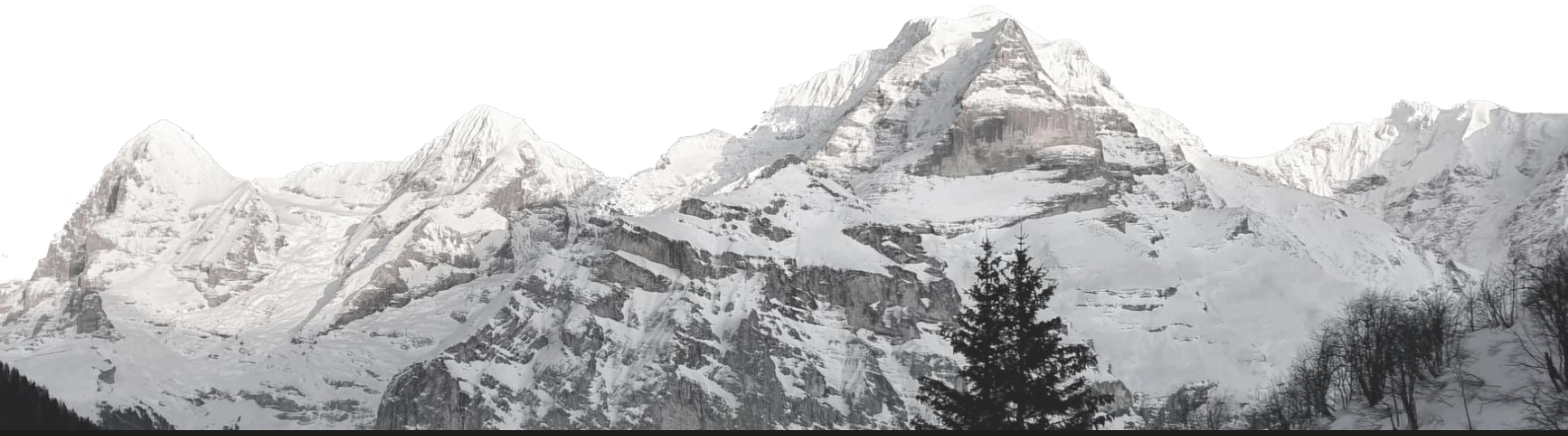
SILENTSYS

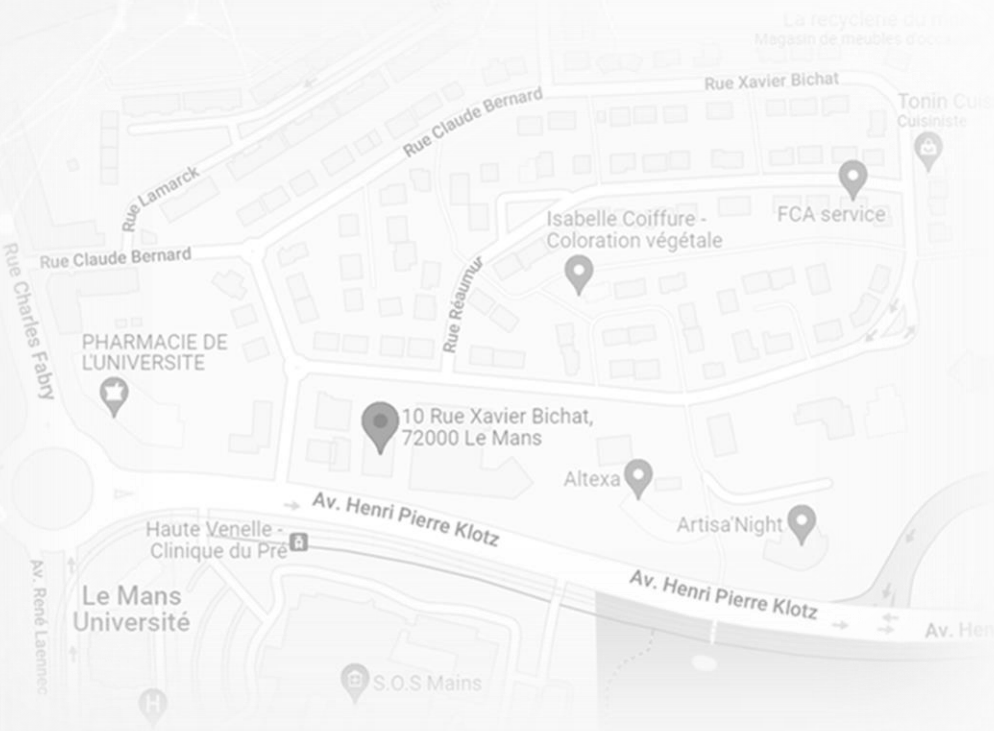
ultralow noise systems

CATALOG
PRODUCTS AND SERVICES



PHOTONICS ELECTRONICS THz / GHz

info@silentsys.com
www.silentsys.com



SILENTSYS

ultralow noise systems

SILENTSYS SAS
10 rue Xavier Bichat
72000, Le Mans
France

BOOST YOUR LAB
WORK WITH SIMPLICITY

CATALOG
revision 4.b – May 2023

Company presentation

WHO WE ARE

SILENTSYS SAS is a French company, spin off of the University of Neuchâtel in Switzerland, that develops, produces and commercializes innovative ultralow noise systems covering photonics, microwave/THz and electronic modules.

Thanks to our well-established know-how and our patented designs, SILENTSYS offers high-performance systems that are compact, easy to use and affordable.

SILENTSYS
ultralow noise systems

- AGILITY
- KNOW-HOW
- INNOVATION
- MADE IN FRANCE

WHAT IS 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.

Team of 9 people

Dr. Pierre Brochard

President & Co-founder

Dr. François Labaye

Board member & Co-founder

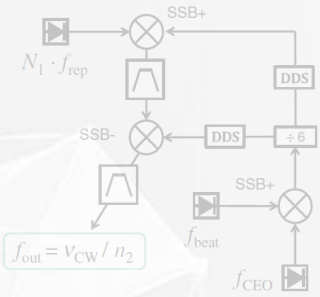
Dr. Valentin Wittwer

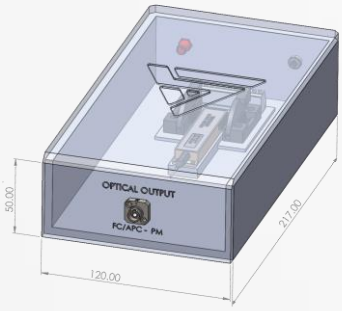
Board member & Co-founder

Ing. Romain Frénéhard

CTO & Co-founder

PROOF-OF-CONCEPT





Contact us for a proof-of-concept so we can put forward different solutions to your challenges…

We are researchers with a strong imagination!

SILENTSYS

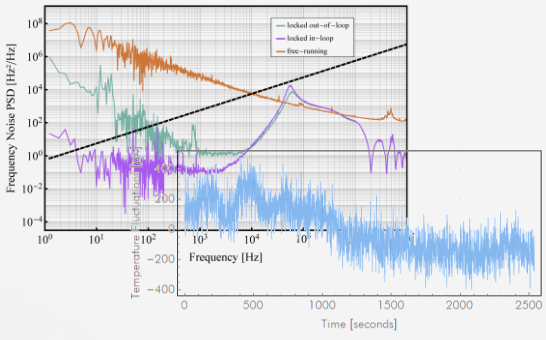
SERVICES

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?

We are here to bring you the best solutions!

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.

Let us help you to save your time!

Contact us to discuss your needs

sales@silentsys.com

PHOTONICS

We offer compact, plug and play, and convenient off-the-shelf products for your lab experiments and industrial developments.

Covering UV, VIS, NIR to MIR!

SILENTSYS

PRODUCTS

