

LIGHTMED LIGHTLAS DEUX – V™ YAG/SLT/VITREOLYSIS SYSTEM

vs. *QUANTEL OPTIMIS FUSION*





LIGHTMED CORPORATION	vs.	QUANTEL MEDICAL
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Model	LIGHTLas Deux-V™	OPTIMIS Fusion
Manufactured by	LightMed Inc. CALIFORNIA, USA	OPTOTEK d.o.o. SLOVENIA
Slit Lamp Type	Integrated CSO (Italy) SL 950	Integrated CSO (Italy) SL980*
Magnification Range	Integrated 5-step	Integrated 3-step*
Laser Type	Q-Switched (CQ-Crystal) Nd; YAG	Q-Switched (Passive) Nd: YAG*
Wavelength	1064nm / 532nm	1064nm / 532nm
Application	YAG/SLT/VITREOLYSIS	YAG/SLT*
Mode Structure	Fundamental	Fundamental
Spot Size	8 µm (YAG mode) / 400 µm (SLT mode)	10 µm (YAG*) / 400 µm (SLT mode)
Cone Angle	16° (YAG mode) / 3° (SLT mode)	16° (YAG mode) / 3° (SLT mode)
Max Repetition Rate	Up to 3.0 Hz for YAG and 2.5Hz for SLT	Up to 2.0 Hz for YAG* and 2.5Hz for SLT
Pulse Width	4ns (YAG mode) & 3ns (SLT mode)	4ns (YAG & SLT* mode)
Air Breakdown	<2.5mJ (typical)	<3.5mJ* (typical)
YAG Offset Shift	±500µm Anterior Posterior Continuous Adj.	3 step* - 150µm, +30µm, ±150µm
Output Energy	0.2mJ -15mJ continuously variable (YAG) 0.2mJ – 2.6mJ continuously variable (SLT)	0.3mJ -15mJ continuously variable (YAG*) 0.2mJ – 2.0mJ continuously variable (SLT*)
Max Energy	45 mJ	30mJ*
Auto Calibration	YES for YAG and SLT Mode	No Auto Calibration*
Cooling	Air Convection & Thermal KTP System	Air Convection*
Burst Mode	1,2 or 3 pulses per burst (YAG mode) 1 pulse (SLT mode)	1,2 or 3 pulses per burst (YAG mode) 1 pulse (SLT mode)
Motorized Table	Portable & 2 Optional Table Types	Integrated table only*
Configuration Options	SLT YAG/SLT YAG/SLT/VITREOLYSIS + 532 or 577 or 810 Single Spot Photocoagulator with CW and MP Mode	YAG/SLT YAG/SLT + 532 Photocoagulator Single Spot * YAG/SLT + 532 Photocoagulator Multi Spot *

* Indicates a Quantel's significant technical and clinical deficiency vs. LIGHTLas Laser system.

SMART & ERGONOMIC INTEGRATED DESIGN

The LIGHTLas YAG & YAG/SLT Deux was designed for physician and patient comfort for fast and convenient operation. Its ergonomic and uniquely integrated design makes it the most functional and comfortable YAG/SLT laser to operate.

The laser permits for convenient dual handed controls, and exhibits short working distance between the objective lens and the patient's eye, thus reducing back strain for the user.

The outbound mounted chinrest facilitates convenient accommodation of patient, enhancing their posture comfort and in-treatment compliance.

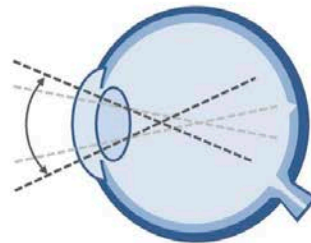


QUALITY PRECISION OPTICS

The LIGHTLas YAG features excellent quality components and high-resolution slit lamp optics, optimized for anterior segment procedures. Whereas the beam splitter free design with internally coated safety optics as opposed to fixed safety filters, assure unmatched procedural viewing clarity and a larger field of view compared to most contemporary lasers in the market.



