

## LEADLESS HEART RATE LOGGERS MINIMIZE IMPACT OF SURGERY AND REMOVE HOUSING CONSTRAINTS

Ásgeir Bjarnason<sup>1\*</sup>, Anna Veronika Bjarkadóttir<sup>1</sup> and Andrés Gunnarsson<sup>1</sup>  
<sup>1</sup>Star-Oddi, Gardabaer, ICELAND \*corresponding author: asgeir at star-oddi.com

### How it works

Star-Oddi offers a range of implantable data loggers that all allow group housing. Star-Oddi's HRT product line records temperature and ECG derived heart rate, without disturbance to the study animal. During heart rate measurements a short period of ECG is recorded, and a mean heart rate value is calculated from that recording window.

Each measurement is rated based on quality in the software using a "Quality index". In addition it is possible to store a limited number of ECG recordings to validate the heart rate calculations further.

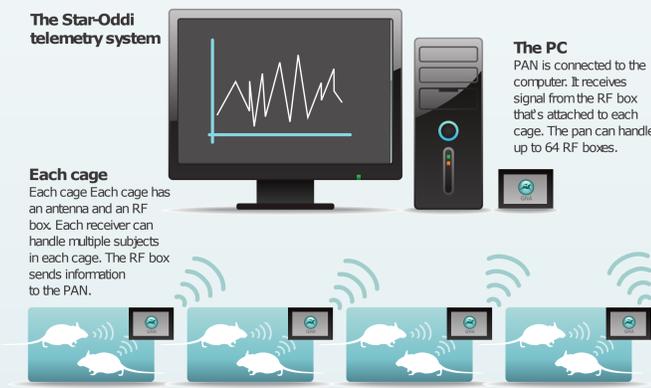


### Real time telemetry allows group housing

The telemetry system allows users to see data in real time, as well as logging the data into memory, and is suitable for both short- and long-term studies.

The system is suitable for small laboratory and animals and allows group housing, technically up to 10 animals per cage. In addition the system is easy to set up and flexible, with the possibility of moving the system, between locations, or animals between cages, without data interruption.

### Suitable for: Mice, rats, ferrets and other small laboratory animals



### No housing restriction with a logging only system

For users who don't need to see data in real time Star-Oddi offers an easy to use logging only system where loggers can record temperature and heart rate.

No housing restrictions apply making the loggers suitable for use in most animal models and suitable for all biosafety levels.

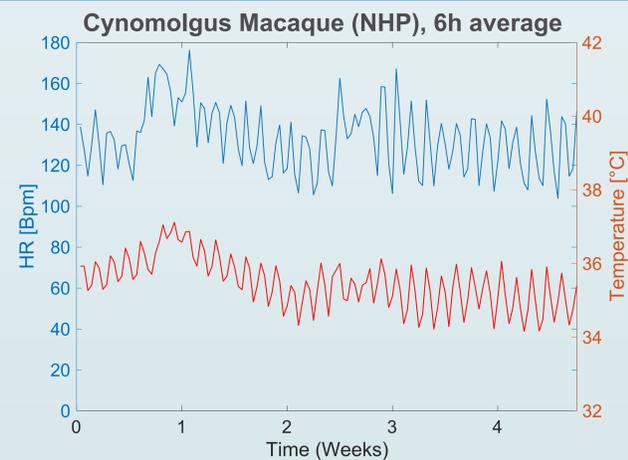
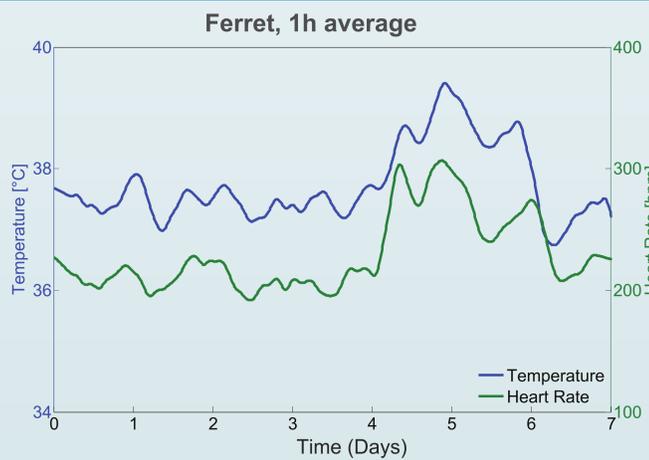
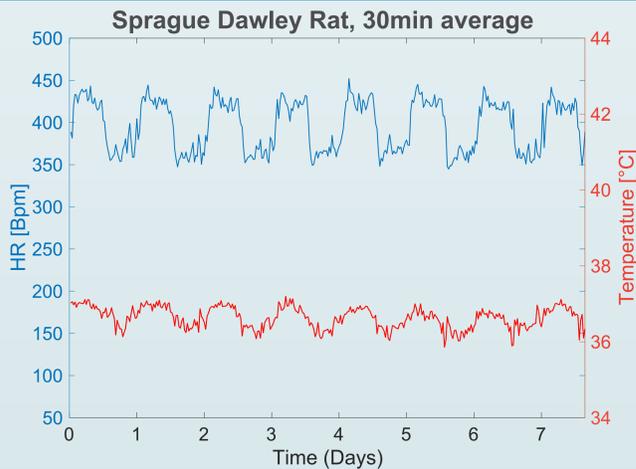
To date the loggers have been used in over 50 animal models, both laboratory animals and wildlife.

### Suitable for: Mice, rats, ferrets, rabbits, NHPs and most other models



Centi-HRT 46x15mm and 19g  
 Milli-HRT 13x39.5mm and 11.8g  
 Micro-HRT 8.3x25.4mm and 3.3g\*  
 \*Also available as a telemetry device

### EXAMPLE DATA



For more examples of standard use in laboratory animals:

- [1] **Evaluation of Minimally Invasive Data Logger for Collection of Heart Rate and Body temperature in Cynomolgus Monkeys.** Cordes et.al. Global Safety Pharmacology (Pfizer, Groton, USA)
- [2] **Evaluation of Shipping Stress in Surgically Altered Rodent Model.** Lubejko<sup>1</sup>, Kreuser<sup>1</sup>, Cordes<sup>2</sup>, Karicheti<sup>3</sup>, Bernal<sup>1</sup>, Bragi<sup>1</sup>.  
<sup>1</sup>Surgery and Anesthesia and <sup>2</sup>Drug Safety Research and Development (Pfizer, Groton, USA) <sup>3</sup>Surgical Services, (CRL., Raleigh, USA)
- [3] **Procedure for a better heart rate and temperature loggers read out in laboratory rat using Star-Oddi HRT sensor.** IPS Therapeutique (white paper)

### Commitment to the 3Rs

NC  
3R<sup>s</sup>

National Centre  
for the Replacement  
Refinement & Reduction  
of Animals in Research

#### Reduction

Star-Oddi's loggers perform automatic measurements, without human interference which avoids stress induced measurement fluctuations. This can contribute to reducing the number of animals used, as fewer animals are required to get reliable data.

#### Refinement

As the loggers are small and without external leads, surgery is minimally invasive and surgery time is short, with only a small incision needed to implant or explant the loggers. This facilitates quick recovery and minimises wound pain, contributing to animal welfare throughout the study.



**STAR ODDI**  
Logging Life Science

