

Specification of Implantable Telemetry System for small laboratory animals

Implantable telemetry system is essential to study the effects of drug or chemical in small laboratory animals by measuring the different bio potential signals from stress free, freely moving animals in home cage.

1. The System is composed of the following components for six animals at a time
2. One Matrix Module for connecting receiver & computer.
3. Three small animal receiver module for plastic cage for collecting the data from transmitter.
4. One Ambient Pressure Reference module at the time of pressure measurement.
5. Three Transmitter (Bio-potential, Pressure, Temperature & Activity) for measuring arterial, systolic, diastolic, & mean blood pressure, Bio-potential parameters, Temperature & Spontaneous Activity
6. Three Transmitter- (Bio-potential, Temp,) for the measurement of ECG, EMG, EEG and core body temperature.
7. Data Acquisition & Analysis Software with ECG & Blood Pressure Analysis Module.

1).Matrix- should have the following features---

- Capability for simultaneous sampling from up to eight implants/transmitters.
- Fully calibrated telemetry data acquisition, optimized to maintain data integrity throughout the system
- Ethernet connectivity providing improved system portability.
- Automatic receiver detection and dynamic connectivity monitoring.
- Easy access to high definition implant benefits such as implant serial number, battery on time counter and auto calibration.

2). Receiver-should have the following features---

- Visual indicators of performance of signal strength of receiving data and power on sign.
- Ability for monitoring animals housed in plastic cage.

3). Ambient Pressure References- should have the following features---

- Accurate pressure measurement.
- Barometer to measure atmospheric pressure.
- Ability to measure pressure via pressure transmitter in order to compensate for the absolute measurement taken by the transmitter.



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4). **Transmitter-** for Pressure, Bio-potential, Activity & Temp should have the following features

- Capacity to collect blood pressure, bio-potential signal, activity & temperature in a single study.
- The weight & volume of the transmitter should be a minimum 8gm & 5.9cc respectively with battery life of minimum two months.

5). **Transmitter-** for Bio-potential & temp should have the following features

- Capacity to collect bio-potential signal, temperature in a single study.
- The weight & volume of the transmitter should be minimum 7gm & 3.7cc respectively with battery life of minimum three months.

6). **Data Acquisition & analysis Software-** should have the following features—

- The software should have the capability to record and analysis pressure & bio-potential signal.
- Software for electrocardiogram and Blood Pressure analysis should come with the system.
- Electrocardiogram analysis software should analyze accurately ECG complexes with the help of ECG cycle detection method.
- It should calculate RR Interval, Corrected QT calculations, wave height and cross comparisons.
- Blood Pressure Analysis software should analyze from the circulatory system and can derive on a beat to beat basis, values for the cardiac cycle such as Systolic, Diastolic, Heart Rate & $\pm dp/dt$.



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