THz / GHz

We provide laser frequency stabilization/down-conversion systems that enable low-noise THz or GHz signal generation.

ELECTRONICS

SILENTSYS proposes different electronic modules that aim to improve your setups, experiments and systems.

SILENTSYS PRODUCTS

OFD - OPTICAL FREQUENCY DISCRIMINATOR

A compact and useful product for laboratory experiments and industrial developments.

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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.

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ALM-01 - ULTRALOW NOISE POWER SUPPLY

The ALM-01 is a very low noise plug and play power supply that delivers 3 voltages of up to 1.3 A each and 25 W in total with an unprecedented level of ripple.

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ALM-05 - ULTRALOW NOISE POWER SUPPLY

The ALM-05 is an ultralow noise plug and play power supply that delivers up to 3 A with an unprecedented level of ripple.

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ALM-08 - ULTRALOW NOISE POWER SUPPLY

The ALM-08 is a very low noise plug and play power supply that delivers 2 voltages: 2V with up to 8A and 12V, with an unprecedented level of ripple.

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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..

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TEC-01 – LINEAR TEMPERATURE CONTROLLER

TEC-01 is a low-noise Linear Temperature Controller that enables high-performance temperature locking and measurements with up to 4 NTCs.

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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.

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Products

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 being successful in achieving frequency noise levels as low as 0.1 Hz^2/Hz; and this in a compact and user-friendly package.

