Etisense

Jacketed monitoring for life sciences

PROPOSITION ADVANCED-8

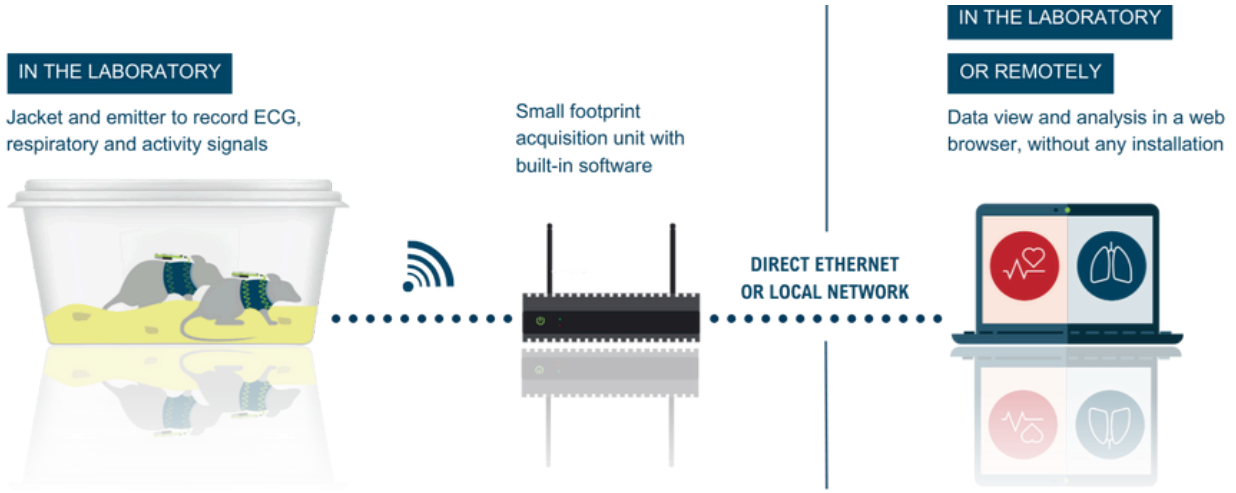


DECRO® by ETISENSE



DECRO External Telemetry Solution

The DECRO external telemetry solution measures **respiratory function**, **external ECG**, and **activity levels** in up to 8 or more animals simultaneously, without surgery or restraint. It is designed to simplify the process of setting up and starting a study. Researchers can quickly and easily connect the system to their animals and start monitoring their vital signs in real-time. The solution is built as a platform which can seamlessly expand to cover multiple species and incorporate additional features.



DECRO solution is composed of:

- **Instrumented jacket(s):** available for rat, marmoset, dog, and minipig models, each tailored to the species and the animal's morphology and size (software and hardware remain the same across all species).
- **Emitter(s) and batteries:** digitizing and transmitting physiological signals via to an acquisition unit.
- **Acquisition unit:** ensure direct signal recording in animal facilities, along with its electronic accessories.
- **Analysis Software:** DECRO LASA software goes beyond simple acquisition and visualization by integrating advanced analyzer modules that extract meaningful physiological parameters from recorded signals. These modules rely on plethysmography-based measurements, combining cardiorespiratory cycle detection, artifact filtering, and advanced data processing to turn raw signals into actionable scientific insights.
- For greater flexibility, LASA is also available via a cloud instance managed by Etisense (monthly charges apply), enabling remote access from anywhere. This facilitates seamless collaboration, flexible storage, efficient teamwork, and direct technical support — opening broader possibilities for all DECRO users.

Jackets and Species

DECRO jackets are made from high-quality, durable and soft textiles certified OEKO-TEX® STANDARD 100 designed to ensure **comfort** and **optimal fit** for each animal model. In rats and marmosets, the jackets embed plethysmographic sensors (respiratory function) and protect the two external ECG electrodes. For large species such as dogs and minipigs, the jackets integrate both ECG and plethysmographic sensors.



