

# SILENTSYS

ultralow noise systems

## CATALOG PRODUCTS AND SERVICES



PHOTONICS

ELECTRONICS

THz / GHz

info@silentsys.com  
www.silentsys.com



# Company presentation



## WHO WE ARE

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

Current technologies are bulky, expensive and only available in a narrow range of wavelengths, which limits scientific and, above all, industrial progress. This is why we have developed "ready-to-use" products to meet these needs. We are able to design with customers very high value-added projects in a wide range of sensitive fields.

Thanks to our know-how, patented technology and innovative designs, we can 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".

**SILENTSYS**  
ultralow noise systems

- ◆ RIGOUR
- ◆ CURIOSITY
- ◆ COMMITMENT
- ◆ PROFESSIONALISM

## 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 11 people



Facilities 200m<sup>2</sup>



Made in France



Dr. Pierre Brochard  
President & Co-founder



Ing. Romain Frénéhard  
Director & Co-founder



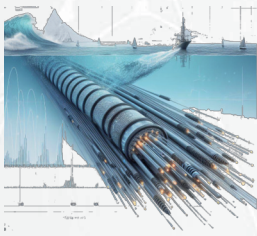
Dr. François Labaye  
Board member & Co-founder



Dr. Valentin Wittwer  
Board member & Co-founder



Prof. Mehdi Alouini  
Board member



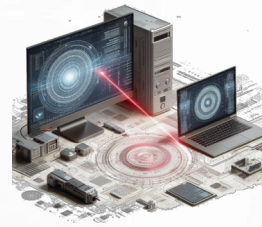
### **Optical Fiber Sensing**

→ Longer detection range



### **LiDAR / RADAR**

→ Better precision



### **Quantum computing/ Gravitometry**

→ Easier atom manipulation

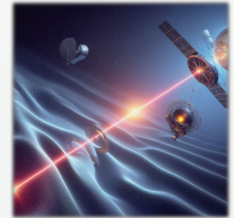
# **SILENTSYS**

## APPLICATIONS



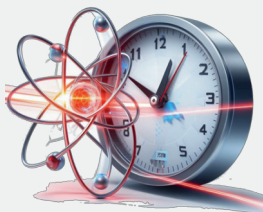
### **Quantum information network, quantum internet**

→ Securing data transmission



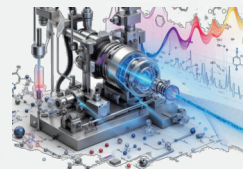
### **Interferometry**

→ Improved sensitivity



### **Optical Clocks**

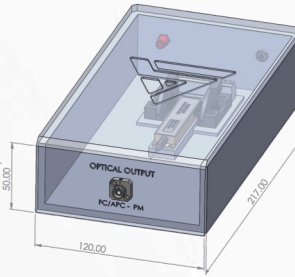
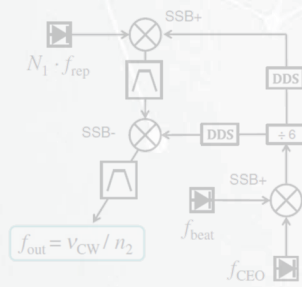
→ Finer atomic transition



### **Microscopy/Spectroscopy and holography**

→ Best resolution

# 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

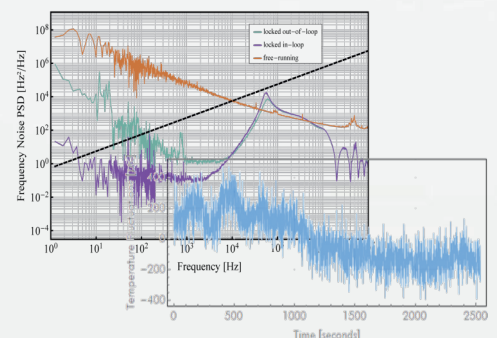
### CUSTOM-MADE SOLUTIONS



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](mailto: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.



## 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.



## 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.



## 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.



## 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.



## 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.



## 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<sup>2</sup>/Hz; and this in a compact and user-friendly package.

