

DECRO PRODUCT CATALOG 2025





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DECRO External Telemetry System

The DECRO external telemetry system measuring **respiratory function**, **external ECG**, and **activity levels** in up to 8 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): embedding plethysmographic sensors (respiratory function) and protecting the 2 external ECG electrodes. Jackets are specific to the species and size of the animals
- Emitter(s) and batteries: digitizing and transmitting physiological signals via Bluetooth to an acquisition unit
- Acquisition system: consisting of an acquisition unit combined with an analysis server (for the Advanced range) and electronic accessories enabling the acquisition of physiological signals
- **Software:** LASA Start (up to 2 animals) or Advanced software (up to 8 or more animals) allowing optimized and more powerful features.

Jackets and Species



DECRO jackets are made from high-quality, durable textiles designed to ensure **comfort** and **optimal fit** for each animal model. DECRO can be used on rat, marmoset, dog and minipig*. The software and hardware are the same for all the species, only the jackets and consumables are different to fit with the morphology of the model.



*Available on demand.

Hardware: Emitters and Acquisition Units

DECRO hardware ensures precise real-time data collection. Bluetooth **low-energy** emitters transmit signals with minimal interference and feature an automatic reconnection protocol for seamless monitoring. Our hardware meets industrial **EMC standards** (CE and FCC) and provides a plug-and-play experience for effortless operation. Acquisition units manage multiple emitters with the guarantee of **no cross-talk** between signals from one animal to another.

Comprehensive LASA Software

The LASA software is a platform for recording and analyzing physiological data. Accessible directly from a browser with **no installation required**, it organizes studies into phases, sessions, and sequences for streamlined data management.

The software enables **real-time signal monitoring**, battery tracking, and event marking, while Scheduler automates data acquisition at a specific point for precise recordings. Researchers can **program recordings** at predefined intervals, ensuring efficient and accurate data collection.

LASA provides various data export options, including Excel, CSV, and HDF5 formats, allowing integration with third-party tools.





DECRO Solutions

DECRO telemetry solution is available in two ranges (Start and Advanced) which can be chosen according to the number of animals studied and the nature of the studies.

Range	Solution	Nb of animals	Uses
Start	Start-1	1	 To monitor between 1 or 2 animals simultaneously
Otart	Start-2	2	 Data storage capacity: 120 GB (600 hours of signal recording)
	Advanced-4	4 • To m • Spec parall	 To monitor up to 4 or 8 animals simultaneously Specifically designed for high throughput and parallelized usage, capable to manage databases of 2 To (10 000b of recording)
Advanced	Advanced-8	8	 High computational power to fasten (>x10) and parallelize analysis User authentication and permission module (UAP) included Security and audit trail options available for GLP and 21 CFR Part 11 compliance

In addition to the basic software analyser modules, we offer an additional **ECG delineation** module that can be ordered separately.

All the software is pre-installed on hardware with anchored license.

*Consumables (instrumented jackets, fitting tubes and ECG electrodes) are not included and have to be ordered separately.

DECRO Start Range



The **DECRO Start** solution is a plug-and-play setup designed to monitor between 1 or 2 animals simultaneously. Both systems are packaged in compact flight cases (5,5 kg - 42x35x18 cm) that include:



- An acquisition system (SYS-S1 or SYS-S2);
- Electronic accessories (1 Ethernet cable of 2m, 1 USB 3.0 Gigabit Ethernet adapter, 1 USB mains charger with 4 ports, 1 local IEC cable, and micro-USB cables for charging batteries);
- 1 or 2 **DECRO telemetry emitters** (*EMET-HD-ACQ-REVG*) with Bluetooth low energy (model G) for wireless acquisition of physiological signals;
- 2 rechargeable **micro-USB batteries** (*EMET-HD-BAT-REVG*) per emitter, allowing 24-hour continuous monitoring;
- Start **LASA software** for acquisition system, enabling the simultaneous monitoring of up to 2 animals:
 - Includes 1 (SW-START1-V2) or 2 acquisition slots (SW-START2-V2), featuring a proprietary protocol for data loss detection, and automatic reconnection;
 - Emitter control and real-time signal visualization from a web browser;
 - Automatic analysis of cardiac and respiratory cycles and parameters;
 - Activity index;
 - Management, analysis, and visualization of individual data;
 - Raw data and reports export for statistical analysis with third-party software.

Reference	Start-1	Start-2	Technical specifications	Warranty
SYS-S1	\checkmark	-	Compact and hardened system Processor Intel Atom (or	
SYS-S2	-	\checkmark	equivalent) RAM 4 Go and storage capacity 120 Go SSD	
EMET-HD-ACQ-REVG	x1	x2	 Surface ECG: 500Hz - 24 bits Inductive respiratory plethysmography: 200Hz - 32 bits 3D acceleration: 16bits - 12,5Hz 	1 year
EMET-HD-BAT-REVG	x2	x4	LiPo (250mAh - 3.7V) – micro-USB Battery life: 12 hours minimum when used continuously	
SW-START1-V2	\checkmark	-	LASA Start-1 V2 with 1 acquisition slot.	
SW-START2-V2	-	\checkmark	LASA Start-2 V2 with 2 acquisition slots.	