SPECIFICATIONS

- Laser type: single-frequency continuous wave
- Optical power in: ~200 µW before saturation
- Optical Input: typ. FC/APC connexion

- Electrical output voltage range: ± 5V max
- Electrical output connector: SMA female

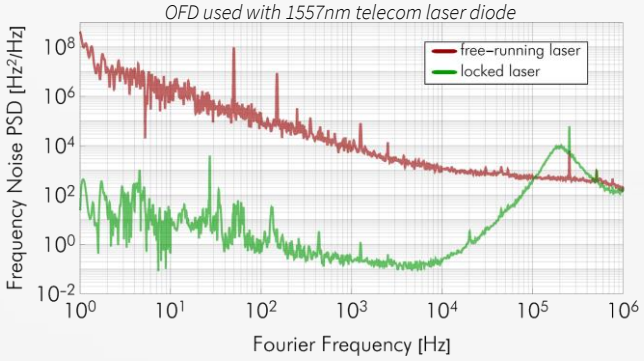
- Free Spectral Range (FSR): typ. 1 MHz to 1 GHz
- System sensitivity: typ. 1 MHz/V to 1 GHz/V
- Frequency noise floor limit: typ. < 0.1 Hz^2/Hz
- Typical laser linewidth achievable: up to Hz-level
- Systems dimensions: 360 × 360 × 88 mm^3

- External control of the Optical module temperature

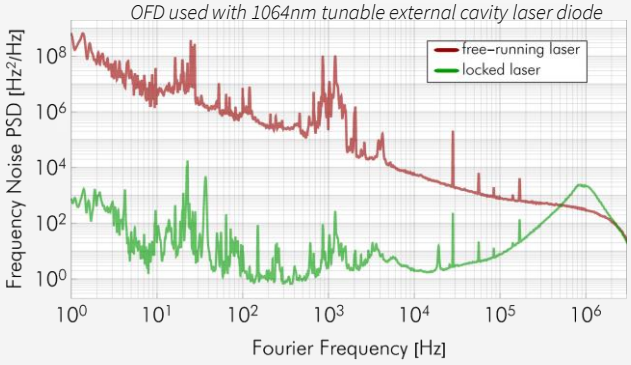
Ultralow frequency noise
Compact & TurnKey
UV-VIS-NIR-MIR
1 to 2 channels

PERFORMANCES

OFD used with 1557nm telecom laser diode



OFD used with 1064nm tunable external cavity laser diode

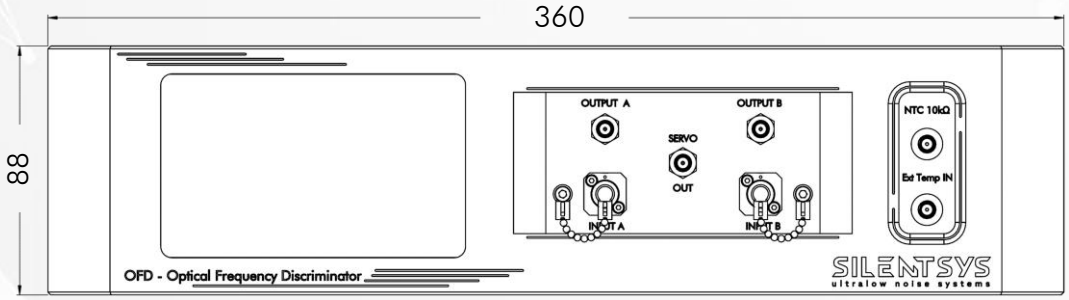


Coming soon : PID controller included !

