

# PASCAL<sup>®</sup> Synthesis

## Photocoagulator



Gold Standard for Retinal Laser Treatment



\* Courtesy: Kagawa University, Yata Eye Clinic and Yaizukogawa Eye Clinic  
 \* Not available in all countries, please check with your distributor for availability in your country  
 \* Subject to change in design and/or specifications without advanced notice.

**IMPORTANT** In order to obtain the best results with this instrument, please be sure to review all user instructions prior to operation.

**TOPCON CORPORATION**  
 75-1 Hasunuma-cho, Itabashi-ku, Tokyo 174-8580, Japan. Phone:3-3558-2523/2522 Fax:3-3965-6898 www.topcon.co.jp

**TOPCON MEDICAL SYSTEMS, INC.**  
 111 Bauer Drive, Oakland, NJ 07436, U.S.A.  
 Phone:+1-201-599-5100 Fax:+1-201-599-5250 www.topconmedical.com

**TOPCON MEDICAL LASER SYSTEMS, INC.**  
 3130 Coronado Drive Santa Clara, California 95054 USA  
 Phone:+1-408-235-8200 Phone:(USA only)+1-888-760-8657  
 Fax:+1-408-235-8259 Email: tmlsinfo@topcon.com

**TOPCON CANADA INC.**  
 110 Provencher Avenue, Boisbriand, QC J7G 1N1 CANADA  
 Phone:+1-450-430-7771 Fax:+1-450-430-6457 www.topcon.ca

**TOPCON EUROPE MEDICAL B.V.**  
 Esseebaan 11, 2908 LJ Capelle a/d IJssel, P.O.Box 145,  
 2900 AC Capelle a/d IJssel, THE NETHERLANDS  
 Phone:+31-(0)10-4585077 Fax:+31-(0)10-4585045  
 E-mail: medical@topcon.nl; www.topcon.eu

**ITALY OFFICE**  
 Viale dell'Industria 60, 20037 Paderno Dugnano, (Milano), ITALY  
 Phone:+39-02-9186671 Fax:+39-02-91081091 E-mail: topconitaly@tiscali.it; www.topcon.it

**DANMARK OFFICE**  
 Præstemarksvej 25, 4000 Roskilde, DANMARK  
 Phone:+45-46-327500 Fax:+45-46-327555  
 E-mail: topcon@topcondanmark.dk www.topcondanmark.dk

**IRELAND OFFICE**  
 Unit 276, Blanchardstown, Corporate Park 2 Ballycoolin Dublin 15, IRELAND  
 Phone:+353-18975900 Fax:+353-18293915 E-mail: medical@topcon.ie; www.topcon.ie

**TOPCON S.A.R.L.**

BAT A1 3 route de la révoite 93206 SAINT DENIS CEDEX  
 Tel : +33 1 49 21 23 23 Fax : +33 1 49 21 23 24 E-mail:topcon@topcon.fr; www.topcon.fr

**TOPCON DEUTSCHLAND G.m.b.H.**

Hanns-Martin-Schleyer Strasse 41; D-47877 Willich, GERMANY  
 Phone:+49-(0)2154-8850 Fax:+49-(0)2154-885177 E-mail:med@topcon.de; www.topcon.de

**TOPCON SCANDINAVIA A.B.**

Neogatan 2; P.O.Box 25; 43151 Mölndal, SWEDEN  
 Phone:+46-(0)31-7109200 Fax:+46-(0)31-7109249 E-mail:medical@topcon.se; www.topcon.se

**TOPCON ESPAÑA S.A.**

**HEAD OFFICE**  
 Frederic Montpou 4 Esc. A Bajos 3, 08960 Sant Just Desvern Barcelona, SPAIN  
 Phone:+34-93-4734057 Fax:+34-93-4733932 E-mail: medica@topcon.es; www.topcon.es

**TOPCON ( GREAT BRITAIN ) LTD.**

Topcon House Kennet Side Bone Lane Newbury Berkshire RG14 5PX United Kingdom  
 Phone:+44-(0)1635-551120 Fax:+44-(0)1635-551170 E-mail:medical@topcon.co.uk www.topcon.co.uk

**TOPCON POLSKA Sp. z o. o.**

ul. Warszawska 23; 42-470 Siewierz, POLAND  
 Phone:+48-(0)32-6705045 Fax:+48-(0)32-6713405 www.topcon-polska.pl

**TOPCON SINGAPORE MEDICAL PTE. LTD.**

1 JALAN KILANG TIMOR #09-01 PACIFIC TECH CENTRE SINGAPORE 159303  
 Phone:+65-68720606 Fax:+65-67736150 E-mail:medical\_sales@topcon.com.sg www.topcon.com.sg

**TOPCON INSTRUMENTS ( MALAYSIA ) SDN.BHD.**

No. D1, (Ground Floor), Jalan Excella 2, Off Jalan Ampang Putra,  
 Taman Ampang Hilir, 55100 Kuala Lumpur, MALAYSIA  
 Phone:+60-(0)3-42709866 Fax:+60-(0)3-42709766