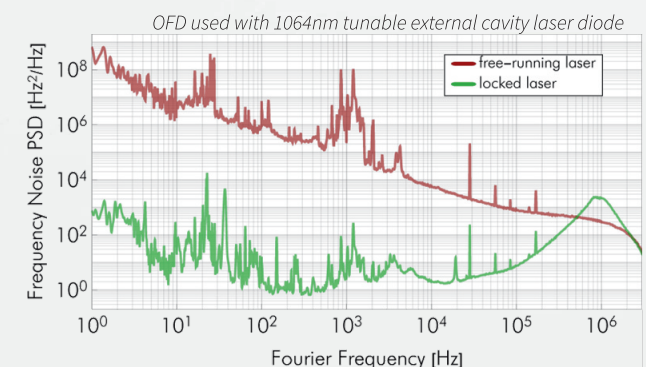
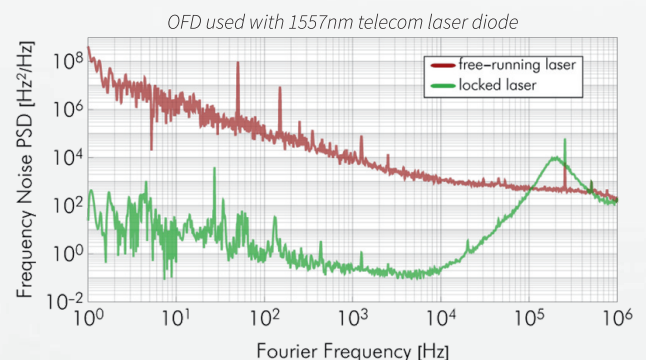
## SPECIFICATIONS

- Laser type: single-frequency continuous wave
- Optical power in: ~200  $\mu$ W before saturation
- Optical Input: typ. FC/APC connexion
- Electrical output voltage range:  $\pm 5$  V 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<sup>2</sup>/Hz
- Typical laser linewidth achievable: up to Hz-level
- Systems dimensions: 360  $\times$  360  $\times$  88 mm<sup>3</sup>
- External control of the Optical module temperature

Ultralow frequency noise  
Compact & TurnKey  
UV-VIS-NIR-MIR

1 to 2 channels

## PERFORMANCES



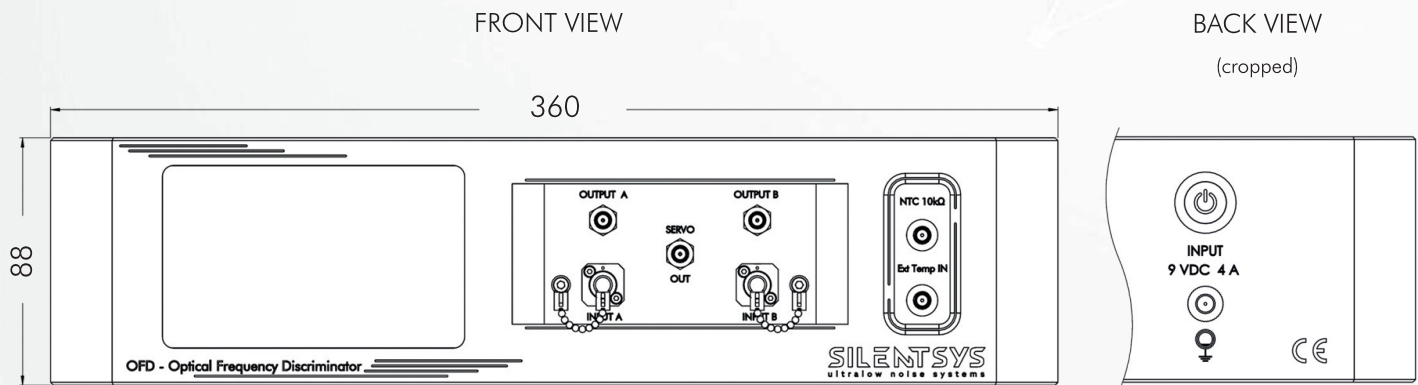
Coming soon : PID controller included !



