

20 June 2019

QD Laser, Inc.

## Development of New Types of Retinal Scanning Laser Displays with Lower Cost and Smaller Size

World Premiere at Laser World of Photonics 2019 (Munich, Germany, 24-27 June 2019)

QD Laser, Inc. (Head office: Kawasaki City, Kanagawa Prefecture; President: Mitsuru Sugawara, hereinafter referred to as QD Laser) has succeeded in developing an innovative new retinal scanning laser displays by utilizing QD Laser's proprietary retinal scanning projection technology. At the Laser World of Photonics 2019 (Munich, Germany, June 24-27, 2019), two world premier prototypes will be exhibited and demoed.



Figure 1 Retissa Handy

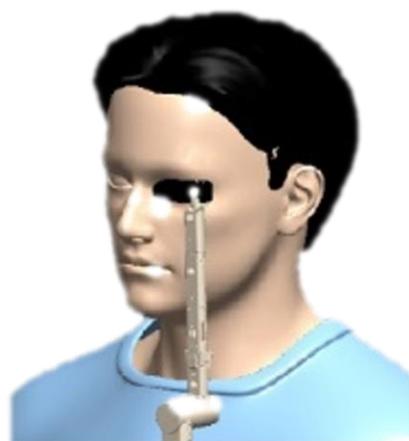


Figure 1 Retissa Flex Periscope

- Summary

QD Laser has succeeded in developing an innovative new retinal scanning laser eyewear by utilizing QD Laser's proprietary retinal scanning projection technology. We have realized very inexpensive and miniaturized laser eyewear by combining our proprietary optical technology named VISIRIUM® technology with existing pico-projectors. At the Laser World of Photonics 2019 (Munich, Germany, June 24-27, 2019), two prototypes will be exhibited and demoed.

- Background

QD Laser has developed a laser retinal scanning technology named "VISIRIUM® Technology" that draws images directly onto the retina. This technology is based on the combination of laser and optical technology developed since its founding, combining weak light from a three-primary-color laser light source with a minute mirror (MEMS mirror) oscillating at high speed.

Launched in 2018, the "RETISSA® Display" is a head mounted display that is the first product of the commercialization of this "VISIRIUM® technology". Since its release, it has provided a new vision through Re-defining the Vision™.

By diverting the existing pico-projector product and the pico-projector built-in smartphone as an image projection engine, the newly developed optical attachment enables safe and wide viewing angle retinal projection. By combining simple optics and commoditized projection devices, the devices offer lower cost, smaller size, and improved convenience.

- Two prototypes to be unveiled this time

1. Retissa Handy (Figure 1)

By combining a commercially available pico-projector with a unique Maxwell optics system, you can view a high-resolution retinal projection image in a hand-held size as shown in Figure 1. The free focus feature allows you to enjoy an image with a horizontal viewing angle of 40 degrees naturally regardless of the focusing ability.

As a new initiative, RETISSA® Handy has been used to train Uran Sawada, a member of the Japan Para Athletic Federation.

2. Retissa Flex Periscope (Figure 2)

The combination of a small projector and an image-propagating optical system with a unique flexible structure enables a retinal projection display to be realized with the glasses in place without interfering with ordinary corrective glasses. The unique image propagation optics developed this time allows the size of parts around the eye to be minimized because there is no electrical circuit around the eyes. As with Retissa Handy above, the image quality does not depend on the user's vision due to the free focus feature. It is a technology that plays a role like an earphone in pico-projectors or smartphones with built-in pico-projectors.

- Outlook

The superior portability and cost reduction features of the newly developed RETISSA® Handy and RETISSA® Flex Periscope make it easier for anyone to use a retinal scanning laser display. In the future, we plan to develop new features such as ultra-small and inexpensive perimeters, early detection of eye disease, self-examination of eye, peripheral vision training, and integration with smartphone applications and smartphone functions.

Starting from this exhibition, we will gather opinions and requests from various angles, and we will complete the products that are truly required by the market, in terms of cost, function, and design. In addition, we aim at wide spread of retinal scanning projection technology as application product of existing pico-projection, and we will seek business partners in various forms.

- QD Laser, Inc.

QD Laser, Inc. was established as a spin-off venture from Fujitsu Ltd. (Head office: Minato-ku, Tokyo; President: Tatsuya Tanaka; hereinafter, Fujitsu) in April 2006, with the investment of Fujitsu and Mitsui & Co. Global Investment (former MVC) under Mitsui & Co., Ltd. (Head office: Chiyoda-ku, Tokyo; President: Tatsuo Yasunaga). Based on the joint development of Fujitsu Laboratories Ltd. (Head office: Kawasaki City, Kanagawa Prefecture, President: Hidenori Furuta) and the University of Tokyo by over 10 years of industry-academia collaboration, QD laser develops, manufactures and sells high-performance semiconductor lasers including quantum dot lasers from visible to 1300 nm in wavelength. The corporate statement “Through light, the world is evolving” symbolizes our will to contribute to society through laser and optical technologies.

We have continued development of for retinal scanning laser eyewear technology including a support for a clean device society implementation promotion project by the National Research and Development Corporation New Energy and Industrial Technology Development Organization (NEDO), and a support tool for practical application of welfare tool for FY2015. In 2018, we launched the world's first sales of RETISSA® Display, a consumer retina scanning laser eyewear.

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- ✓ Specifications are subject to change without notice.
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