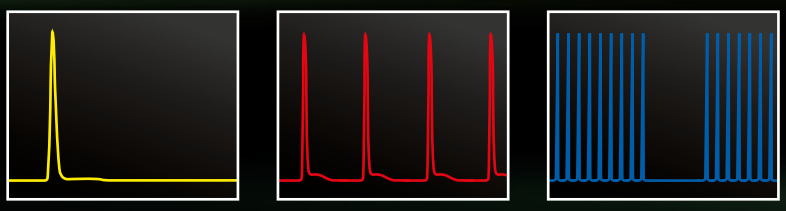
PicoQuant

Diode Lasers

Flexible picosecond pulsed solutions



Vision

PicoQuant delivers reliable, affordable, and compact turn-key laser solutions that empower you to focus on your application. Our aim is to eliminate the need for specialized knowledge, allowing you to channel your energy into innovation and discovery.

“The pulsed lasers from PicoQuant have proven crucial to the research of my laboratory.”

W. E. Moerner, Stanford University, USA
Nobel Prize Laureate

PULSES ON DEMAND.

TAILORED TO YOUR NEEDS.

Your Benefits

RELIABILITY

With over 25 years of experience in gain-switched technology, our lasers ensure long-term reliability and minimal downtime. They are based on compact, reliable laser diodes with advanced electronics that generate a wide variety of pico-second pulsed output patterns.

PRECISION

Designed for exceptional precision, our lasers support you in generating accurate and detailed results in your application. The gain-switch tech-nology provides unparalleled precision in pulse generation, which is crucial for high-resolution spectroscopy and imaging.

FLEXIBILITY

Our laser solutions, with pulse-on-demand capabilities and a large selection of wavelengths, provide the optimal specifications for your specific application, ensuring maximum efficiency and effectiveness.

EASE OF USE

Spend less time troubleshooting and more time on what matters - our intuitive products remove the technical barriers. Fully computer-controlled and easily integrated into your system, they ensure that even complex operations can be managed with minimal effort.

Technical Highlights

Fast and short pulses

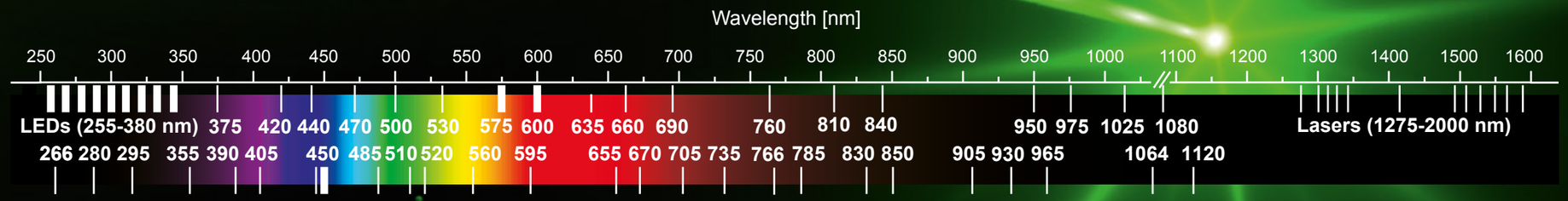
Powered by gain-switching technology, clean optical pulses with minimum decay, ringing or afterpulse background are provided. Benefit from pulse widths as short as 20 ps and repetition rates ranging from single shot to ultrafast 200 MHz.

Widest spectral coverage

Explore the full spectrum from UV to IR with our diode lasers ranging from 266 to 1990 nm. Critically accessible UV, green and yellow wavelengths become available by frequency conversion and tapered amplified diodes. For bandwidths close to the transform limit, narrow-linewidth solutions are offered.

Pulses on demand

Achieve unparalleled versatility with operation in pulsed, burst, and (gated) CW emission, offering variable pulse shapes and sequences from low picoseconds up to milliseconds. Fully triggerable both internally and externally, our low-jitter diode lasers adapt seamlessly to meet the demands of any application.

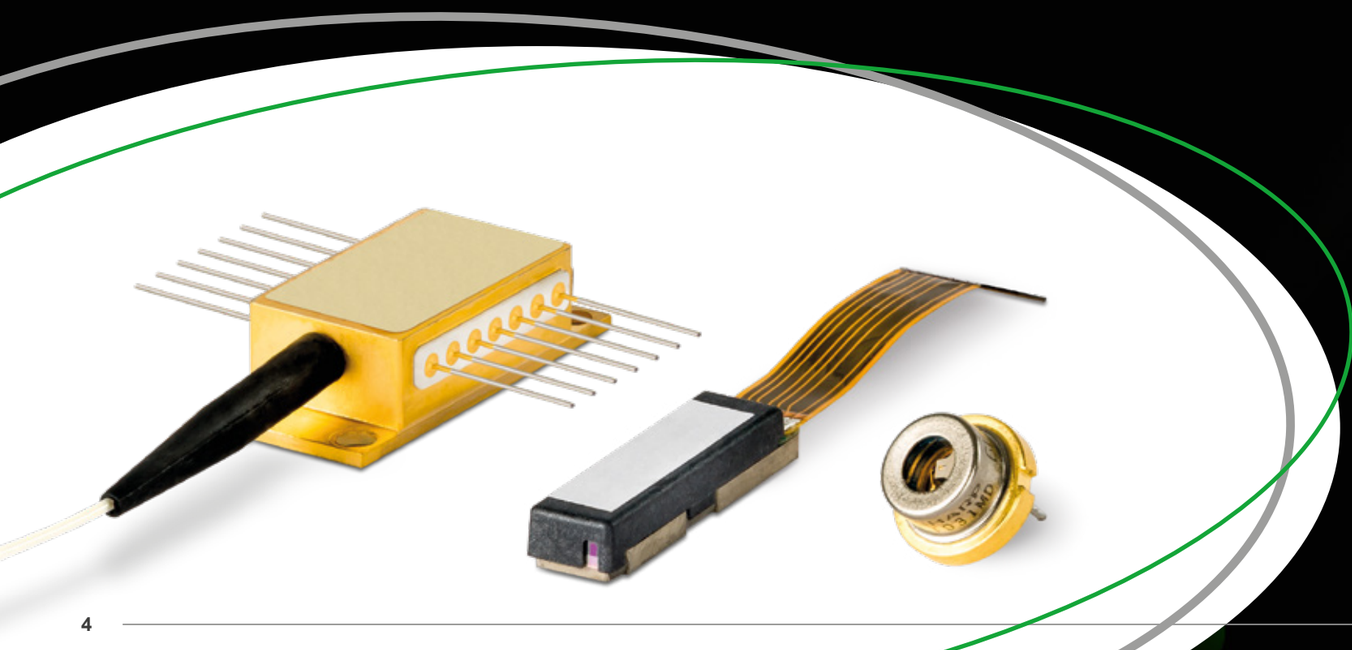


Enhanced output power

Experience powerful performance with up to several Watts. Our master oscillator fiber amplifier (MOFA) concept ensures clean and short pulses even at high power levels across the entire range of repetition rates

Compact turn-key systems

Our robust, turn-key lasers offer plug-and-play simplicity with a focus on ease-of-use, whether you prefer standalone or driver-head based devices. Expertly engineered, we facilitate an instant operation and straightforward beam alignment.

