111mm (±2mm)			185mm (±3mm)			262mm (±4mm)	
Marking field		55mm x 55mm			110mm x 110mm			160mm x 160mm	
Scanning speed max.		6,000mm/s			12,000mm/s			12,000mm/s	
Line speed max.		120m/min		85m/min	240m/min		170m/min	240m/min	
Average output		30W	20W	10W	30W	20W	10W	20W	30W
Ambient temperature		0 to +40°C (no condensation or frost), storage: -10 to 60°C							
Ambient humidity		35 to 85%RH (no condensation or frost)							
Marking method		Galvanometer scanning method							
Marking laser		CO_2 laser λ = 10.6µm (9.3µm LP 42xS9U), laser class 4							
Guide laser		Semiconductor λ = 655nm, laser class 2, 1mW							
Array of character		Straight line, proportional/typewriter, arced, tilted							
Type of characters		Capital & small characters, numerals, katakana, hiragana, kanji (JIS level 1 & level 2) symbols, user-defined characters (up to 50 types)							
Bar codes/2D codes		CODE39, CODE128, ITF2/5, NW-7, JAN/UPC/EAN, RSS 14, RSS limited, RSS expanded (GS1 Databar), GS1 Data Matrix, QR, Micro QR, Data Matrix (ECC200), etc.							
Logos/Graphics		VEC, DXF, BMP, HPGL, JPEG, AI*, EPS*							
Cooling method		Forced-air cooling							
Supply voltage		90 to 132VAC or 180 to 264VAC (auto-changing), 50/60Hz							
Power consumption		1,200W (at 200VAC)		700W (at 200VAC)	1,200W (at 200VAC)		700W (at 200VAC)	1,200W (at 200VAC)	
Inputs		Remote, trigger, encoder (A), encoder (B), shutter control, laser pumping, alarm reset, emergency stop, laser stop, etc.							
Outputs		Power supply (+12V), remote, marking ready, marking, marking finished, laser pumping, warning, alarm, confirmation end, counter finish							
Communication ports		RS232, digital I/Os, Ethernet							
Marking condition		Static and marking on the fly							
Functions		› marking order optimizing › correction of intersection › counter marking › current date/time marking › expiry date marking › lot marking › logos/pictures marking › bold marking › logo data USB transfer	› I/O monitor › system offset › common character setting › font selection › proportional marking › marking image display › operator adjustment › error log display › work image display		› guide laser › power speed setting per line/logo file › step & repeat › time delay › serial data processing & marking › multilayered marking › backup			› various processing functions › dual pointer › marking time measurement › font/logo creation/editing › power check/correction › I/O simulation › focus adjustment › marking on moving objects	
Weight of head		20kg	16kg		20kg		16kg	20kg	
Weight of controller		12kg	11kg		12kg		11kg	12kg	

* Adobe Illustrator® is necessary

Dimensions

LP-400 head - standard model
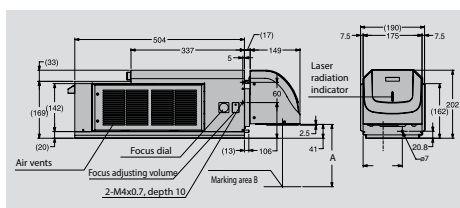
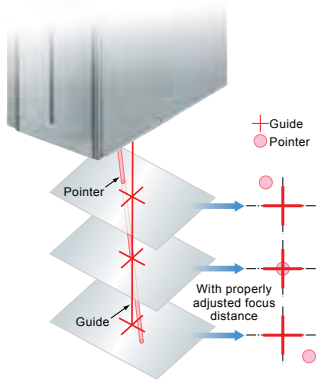| Type	Marking distance A (mm)	Marking area B (mm²)
LP-4X1	111	55 x 55
LP-4X0	185	110 x 110
LP-4X5	262	160 x 160

LP-400 head - tower model
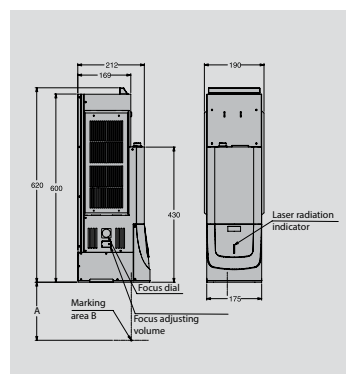
LP-400 controller
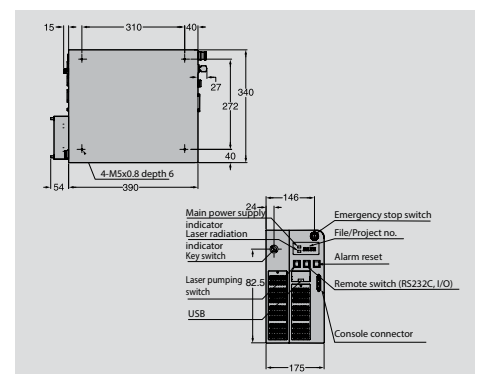


* All measurements in mm

Focus guide laser

Panasonic laser markers incorporate focal pointers created by a red guide laser to make it easier to check and adjust the center position and focus distance.

