Winning Technology for Horses

EquuSense Ultra 1.0

Equine Motion and Physiology System for Research and Teaching

The EquuSense Ultra system is a sophisticated, powerful and flexible telemetry and informatics system that provides unrivalled data on how horses move and their physiological performance, while walking, trotting, cantering, galloping or jumping. Each sensor node provides objective and reproducible information on position, velocity, acceleration, orientation and rotation, relative to the horse or a global frame of reference, to an accuracy of a few millimeters or a few degrees, up to 2,000 times per second. It can be customized with a variety of sensors to measure other key physiological parameters or environmental conditions.

The EquuSense Ultra system is designed to support research and teaching, such as in equine veterinary schools or clinic, with a baseline configuration that includes all the key elements:

- Eighteen (18) wireless position sensor nodes and attachments
- Customized physiological sensor packages
- Ruggedized laptop
- Software, open interfaces to data, linkages to MATLAB and on-line service support

The EquuSense Ultra system has applications throughout equine research and teaching, in fields such as orthopaedics, gait analysis and biomechanics:

- Objective evaluation in clinical trials to support evidence-based medicine
- Motion capture and analysis, for insight into biomechanics and physiology
- Developing biomechanical models
- Illustrating normal and abnormal motion
- Teaching and developing diagnostic skills

Evidence-based medicine is becoming increasingly important. The EquuSense Ultra system provides unrivalled objective data on equine biomechanics and physiology under real-world conditions. EquuSys has worked closely with leading researchers since its foundation, and will continue to collaborate closely with leading research and teaching institutions, such as equine veterinary schools, hospitals and clinics to support their research and teaching. It is committed to enabling evidence-based medicine to provide fresh insights and transform clinical practice throughout the equine industry.

Technical specifications

User Interface

- Setup system, select mode of operation, link to other systems such as forceplates and cameras
- Input descriptive and clinical data, such as horse, professional, and trial information
- Start and stop measurements, stream or download data from sensors
- Use pre-packaged clinical displays or export data to other programs for off-line analysis
- Backup data to servers, download data from servers for comparison

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Performance

- Capable of measurements from walk to gallop, including jumping
- Sampling up to 2,000 samples per second per sensor, 16,000 samples per second total
- In streaming mode capacity of several hours, in logging mode up to 15 minutes
- Output resolution to ±≤1mm, ±<1, accuracy to ±≤10mm, ±5°
- Input range automatically configured from ±1.7g to ±250g, ±300°/s to ±10,000°/s
- Open interfaces to raw data and export to other programs, such as MATLAB

Output

- 3D position, linear velocity and linear acceleration
- 3D orientation and rotation (angular velocity)
- 3D magnetic field
- GPS position

System configuration, size and weight

- Eighteen (18) position sensor nodes: 63mm x 63mm x 25mm; 100g
- Sensor nodes have IP67 ingress protection
- Hub: pico-ITX computer; 170mm x 160mm x 42mm; 500g
- Workstation: 15.4”, 1920 x 1200 display; 120GB hard drive
- Service: automatic online backup with unlimited capacity and support
- Support: includes training and updates