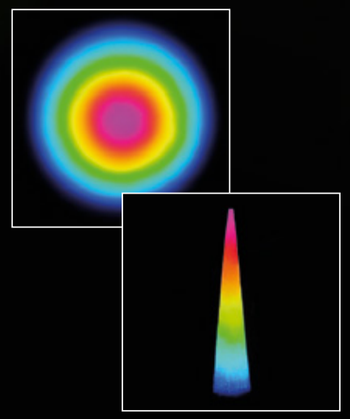


Versatile options, verified quality

Choose between collimated free-beam emission and single- or multi-mode fiber coupling for ultimate flexibility. Each diode laser is tested for long-term stability and comes with comprehensive test sheet data including individual diode characterization, ensuring maintenance-free performance and reliability.

Customization on request

You have special demands? Tell us more! Whether a modification of power, pulsewidth or wavelength is needed, we offer special developments which aim for tailoring the laser performance to your unique application.



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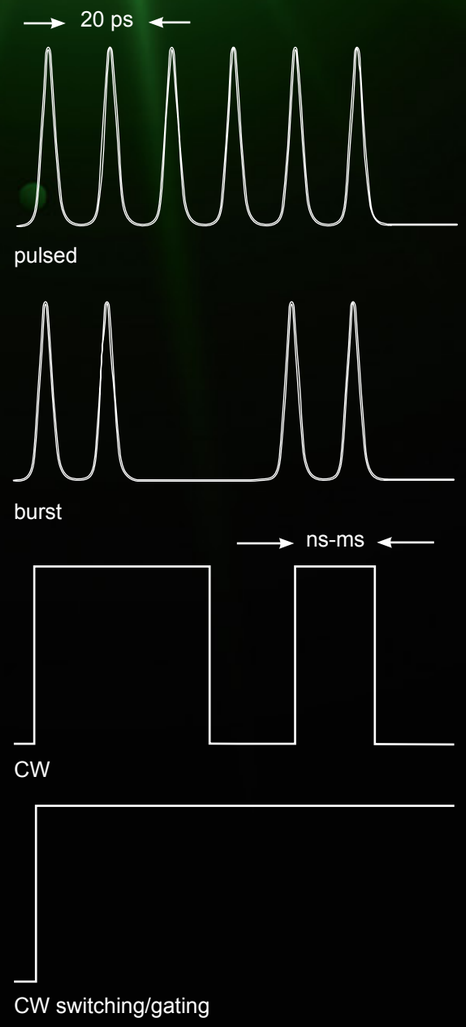
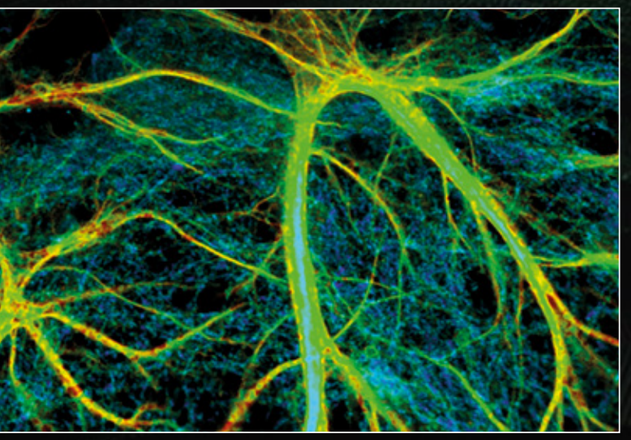


Applications and Methods

PicoQuant lasers empower a wide range of scientific and industrial applications. From cutting-edge research in materials and life sciences to advanced technologies in quantum optics and metrology, our solutions provide the precision and flexibility needed to achieve outstanding results. Explore how our lasers contribute to technological advancements and groundbreaking discoveries.



Life Science

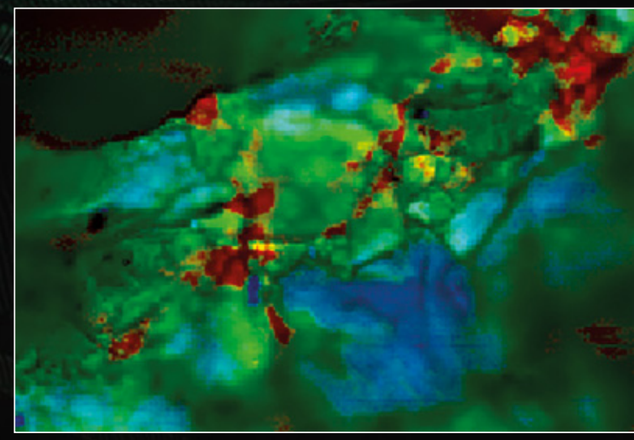
Lasers supporting advanced biological research by enabling high-resolution imaging and precise fluorescence measurements.

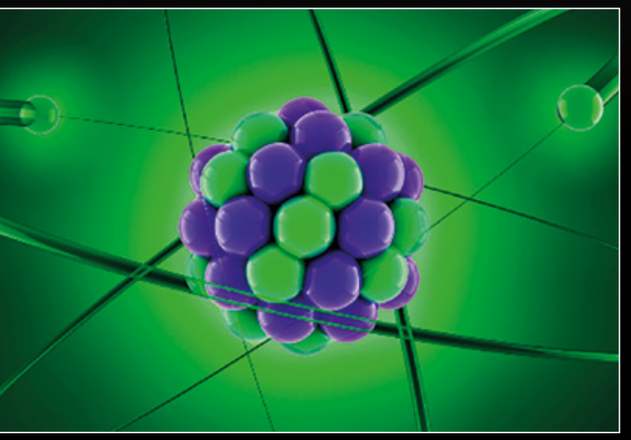
- Time-Resolved Fluorescence
- Microscopy and Imaging
- Particle Diffusion
- Photobleaching

Materials Science

Powerful tools for investigating material properties, nanostructures, and photonic processes in semiconductors and beyond.