**TOPCON INSTRUMENTS ( THAILAND ) CO.,LTD.**

77/162 Sinnsathorn Tower, 37th Floor Krungthorhuri Rd., Klongtong,  
 Klongsam, Bangkok 10600, THAILAND  
 Phone:+66(0)2-440-1152-7 Fax:+66-(0)2-440-1158

**TOPCON CORPORATION BEIJING OFFICE**

Block No.9, Kangding Street Beijing Economic-Technological Development Area,  
 Beijing, 100176, CHINA  
 Phone:+86-(0)10-6780-2799 Fax:+86-(0)10-6780-2790

**TOPCON CORPORATION SHANGHAI OFFICE**

14L Huamin Empire Plaza, No.726, Yan-an Xi Road,  
 Shanghai, 200050, CHINA  
 Phone:+86-(0)21-5238-7722 Fax:+86-(0)21-5237-0761

**TOPCON CORPORATION BEIRUT OFFICE**

P.O.Box 70-1002 Antelias, Beirut, LEBANON  
 Phone:+961-4-523525/523526 Fax:+961-4-521119

**TOPCON CORPORATION DUBAI OFFICE**

P.O.Box 293705, Dubai Airport Free Zone L.L.U. J-12, Dubai, U.A.E.  
 Phone:+971-4-299-5900 Fax:+971-4-299-5901

PERFORMANCE  
 YOU CAN COUNT ON



# PASCAL®

Pioneer in Pattern Scanning Lasers

## Gold Standard for Retinal Laser Treatment



## What PASCAL Experts Say



“Pattern scanning method is the preferred way and I believe it’s standard of care”

**Mark S. Blumenkranz, MD**

HJ Smead Professor and Chair Director of the Byers Eye Institute at Stanford University



“PASCAL’s Endpoint Management algorithm provides very precise and reliable control of the laser settings below ophthalmoscopic visibility. Especially exciting are the clinical results confirming efficacy of the non-damaging retinal treatment for CSR. Our basic research demonstrates that cellular response to this treatment begins with up-regulation of heat shock proteins, and involves expression of alfa-A Crystallin, known for its neuro-protective properties”

**Daniel Palanker, PhD**

Associate Professor  
Department of Ophthalmology & Hansen Experimental Physics Laboratory at Stanford University

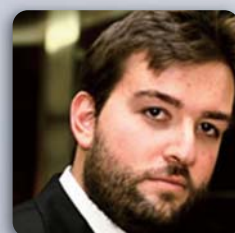
“Result is greater patient comfort with decreased pain”  
“Much safer, much more effective”

**Pravin U. Dugel, MD**  
Retinal Consultants of Arizona



“Less tedious by both shortening the procedure time and decreasing patients’ discomfort without sacrificing efficacy”  
“Unlike Micropulse, Endpoint Management allows the surgeon to visually see where he has placed burns”

**Manish Nagpal, MD**  
Retinal Foundation Gujart, India



“When using Endpoint Management, I have seen very nice long term results in decreasing fluid and improved visual results”  
“A very quick treatment”

**Daniel Lavinsky, MD**

Federal University of Rio Grande do Sul Porto Alegre, Brazil



“More comfortable treating areas closer to the fovea”

**Rahul Khurana, MD**

Northern California Retina-Vitreous Associates

“For diffuse oedema, I am an advocate of combined laser and intravitreal pharmacotherapy, as laser seems to reduce the number of injections needed and perhaps the longterm side-effects of repeated anti-VEGf therapy such as Geographic Atrophy.”