LIGHTLas YAG Segment Viewing



LIGHTLas YAG Field of view

10% Larger Field of View

** Both LightMed and Quantel systems feature an integrated CSO supplied slit lamp. However the LightMed SL950 slit lamp has been exclusively designed to serve as laser integrated slit lamp ensuring optimum anterior and posterior viewing with now compromise.*

BUILT IN 5-POSITION MAGNIFICATION CHANGER

The LIGHTLas Deux features a five-position magnification changer. When combined with the laser's enhanced optical design, it assures greater flexibility for diagnostics and treatment outcomes.

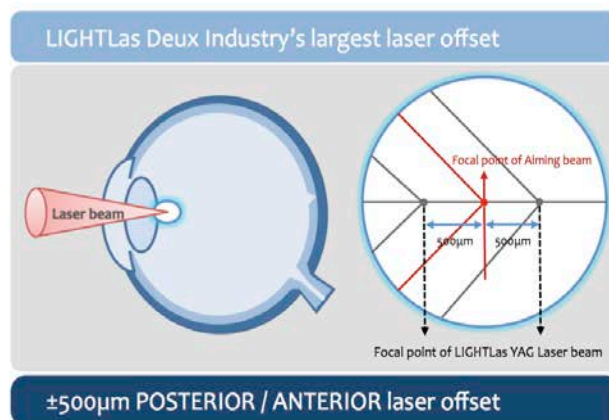
The design allows optimal viewing of fine structures and a wide field view of the treatment area, whereas the integrated design minimizes the working space (length) assuring greater levels of convenient for the physicians (for example not having to reach out with their arms maintaining a more comfortable working position, and ability to use greater range of laser lens choices without the need of asserting pressure on the patients eye).



* Quantel Fusion features only a three-position magnification changer significantly reducing the systems diagnostic and viewing capabilities.

INDUSTRY LARGEST $\pm 500\mu\text{m}$ POSTERIOR / ANTERIOR FOCUS SHIFT

The LIGHTLas YAG features industry's largest range of focal plane shift, providing great flexibility for more precise and accurate procedures. This assures better clinical versatility, and is essential when dealing in multi-patient environments with numerous IOL types, as the large focus shift allows precise titration of treatment focus without compromising comfort and preventing the possibility of lens pitting. The posterior and anterior offset setting is adjustable within a massive range of $\pm 500\mu\text{m}$, continuously variable with selected audible and detent steps, facilitating procedure and operation during procedure in dark room conditions.

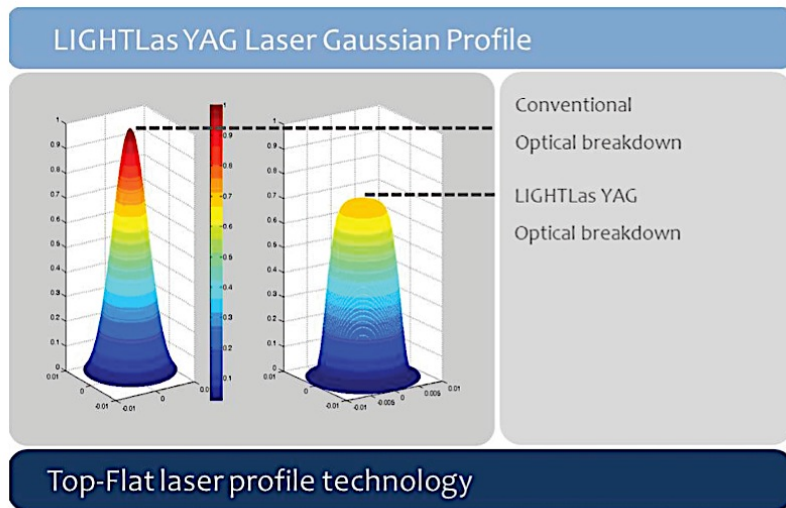


* Quantel Fusion offset setting allows only 3 settings at $-150\mu\text{m}$, $+30$ and $+150\mu\text{m}$. While the feature is applicable to the YAG procedure only, the LightMed unit still has far greater adjustment range to assure greater clinical precision, reduce possibility of lens pitting and assists in easier Vitreolysis Treatment.

