

JK Series

CW Lasers with SuperModulation

Models JK401, JK501, JK802, and JK1002 Lasers

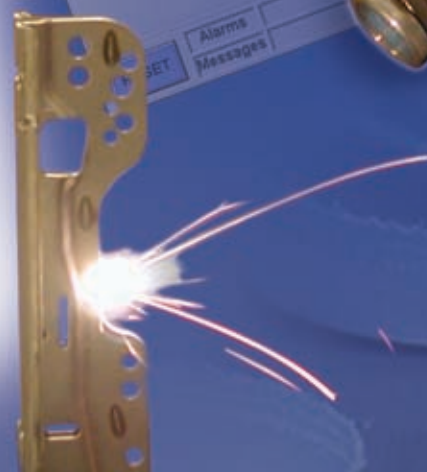


Better than just CW: Higher performance welding and cutting with high reliability and low process cost.

- Next-generation design for increased reliability and reduced cost of ownership
- Unique SuperModulation™ widens process window and increases capability
- Products range from 400–1000W average power at the workpiece with 800–2000W maximum modulated peak power
- Patented Luminator™ pre-aligned fiber-optic beam delivery system prevents back reflection damage to the fiber
- Graphical user interface software decreases level of experience required to operate the system
- Remote diagnostic access for increased support efficiency



GSI Lumonics



Next-Generation Lasers that Provide Reliability and Efficiency

GSI Lumonics' *JK Series* of continuous wave (CW) Nd:YAG lasers is a product family ranging from 400 to 2000 Watts. These proven performers are used for fast keyhole welding, efficient metal and silicon cutting, heat treating, and cladding.

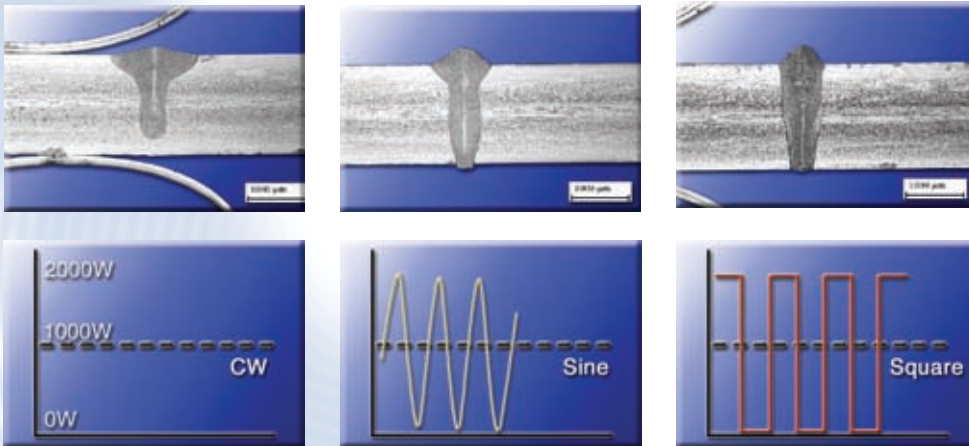
Unlike other CW lasers, these lasers also feature *SuperModulation™*, an innovative modulation technique that provides improved beam-material interaction for more efficient processing.

GSI Lumonics, who first brought CW lasers to the market in 1992, has designed this third generation of product with a commitment to reducing total life cycle laser costs through innovation. In developing these robust laser systems, GSI Lumonics has drawn upon thousands of hours of operating experience and has refined, simplified, and tested their technological capabilities, incorporating them into this latest product offering.

SuperModulation – Better than just CW

SuperModulation is a patent pending technique in which some energy is stored in the laser's power supply during the laser's off-time or during a low average power cycle, and then is delivered to the lasing medium during a later on-time or a high average power cycle. This produces a momentary output power that is up to 2X higher than that of the laser's mean power rating for:

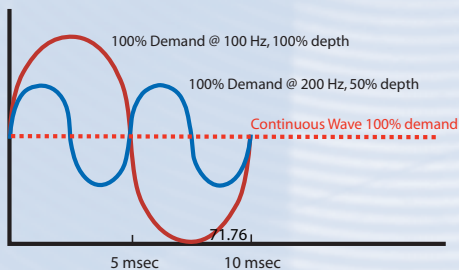
- More precise, higher penetration welding with less heat distortion and without compromising speed
- Cleaner, more controlled cutting of complex shapes
- Greater depth of focus
- Significantly improved processing of reflective materials



Improvements in weld penetration and shape with Sine Wave and Square Wave SuperModulation.

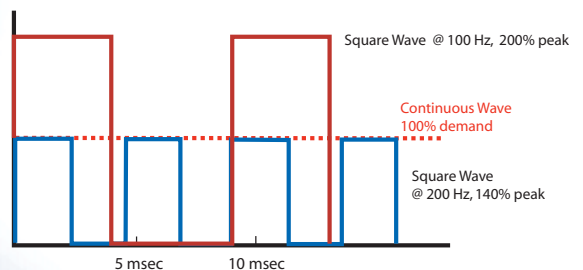
SuperModulation offers the speed of CW laser processing with the control of a pulsed laser. By allowing process engineers to truly control such factors as weld penetration, heat effected zones, cooling rates, kerf quality, cornering speeds, and burnback, users can gain more control, performance, and efficiency from their laser processing system.

Sine Wave Modulation - up to 200% peak power



Graph of Sine Wave SuperModulation compared to Continuous Wave.