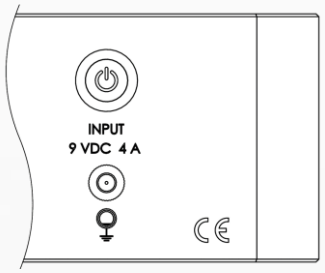
Products

DRAWINGS

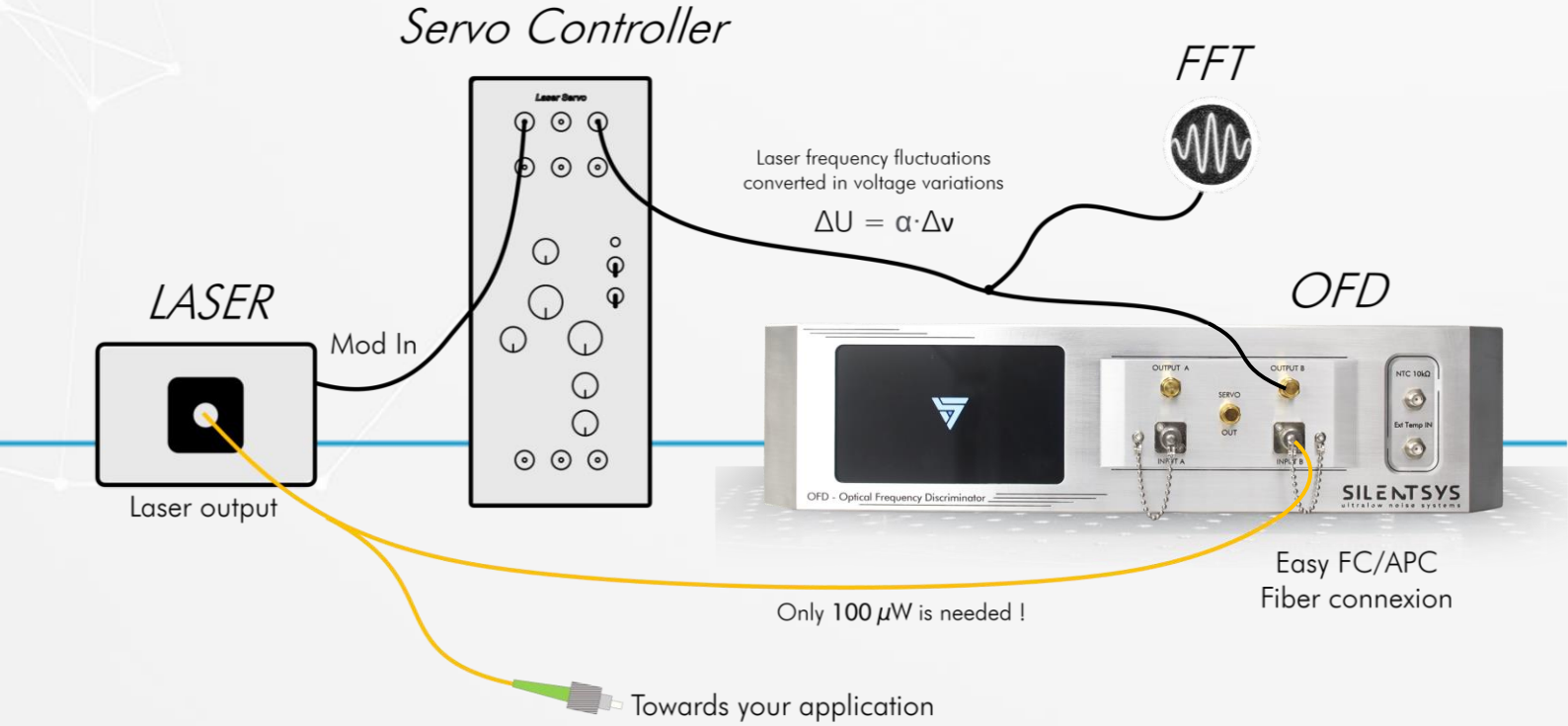
FRONT VIEW



BACK VIEW
(cropped)



HOW-TO-USE



ENHANCE YOUR LASER WITH SIMPLICITY !

Products

SLIM LINER

HIGH SPECTRAL PURITY LASER SOURCE

Ultralow frequency noise
< 1Hz Lorentzian linewidth
Compact & TurnKey

Products

SPECIFICATIONS

The Slim Liner is the single frequency laser that offers intrinsic optical linewidths narrower than 1 Hz, ultralow phase/frequency noise, as well as shot noise limited relative intensity noise above a few hundred kHz. It includes UTI grid single frequency lasers, optically referenced single frequency lasers, and tunable single frequency lasers. Other wavelengths are also possible on request.

Wavelength range: 1530-1560 nm (DWDM ITU table); other wavelengths on request
Wavelength stability: < 100MHz/4hours (free running version)
Optical Lorentzian linewidth: <1 Hz
Laser emission: CW
Output power: 1 to 100 mW
Power stability: < 2%
Phase noise @10kHz: -90 dBc/Hz
RIN (above 100 kHz): < -155 dB/Hz
SMSR: 70 dB