SUPERB CRYSTAL Q-SWITCH LASER TECHNOLOGY

Unique Crystal Q-Switch laser cavity technology provides optimum tissue cutting precision and consistent shot-to-shot output energy at industry's lowest optical breakdown levels. This reduces the noise associated with photodisruption, assuring better patient compliance and allows procedures to be done with lower energy levels, reducing treatment side effects and lens pitting.

The 2.5Hz (ability to fire the laser 2.5 times per second) system design assures superb energy density and sets the LIGHTLas YAG amongst the fastest systems in the market, allowing fast yet highly precise and safe treatments.



** It is fair to state that LightMed's proprietary Crystal Q-switch technology sets LightMed significantly apart from Quantel Fusion as well as any other competitor in the market.*

While a hidden feature, just like the engine of a car; cavity is the single most –important element of laser system that is too often overlooked by professionals choosing to make a buying decision. Cavity Technology and its mode of operation is what makes LightMed laser a safe and sound investment with unprecedented advantages

- *Crustal Q switch produces significantly less oxidization than Quantel's Passive mode, assuring LightMed's Cavity will outlast Quantel 3-fold, producing consisting cutting and photodisruption.*
- *When in YAG Mode, an 8µm spot size (compared to 10 µm spot size of Quantel Fusion) produces more controllable and safer photodisruption effect, that is furthermore better clinically recognized standard amongst most laser manufacturers. The 10µm spot size is only produced by Quantel, ARC and Optotek (as technology made and designed by Optotek Slovenia).*
- *When in YAG Mode Quantel Fusion produces only 0.3 – 10mJ energy in YAG mode in stepped sequence. LightMed laser allows Continuously variable energy selection from 0.2 – 15mJ typically (in single spot) assuring more precise titration of energy settings for optimum clinical results.*
- *When is SLT Mode, Quantel produces as 4ns pulse width that's does not comply with current and recognized by all clinical studies protocol using a 3ns pulse. There have been no formal clinical studies ever conducted on SLT procedure with a 4ns pulse width.*
- *When in SLT Mode Quantel Fusion produces only 0.3 – 10mJ energy in YAG mode in stepped sequence. LightMed laser allows Continuously variable energy selection from 0.2 – 15mJ typically*
- *Quantel Fusion produces only a maximum output of 30mJ compared to 45mJ of LightMed. It is the least powerful laser engine in the market (same as ARC and Optotek), which suggests that the laser cavity operates at higher capacity, leading to reduced life span and increased energy fluctuations.*

