

CATALOG PRODUCTS AND SERVICES



COMPANY PRESENTATION



WHO WE ARE

SILENTSYS is a French company based in Le Mans, that develops, produces, and markets innovative low-noise systems covering photonics, microwaves/THz, and electronic modules.

Thanks to our know-how, patented technology, and innovative designs, we offer high-performance, compact, easy-to-use, and affordable systems, such as turnkey laser frequency stabilization modules enabling linewidths in the Hz range to be achieved in a "compact format."



OUR MISSION

Our goal is to provide systems that are highly compatible with the needs of emerging industrial and laboratory applications such as those related to Quantum technologies, as well as Communications, Cryptography, Computing, Metrology, Sensing....

We aim to offer solutions that best fit your application and make your life easier.



Since 02.2021



Facilities 300 m²



Made in France

SILENTSYS pushes research and industry forward by making deep tech accessible in terms of cost, size, and simplicity.







Optical Sensing

Long optical fibers are widely used for temperature, strain, and acoustic sensing. This relies on Rayleigh, Brillouin, and Raman scattering. Such sensing systems are limited in distance and resolution partly due to the laser's coherence length. SILENTSYS provides highly coherent laser sources, dramatically enhancing optical sensing capabilities.



Lidar / Radar

Lidar and Radar technologies are expanding rapidly, enabling greater distances and resolutions, for example, in wind speed monitoring. The oscillator source (laser or RF synthesizer) must exhibit minimal phase noise. SILENTSYS offers extremely low phase noise lasers, enabling tunable GHz/THz signal generation to boost Lidar and Radar.

APPLICATIONS



Metrology, the science of precise measurements of physical quantities, increasingly relies on lasers and RF signals. The better the laser and RF quality, the more accurate the measurement. SILENTSYS provides low phase noise lasers and tunable low phase noise GHz/THz signals, advancing metrology with unmatched precision.



Quantum Tech

Quantum technologies are fundamentally transforming our world! These technologies explore matter at the microscopic scale (atoms, ions...). To interrogate, cool, and manipulate such particles, low phase noise and frequency-stable lasers are critical. SILENTSYS provides systems tailored for the rise of Quantum Technologies.

CUSTOM-MADE SOLUTIONS



You have specific needs in your company or lab for your systems or experiments and you can't find anything on the market that fits?

STUDIES & ANALYSIS



We are armed with several years of experience in the ultralow noise area; contact us to do specific measurements and analysis with our dedicated instruments.

EXPERTISE & SERVICES

SIGNAL NOISE & STABILITY

SIGNAL GENERATION AND ACQUISITION

THERMAL STABILIZATION

VIBRATION AND ACOUSTIC ISOLATION

COMPACT SYSTEMS

FIBERED PHOTONIC SCHEME

CONTINUOUS AND PULSED LASERS

SILENTSYS PRODUCTS





SLIM LINER – HIGH SPECTRAL PURITY LASER

The Slim Liner is a single-frequency laser that has an ultra-narrow linewidth and a frequency noise of $0.0004 \text{ Hz}^2/\text{Hz}$.



OFD - OPTICAL FREQUENCY DISCRIMINATOR

The OFD is a product that can characterize and/or stabilize the laser frequency for laboratory experiments and industrial developments.



ULN-PDB - ULTRALOW NOISE BALANCED PHOTODETECTOR

The ULN-PDB module is a plug-and-play ultralow noise balanced photodetector inside a compact and user-friendly package.



ALM-X - ULTRALOW NOISE POWER SUPPLIES

The stability of any system begins with its power supply and it is important to have a stable and low-noise supply in order to minimize its contribution to the entire system and improve performance.



PID-01 - HIGH-SPEED SERVO CONTROLLER

PID-01 is a high-speed servo controller that is digitally controlled using an integrated touchscreen. It provides Proportional, simple Integrator, and double Integrator functions.