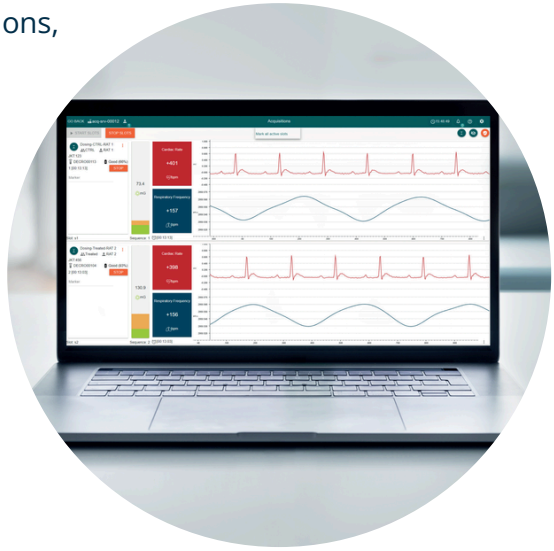
**Do not hesitate to contact us for additional species.*

Hardware: Emitters and Acquisition Units

The DECRO® solution combines intuitive design and miniaturized electronics to deliver high-quality physiological signals without compromising animal welfare. The lightweight emitter records ECG, respiratory, and movement data while preserving natural behavior. It transmits signals in real time to a compact acquisition unit operated via a web browser. The emitter meets EMC, CE, and RoHS standards and features USB-rechargeable and replaceable batteries, making the system ideal for multi-animal studies and easy to deploy.

LASA Analysis Software

LASA is a browser-based platform for recording, structuring, and analyzing physiological data — no installation required. It organizes studies in a structured database, enables real-time monitoring, battery tracking, and scheduled acquisitions, and supports intuitive navigation between raw and processed data.



Analysis can be done remotely, either on a local server or via a secure cloud instance (optional, with subscription).

LASA centralizes data from multiple acquisition units, ensuring collaborative, traceable work with secure storage, user access control, and full data ownership. Data exports include Excel, CSV, and HDF5 formats.

DECRO Advanced-8 Solution

The **DECRO Advanced-8** solution is a plug-and-play setup designed for monitoring up to 8 animals simultaneously. The setup is packaged in a compact flight case (10 kg - 47x37x18 cm) that includes:



- 2 **new generation** acquisition units *(SYS-NANOACQ4)* with integrated proprietary LASA acquisition software;
- Electronic accessories (1 Ethernet cable, 1 USB 3.0 Gigabit Ethernet adapter, 1 local IEC cable, 1 multiport USB charger for batteries with power plug adapters, and 8 micro-USB cables);
- An **analysis and calculation server** *(SRV-LASAV2)* enabling parallel, optimized processing of large data volumes for advanced data analysis and visualization. It supports the management, analysis, and visualization of individual data, allows seamless data transfer to and from the acquisition unit, and includes basic physiological analyzers for ECG, plethysmography, and activity. Raw data and reports can be exported for statistical analysis with third-party software. An authentication and user permission module is also included ;
- 8 **DECRO telemetry emitters** *(EMET-HD-ACQ-REVG)* for wireless acquisition of physiological signals;
- 16 rechargeable **micro-USB batteries** *(EMET-HD-BAT-REVG)*, allowing 24-hour continuous monitoring.

Technical specifications table

Reference		Technical specifications	Warranty
SYS-NANOACQ4	x2	High computational power, fanless, compact and hardened system - Processor Intel Core i7 (or equivalent) RAM 32 Go and extended storage 2To SSD	1 year
SRV-LASAV2			
EMET-HD-ACQ-REVG	x8	• Surface ECG: 500Hz - 24 bits • Inductive respiratory plethysmography: 200Hz - 32 bits • 3D acceleration: 16bits - 12,5Hz	
EMET-HD-BAT-REVG	x16	LiPo (250mAh - 3.7V) – micro-USB Battery life: 12 hours minimum when used continuously	

Basic physiological signals analysis modules

DECRO is an all-in-one solution which allows the recording of cardiac, respiratory and activity physiological signals. The LASA software can support several analyzer modules for the different physiological signals recorded with the jackets. These software modules have been developed to automatically locate physiological events (such as R-peaks, end of inspiration, etc.) and calculate derived physiological parameters (such as heart and respiratory rate). Analyzer modules come with selectable preconfigured parameters for the different species available with the solution. These parameters can be tuned if specific configuration is required.

Cardiac function

ECG analyzer module

The ECG analyzer automatically detects QRS complex in the ECG signal, recorded by 2 skin electrodes, providing a very robust cardiac cycle detection. Once the cycles have been detected the analyzer calculates cycle to cycle derived parameters.

Events and derived parameters provided	Derived from
Events: • R peaks automatic detection Parameters: • R-Ri intervals (ms) • Heart Rate (bpm) • R peak amplitude (mV) • Detection Score (% of exploited signal)	1 Lead Surface ECG signal 

Activity index

Activity analyzer module

This analyzer automatically calculates acceleration derived parameters allowing to quantitatively assess the spontaneous or forced activity level in various environments (treadmill, home cage, etc.). These parameters are known to be proxies of Activity Energy Expenditure.