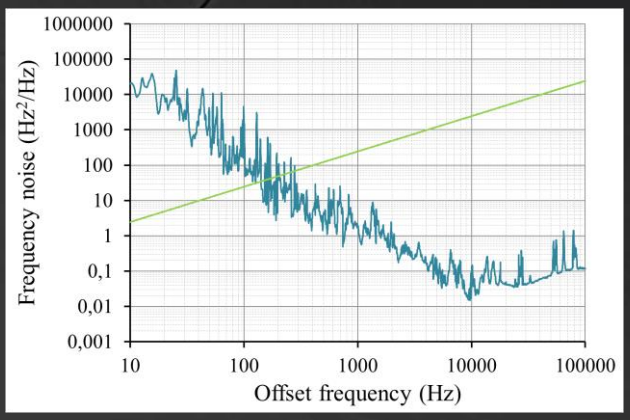
Optical connector: FC/APC - PM
Dimensions (HxWxD): 350 x 290 x 140 mm3
Weight: 5 kg
Operating temperature range: 15°C to 40°C

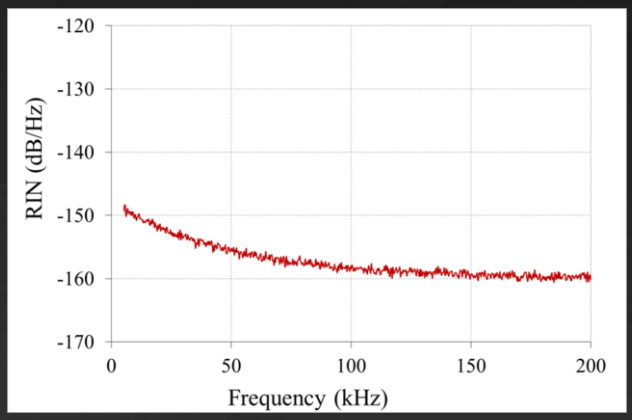
TECHNOLOGY DEVELOPED BY INSTITUT FOTON (Université de Rennes, CNRS)

PERFORMANCES

Left: Measurement of the frequency noise PSD of the Slim Liner (blue curve) with the beta-separation line (green curve). This is obtained by beating two independent and identical Slim Liners.

Right: Measurement of the Relative Intensity Noise (RIN) of the Slim Liner





COMING SOON...

ULN-PDB

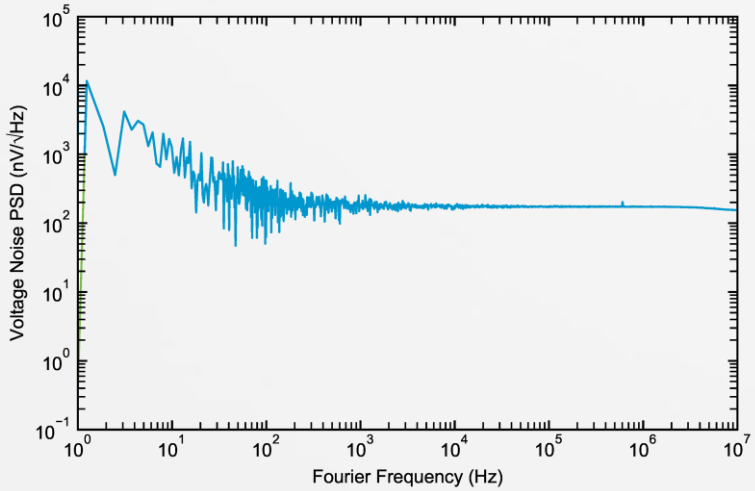
ULTRALOW NOISE BALANCED PHOTODETECTOR

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, Si or GaAs photodiodes and offers a bandwidth of 100 MHz with a high gain up to 3,9 kV/A in a DC-coupled version.

SPECIFICATIONS

- Number of outputs: 2
- Trans-impedance gain: 3.9 kV/A (x1) and 39 kV/A (x10)
- Output impedence: 50 Ω
- Bandwidth: 100 MHz
- Output connectors: SMA female
- Input connectors: FC
- Output voltage range: -3 V to +3 V
- Input supply: 5 to 9 VDC
- Input plug: P1J

- Product dimensions: 71 x 48 x 29 mm^3
- Product weight: approx. 300g
- Bi-color LED display



PERFORMANCES

Typical voltage noise power spectral density of the output with x1 channel and 500 µW optical power:

(limited by the measurement noise floor)