**Paulo Stanga, MD**  
Manchester Royal Eye Hospital Manchester, UK

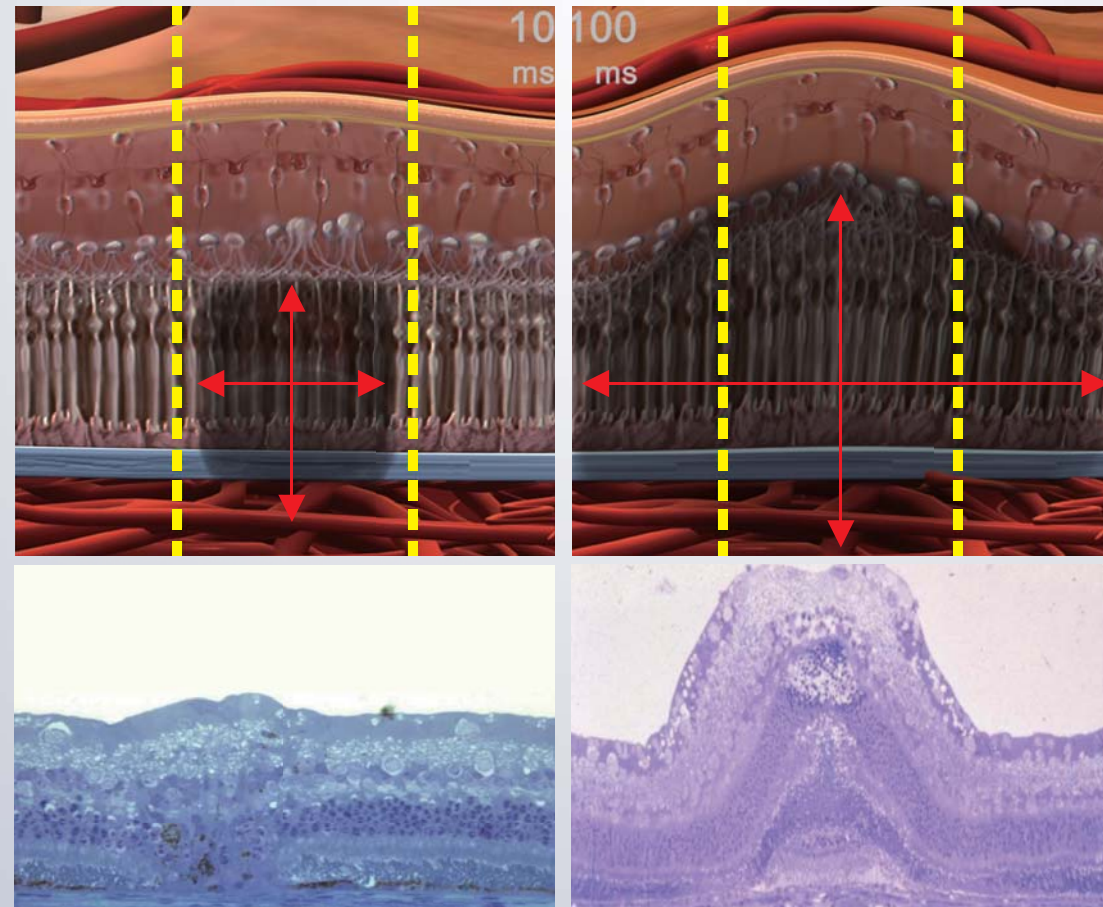


“Physicians should consider PSLT as a good option to reduce IOP...”

**Miho Nozaki, MD, PhD**  
Nagoya City University



# PASCAL® METHOD



PASCAL

Less Pain, Less Destruction

Conventional Laser

More Painful, Cellular Destruction

## PASCAL LEGACY

The PASCAL (Pattern Scanning Laser) method of photocoagulation was initially developed at Stanford University. The PASCAL Method of Photocoagulation is designed to treat retinal diseases or glaucoma using a single spot or a predetermined pattern array. With the PASCAL Method of photocoagulation less heat is diffused to the Retinal Nerve Fiber Layer and the Choroid. Photo thermal stimulation is a method which enables the tissue to regenerate without being destroyed.

# 10

## Reasons for Choosing PASCAL®

1. The original Pattern scanning laser with Highest quality, and largest installed base
2. Strong body of clinical evidence using PASCAL Pattern Scanning Laser Treatment in 532 nm and 577 nm wavelengths --more than 20 peer-reviewed clinical articles.
3. Redefining Laser Therapy™ photo-thermal stimulating Endpoint Management™ technology
  - Provides freedom to treat closer to the fovea without fear of causing retinal damage or vision loss
  - Allows for greater physician flexibility and control in providing therapeutically effective, vision-sparing treatment of retinal disease
  - Superior to Micropulse technology due to Landmark Patterns providing visible indicators of the treated region and “one setting” interface
4. Affordable pricing competitive to single spot lasers.
5. PASCAL method delivers increased patient comfort during treatment with exposure durations down to 10 ms.
6. PASCAL technology saves time and allows more patients to be seen
  - A full PRP can be completed in just one treatment session.
  - Less patient and Doctor fatigue during any photocoagulation procedure
7. Four fiber beam delivery:
  - Maintains a long and constant depth of focus for all spot sizes
  - Offers a safer, easier to use platform when compared to other pattern scanning technologies
  - Even power distribution across entire beam profile
8. Multi-functional. PASCAL Lasers can Treat Both Retinal and Glaucoma Disorders
9. PSLT\* (Pattern Scanning Laser Trabeculoplasty™) for Glaucoma
  - Minimally traumatic computer-guided therapy for Laser Trabeculoplasty
  - Successfully reduces IOP without scarring and burns
  - Auto advance feature increases speed and accuracy of treatment
  - Retreatment is available for the patient

\*Not yet available in the US.
10. Unique PASCAL features to simplify procedures and save time
  - Intuitive touch screen that provides physicians with easy access to patterns and control of power
  - 3-D Remote Control
  - Printed reporting to easily log patient data and treatment parameters