- Time-Resolved Photoluminescence (TRPL)
- Semiconductor Diagnostics
- Quantum Dot and 2D Material Characterization
- Nanoparticle Upconversion





Quantum Optics

Enabling cutting-edge research in quantum communication and light-matter interaction with single photons and nonlinear optics.

- Single-Photon Emitters
- Spontaneous Parametric Down Conversion (SPDC)
- Quantum Key Distribution (QKD)
- Qubit Control and Readout

Metrology

Reliable laser systems for accurate measurements, alignment tasks, and detector testing in industrial and research environments.

- Light Detection and Ranging (LiDAR)
- Laser Seeding
- Detector Testing
- Camera Calibration

Diode Laser and LED Solutions

Classic

Reliable diode lasers and LEDs covering the widest spectral range from UV to IR including fiber-amplified and frequency-converted options.

Flexibly powered by single and multi-channel pulse drivers.

WARNING
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

Standalone

High-power and multi-color series of diode lasers involving fiber amplification and frequency conversion.

WARNING
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

DANGER
LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT

Compact 3-color and 1-color diode laser solutions designed for ease-of-use.

WARNING
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

Smart

High-end series of diode lasers and LEDs with an advanced driver enabling an improved performance and additional features.

WARNING
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

OEM

Diode lasers for system integration and the generation of programmable pulse shapes.

WARNING
LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT

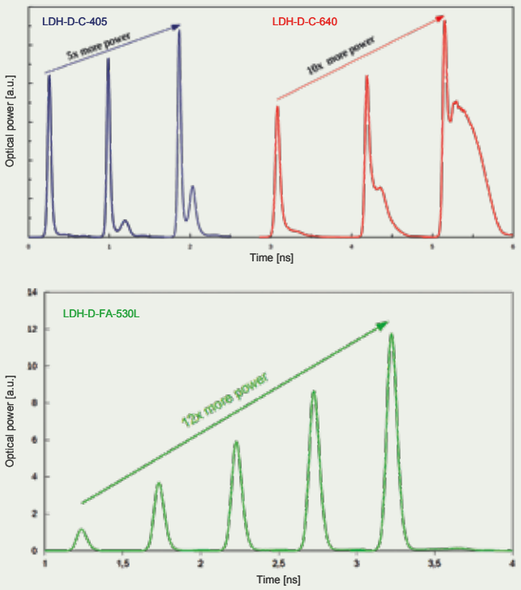
LDH and PLS Series

Classic Picosecond pulsed laser heads

PicoQuant offers the largest selection of picosecond pulsed laser diode and LED heads currently available on the market. Thanks to a proprietary fiber amplification technology, the product range is rounded out with high-powered versions and wavelengths that cannot be achieved with directly pulsed laser diodes.

- *Wavelength range from 255 to 1990 nm*
- *Average power up to 450 mW*
- *Synchronization output*
- *External trigger input*
- *Fast and slow gating inputs*

Pulsing Diode Lasers

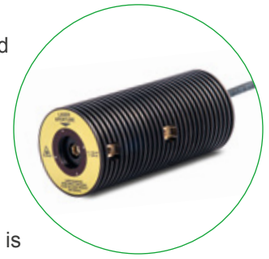


Typical pulse profiles of blue, green and red diode laser heads generated by increasing driving currents of the laser diodes. As a striking feature, fiber-amplified and frequency-converted diode lasers not only reach significantly higher output powers, but also maintain a particularly narrow pulse width.

LDH-D Series

Classic laser head series with directly pulsed laser diodes. Emission lines covering the spectral range from 375 to 1990 nm. These laser heads can be operated either in pulsed or (gated) CW mode.

LDH-D-TA Series



This laser head series is based on tapered-amplified microchips and provides emission wavelengths at 532, 561, or 589 nm. The LDH-D-TA Series offers picosecond light pulses in a spectral range that is especially valuable for the excitation of fluorescent probes in life science.

PLS Series

The pulsed LEDs of the PLS series are the fastest miniature sub-nanosecond pulsed LED sources commercially available, with emission wavelengths ranging from 255 to 600 nm and repetition rates up to 40 MHz.

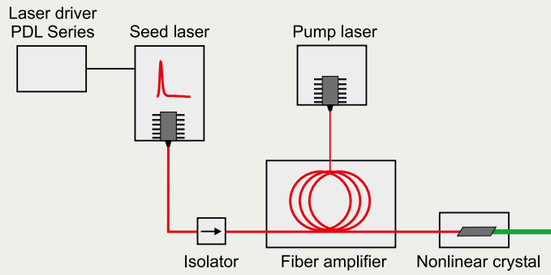
LDH-P-FA Series

Laser heads from the LDH-P/D-FA series are based on a Master Oscillator Fiber Amplifier (MOFA) concept with optional frequency conversion.They provide high-powered (1 to 450 mW, depending on wavelength) picosecond light pulses at 266, 355, 532, 561, 766-774, 1064, or 1532-1560 nm.

The MOFA concept

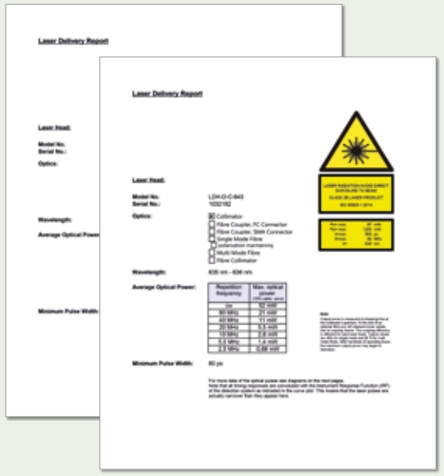
The master oscillator (seed diode) generates infrared picosecond light pulses with variable repetition rates of up to 80 MHz using PicoQuant's proven gain-switching techniques. The seed diode output is connected to a fiber amplifier system, which boosts the seed laser pulses while maintaining other beam characteristics like the emission wavelength, polarization, and short pulse width.

Fiber-Amplified Diode Lasers



Scheme of a frequency-doubling fiber-amplified laser. A picosecond diode laser is used as a seed for a fiber amplifier in a Master Oscillator Fiber Amplifier (MOFA) arrangement. An optional nonlinear crystal is added to convert the emission wavelength.