OFC - OPTICAL FREQUENCY CORRELATOR

The OFC system is comprised of a common 2-input optical frequency discriminator (OFD). This makes it possible to frequency-stabilize two wavelength-distant lasers onto the same optical reference in order to reduce their frequency fluctuations and to correlate them.

PHOTONICS







EW

SLIM LINER



THE NARROWEST-LINEWIDTH LASER

The SLIM LINER, a high spectral purity laser source, is a single-frequency, ultra-narrow linewidth laser. It is based on the Self-Adaptive Photonic Oscillator (SAPO) technology developed by the Institut Foton at Université de Rennes in France. A pump laser is locked onto a cavity using stimulated Brillouin scattering, which offers an extremely narrow gain bandwidth, naturally favoring a high spectral purity.

SPECIFICATIONS

- Laser emission: Continuous Wave (CW)

- Available wavelengths: 1529 to 1562 nm or custom
- Output power: typ. 10 mW (higher power accessible upon demand)
- Polarization Extinction Ratio (PER): typ. > 20 dB
- Optical output connector: FC/APC with narrow key
- RIN: typ. <-150 dBc/Hz at 1 MHz

- Temperature control input voltage range: ±5 V

- NTC resistance reading connector: SMA
- Temperature control input connector: SMA
- Power supply plug: P1J
- System dimensions: 360 × 360 × 88 mm³
- System weight: 5.5 kg

FREQUENCY NOISE < 0.0004 Hz²/Hz

PERFORMANCES

Optical Power Spectrum on a Span of 1 MHz

RefLevel 1260 dtb Mess Time 20 m State 1.010607 Mess * At 0 dt Freg 3.1261 GHz Rectangth 2003 RBW 1.003Hz * Att 0 dt Freg 3.1261 GHz Rectangth 2003 RBW 1.003Hz * Att 0 dt Freg 3.1261 GHz * Att 0 dt Freg 3.1260 GHz * Att 0 dt Freg 3.12



Contact us to discuss your needs

PHOTONICS

sales@silentsys.com



OFD





OPTICAL FREQUENCY DISCRIMINATOR

The OFD system smartly delivers a voltage signal that is proportional to the frequency fluctuations of the input laser beam. This turn-key module is suitable for laser frequency noise characterization and/or for laser frequency stabilization to drastically reduce its optical full width at half maximum linewidth. The OFD features ultralow noise performances that can successfully achieve frequency noise levels as low as 0.01 Hz²/Hz, while remaining in a compact and user-friendly package.

SPECIFICATIONS

- Laser type: single-frequency continuous wave
- Available wavelengths: from 400 nm to 2200 nm
- Optical power in: ~200 µW before saturation
- Optical input: typ. FC/APC connection
- Electrical output voltage range: ± 3 V max
- Electrical output connector: SMA female
- Free Spectral Range (FSR): typ. 1 MHz to 1 GHz
- Frequency noise floor limit: typ. < 0.01 Hz²/Hz
- Typical laser linewidth achievable: down to Hz-level
- System weight: 8.2 kg
- System dimensions: 360 × 360 × 88 mm³
- External control of the optical module temperature

UV-VIS-NIR-MIR 1 to 2 channels

PERFORMANCES







Coming soon: OFD 3rd generation !

Contact us to discuss your needs

PHOTONICS





DRAWINGS





ENHANCE YOUR LASER WITH SIMPLICITY !

Contact us to discuss your needs

PHOTONICS





ULN-PDB

ULTRALOW NOISE BALANCED PHOTODETECTOR



The ULN-PDB module is a plug-and-play ultralow noise balanced photodetector in a compact and user-friendly package. It is proposed with InGaAs and Si photodiodes and offers a bandwidth of 100 MHz with a high gain of 39 kV/A in a DC-coupled version.