UNMATCHED LONG-TERM PERFORMANCE

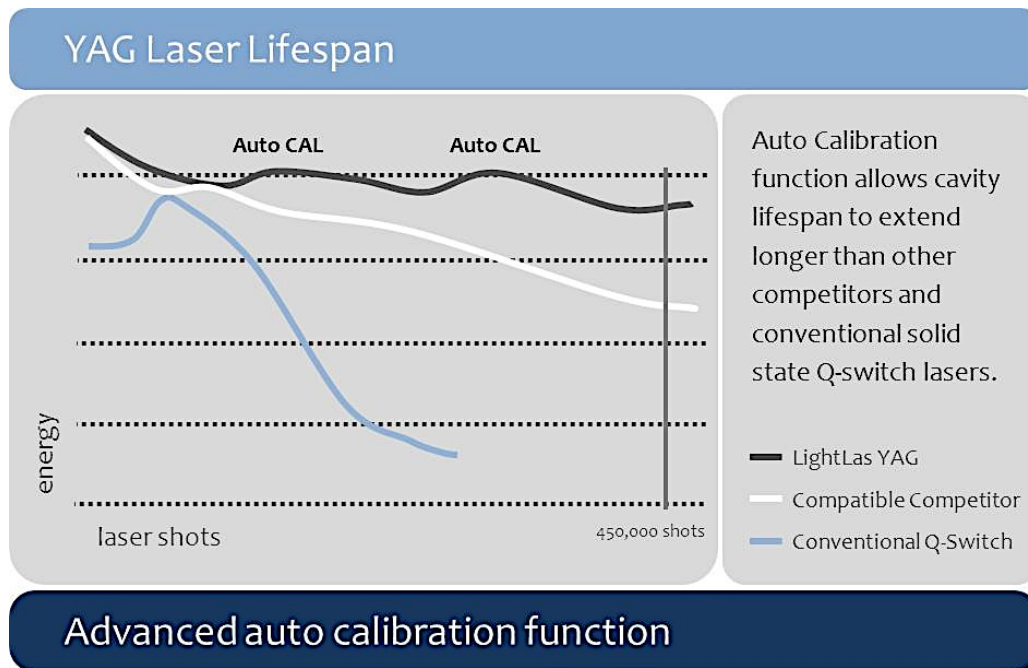
The already superb, fast and reliable laser engine technology is further complemented by proprietary auto-calibration function, which assures exceptional laser cavity life span.

Unlike other lasers in the market that require frequent maintenance to promote its life span, the LIGHTLas YAG & Deux will intelligently engage in auto-calibration mode as soon as the microprocessor senses degradation in output power over the predetermined levels. The laser will self diagnose and set optimum internal parameters to continually assure peak performance regardless of the laser age.

This unique feature significantly enhances the overall costs of ownership and reduces service requirements, yet assures operational safety and convenience of controllable results.

LightMed's cavity has been tested for life expectancy producing up to 450,000 at peak performance and a further 200,000 until reaching a point of decay. Again it is worth to mention that this is at least 3-fold the life expectancy of Quantel Fusion system with none or very limited need for technical callouts.

To assure even greater piece of mind, LIGHLas laser is designed to sense a thermal increase of temperature of the cavity (especially when laser is fired very frequently at high repetition), which will intentionally trigger the laser into standby mode until the cavity resumes optimum temp conditions. Quantel Fusion allows the laser to operate regardless of cavity temperature increasing the risk of energy spikes and significantly shortens the laser engine lifespan.



Advanced auto calibration function

* Quantel Fusion laser does not feature the auto calibration function.

While indeed both laser systems will degrade in time (taking into consideration that Quantel System will degrade sooner), its important to consider that as the energy begins to drop in the Quantel system and it begins to fluctuate beyond the industry safe standards (allowed for 20% tolerance) the Fusion system will trigger an error message and require more frequent maintenance thus expensive services and increased down times.

(When and if the energy in the LightMed system begins to fluctuate beyond the allowed levels, system will engage automatically into calibration mode).

CONVINIENT & EASY CONTROLS

The LIGHTLas YAG & SLY features large, clear displays with easily accessible controls, making it most the user-friendly laser available. Laser parameters can be seen and adjusted beneath the oculars, allowing them to verify parameter verification without the need to shift their head away from binoculars assuring adequate procedure focus and attention.



LIGHTLas convenient displays and easy to reach controls.



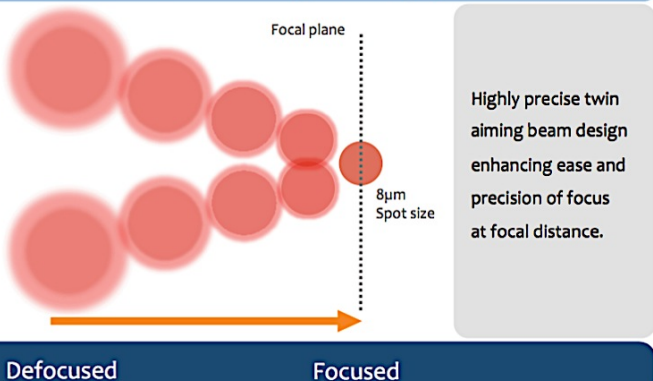
Fusion small display and un-ergonomic controls.