Quality Control



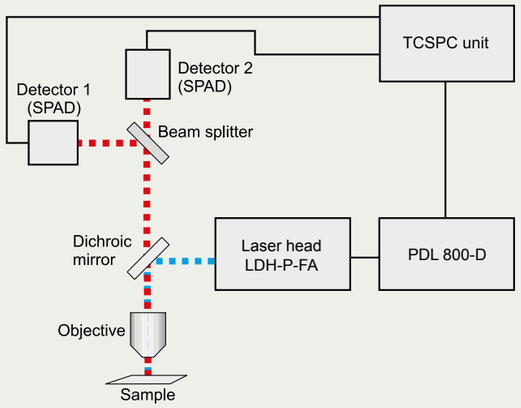
Each laser and LED head is shipped with a comprehensive test data sheet, documenting pulse profiles, power values, and spectral emission profiles at different intensity settings. These data sheets ensure full transparency and traceability, as all measurements are stored in our database for future reference. With over 25 years of accumulated measurement data, we maintain high-quality standards and consistency in our products.

PDL 800-D and Sepia PDL 810

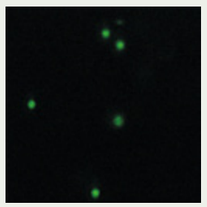
Classic Single-channel laser drivers

Our classic manually-controlled PDL 800-D driver and the fully computer-controlled PDL 810 driver are perfectly suited for PicoQuant's LDH and PLS Series. With a proven track record for outstanding reliability they are made for any single-wavelength application. Wavelength changes are as simple as plugging in a different laser or LED head. Their high quality and reliability are expressed by a unique 5-year limited warranty.

Fluorescence Antibunching



Photon antibunching can be used to identify single emitters in the observation volume. In a typical set-up, the beam is split 50/50 onto two detectors connected to a single TCSPC unit for data acquisition and coincidence counting. In this example Fluorescence Lifetime Imaging (FLIM) was first used to locate Nitrogen Vacancy (NV) centers in diamond, excited at 532 nm. In the subsequent antibunching trace, the missing peak at lag time zero then proves that there is indeed only a single fluorescent emitter in the nanocrystal under investigation.



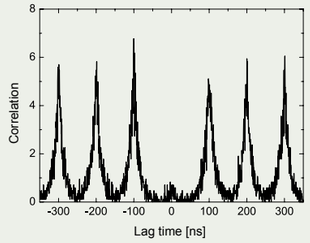


Image courtesy of Jörg Wrachtrup, University of Stuttgart, Germany

Broad range of repetition rates

The drivers may trigger the laser autonomously from their built-in crystal oscillator or, if a more complex triggering scheme is needed, can also be triggered by an external signal. Any output frequency from single shot (if triggered externally) to 100 MHz is supported. All laser pulses are accompanied by a synchronization signal, which is ideally suited to, e.g., synchronize other devices in the set-up such as Time-Correlated Single Photon Counting (TCSPC) electronics.

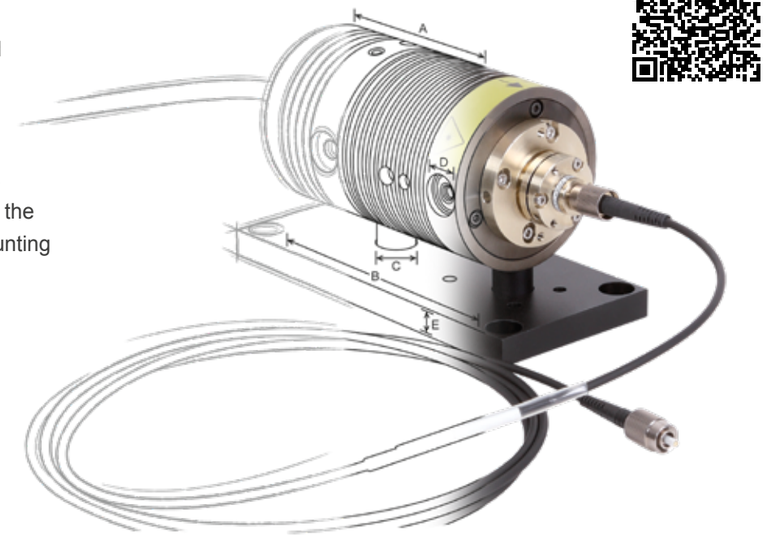
Take full control

The optical output power can be easily adjusted to match the excitation power to the requirements of your application.
Besides varying laser power in pulsed mode, both universal drivers can operate laser heads of the LDH-D Series in (gated) CW mode.

Fiber Coupling

A coupling solution for any laser

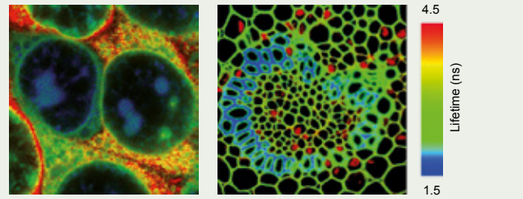
Most laser sources from PicoQuant provide a collimated output beam, including laser heads from the LDH and LDH-I series as well as the high-power VisUV and VisIR laser modules. All of these laser sources can be optionally coupled into a variety of optical fibers (such as multi-mode, single-mode, or polarization-maintaining single-mode) via different connector types, collimation or even microfocus optics to suit your requirements best.



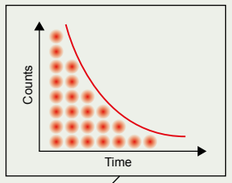
Pre-aligned and optimized

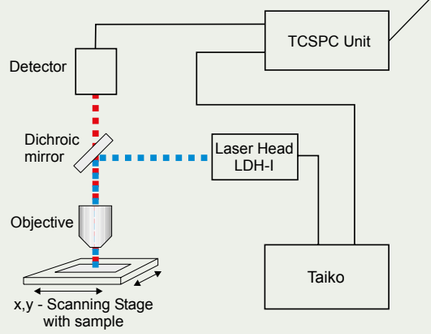
All fiber coupled laser heads are pre-aligned for maximum performance before delivery. Although fiber and coupler can be unmounted from the laser head, this is not recommended, since remounting always requires a realignment of the coupling. This is a complex task requiring great experience, especially for single-mode fibers which have a core diameter of only a few micrometers.