# New Approach for Glaucoma Treatment: PSLT™

Optional Software



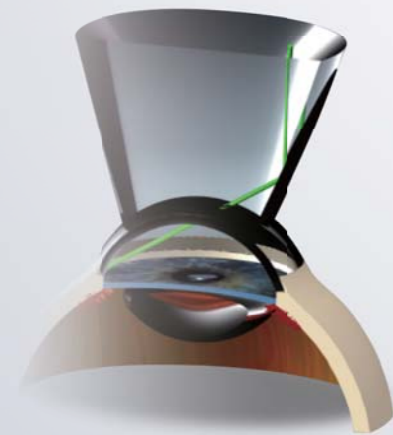
## PSLT (Pattern Scanning Laser Trabeculoplasty™) for Glaucoma

The scanning technology and precision of PASCAL systems uses a tissue sparing laser delivery modality for laser trabeculoplasty. Pattern Scanning Laser Trabeculoplasty (PSLT)\* provides rapid, precise, and minimally traumatic (subvisible) computer-guided treatment with exact abutment of the patterns. The patterns readily align to the meshwork, allowing faster and easier applications compared to other laser modalities. Physicians can now use their PASCAL lasers for glaucoma management with either ALT or PSLT; along with other conventional procedures.

<http://web.stanford.edu/~palanker/publications/PLT.pdf>

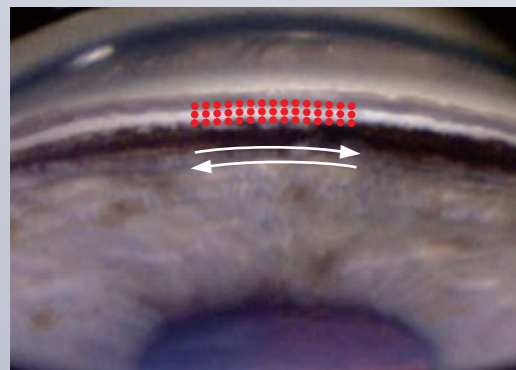
### The advantages are clear:

- » Computer guided treatment
- » Non-destructive procedure
- » Clinically effective
- » Ability to retreat if necessary



## Easy Operation

Our exclusive procedure provides computer guided placement of the treatment patterns ensuring full coverage of the trabecular meshwork and eliminating the chance of overlap like other SLT procedures.



The pattern automatically rotates 11.25 degrees to align adjacent to previous treatment site

## PASCAL Modularity

All PASCAL Synthesis Lasers can be upgraded with software modules, which enhance the treatment and increase the functionality of your laser. With the PSLT module you can add anterior functionality to your retinal laser, converting it into a versatile tool. Endpoint Management adds thermal retinal stimulation therapy to your PASCAL Synthesis.

# PASCAL Technology is Unique Beyond Comparison

## PASCAL Technology

PASCAL is not only the first pattern scanning laser in the world, it also incorporates the optimal design for pattern scanning.

### More beam fibers

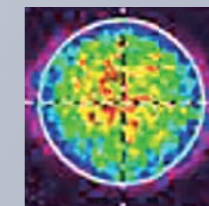
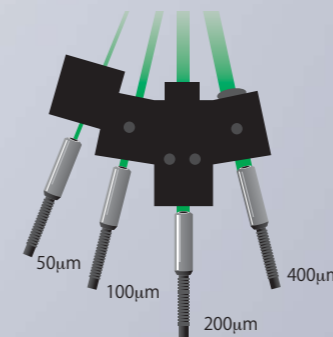
The PASCAL technology incorporates four separate fibers in the design, one for each spot size. Advantages are;

- » Low energy density on the cornea
- » A long and constant depth of focus for all spot sizes
- » A uniform power distribution within each laser spot
- » Comprehensive images of 4 beam spots on retina

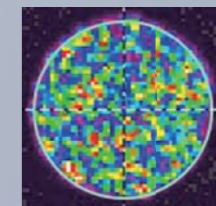
### More Patterns

Based on 8 years of experience, PASCAL offers an easy accessible wide range of comprehensive retina and macular patterns as well as patterns for treating glaucoma. Precise pattern spacing allow consistently spaced burns. A single spot laser is incorporated as well.

## 4-Fiber Beam Delivery



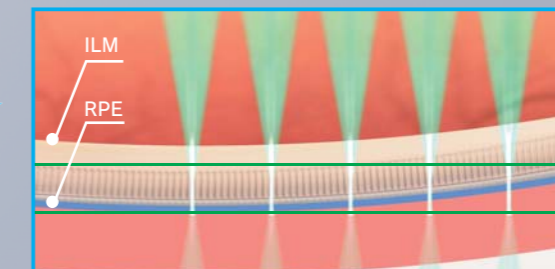
Other lasers have "hot spots" in the beam profile



PASCAL has uniform energy distribution

## PASCAL 4-Fiber Beam Delivery

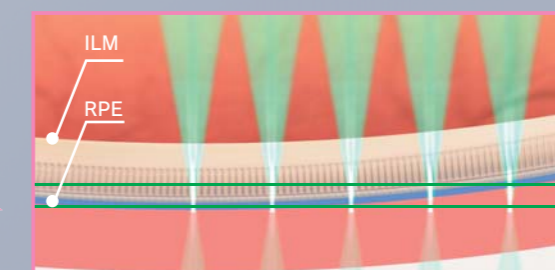
Pattern Scanning Laser delivers multiple spots onto the retina. All the spots must be of correct beam diameter to ensure consistent uptake.