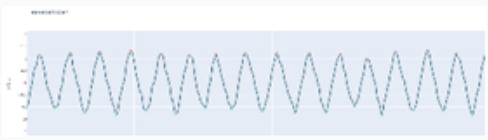
Events and derived parameters provided	Derived from
• Overall Dynamic Body Acceleration (ODBA) (mG) • Activity index (normalized 3D acceleration in mG every second • Detection Score (% of exploited signal)	3D Accelerometer

Behavioral assessment might be implemented using neurobehavioral observational battery tests that are compatible with the jacket.

Respiratory function

RIP analyzer module

This analyzer provides an automatic identification of respiratory cycles in the respiratory inductive plethysmography signals, recorded from the 2 RIP bands embedded in the jacket. It calculates for each cycle standard volume and timing derived respiratory parameters. The analyzer also provides automatic allometric and manual calibration features.

Events and derived parameters provided	Derived from
Events: • Automatic detection of inspiratory and expiratory ends • Automatic detection of respiratory cycle Parameters: • Respiratory Cycle Time (ms) • Respiratory rate (bpm) • Tidal volume (arb.u or mL) • Inspiratory-Expiratory time (sec) and ratio • Minute volume (arb.u/min or mL/min) • Detection Score (% of exploited signal) • Peak Inspiratory Flow • Peak Expiratory Flow	2 Inductive Plethysmography Bands 

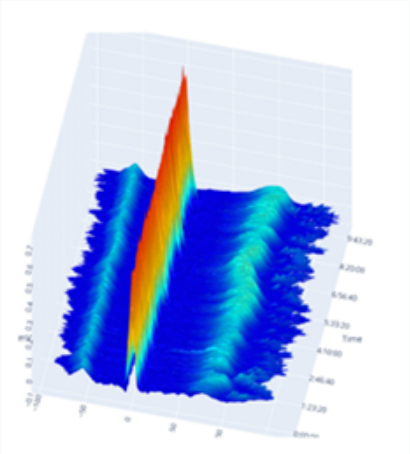
Respiratory volume calibration is available by 2 methods, automatic allometric calibration or reference method calibration.

Software additional modules

Additional modules are add-ons that can extend the software with complementary features. They need to be ordered separately. The following modules are currently available:

ECG delineation analyzer module

This module provides an **automatic delineation of ECG**'s characteristic points and waves on averaged ECG waveforms. It uses averaging algorithms to provide high rejection of noise in the signal as well as probabilistic approaches to provide robust localization of the beginning and end of P and T waves and QRS complex. Mathematical and individual QT correction are available directly in the module. This module is available on all product ranges and needs to be ordered separately.

Events and derived parameters provided	Derived from
Events: • Automatic ECG delineation of fiducial points (P, Q, R, S, T...) • Begin / end of P and T wave and QRS complex Parameters: • Automatic calculation of ECG intervals (R-Ri, P-Ri, QRSi, Q-Ti, S-Ti, Tp-e) in ms of averaged ECG waveforms • P, T waves durations (ms) • Q-Tic (ms, available with a choice of 7 correction formulas) • P-R and S-T segments (mV) • P, QRS, T amplitudes (mV) • P, QRS, T areas (uV.s) • Detection Score (% of exploited signal) Views: • 3D waterfall visualization	1 Lead Surface ECG signal 

User authentication and permission module (UAP)

This security module (GLP compliant and 21 CFR Part 11) implements user authentication and permission management based on roles assigned to users. This will ensure a better control and protection of data recorded.

Description	Available on
• Controlled access to the software with user authentication • Roles and permission matrix to easily control permission by type of users • Synchronization of users possible with LDAP directory • HTTPS encryption	Included in Advanced Software

Audit trail module (GLP)

This module implements an audit trail **for the system and the studies**. This module is required in order to qualify the solution in GLP environment and is compliant with GLP / 21 CFR Part 11 requirements.

Description	Available on
• Log permanent date and time stamped containing the name of the user that performed the action and the description of the action • Allows to view subset of the audit trail at object level (study, session, analysis, group) allowing to easily inspect all events related to this specific object • Audit trail export (PDF)	Advanced Software

Services

Etisense provides a number of services to assist users with installation, usage, and advice related to the solution. These services can be ordered separately from the products.