Fluorescence Liftetime Imaging (FLIM)



In Fluorescence Lifetime Imaging (FLIM), a sample is scanned and the fluorescence lifetime is determined for each pixel and displayed in a false color scheme. Lifetimes are usually obtained via Time-Correlated Single-Photon Counting (TCSPC), a method requiring short laser pulses with variable repetition rates – a condition perfectly fulfilled by PicoQuant's diode lasers.





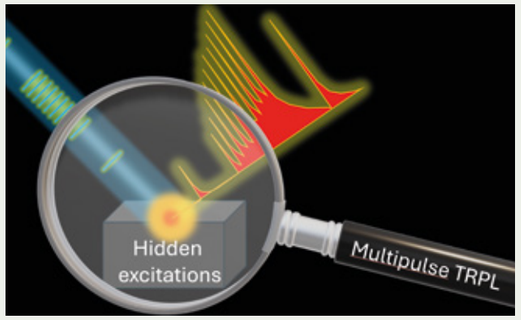
Principle of the measurement setup including a TCSPC histogram.

Sepia PDL 828

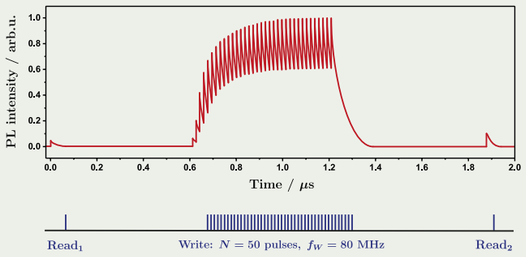
Classic Multi-channel laser driver

PicoQuant's Sepia PDL 828 is a high-end laser driver designed for maximum flexibility. It is particularly well-suited for applications such as Pulsed Interleaved Excitation (PIE), Alternating Laser Excitation (ALEX), pump-probe spectroscopy, and a wide range of other applications - from time-resolved fluorescence to quantum optics and diffuse optical tomography.

Complex Burst Pattern in Photoluminescence



For materials with "memory", having hidden non-radiative excited states, the selection of repetition rate is difficult as hidden states remain even if Photoluminescence (PL) is already zero. The target is to probe the sample both for PL with and without hidden state.



The Read-Write-Read approach using the burst pattern of the Sepia PDL 828, equipped with oscillator module SOM 828-D, consists of a $Read_1$ pulse with long waiting time, followed by a burst of Write pulses to reach a quasi steady state and is finished by the $Read_2$ pulse after a waiting time to probe this state. The waiting time is varied to characterize hidden states. This approach is exemplarily used to monitor trapped carrier dynamics in a $CsPbBr_3$ microplate.

Image courtesy of Ivan Scheblykin, Lund University, Sweden

- *Modular design*
- *Up to 8 laser or LED sources*
- *Flexible sequences and burst patterns with PC control*
- *Various synchronization and trigger options*

Computer Control

Design your pulse pattern using the intuitive GUI software or an extensive API library. Our new Python wrapper makes it easy to control, automate, and synchronize the Sepia PDL 828 with just a few lines of code.

Add-On: Laser Combining Unit

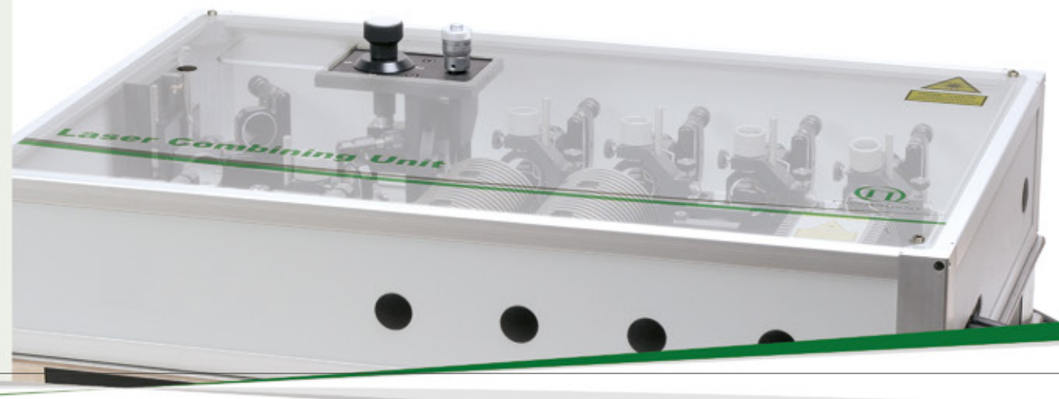
Guide your multi-color excitation pattern through a compact housing into a single fiber and reduce the time spent on optical alignment. PicoQuant's Laser Combining Unit (LCU) enables you to combine the optical output of up to five laser heads into a single-mode polarization-maintaining fiber.

Modular design

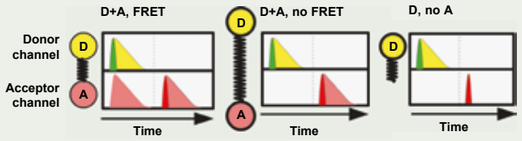
A compact, modular driver unit designed for all laser heads in the LDH series, pulsed LEDs from the PLS series, and high-power lasers from the VisUV/VisIR series. It consists of a mainframe, up to eight laser modules, and the powerful oscillator module SOM 828-D - the "smart brain" of the Sepia.

Flexibility

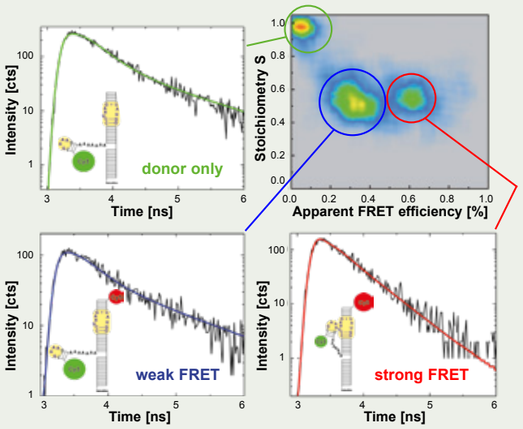
The SOM 828-D oscillator module allows you to create user-defined pulse trains ("bursts") of varying durations, including delays with picosecond accuracy. It offers numerous delayable synchronization output options, as well as an external trigger input. You can drive any combination of pulsed sources with wavelengths ranging from 255 nm to 1990 nm, select repetition rates quasi-continuously, and incorporate ns up to ms pulses using fast and slow gate technologies.