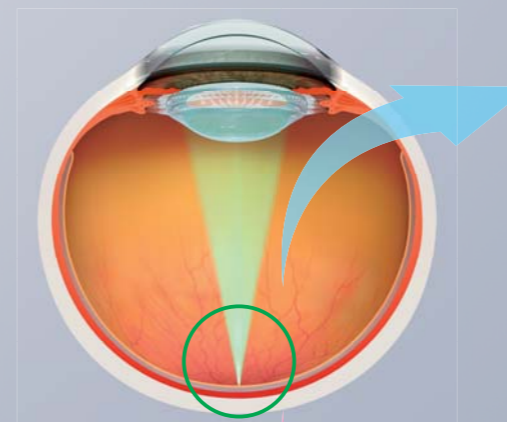
Wide depth of focus

## Other Laser Beam Delivery by Zoom Optics

Zoom Optics and narrow depth of focus may compromise the ability to scan a larger area with consistent uptake.

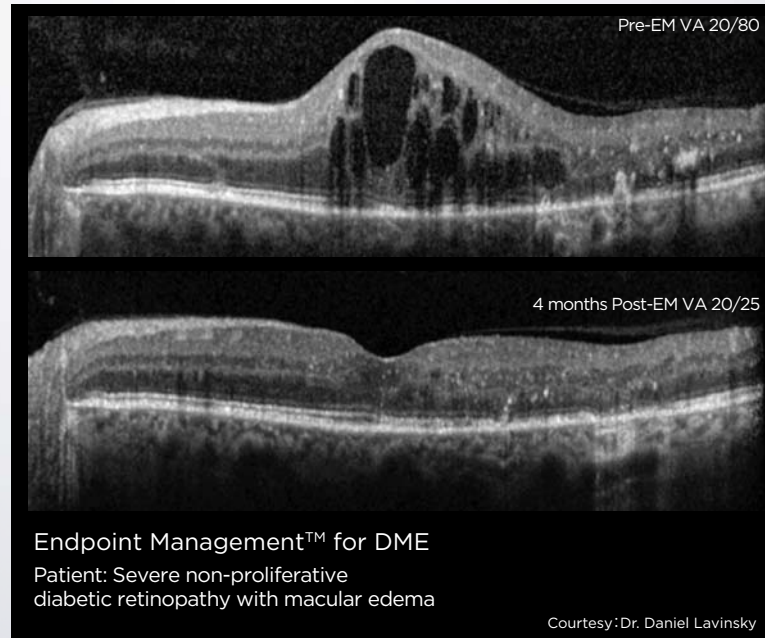


Narrow depth of focus



\* PSLT is not available in all countries, please check with your distributor for availability in your country  
 \* PSLT is optional software

Photo-thermal Stimulation Endpoint Management™



Endpoint Management™ : Redefining Laser Therapy™

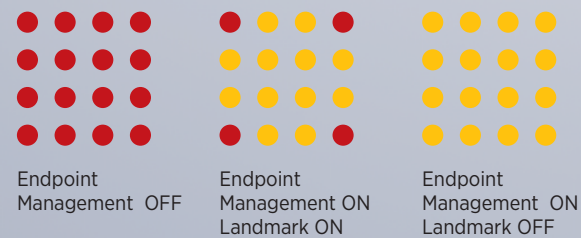
Endpoint Management (EpM) uses photo-thermal stimulation, which selectively stimulates the RPE without the destruction associated with conventional laser photocoagulation. Using EpM, you can precisely reduce the power and specifically affect RPE cells.

EpM begins with titrating laser power to a hardly visible burn, then the clinician selects the percentage of that energy to be delivered to the treatment locations. Landmark Patterns provide visible indicators of the treated region.

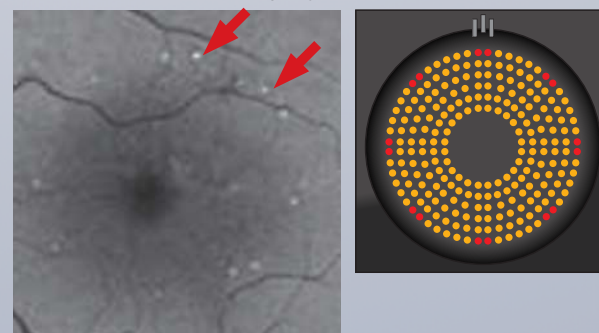
EpM can be used for PASCAL lasers with 532-nm or 577-nm laser wavelengths for macular treatment and for PRP.

Landmark™ Patterns

Landmarks are a unique and highly useful tool to identify an area which has been treated with photo thermal stimulation. It takes the guess work out of successive treatment.