SPECIFICATIONS

- Number of outputs: 1
- Trans-impedance gain: 39 kV/A (adjustable on demand)
- Noise equivalent power (NEP): 3 pW/√Hz
- Output impedance: 50 Ω
- Bandwidth: 100 MHz (adjustable on demand)
- Output voltage range: -3 V to +3 V
- Si responsivity: 0.4 A/W at 650 nm
- InGaAs responsivity: 0.9 A/W at 1550 nm
- Available wavelengths: 400 nm 2200 nm (depending on the photodiode's type)
- Photodiode damage threshold: typ. 5 mW

PERFORMANCES

Typical voltage noise power spectral density of the output with 500 μ W optical power:

- Output connector: SMA female
- Input connectors: FC
- Product dimensions: 108 x 79 x 33 mm³
- Product weight: approx. 300 g
- Mono-color LED display



PHOTONICS





ALM-01

ULTRALOW NOISE POWER SUPPLY

SVDC 12VDC 15/DC ALMOI

The ALM-01 module is a plug-and-play ultralow noise power supply that delivers 3 voltages at a maximum of 1.3 A each and 25 W in total with an unprecedented level of ripple, all this in a compact and user-friendly package.

SPECIFICATIONS

- Number of outputs: 3
- Output voltages: 5 VDC, 12 VDC, 15 VDC (custom values upon request)
- Max. output current: 1.3 A per output
- Output connectors: BNC
- Residual ripple: < 5 to 50 µVrms (1 Hz...1 MHz)
- Voltage accuracy: ±1%
- Short circuit protections

- Product dimensions: 155 x 125 x 32 mm³
- Product weight: approx. 900 g
- Bi-color LED indicator per output
- LED color threshold: approx. 1.2 A

PERFORMANCES

Typical voltage noise power spectral density of 5 VDC output:

(limited by the measurement noise floor)







ALM-05

ULTRALOW NOISE POWER SUPPLY

The ALM-05 is an ultralow noise, plug-and-play power supply that delivers a maximum voltage of 5 VDC at 3 A with an unprecedented ripple level, all in a compact, user-friendly package.



SPECIFICATIONS

- Number of outputs: 1
- Output voltage: 5 VDC (custom values upon request)
- Output current: up to 3 A
- Output connector: BNC
- Residual ripple: < 5 to 50 µVrms (1Hz...1MHz)
- Voltage accuracy: ±1%
- Short circuit protections

- Product dimensions: 52 x 125 x 32 mm³
- Product weight: approx. 700 g
- Bi-color LED indicator per output
- LED color threshold: approx. 2.8 A

PERFORMANCES

Typical voltage noise power spectral density of 5 VDC and 2 A output:

(limited by the measurement noise floor)







ALM-08

ULTRALOW NOISE POWER SUPPLY

The ALM-08 module is a plug-and-play ultralow noise power supply that delivers 2 voltages: 5 VDC up to 1 A and 2 VDC up to 8 A, with an unprecedented level of ripple, all this in a compact and user-friendly package. It has been designed to supply optical amplifiers.



SPECIFICATIONS

- Number of outputs: 2
- Output voltages: 2 VDC, 5 VDC (custom values upon request)
- Output currents: 8 A for 2 V and 1 A for 5 V
- Output connectors: Screw terminal blocks
- Voltage accuracy: ±1%
- Short circuit protections

- Product dimensions: 107 x 66.5 x 29 mm³
- Product weight: approx. 500 g
- Bi-color LED indicator per output
- LED color threshold: approx. 5 A and 500 mA
- Temperature elevation from ambient: 17 °C at 5 A and 25 °C at 8 A

PERFORMANCES

Typical voltage noise power spectral density of the 2 VDC channel:







PID-01

HIGH-SPEED SERVO CONTROLLER

PID-01 is a high-speed servo controller that is digitally controlled using an integrated touchscreen. It provides Proportional, simple Integrator and double Integrator functions. It features ultralow voltage noise, more than 200 dB open-loop gain, and a bandwidth of > 30 MHz.