Single-Molecule Förster Resonance Energy Transfer (smFRET)



In Pulsed-Interleaved Excitation (PIE) two laser pulses are used sequentially to excite donor (D) and acceptor (A) molecules independently. The resulting fluorescence emission patterns can be used to discriminate between molecules showing Förster Resonance Energy Transfer (FRET) and molecules that don't as well as indicate the absence of A.



FRET analysis of freely diffusing RNA. The experiment aimed at localizing interactions between specific elements of RNA secondary structure, in this case a GAAA tetraloop motif (Cy3 label, green) and its corresponding receptor region (Cy5 label, red). Using PIE, it was possible to calculate a 2D plot of FRET efficiency versus stoichiometry, that enables easy identification of subpopulations for further FRET evaluation.

Data courtesy of Julie Fiore and David Nesbitt, University of Boulder, USA

Taiko PDL

Smart Single-channel laser driver

This universal laser driver has been designed to deliver the highest degree of flexibility and performance, while maintaining an intuitive handling. It operates and monitors any laser head from the LDH-I series and LED head from the PLS-I series. As it recognizes current operational parameters, setting up a measurement has never been easier.

Flexible pulse pattern

Next to pulsed emission, the Taiko allows for the generation of user-defined burst sequences. Additionally, continuous wave operation is supported which can be gated to obtain pulses down to the µs time scale.

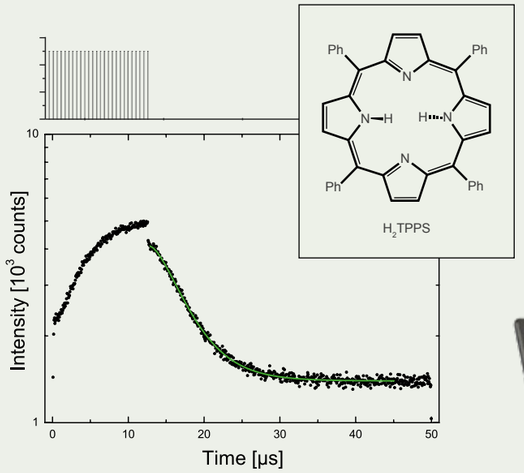
More power and precise control

The Taiko features enhanced power capabilities alongside an additional calibrated optical power mode. Pulse energy and shape can now be chosen to remain constant over the entire range of repetition rates, permitting an optimal adjustment of the pulse parameters. An emission wavelength fine-tuning is enabled by careful temperature control.

Intuitive user interfaces

Operated locally, the one-button control together with a LCD display paves the way for a convenient, yet versatile handling. Remote access becomes possible via PicoQuant's laser driver software (GUI) mediated through USB-C connection. For demanding tasks programming libraries (API) are made available for custom programming.

Singlet Oxygen NIR Phosphorescence



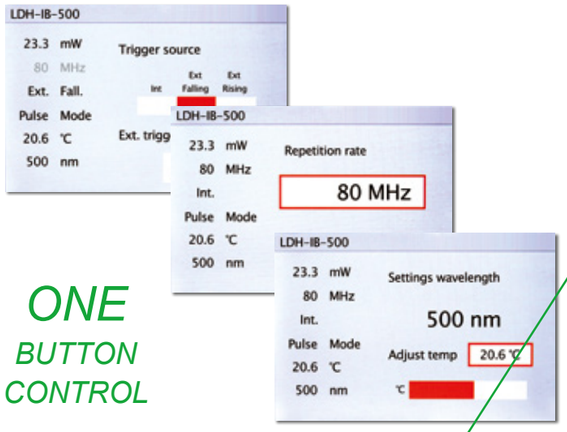
Singlet oxygen is an electronically excited state of molecular oxygen, commonly generated via energy transfer from an excited photosensitizer like H_2TPPS in acetone, and plays a crucial role in photodynamic therapy. Its weak phosphorescence emission around 1270 nm is studied using Time-Correlated Single-Photon Counting (TCSPC) to optimize photosensitizer design and analyze solvent-dependent emission lifetimes. In the below example, burst laser pulses are used to deposit energy into the sample before being stopped long enough to capture the comparably slow decay of the sample yielding a fitted lifetime of approximately 3 µs.

LDH-I and PLS-I Series

Smart Picosecond pulsed laser heads

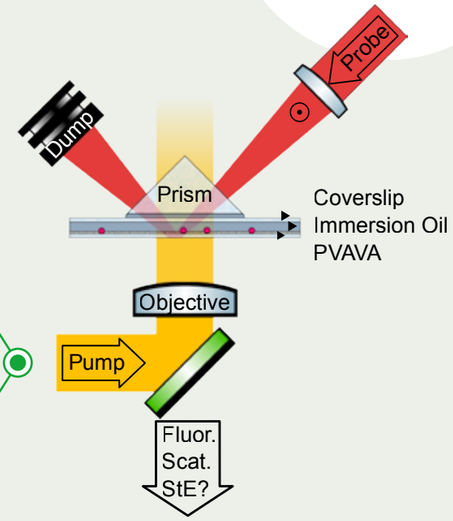
With currently over 60 different laser heads, wavelengths from the UV up to the NIR are covered. You can choose between single and multi-mode diodes, between narrow pulse and high power models. Special tapered-amplified diodes supply solutions in the sparce green, yellow and orange spectral region. Whether your application demands high power, flexible pulse shapes and sequences, or wavelength adjustment, there exists the right laser head tailored precisely to your needs.

- *Wavelength range from 255 to 1550 nm*
- *Single shot to 100 MHz*
- *Synchronization output*
- *External trigger input*
- *Fast and slow gating inputs*



ONE
BUTTON
CONTROL

Pump-probe for stimulated emission microscopy



A novel microscopy approach was explored that combines fluorescence with stimulated emission, leveraging the unique coherence properties of the latter to enable high-contrast imaging with single-molecule sensitivity. The method employed a pump-probe scheme using a Taiko PDL and LDH-IB-640-B operating in maximum power mode as the pump source, alongside a 750 nm mode-locked laser serving as the probe. To minimize background signal, the probe beam was coupled into the sample via total internal reflection, effectively excluding probe light from the detection path. Compared to an analogous setup using ms pulses, this configuration demonstrated a markedly enhanced signal-to-noise ratio.

Data courtesy from Andrew E. S. Barentine and Nobel laureate W. E. Moerner, Stanford University, USA. Adapted with permission from Optica 11, 464-470 (2024).

VisUV

Standalone High-power UV-vis laser

Conceptualized as multi-color modules, the VisUV platform offers up to three parallel laser beams at wavelengths ranging from the UV to the orange spectral region. The single-color modules feature the highest average powers up to >750 mW at repetition rates from single shot up to 80 MHz.