ALM-01

ULTRALOW NOISE POWER SUPPLY

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

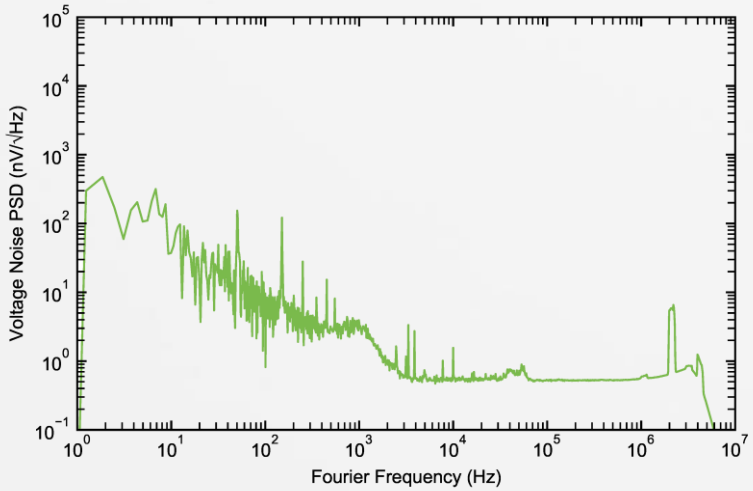
SPECIFICATIONS

- Number of outputs: 3
- Output voltages: 5 VDC, 12 VDC, 15 VDC (custom values on request)
- Output currents: 0 - 1.3 A for each
- Output connectors: BNC (SMA on request)

- Residual ripple: < 5 to 50 μV_{rms} (1Hz…1MHz)
- Voltage accuracy: ± 1 %
- Short circuit protections

- Input supply: Provided, 18VDC
- Input plug: P1J

- Product dimensions: 155 x 125 x 32 mm^3
- Product weight: approx. 2 kg
- Bi-color LED display per output
- LED color threshold: approx. 1.2 A



PERFORMANCES

Typical voltage noise power spectral density of 5V output:

(limited by the measurement noise floor)

ALM-05

ULTRALOW NOISE POWER SUPPLY

The ALM-05 module is a plug and play ultralow noise power supply that delivers 1 voltage of maximum 3 A with an unprecedented level of ripple, all this in a compact and user-friendly package.

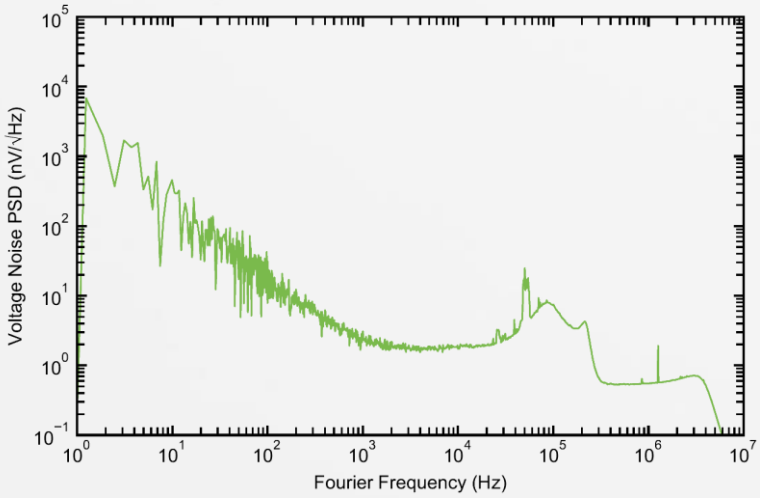
SPECIFICATIONS

- Number of outputs: 1
- Output voltages: 5 VDC (custom values on request)
- Output currents: up to 3 A
- Output connectors: BNC

- Residual ripple: < 5 to 50 μV_{rms} (1Hz…1MHz)
- Voltage accuracy: ± 1 %
- Short circuit protections

- Input supply: Provided, 5.9 VDC
- Input plug: P1J

- Product dimensions: 52 x 125 x 32 mm^3
- Product weight: approx. 700 g
- Bi-color LED display per output
- LED color threshold: approx. 2.8 A



PERFORMANCES

Typical voltage noise power spectral density of 5V and 2A 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: 2V with up to 8A and 12V, 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, 12 VDC (custom values on request)
- Output currents: 8 A for 2 V and 500 mA for 12V
- Output connectors: Screw terminal blocks

- Voltage accuracy: ± 1 %
- Short circuit protections

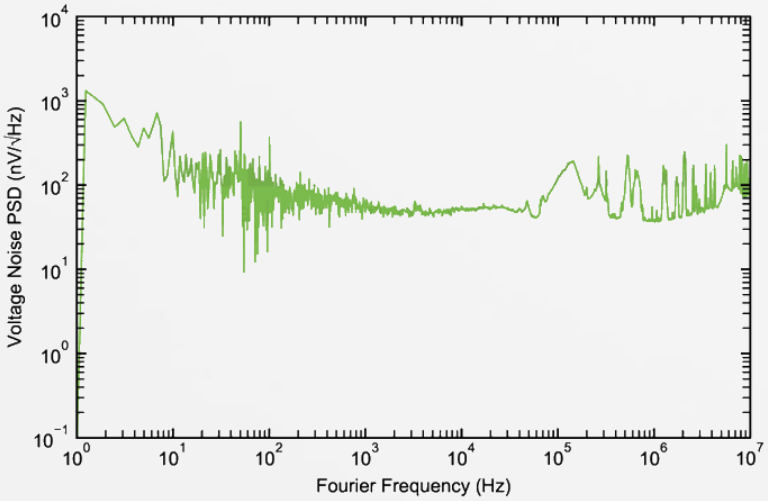
- Input supply: Provided, 18VDC
- Input plug: P1J