SPECIFICATIONS

- Number of outputs: 1 + one monitor
- Number of inputs : 1 + one monitor
- Input voltage noise: 5 nV/√Hz
- Output impedance: 50 Ω
- Input impedance: 50 Ω
- Input Voltage range max: -5 V / +5 V
- Output voltage range max: -4.5 V / +4.5 V
- Output/input connectors: SMA female
- Control bandwidth: > 30 MHz
- Output offset range: 2 V / + 2 V
- Product dimensions: 155 x 150 x 112 mm³
- Product weight: approx. 1.5 kg

- Proportional Gain:

OFF, from - 28 dB to 23 dB (0.2 dB increments)

- Simple Integrator: OFF, from 100 Hz to 10 MHz (16 settings)
- Double Integrator:

OFF, from 100 mHz to 1 MHz (16 settings)



PERFORMANCES

Typical functional diagram of the module:







OFC

OPTICAL FREQUENCY CORRELATOR

The OFC system is comprised of a common 2-input optical frequency discriminator (OFD). This makes it possible to frequency stabilize two wavelength-distant lasers onto the same optical reference to reduce their frequency fluctuations and to correlate them.

Based on this fact, the optical beat frequency between the two stabilized lasers generates a THz or GHz signal that reaches a very low frequency noise level and high frequency stability.

Moreover, as a standard OFD, it smartly delivers a voltage signal that is proportional to the frequency fluctuations of the input laser beam. This turn-key device is suitable for laser frequency noise characterization and/or for laser frequency stabilization to drastically reduce its optical full-width-at-half-maximum linewidth. The OFC features ultralow noise performances, achieving frequency noise levels as low as 0.01 Hz²/Hz, in a compact and user- friendly package. It also includes external temperature control to act on the laser frequency once it is locked onto the OFC.

SPECIFICATIONS

- Number of optical inputs: 2
- Optical input connector: FC/APC
- Laser type: Single-frequency continuous wave
- Optical input power: typ. 200 μW before saturation (measured at 1.5 μm)
- Number of electrical outputs: 2
- Electrical output connector: SMA
- Electrical output voltage range: ±3 V max
- Free Spectral Range (FSR): typ. 1 MHz to 1 GHz
- Frequency noise floor limit: typ. $< 0.01 \text{ Hz}^2/\text{Hz}$
- Typical laser linewidth achievable: down to Hz-level

- External temperature control
- NTC resistance reading connector: SMA
- Temperature control input connector: SMA
- Product dimensions: 360 x 360 x 88 mm³
- Product weight: approx. 8.2 kg
- Aluminum case
- Temperature: +10 °C to +40 °C

OFD 3rd generation with integrated PID and improved performances

With the integrated PID, the operation is simplified; only one tool is needed without an additional module, and everything can be set from the screen, Moreover, the long term stability is improved with better temperature stabilization !





An OEM version of the OFD suitable for industrial applications; meaning easy integration, wide temperature working range, high vibration resilience, scalability and lower price,

COMING SOON!

LASER SOURCE ANALYZER

SILENTSYS is preparing a plug & play device for laser frequency noise analysis that will be able to measure extremelly low frequency noise level with no equivalent on the market!

LASER SOURCES

We are working on stabilized laser sources for industrial applications and high quantities in 1U sizes in order to supply for the current demand.

AMPLIFIERS & FILTERS

Measuring ultralow noise voltages is challenging and requires very specific electronic amplifiers and filters that we developed to characterize our systems (ALM-01-05-08... and OFD, OFC...).

Soon available for you too!

CURRENT DRIVERS

We will soon offer powerful and high-performance laser current drivers that will feature ultralow noise current and high speed external modulation.





DISTRIBUTOR

FR, EU

+33 685 22 01 15 pleroux@optoprim.com



DIRECT SALES

FR, EU, WORLDWIDE

+ 33 786 91 63 01 sales@silentsys.com





 \square



SILENTSYS SAS

10 rue Xavier Bichat Zone Université, 72000, Le Mans, France

SILENTSYS ultralow noise systems



+ 33 786 91 63 01

info@silentsys.com

www.silentsys.com



linkedin.com/company/silentsys



Make your research better!