266 nm | 280 nm | 295 nm | 355 nm | 488 nm | 532 nm | 561 nm | 589 nm

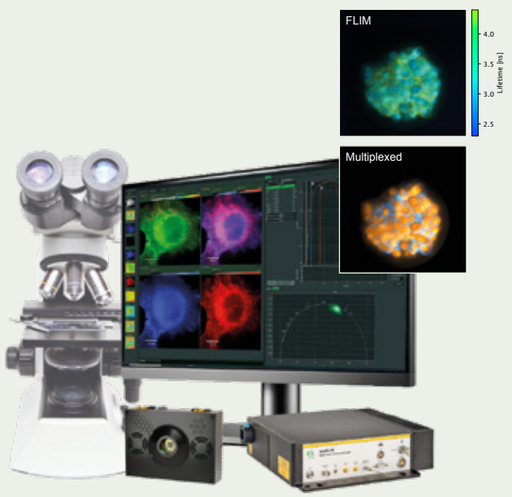
Common to both laser platforms

- *Excellent beam quality*
- *Digital interfaces (USB-C, RS232, Sepia)*
- *Synchronization output*
- *External triggering*
- *Gating input*

Broad spectral coverage

The VisUV laser is available as three, two or single-color platform with typical pulse widths below 85 ps and pulse energies exceeding 50 nJ in the green spectral region. It delivers a collimated output of nearly perfect Gaussian shape, making it ideal for demanding experimental conditions.

Widefield and Lightsheet FLIM



High-power picosecond pulsed lasers of the VisUV and LDH-P-FA series are suited for pulsed excitation in widefield and lightsheet microscopy. Together with a 512x512 SPAD array, this enables fluorescence lifetime imaging (FLIM) with significantly lower acquisition time compared to confocal microscopy. Even lifetime separation is possible as shown on the monitor.
The high-power visible laser VisUV-488 enables FLIM in lightsheet illumination of organoids from mouse embryonic stem cells, giving contrast to fluorescence intensity measurements. By lifetime separation nuclei and membranes can be separated and multiplexed.

Data acquisition in collaboration with Aix-Marseille University, France

VisIR

Standalone High-power NIR laser

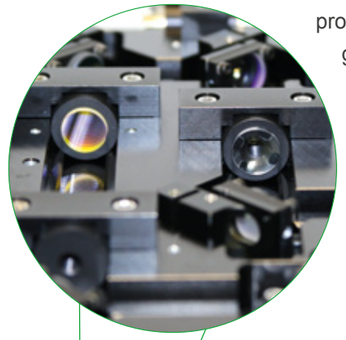
The VisIR platform is ideally suited for high-power applications in the near-infrared spectrum up to 1950 nm or as a depletion laser for STED microscopy e.g. at 766nm. It generates picosecond pulsed laser emission with an output power of up to >1.5 W at repetition rates from single shot up to 80 MHz.

766 nm | 780 nm | 1064 nm | 1531 nm | 1550 nm | 1950 nm

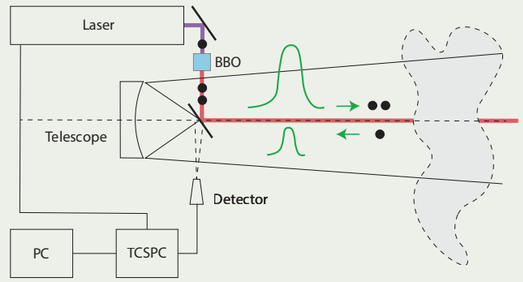
Highest power and flexible pulses

These fiber-amplified and optionally frequency-converted models offer average powers on the Watt scale at optimal pulse repetition rate. To even enhance pulse energies up to more than 150 nJ, the VisUV and VisIR platform can be configured to extended pulse widths of ~0.5 ns with improved coherence (-HC models).

Combining this laser with our programmable pulse generator PPG 512, gives you the freedom to generate any pulse width from 0.15 to 0.5 ns.



Quantum LiDAR using Entangled Photons



Light Detection And Ranging (LiDAR) is a method for determining ranges by targeting an object with a laser and measuring the time for reflected light to return. While being extremely successful, it struggles to distinguish genuine signals from background noise and potential jamming, especially in complex environments. It was recently demonstrated that utilizing spatio-temporal correlations inherent in entangled photons can effectively address these challenges.
The VisUV's short-pulsed emissions and high peak power allow for an efficient Spontaneous Parametric Down-Conversion (SPDC) in nonlinear crystals to generate entangled photon pairs with high stability, perfectly suited for applications in quantum imaging and secure sensing.

Example inspired by Edoardo Charbon, EPFL, Switzerland

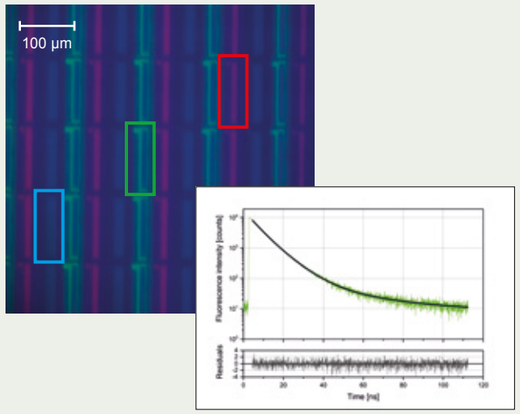
Prima NEW

Standalone Compact 3-color laser

Prima is the ideal laser solution for researchers who need more than one wavelength, have limited space in the lab, measure both short (ns) and long (µs-ms) decay times, work with materials that have a low luminescence quantum yield, and want to avoid daily alignment and laser maintenance.

- *Three colors can be selected among 375, 405, 450, 488, 515, and 640 nm*
- *Triggerable internally and externally, up to 200 MHz*
- *Single-mode fiber-coupling is available for combination 450, 515, 640 nm with 35% coupling efficiency*

Display Pixel Characterization



Accurate display pixel characterization is essential for optimizing color accuracy and response times, both of which impact visual quality and performance. Time-resolved photoluminescence (TRPL) spectroscopy and imaging are powerful techniques to study the emission properties and charge carrier dynamics of display pixels. Using the Prima laser with selectable wavelengths from the UV to the red, individual pixels can be excited in pulsed, burst or (gated) CW mode to measure ps up to ms luminescence decays. This allows researchers to analyze non-radiative recombination processes and motion blur effects, supporting the development of high-performance display technologies.