While Quantel Fusion system also a front panel display, it is small with inconvenient and poorly visible symbols and small push buttons. This requires the doctor to shift their focus and head completely away from the binoculars to verify laser settings. This affects the procedure flow and attention if having to frequently move the head away from the binoculars and readjust. LightMed Deux settings are much more conveniently located allowing the surgeon to maintain better focus on patient and procedure.

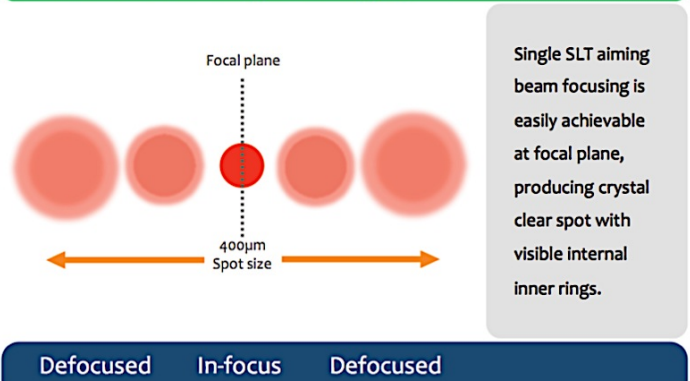
PRECISION WITH EASE

The LIGHTLas YAG uses a dual beam fine-focusing aiming beam system where both beams converge together at the focal target area creating a sharp and easily readable spot. The design assures a high degree of precision yet offers the comfort of effortless laser adjustments.

LIGHTLas YAG Twin Aiming Focusing System



LIGHTLas SLT Aiming Focusing System



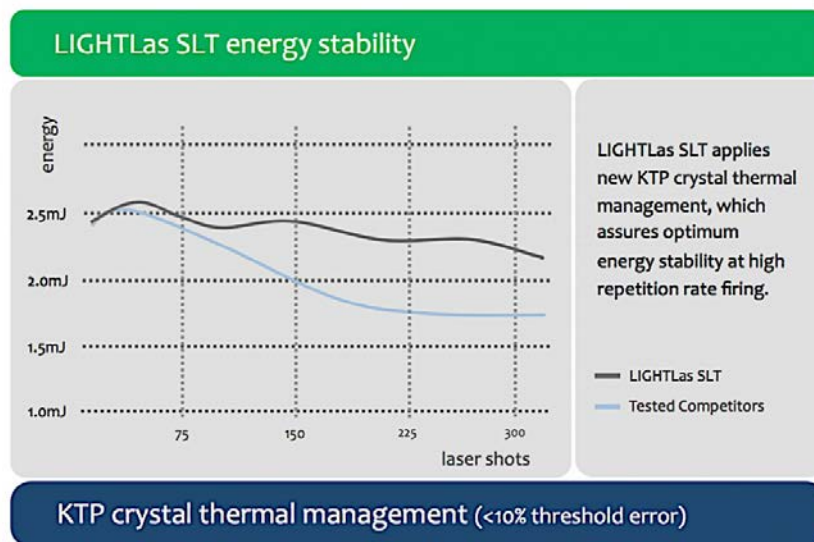
* Quantel Fusion and LightMed Deux feature equally comparable aiming and treatment beam positioning system

THERMAL KTP MANAGEMENT SYSTEM (SLT)

The new LIGHTLas SLT Deux and LIGHTLas SLT Solo feature an proprietary Thermal KTP Crystal Management circuitry and software, which assure most stable SLT output energy performance over high repetition firing.

Due to its physical properties, the KTP crystal that converts the YAG (Photodisruptor / Vitreolysis) wavelength to 532nm (SLT wavelength) may expands under temperature conditions and alters its output energy linearity due to frequent firing of the laser (as industry guidelines allow a $\pm 20\%$ error). This may often affect the treatment precision and its actual clinical outcomes.