Marking guide laser

Panasonic laser markers use an easily visible red guide laser to trace out the set marking data and marking position, allowing you to visually check the marking position before actual marking begins.
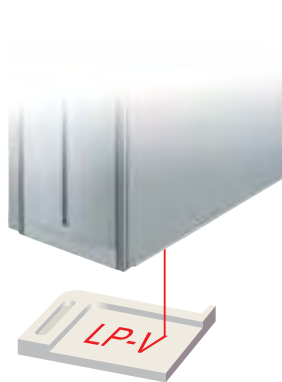
USB connectors

The ability to store system settings on USB memory sticks lets you back up marking settings or copy settings to multiple laser markers.

Focus adjustment

In simplifying calibration at the time of installation, a newly developed focus adjustment feature makes it easy to fine adjust the laser marker's focus without moving the head or fixture.

Installation at almost any orientation

Because of their robust design, Panasonic FAYb and CO2 laser markers can be installed at almost any orientation, enabling easy integration in existing machines, even with limited access or space.
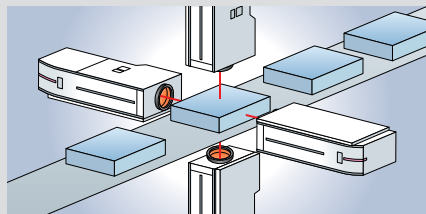
"On the fly" marking

Panasonic laser markers are equipped with an encoder interface, allowing objects to be marked "on the fly" with line speeds of up to 240m/min.

Marking order optimization

Panasonic laser markers automatically determine the most efficient marking order, optimizing high-speed marking.

Not optimized   Optimized
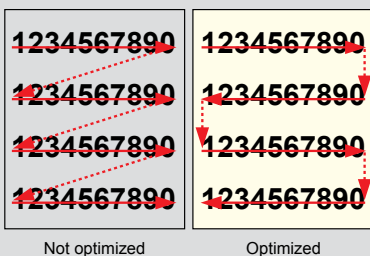
1D and 2D code generation

1D and 2D codes enable product information such as serial and lot numbers to be output in a space-efficient manner. These codes are machine readable and are common for track and trace applications.

Step and repeat

Step and repeat provides high-speed batch marking for printed circuit boards and plastic packaging such as trays and lead frames, helping increase speeds onsemiconductor and electronic component production lines.
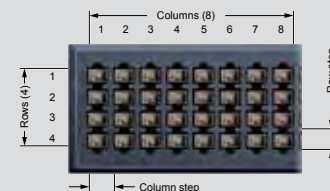
Laser Marker NAVI PC software

Laser Marker NAVI's simple, intuitive mouse-driven interface makes it easy to configure marking conditions and positions in setting files, allowing you to easily create marking layouts according to plan. The application also allows your computer to monitor system operation, and you can check error logs and the I/O monitor at the same time.


Offline configuration

Now you can create and save data at a remote location such as an office and later transfer it to the laser marker on-site for marking. Alternatively, you can avoid the need for an on-site computer entirely by using a USB memory stick and console to save data to the laser marker for marking.
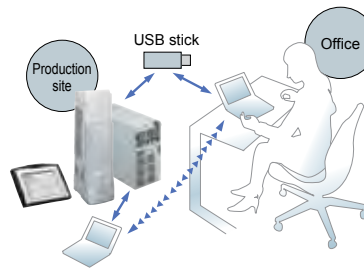
Batch laser marker management

Now you can connect multiple laser markers to a single computer for centralized management of all connected markers and associated configuration data. Easy, straightforward monitoring of settings and operational status rounds off the application's management capabilities.
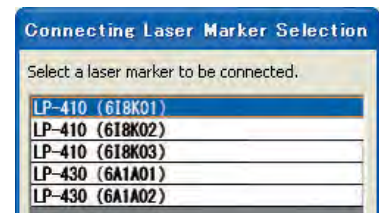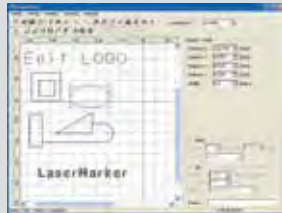