- Product dimensions: 107 x 66,5 x 29 mm^3
- Product weight: approx. 500g
- Bi-color LED display per output
- LED color threshold: approx. 5 A and 500mA

- Temperature elevation from ambiant: 17°C at 5 A and 25°C at 8 A.

PERFORMANCES

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



Products

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: 3
- Number of inputs : 1

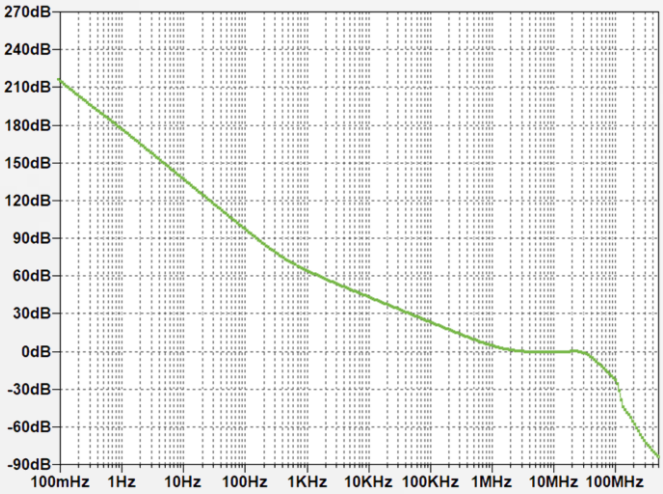
- Output impedence: 50 Ω or 1 MΩ
- Input impedence: 50 Ω or 1 MΩ
- Input Voltage range: -5 V / +5 V
- Output Voltage range: -3 V / +3 V
- Output/Input connectors: SMA female

- Control Bandwidth: > 30 MHz
- Output offset range: - 2.5 V / + 2.5 V

- Input supply: Provided, 9 VDC
- Input plug: P1J

- Product dimensions: 155 x 150 x 112.5 mm^3
- Product weight: approx. 1.5 kg

- Proportional Gain :
  from - 28 dB to 23 dB (0.2 dB increments)
- Simple Integrator :
  from 100 Hz to 10 MHz (16 settings)
- Double Integrator :
  from 100 mHz to 1 MHz (16 settings)



PERFORMANCES

Typical bode diagram of the module:

TEC-01

LINEAR TEMPERATURE CONTROLLER

TEC-01 is a low-noise Linear Temperature Controller that enable high-performance temperature locking and measurements. It is digitally controlled through a touchscreen and can be connected to a computer for acquisition and control. It features a maximum output current of +/- 1.5 A and can measure up to 4 NTCs.

SPECIFICATIONS

- Number of TEC outputs: 1
- Number of NTCs inputs: 4

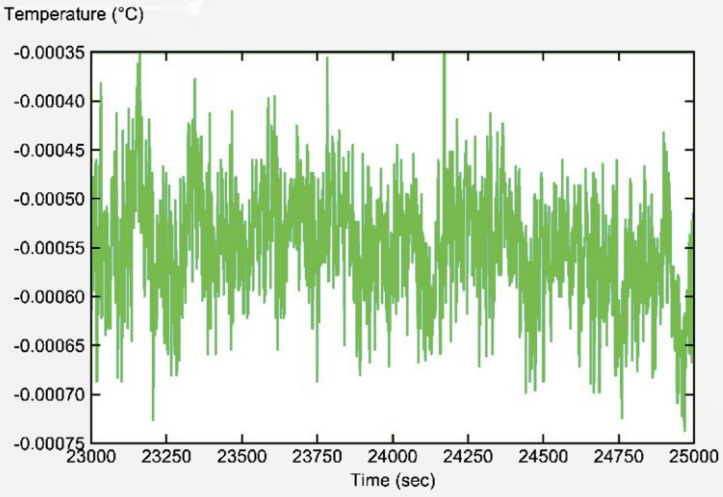
- NTCs: typically 10 kΩ
- NTCs range: 1000 Ω to 75 kΩ
- TEC maximum output current: +/- 1.5 A
- Compliance voltage at max current: +/- 1.5 V

- Input supply: Provided, 9 VDC
- Input plug: P1J

- Product dimensions: 155 x 150 x 112.5 mm^3

- Product weight: approx. 1.5 kg

- Output/Input connectors: Screw terminal blocks
- USB connection to computer and control with commands (coming soon)



PERFORMANCES

Typical out-of-loop temperature measurements of a stabilized system with «free-running» room temperature:

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 precisely.