Square Wave Modulation - up to 200% peak power



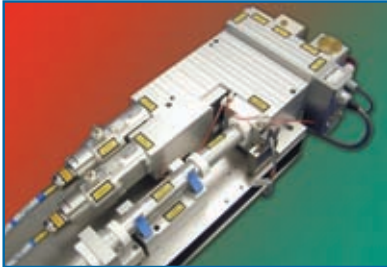
Graph of Square Wave SuperModulation compared to Continuous Wave.

Beam Delivery System

The *JK Series* lasers are available with a combination of time and energy share modules. Up to six time shares and six-way energy shares are available.

In addition, the lasers are offered with our patented *Luminator™* fiber-optic beam delivery system. These plug-in pre-aligned (PIPA) fiber optics allow for rapid set-up and changeout without the need for service intervention, and are designed for long life in continuous robotic or multi-axis applications.

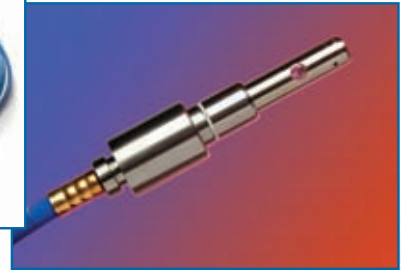
The *Luminator's* patented coupling mechanism virtually eliminates back reflection damage when welding highly reflective materials, and all fibers are fitted with a fiber continuity monitoring system.



2-way timeshare



Fiber optic with bendlock for robotic applications



Patented coupling

Control Technology

The graphical user interface offers easy programming control of the laser with multi-level access for programming, maintenance, and system status.

Man-Machine Interface Options:



Graphical user interface, local/remote on touchscreen Windows-based PC with additional features including:

- on-board process in-view options
- on-board SPC data collection
- data logging of all laser parameters



Control Software for GUI option with additional safety hardware for customer integration.

Remote Interface Options for Machine Integration:

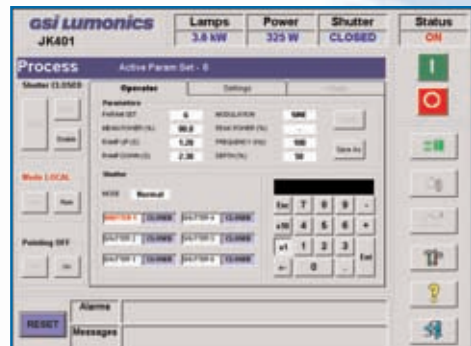
- Parallel interface – PLC compatible
- Serial interface – RS-232 and RS-422
- OPC interface
- TCP/IP interface

Process Tools for Versatility

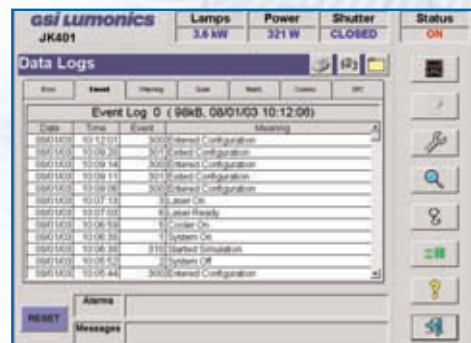
GSI Lumonics offers a range of process tools, including:

- Straight and right-angle focus heads
- CCTV viewing
- Adjustable air knives
- Welding gas delivery systems
- Auto focus cutting nozzles

Special options are also available. Please contact your local GSI Lumonics representative to discuss your requirements.



The graphical user interface simplifies access to all system functions.



Laser Specifications

Model	JK401	JK501	JK802	JK1002
Average Power* (W)	400	500	800	1000
Maximum Modulated Peak Power (W)	800	1000	1600	2000
Number of Lamps	2		4	
Beam Quality 1/2 Angle-Radius (mm.mrad)	16	24	16	24
Laser Response Time (ms)	1.5			
Modulation Frequency (Hz)	100 - 1000			
Output Mode	CW, sine or square modulation			
Standard Compliance	CE, CDRH, Sealed to IP55/NEMA 12			
Fiber-Optic Beam Delivery				
Fiber Core Diameter (µm)	400	600	400	600
Standard Spot Size (nominal) (mm)	0.16–0.60	0.30–0.90	0.16–0.60	0.30–0.90
Standard Fiber Lengths (m)	5, 10, 15, 30, 50			
Maximum Fiber Length (m)	50			
Energy Share Option	Up to 6 ways			
Timeshare Option	Up to 6 ways			
Timeshare Switching Time (msec)	<50			
Focus Head Options	Straight or right angle			
Process Tool Options	CCTV viewing, welding nozzles, autofocus cutting modules and a range of special options.			
Facility Requirements				
Cooling water temperature and flowrate	10 - 18° (typically 33 l/min at 15° C, 43 l/min at 18° C)		10 - 18° (typically 55 l/min at 15° C, 75 l/min at 18° C)	
Maximum Pressure Drop at 18° C	2.5 bar		6.5 bar	
Maximum Inlet Pressure	7.5 bar			
Cooling Capacity (kW)	19		38	
Electrical (Discrete Tappings on Auxiliary Transformer)	380/400/415V +/-10% @ 50 Hz 460/480V +/-10% @ 60 Hz			
Supply Rating (kVA)	21		40	
Maximum Power Consumption (kW)	19		38	
Ambient Temperature (°C)	5 - 40			
W x H x D (mm)	1600 x 1264 x 820		2200 x 1264 x 820	
Weight (kg)	600		800	
Maximum Humidity	95% RH at 20° C, 50% RH at 40° C			

*At workpiece at end of lamp life.

Specifications are subject to change. Please consult Product Center for complete details.