FONT maker software

This useful software allows you to modify or create your own fonts to be marked with the laser marker. It is very useful if registered "®" fonts for company and product names need to be used.
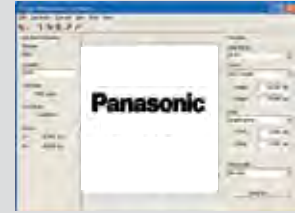

Power check

This convenient feature allows one-touch confirmation of the current attenuation actor relative to the laser's output when the unit shipped. Total laser radiation time is also displayed on the screen to simplify system maintenance and management.
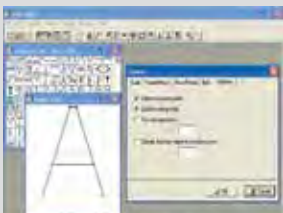
Logo data editing software

Logo data editing software provides a simple and intuitive configuration interface allowing you create and edit your logo files without using commercial CAD software.

Password

A password feature dramatically improves safety and security by restricting users' ability to input certain information and protecting system settings, enabling safe and convenient use of the system for design, technical support, facilities, and production workers.

LOGO CONVERTER

Logo data conversion software output logos and other graphical marks from DXF, HPGL,BMP, or JPEG into the VEC format. Data created by Adobe Illustrator® such as AI and EPS can be converted by "Export Vec", which is included.

Help

Panasonic laser markers include a help feature so that even first-time users are able to operate the system smoothly. Detailed messages inform users of potential configuration mistakes, reflecting our company's belief that a responsive and intuitive interface is an important aspect of system performance.

LTF-C glass marking technology

tesa and Panasonic Electric Works have mutually developed a revolutionary technology called LTF-C (Laser-Transfer-Film-Contrast) to mark glass perma-nently. The technology combines laser markers from Panasonic with Laser-Transfer-Film from tesa, yielding a permanent, high contrast mark that is tamper-proof and as indestructible as the glass itself.

Key advantages:

> Individual marking
> Can be read by standard vision system
> High contrast
> Glass integrity not compromised
> Temperature resistant up to 1000°C
> Impervious to UV radiation
> Resistant against chemical products (acids, bases...)
> Permanent marking (durability more than 25 years)
> Protects against theft and illegal copying
> Prevents counterfeiting

Automobile industry

Automobile windows must be marked permanently and tamper-proof for each specific automobile. In contrast to traditional glass marking, LTF-C requires no caustic substances or subsequent thermal processing. LTF-C is a "cold", flexible laser marking technology.

Advantages:

> Reduction of product scrap via reliable laser technology compared to conventional screen printing
> More efficient stock management due to customer-specific marking applied after glass production
> Recording of individual markings or Vehicle Identification Number (VIN) possible part by part

Pharmaceutical industry

LTF-C glass marking technology allows individual marking of primary packaging for track & trace purposes. The machine-legible Data Matrix code on each syringe means the pharmaceutical product can be tracked seamlessly throughout the process chain.

Advantages:

> 100% tracking of the primary packaging
> Product forgeries can be easily identified
> Excellent legibility
> Integrity of the glass body not compromised
> Permanent
> No particles

Workstation

A high demand to provide not only Laser Markers, but also a professional environment for their operation led Panasonic to develop the new workstation.
Panasonic currently offers three different models.
A rotary indexing table system with x-, y-, z-axis movement and 360° rotation axis. Suitable for small and individual series. All Panasonic fiber laser and the LP-GS are integrated.

Touch panel

With the color touch panel LP-ADP40 a simple operation of
the Laser Marker systems is guaranteed. Even persons unfamiliar with machine operation can easily handle it.
An intuitive and understandable software package allows
the operator to access all setting screens, and the ergo-nomically designed touch panel is easy to operate regardless of whether it is attached to a machine or held by the operator.

Laser fume extraction

Panasonic recommends employing an extraction unit when using a Laser Marking System. This protects the operator from health hazards and extends the service life of the laser.
Special laser fume extraction units are available, e.g. for PVC marking applications.

Protective googles

To protect your eyes against laser radiation we offer special goggles for laser marking systems. The protective goggles allow you to move and act freely in the dangerous operation zone and prevent damage to your eyesight even if you unintentionally look into the laser beam.

More information on www.laser.panasonic.eu

North America	Europe	Asia Pacific	China	Japan

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