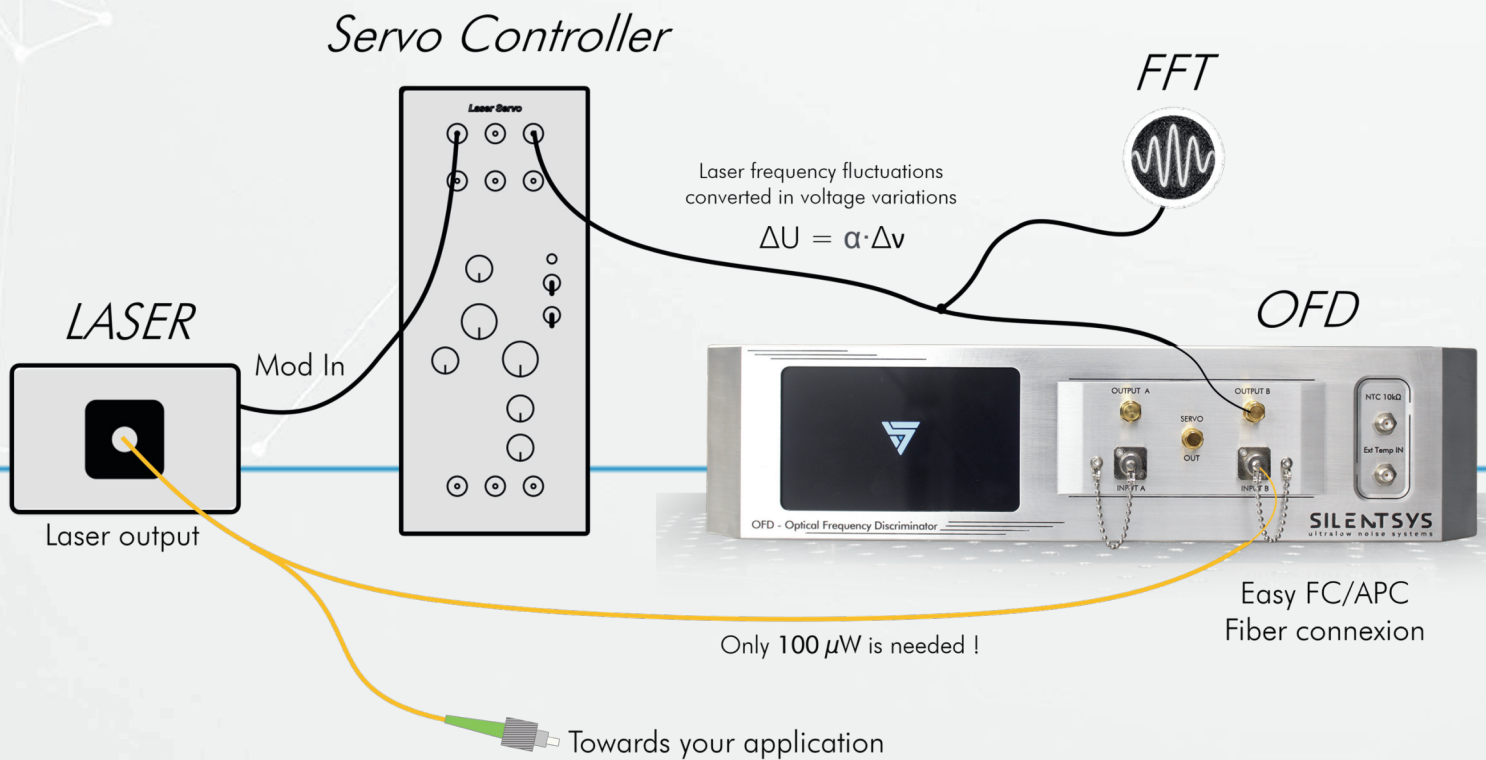
# PRODUCTS



## DRAWINGS



## HOW-TO-USE



ENHANCE YOUR LASER  
WITH SIMPLICITY !







## 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 of 39 kV/A in a DC-coupled version.

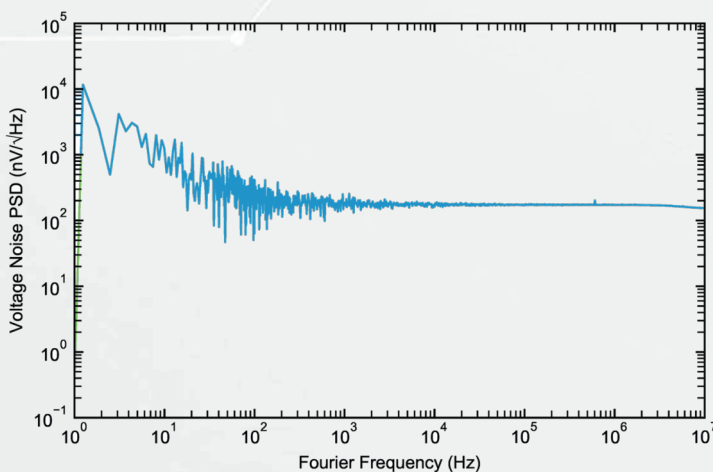


### SPECIFICATIONS

- Number of outputs: 1
- Trans-impedance gain: 39 kV/A
- Output impedance: 50  $\Omega$
- 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: 108 x 79 x 33 mm<sup>3</sup>
- Product weight: approx. 300g
- Mono-color LED display



### PERFORMANCES

Typical voltage noise power spectral density of the output with 500  $\mu$ W optical power:

(limited by the measurement noise floor)