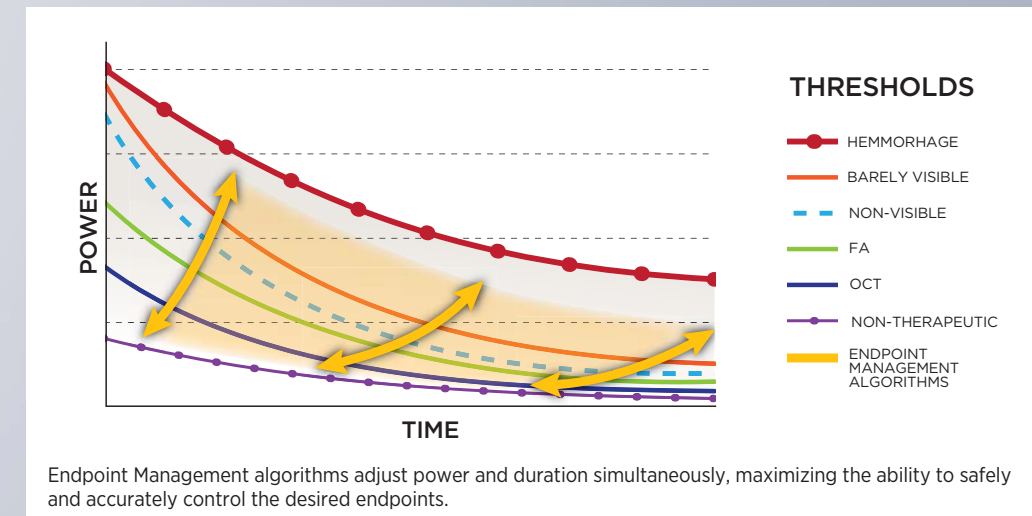
Case: "Endpoint Management's unique "Landmark" feature outlines the treated area in a macula grid pattern."



Courtesy-Dr. Daniel Lavinsky

Endpoint Management™ is mathematically precise

The Arrhenius Integral coupled with research and data on RETINAL laser-tissue interactions create the algorithms that are applied with Endpoint Management software. By use of this formula, heat induced changes in the retina are controlled as Endpoint Management simultaneously modulates the laser power and duration, providing linear control over a non-linear process.



Easy Operation

The yellow dots displayed in any pattern indicate the laser spots that will be irradiated using the energy level set by Endpoint Management. The red dots, while Endpoint Management is active, indicate the laser spots that will be delivered at the titration level of energy and will provide the "Landmark" reference points outlining the treated area.

A simple, single selection of the percentage of energy to deliver, activates the Endpoint Management algorithm to automatically adjust power and duration to the appropriate levels.



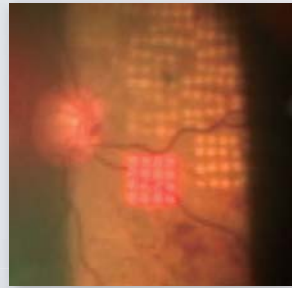
Endpoint Management OFF



Endpoint Management ON / Landmark OFF



Endpoint Management ON / Landmark ON



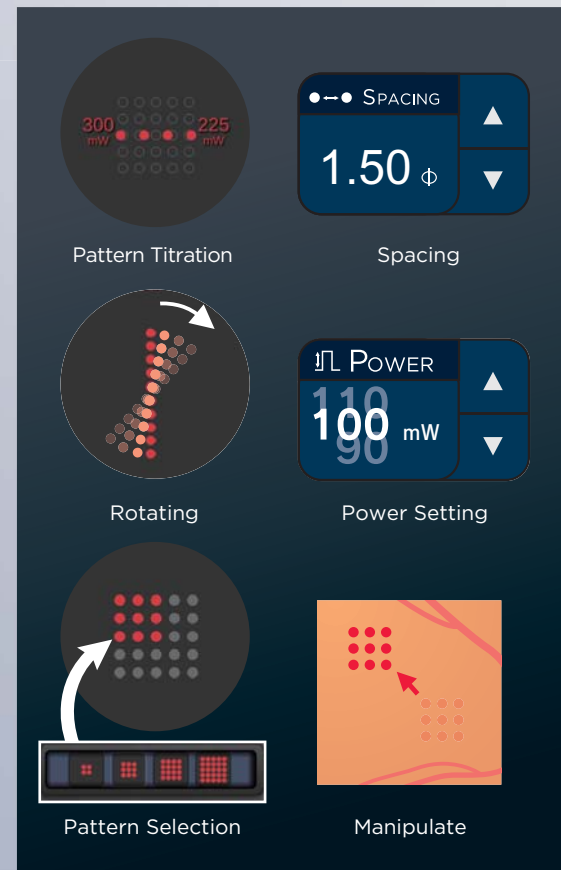
### PASCAL Aiming Beam Pattern Delivery

Unlike competitive systems, PASCAL aiming beam pattern delivery is identical to the treatment pattern, without flashing rows or treatment outlines.