Common to both lasers

"We can perform about 90% of our spectroscopy experiments with the three excitation wavelengths provided by Prima. Prima can greatly simplify our optical set-up thanks to its small size and fiber output, which facilitates its use."

Alexandre Fürstenberg
University of Geneva, Switzerland

Unico NEW

Standalone Compact 1-color laser

Introducing our state-of-the-art gain-switched picosecond laser, a compact, all-in-one solution designed to meet the rigorous demands of life science and materials science applications. This laser system is engineered to deliver precise, high-quality pulses in the picosecond range, making it an ideal tool for time-resolved fluorescence spectroscopy and imaging.

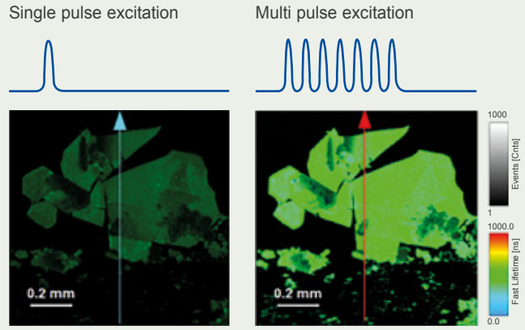
- *Single-color option can be selected among 450, 488, 515, and 640 nm*
- *40% fiber coupling efficiency for all wavelengths*

Full flexibility:
Designed for both time-resolved and steady-state measurements. Excels in fast CW switching, making it ideal for measuring longer lifetimes in the µs-ms time scale range, especially in materials with low luminescence quantum yield.

Versatile operation
Operate in pulsed mode with internal repetition rates from 1 kHz to 200 MHz, or externally from single shot up to 200 MHz. Combine with other laser diode heads for advanced excitation patterns like bursts, Pulse Interleaved Excitation (PIE), or Alternative Laser Excitation (ALEX).

- *Compact, all-in-one, affordable*
- *ps- and ns-pulsed, CW operation, and fast CW switching*
- *Fully computer-controlled*

Phosphorescence Lifetime Imaging (PLIM)



Phosphorescence Lifetime Imaging (PLIM) is a powerful technique for studying long-lived luminescent compounds by measuring the time delay between pulsed laser excitation and photon emission. The technique relies on Time-Correlated Single Photon Counting (TCSPC) or Multi-Channel Scaling (MCS) with multi-stop capabilities to build a time-resolved histogram of phosphorescence decay. Since low laser repetition rates can lead to inefficient excitation, the burst mode feature of diode lasers from PicoQuant enables multi-pulse excitation to efficiently pump phosphorescent molecules into their excited states. This significantly reduces acquisition times while maintaining accurate lifetime measurements, making PLIM more practical for studying transition-metal and lanthanide complexes, quantum dots or perovskites.

Laser for integration

OEM Enlighten your innovation

PicoQuant's reliable and robust picosecond pulsed laser technologies are also available for OEM integration. We offer cost-effective and compact off-the-shelf OEM products as well as custom-tailored solutions for research and industry.

- *Pulses on demand and adjustable repetition rate*
- *Programmable pulse shapes*
- *Compact & cost-effective*
- *Wavelengths selectable*
- *Adapted to your needs and application*

OEM picosecond pulsed lasers NEW

Extremely dense, computer-controlled OEM lasers of the CPDL-Q series are ready for any luminescence excitation application. To name few possibilities: Plate readers, Raman microscopes, wafer tester or surgery assistance, but also for LiDAR, detector testing and camera calibration or any innovation needing a picosecond pulsed laser from UV to NIR.
Flexibility is underlined by unique trigger/gating options internally and externally from single shot to 200 MHz, from CW to ns and µs pulses.

OEM seed lasers

CPDL-S-F(A) series are especially designed as picosecond pulsed seed lasers for high power solid state amplifiers. Our long-term partners appreciate the compact housing, direct fiber output, single shot to 100 MHz, USB control and an optional preamplifier.

Programmable pulse shapes

For advanced applications, we offer ns pulse shaping capabilities for clean rectangle pulses without overshoot and oscillations or you can even draw arbitrary temporal pulse shapes. We offer a laser with programmable output (PPL 512), a modulator to shape your own CW seed (PPA 512) or programmable signal generator to control EOMs (PPG 512).

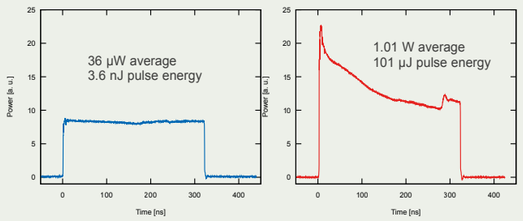
Individual solutions

Year by year, we solve individual OEM tasks for custom housings, interfaces, pulse shapes, power levels and trigger options by designing custom OEM lasers or adapting existing solutions.
How can we help you?

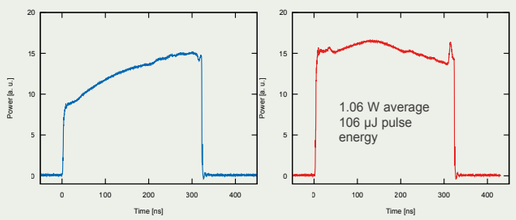
Programmable Pulse Shaping

Seed, 10 kHz **Amplifier output**

Distortion by fiber amplifier saturation

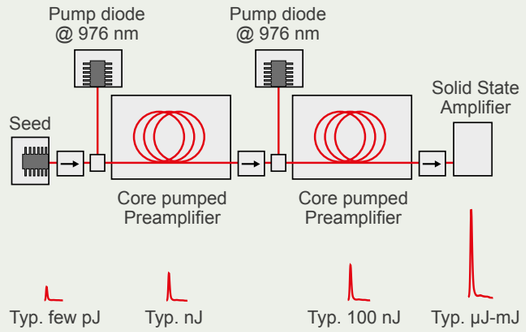


Compensation of amplifier saturation



Programmable pulse shapes can be used to compensate for saturation effects of fiber amplifiers, which exhibit strong gain-saturation especially in the ns pulse regime. The example shows the output of a fiber amplifier with and without compensation by pulse shaping of the seed pulse.

Solid state booster



Working principle of a solid state booster used in one of PicoQuant's OEM lasers. Light pulses from a seed laser diode are amplified in a first fiber stage (preamplifier) before passing a second fiber stage and finally frequency converted via a non-linear crystal (optional).

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