LightMed's proprietary technology eliminates the KTP variations engaging a special thermal control mechanism and circuitry that assure optimum shot-to-shot performance and reduce the energy variation error to more than double of competitors.



** the KTP thermal management system is exclusive to LightMed design and not present the Quantel or any other contemporary systems. This assures much more consistent shot-to-shot performance especially over prolonged periods of time and in ageing lasers.*

ADVANCED LASER FIRING MECHANISM

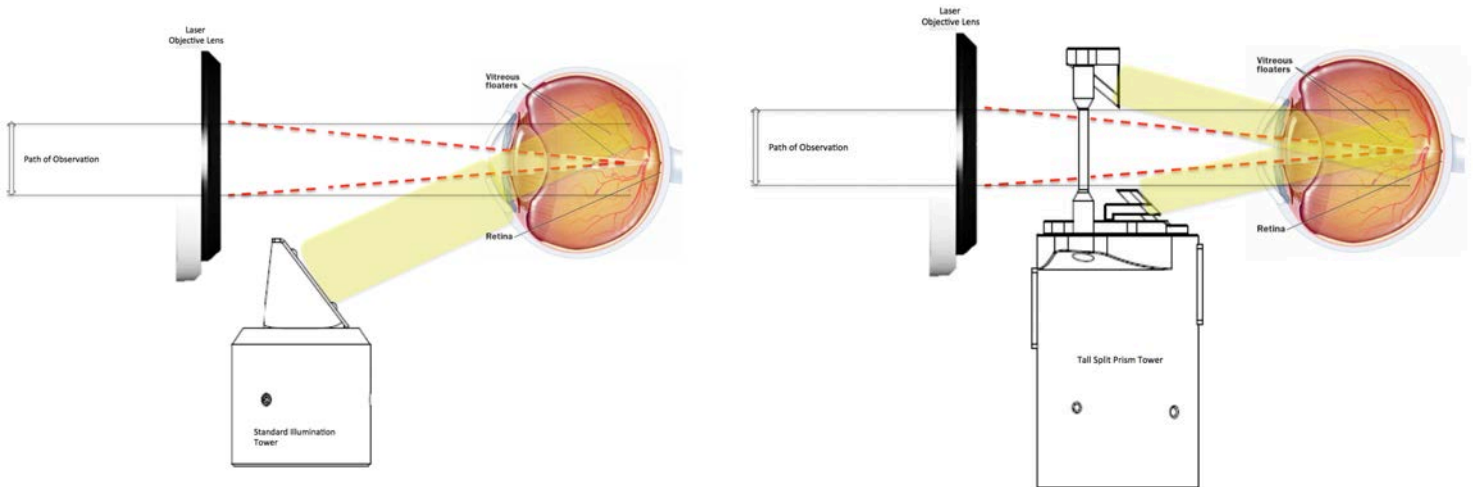
While another hidden advantage, prosperous customers need to understand that the LIGHTLas YAG / Deux features a direct fire-to-joystick- switch mechanism that assures perfect performance regardless of product age and position of the joystick.

Quantel Fusion uses a contemporary off-the shelf slit lamp, its internal joystick mechanism is connected by slip-ring and micro switch mechanism to trigger (fire) the laser. In time, the coating of the slip rings wears off, increasing possibility of laser misfire in desired position.

VITREOLYSIS TREATMENT FUNCTION

The LightMed Deux and YAG Laser system delivered or later configured as LIGHTLas-V platform, being fitted with a special split prism illumination tower (below right) that produces enhanced viewing positioning the illumination in the same path of the eyepieces and the treatment beam.

This coaxial illumination facilitates easier focusing of the laser in the vitreous cavity of the eye, and eases laser energy titration which is very important in treatment of vitreous floaters with the YAG function of the device.