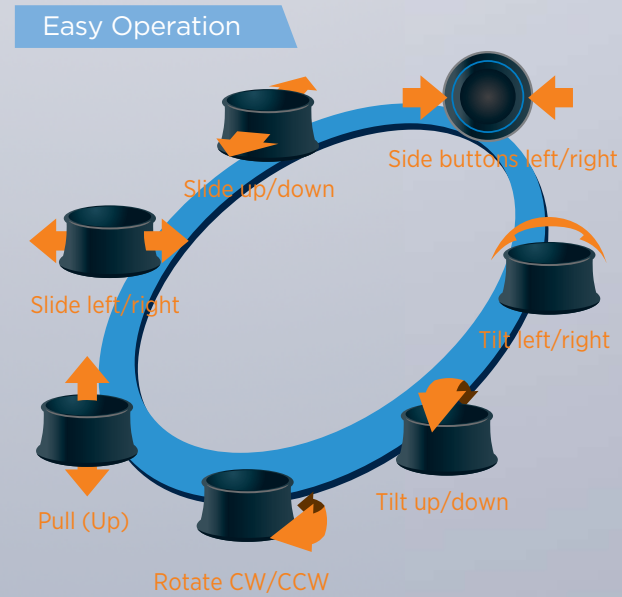
### Intuitive User Interface

The touchscreen user interface is intuitive and easy to navigate through the different pattern parameters.



### 3D Controller

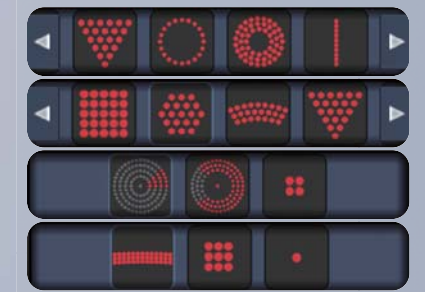
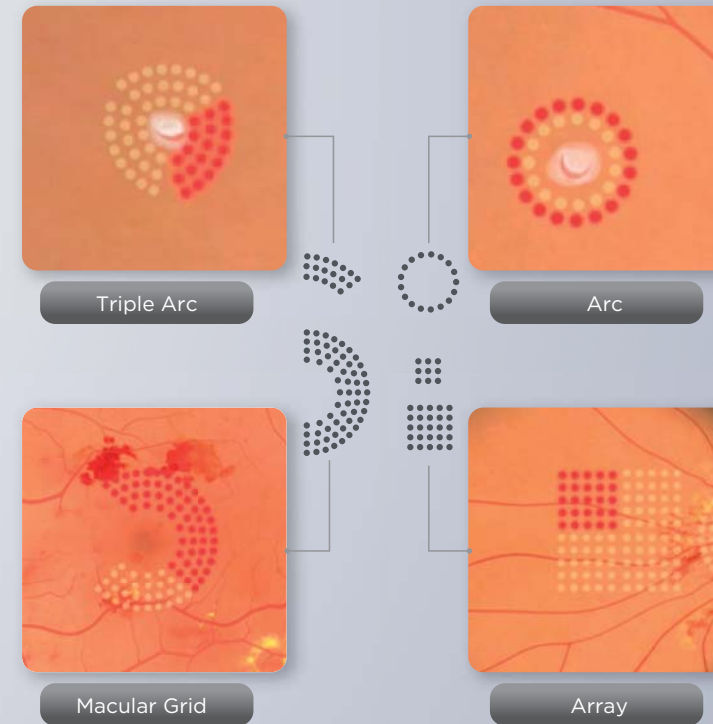
Allows the physician an ergonomic and illuminated device to conveniently manipulate patterns, power settings and laser positioning.



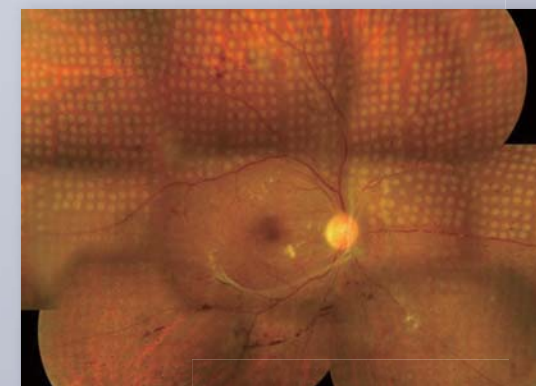
### A Multitude of Available Patterns

Physician designed pattern palette provides many variations to encompass almost any clinical need.

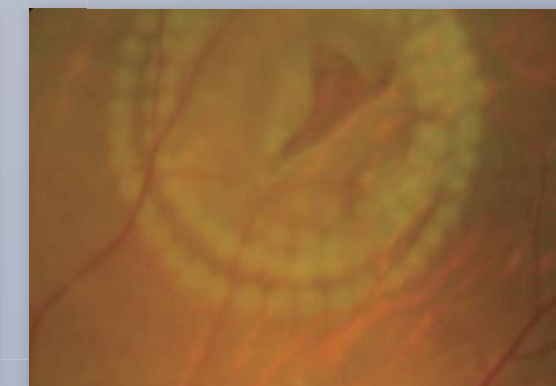
Synthesis has a unique macular pattern. The "ring", which can be adapted from inside rings, and/ or outside rings.