## ALM01

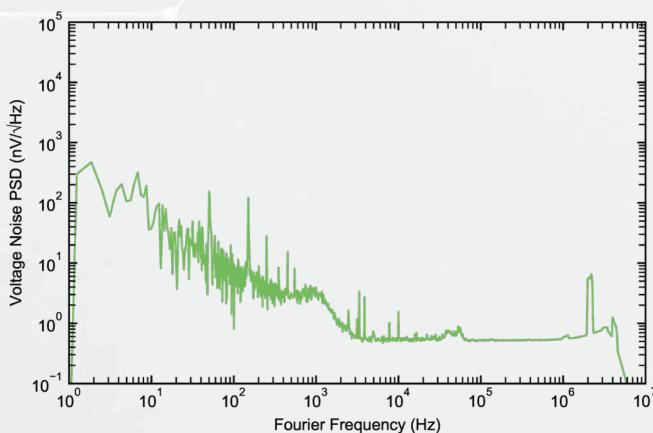
### ULTRALOW NOISE POWER SUPPLY

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  $50 \mu\text{Vrms}$  (1Hz...1MHz)
- Voltage accuracy:  $\pm 1 \%$
- Short circuit protections
- Input supply: Provided, 18VDC
- Input plug: P1J
- Product dimensions: 155 x 125 x 32 mm<sup>3</sup>
- 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)

# PRODUCTS



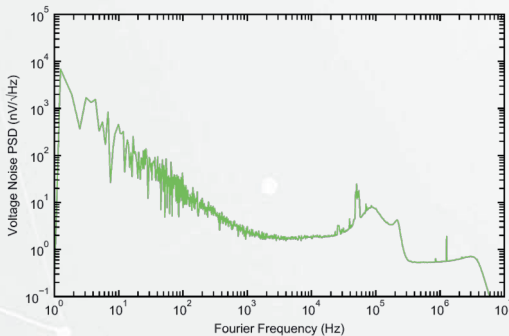
## ALM05

### 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.

### PERFORMANCES

Typical voltage noise power spectral density of 5V and 2A output: (Limited by the measurement noise floor)



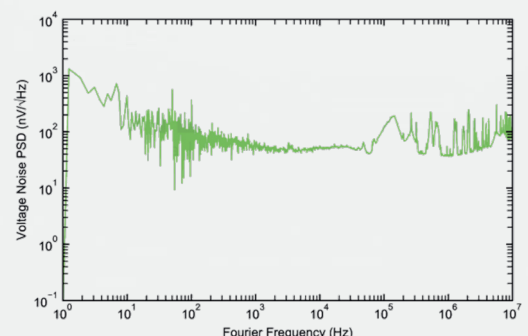
## ALM08

### 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.

### PERFORMANCES

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





## PID01

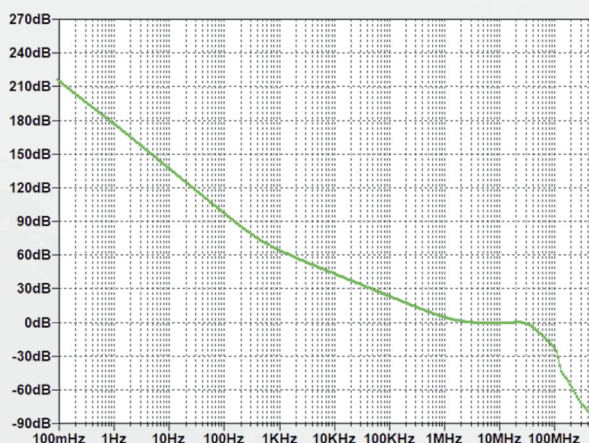
### HIGH SPEED SERVO CONTROLLER

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
- Output impedance: 50  $\Omega$
- Input impedance: 50  $\Omega$
- 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

- Provided input supply : XP-POWER ACM36US09
- Input plug: P1J
- Product dimensions: 155mm x 150mm x 112mm
- 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:





## 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  $0.1 \text{ Hz}^2/\text{Hz}$ ; 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 !

## 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.

## 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!

## 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 ...*

## Distributor

FR, EU

+33 685 220 115  
info@morephonics.com



## Direct sales

FR, EU, WORLDWIDE

+33 650 92 18 75  
sales@silentsys.com

## LOCATION



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

A detailed map of the Le Mans area, showing streets like Rue Xavier Bichat, Rue Claude Bernard, and Av. Henri Pierre Klotz. A red pin marks the location of SILENTSYS SAS at 10 Rue Xavier Bichat, 72000 Le Mans. Other landmarks like Le Mans University and various local businesses are also labeled.

# SILENTSYS

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+33 650 92 18 75



info@silentsys.com



www.silentsys.com



Linkedin

linkedin.com/company/silentsys