Quantel's Conventional Low prism tower clips the illumination path making it difficult and dangerous to focus on vitreous floaters

LightMed Split Optional prism tower positions the illumination path in the same axis of viewing and treatment beam, producing greater depth of focus in vitreous chamber

**Quantel Fusion is incapable of performing the VITREOLYSIS function, lacking adequate laser OFFSET, Cavity Technology producing adequate plasma and Coaxial Illumination system to assure a safe and convenient operation. T*

MULTIPLE CONFIGURATIONS AND UPGRADE OPTIONS

LIGHTLas laser can be offered as YAG alone, YAG/SLT or YAG/SLT Vitreolysis from the start, or can be field-upgraded / configured at anytime. LIGHTLas YAG and Deux can also adapt with one of LightMed's unrivaled photocoagulators, creating a powerful multi-purpose anterior and posterior laser workstation.

This combination assures maximum cost and space saving capabilities. Whereas integration with one of LightMed's new generation 532nm (green) or 577nm (yellow) and 810nm (infrared) Photocoagulators, or dual-wavelength Photocoagulators all featuring conventional and sub-threshold (micro pulsing) treatment mode technology, make the LIGHTLas a powerful combination platform.

The Photocoagulator treatment laser is delivered through an attachment type delivery system that conveniently mounts on the LIGHTLas YAG without affecting its core performance.

The laser console can be conveniently located on a specially designed swivel plate for enhanced functionality, or mounted on the side column for enhanced space.

In addition LIGHTMED LIGHTLas YAG and Deux models are available in portable configuration or with single or dual motorized tables for enhanced clinical treatment and clinical mobility. Catering for better cost, space saving or easier accommodation of patient of physician.

Quantel Fusion is available only as table-integrated system limiting portability options or choice of easily adaptable tables such as Dual Column (wheel chair accessible stand).



LIGHTMED LIGHTLAS IS WORLDS ONLY ALL-IN-ONE WORKSTATION CAPABLE TO PERFORM:
 YAG + VITREOLYSIS + SLT + Conventional Photocoagulation (e.g PRP) + Subthreshold Photocoagulation (e.g DME) + MLT (Glaucoma) + Transscleral Photocoagulation (Glaucoma) with a detachable console for further use in O.R with Endo and LIO...

AVAILABLE LIGHTLAS CONFIGURATIONS	
LIGHTMED	QUANTEL
<ul style="list-style-type: none"> LIGHTLAS SLT (Solo) LIGHTLAS Deux (YAG/SLT) LIGHTLAS Deux - V (YAG/SLT/VITREOLYSIS) LIGHTLAS Deux - V + Single-spot, Single-Wave Photocoagulator (with a choice of 532, 577, 810nm Wavelengths in CW and MP-Mode) LIGHTLAS Deux - V + Single-spot, Single-Wave Photocoagulator (with a choice of 532, 577, 810nm Wavelengths in CW and MP-Mode) 	<ul style="list-style-type: none"> OPTIMIS Fusion (YAG/SLT) OPTIMIS Fusion (YAG/SLT) + 532 Photocoagulator (available as single spot or multi spot)

** Quantel Fusion only adapts to Combination with Vitra 532nm laser. It cannot be offered with any additional wavelength, significantly limiting the system capabilities and investment scope. Vitra Photocoagulator is also not available with MicroPulse technology (licensed by Quantel Medical from IRIDEX offered at additional cost). Quantel offers the Micro Pulse only with Supra 577nm wavelength, while LightMed offers its proprietary sub threshold technology with every Photocoagulator wavelength.*

While Quantel advocates their combination of Fusion laser with Vitra Pattern scanning attachment it needs to be said that Quantel pattern scanning system has no micro pulse, is dangerously slow producing 5x5 grid in over 1.3s (vs LIGHTMEDs TruScan dedicated scanning laser producing same grid at 0.273s). Quantel also uses a 3rd control panel for scanner use, adding clutter to already a cluttered system. LightMed perceives its pattern laser as a dedicated tool of trade for retinal specialist this offering it as dedicated separate system.