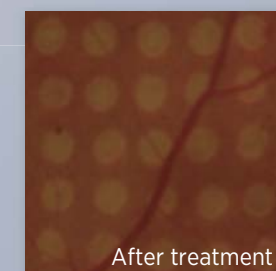
### Case Images



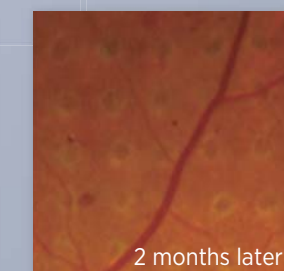
PDR



Retinal breaks



After treatment





2 months later

Zoom up images

# PASCAL Line Up

# Specifications

## PASCAL Synthesis Series

Model Name	Wavelength	Slit Lamp	Specifications
	Y7 Type	YELLOW 577nm	<ul style="list-style-type: none"> <li>» Short pulse duration</li> <li>» Continuous laser pulse</li> <li>» Precise pattern spacing</li> <li>» 4-Fiber Beam Delivery</li> <li>» Compact design ideal for use in an outpatient clinic or operating room</li> <li>» Dual-ports offer convenience of switching between an LIO and endophotocoagulation probe without interchanging connections</li> <li>» Endpoint Management™<sup>1</sup></li> <li>» PSLT<sup>1</sup></li> </ul>
	G7 Type	GREEN 532nm	
	Y4 Type	YELLOW 577nm	
	G4 Type	GREEN 532nm	
	TwinStar <sup>2</sup>	YELLOW 577nm  RED 638nm	

## Synthesis (Y7 / G7 / Y4 / G4)

## Synthesis TwinStar

<b>Laser</b>	Available in 577nm or 532nm Optically Pumped Semiconductor (OPSL)	577nm , 638nm <sup>1</sup>
<b>Patterns</b>	Single Spot, Array, Triple Arc <sup>2</sup> , Triple Ring, Arc, Line, Circle, Macular grid, Glaucoma (PSLT <sup>3</sup> )	
<b>Power</b>	0 - 2000mW	577nm: 0 - 2000mW 638nm: 0 - 600mW <sup>4</sup>
<b>Power Control</b>	3-D Controller and Touch Screen User Interface	
<b>Treatment</b>	Pulse Durations 5 to 1000ms <sup>4</sup>	
<b>Aim Beam</b>	635nm diode	670nm diode
<b>Aim Beam Power</b>	Adjustable to < 1mW	
<b>Delivered Spot Size</b>	50, 100, 200, 400 μm	577nm: 50, 100, 200, 400 μm 638nm: 60, 200 μm
<b>User Interface</b>	3-D Controller and Touch Screen Control Panel Display (26.5 cm; 10.4 in)	
<b>Slit Lamp Compatibility</b>	Haag-Streit 900 BM / BQ, Topcon SL-PA01	Topcon SL-PA03
<b>Laser Console Dimensions</b>	Height: 23 cm (9 in) Length: 31 cm (12 in) Width: 38 cm (15 in) Weight: 15 kg (35 lbs)	
<b>Input Power Requirement</b>	100 - 240 VAC; 50/60Hz 200VA	
<b>Cooling</b>	TEC / Air Cooled	

\*1: 577nm is for Single, Pattern scan, PSLT and Endpoint Management 638nm is only for single spot


\*2: Triple arc is only for Angle treatment by PSLT

\*3: PSLT is optional software

\*4: Pulse Durations 5ms is only for Triple arc

## Optional Accessory

### PASCAL LIO<sup>3</sup> Laser Indirect Ophthalmoscope

	<b>Specifications</b> <ul style="list-style-type: none"> <li>» Allows physicians to offer laser photocoagulation treatments to patients unable to sit at a slit lamp</li> <li>» Compatible to PASCAL 532 nm and 577 nm laser systems<sup>3</sup></li> <li>» Provides increased access to the far periphery of the retina</li> <li>» Large or small aperture selection for dilated or non-dilated or small pupils</li> <li>» Aperture selections automatically adjust illumination and viewing mirrors for maximum stereopsis</li> <li>» Multiple illumination filters available in clear white, cobalt blue, red-free and diffused allow physicians to examine and/or treat with superior visualization of the retina</li> <li>» Independent illumination and laser position control</li> <li>» LED light source offers brighter and whiter illumination for high definition retinal images</li> <li>» Conveniently mounts on wall or desktop for easy access</li> <li>» Small and lightweight headset battery offers up to 2 hours of use without recharging</li> <li>» Soft cushioned headband adjusts and balances perfectly to suit all head shapes and sizes</li> </ul>
---	--

\*1 EpM and PSLT are optional software

\*2 PASCAL Synthesis Twinstar and PASCAL LIO are not available in all countries, please check with your distributor for availability in your country

\*3 Laser consoles must have compatible hardware and software to support LIO use