Based on this fact, the optical beat frequency between the two stabilized lasers generates THz or GHz signal that reach a very low frequency noise level and that are easily frequency tunable.

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 0.1 Hz^2/Hz; and this in a compact and user-friendly package.

OFD WITH INTEGRATED PID

With the integrated PID, operation is simplified, only one tool is needed, no need for an additional module, everything can be set from the screen.

SLIM LINER

The Slim Liner is the single frequency laser that offers intrinsic optical linewidth narrower than 1 Hz, ultralow phase/frequency noise, as well as shot noise limited relative intensity noise above a few hundred kHz

COMING SOON !

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!

ACQUISITION CARDS

SILENTSYS is preparing, following the product LEO, an ultralow noise et high - resolution (32-bits) acquisition card designed for ultra-precise voltage and temperature measurements.

LASER DRIVERS

We will soon offer powerful and high-performance laser drivers that will include linear temperature control and low-noise high bandwidth (10 MHz) current driver functions

Stay tuned …

DISTRIBUTORS

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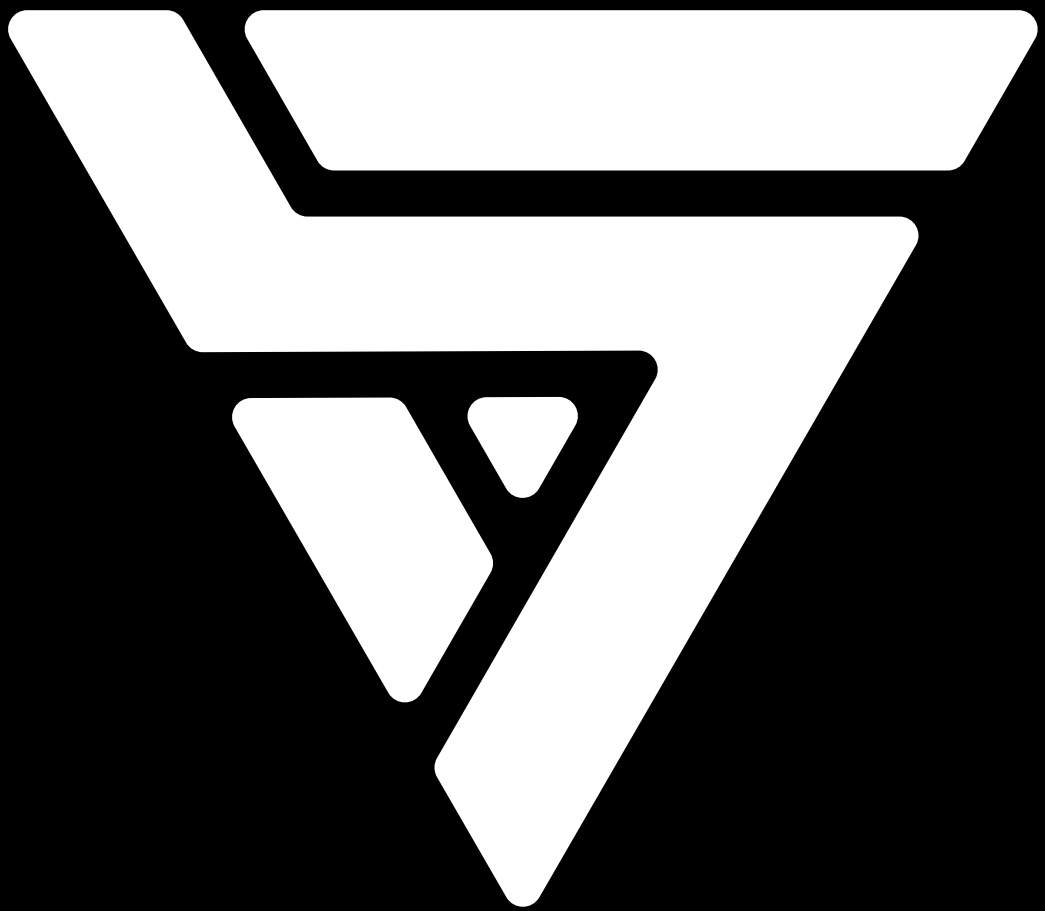

Make your research better !