Installation and Training

Etisense products come with a technical note, which includes a user manual describing specifications and operating procedures.
Although the installation and in-vivo training services offered by Etisense are optional, we highly recommend their use to ensure that the solution is utilized under the most optimal conditions.

Includes
• A half-day on-site* or remote training session for installation, in-vivo training and basic software training • A half-day of online credits, valid for 12 months following the installation and training session to explore advanced software features and functionalities.

**If the Customer's site is located outside of France, travel expenses for the Etisense representative, calculated individually, may be charged.*

Data analysis

Etisense offers comprehensive physiological data analysis services designed to optimize and simplify your workflow. Our data scientists can support you throughout the process — from refining signal processing to interpreting results and generating clear, actionable reports.

Services may include:
• Review and optimization of signal processing and analysis parameters • Data analysis and synthesis of raw signals into meaningful outputs • Joint review of signal quality obtained during experimentation • Interpretation of results and support with professional report generation

A quote will be provided based on a technical specification document that reflects your experimental design and analysis needs.

Scientific and Experimental Consultancy

Etisense offers tailored consultancy services to help you design and execute your studies with greater confidence and efficiency. Whether you're setting up an in-vivo protocol, integrating multiple devices, or troubleshooting on-site, our experts are here to guide you at every step.

Services may include:
• Optimization of experimental design to ensure robustness, relevance, and compatibility with your Etisense solution • Technical support for integration and synchronization with other equipment in your lab • On-site in-vivo experiment assistance for setup, execution, and real-time issue resolution

Our goal is to help you streamline your research process and ensure the most effective use of our technology within your setup.

Other services

Etisense offers a variety of customized services to meet specific needs of our clients, including:

- Custom data export formats and software development;
- Backup and restoration for software and data;
- Custom design of jackets outside of our standard catalog (species, sizes);
- Team training sessions;
- Preventive maintenance visits for both equipment and software.

These services are subject to quotation based on the requirements detailed by the client in a specifications document.

Warranty and customer support services

Warranty

The products and software sold by Etisense are manufactured and tested to high quality standards. We guarantee their proper functioning under the following conditions:

- Acquisition units and analysis servers and their electronic components are guaranteed for twelve (12) months parts and labor from their delivery date;
- Emitters and their batteries are guaranteed for twelve (12) months parts and labor from their delivery date;
- Accessories: Accessories for which an expiration date is indicated on the packaging are guaranteed until the expiration of that date or upon opening of the seals. Other accessories are not covered by the warranty;
- The purchase of a software provides access to updates for patches and fixes for issues occurring on the version of the software over a period of twelve (12) months from the delivery date.

Exclusions from the warranty include:

- Premature wear of the products due to shocks, splashes of liquids or fluids, or resulting from damage caused by animals (biting, crushing, etc.);
- Any use outside of normal operating conditions and specifications indicated in the Technical Notices of the products;
- Any attempt to open, disassemble, reassemble, or repair a product.

Customer support and technical assistance

To receive general assistance or solve technical issues related to our products and software, any Etisense client can request support from our Customer Support team.

Etisense offers two levels of assistance, accessible to all our customers: 1) the "Basic Support," included with the purchase of a solution for a period of 12 months from the delivery date, and 2) the annual Extended Support and Software Updates "ESSU" service package, designed to meet the specific needs of clients and provide priority support service, available for subscription at any time.

The comparative table of Etisense service levels is on the following page.

Service	Basic Support	ESSU
Access to the Help Center for handling inquiries via email and our website	Included	
Targeted first response time	4 hours (business days and office hours (UTC+1/CET)	
Fault Diagnosis	Included	
Target intervention times based on the severity level: Critical (i.e. causing study discontinuation)	3 business days	1 business days
Major (i.e. significant system performance degradation, issues with analyzing data, or generating reports)	5 business days	
Minor (i.e. non-critical system glitches)	10 business days	
Repair or replacement of the product within the warranty terms	Included	
Repair or replacement of the product outside of warranty terms	Not included	Free repair and replacement at discounted level
Preventive maintenance for equipment and software, including the submission of a report	Not included	Included once (1) a year
Software updates	Included	
Software upgrades	Not included	Included
Backup and restoration of software and/or data	Not included	Included once (1) a year
Support in using the solution, data analysis services, or any other scientific advisory	Not included	6 half-days included/year
Loan of a replacement product to ensure business continuity	Not included	Optional service

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Request a quote at sales@etisense.com

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