The **DECRO Advanced** solution is a plug-and-play setup designed for monitoring between 4 or 8 animals simultaneously. Both systems are packaged in compact flight case (10 kg - 47x37x18 cm) that include:



- A new generation acquisition system (SYS-ADV4-V2, SYS-ADV8-V2);
- An **analysis and calculation server** enabling acquisition unit control and data centralization;
- Electronic accessories (1 Ethernet cable, 1 USB 3.0 Gigabit Ethernet adapter, 1 local IEC cable, 1 USB charger for batteries with 8 ports, and micro-USB cables;
- 4 or 8 **DECRO telemetry emitters** (*EMET-HD-ACQ-REVG*) with Bluetooth low energy (model G) for wireless acquisition of physiological signals;
- 2 rechargeable **micro-USB batteries** (*EMET-HD-BAT-REVG*) per emitter, allowing 24-hour continuous monitoring;
- Advanced LASA software (SW-ADV-V2) installed on the analysis server allowing:
 - Unified control of the emitters and real-time signal visualization from a web browser;
 - Parallel and optimized processing for large data volumes (10x faster), and data processing queuing feature;
 - Automatic analysis of cardiac and respiratory cycles and parameters, and activity index;
 - Management, analysis, and visualization of individual data;
 - Raw data and reports export for statistical analysis with third-party software;
 - Pre-installed User authentication and permission module (UAP) enabling:
 - Roles and permissions matrix with user authentication for secure access control
 - Synchronization of users with LDAP directory
 - HTTPS encryption.

Reference	Adv-4	Adv-8	Technical specifications	Warranty
SYS-ADV4-V2	\checkmark	-	High computational fanless compact and hardened system -	
SYS-ADV8-V2	-	\checkmark	storage 2To SSD	
EMET-HD-ACQ-REVG	x4	x8	 Surface ECG: 500Hz - 24 bits Inductive respiratory plethysmography: 200Hz - 32 bits 3D acceleration: 16bits - 12,5Hz 	1 year
EMET-HD-BAT-REVG	x8	x16	LiPo (250mAh - 3.7V) – micro-USB Battery life: 12 hours minimum when used continuously	
SW-ADV-V2	\checkmark	\checkmark	LASA Advanced V2 with 4 or more acquisition slots, UAP module included	

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.



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 	2 Inductive Plethysmography Bands
 Minute volume (arb.u/min or mL/min) Detection Score (% of exploited signal) Peak Inspiratory Flow Peak Expiratory Flow 	***VVVVVVVVVVVVVV

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

Software additional modules



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 	1 Lead Surface ECG signal
 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 	

Consumables

Instrumented Jackets

Rat jackets

(weighting between 220 and 700g)*



Ref.	Description
JKT-RAT-T0	DECRO Jacket for rat - Size 0
JKT-RAT-T1	DECRO Jacket for rat - Size 1
JKT-RAT-T2	DECRO Jacket for rat - Size 2
JKT-RAT-T3	DECRO Jacket for rat - Size 3

The <u>following grid</u> is available to help choosing the right size.

Nude jackets

The nude jackets have the same design as the instrumented jackets, but are not embedding sensors. Nude jackets are notably suited to **protect catheters** or **wounds** from the animal, or to embed other type of emitter (i.e. activity tracker).

Nude rat jackets

Ref.	Description	
JKT-RAT-NU-T0	DECRO Jacket for rat, nude - Size 0	
JKT-RAT-NU-T1	DECRO Jacket for rat, nude - Size 1	
JKT-RAT-NU-T2	DECRO Jacket for rat, nude - Size 2	
JKT-RAT-NU-T3	DECRO Jacket for rat, nude - Size 3	





Fitting tubes

The fitting tubes are designed to help handlers equipping the animals with the jacket. The use of tubes for rat is **highly recommended**.



Ref.	Description
FTUB-R-BD	Set of 3 rat fitting tubes including a set of 5 pieces of habituation fabric

ECG electrodes





Species	Ref.	Description	Size
Rat	ELEC-R-20	20 ECG electrode pairs & 1 bottle of ECG Gel	5,5 cm

Consumables for which an expiration date is indicated on the packaging are guaranteed until the expiration of that date or upon opening the seals. Jackets are not covered by the warranty.



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 systems including units and acquisition 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 provides Basic Support, which is included with the purchase of a solution for a period of 12 months from the delivery date. Basic Support includes assistance with resolving bugs, addressing non-conformities, and access to patches or updates for the acquired Software version. This service ensures the proper functionality and reliability of the solution during the warranty period.

A comprehensive overview of Etisense's support services is provided on the following page.

Service	Basic Support
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
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	Subject to quotation
Preventive maintenance visits for equipment and software, including the submission of a comprehensive report*	Subject to quotation
Free of charge loan of a replacement product to ensure business continuity*	Subject to quotation
Software updates	Included
Software upgrades*	Subject to quotation
Backup and restoration of software and/or data*	Subject to quotation
Support in using the solution, data analysis services, or any other scientific advisory*	Subject to quotation

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