QUASAR

SENSING A WORLD OF POTENTIAL™

Dry Sensor Interface

DSI 10/20

Simple Ambulatory No-prep Dry EEG System

QUASAR

SENSING A WORLD OF POTENTIAL

The Dry Sensor Interface's

SANDTechnology

Simple: Headset is typically self-donned in under 5 minutes, comfortable for over 8 hours, and instantly taken off

Ambulatory: Patented technologies reduce environmental and motion artifacts

No-prep: High quality signals are obtained without skin abrasion or preparation

Dry: Dry sensors require no gels or fluids, and do not leave messy residue

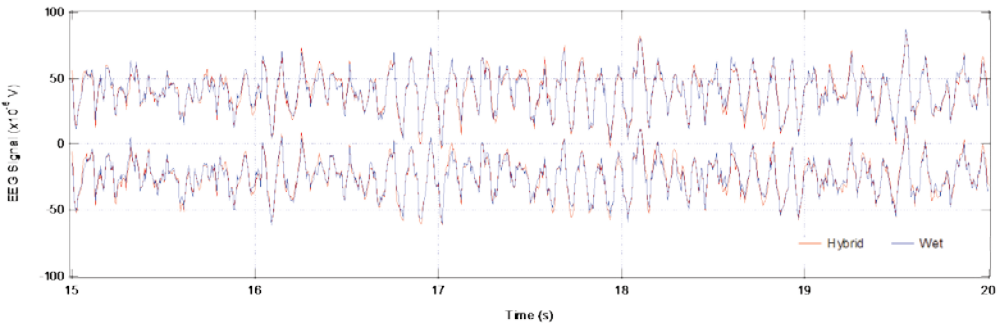
DSI 10/20 Spesicifations

Sensors: up to 23 at 10/20 International System
Number of digitized inputs: 12 selectable differential channels
Headsize fit: 55-60cm circumference
Headset weight: 500g

Run-time: >24hrs continuous
Internal data storage: 70hrs
Wireless range: 10m
Sample rate: 240 or 960 Hz
Gain: 60

Hybrid Sensors Provide High Fidelity Signals

QUASAR's hybrid (capacitive/resistive) ultra high-impedance sensors record high fidelity EEG signals comparable to those obtained with wet electrodes



Alpha activity recorded with juxtaposed **Wet** electrodes and **Dry** Sensors

DSI 10/20's compact DAQ features 12 high precision differential amplifiers and16-bit digitizers, and transmits data in wired or wireless modes, or records to onboard flash memory.

Dry EEG for Cognitive and Medical Research

The DSI 10/20 is a headset prototype designed to operate in a laboratory or office environment. This wireless headset reproducibly positions 21 sensors at the 10/20 International System locations and provides easy and comfortable wear for extended periods.

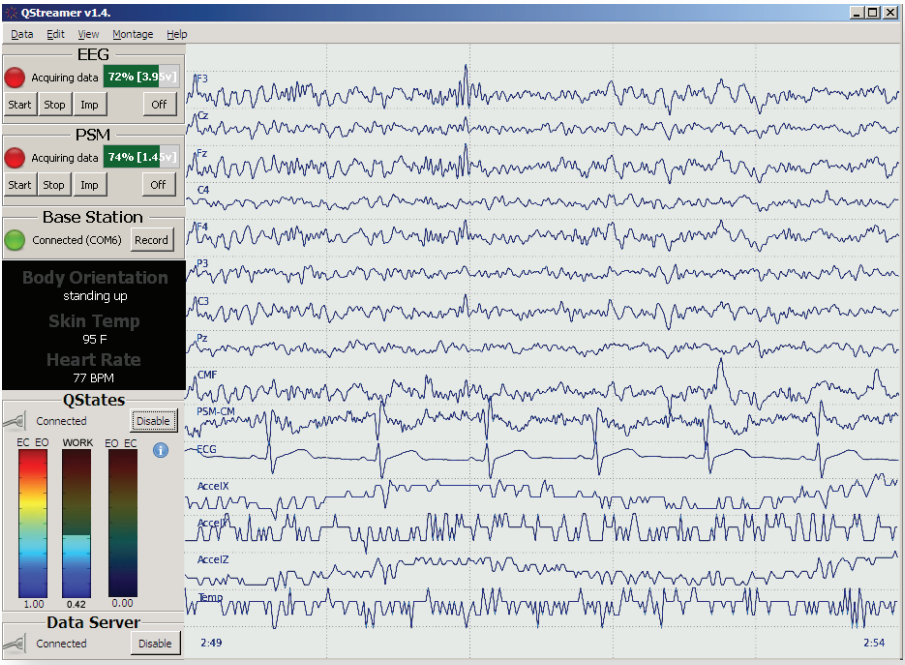
The DSI 10/20 is a research prototype designed to meet ANSI safety standards, and has been designated a non-significant risk device for use in human research by several IRBs. The system can be cleaned by users, and sensor tips are reusable and replaceable.

Analog/Digital converter: 16 bits
Analog/Digital resolution: 0.317 μV referred to input
Common mode rejection ration: >120dB
Channel cross-talk: < -70dB with sensors
Noise (1-50Hz): < 3 μV pk-pk

Input impedance (1Hz): 47GΩ
Input bias current: < 25pA
Bandwidth: 0.02-120Hz
DC offset tolerance: +/-200mV
Maximum input range: 10mV pk-pk

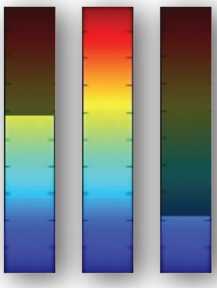
Intuitive System Interface

QStreamer is a simple data acquisition software with an intuitive interface to control the system and acquire data.
The software can interface in real-time with QStates, QUASAR's powerful real-time cognitive state classification algorithm, as well as export data into a format compatible with 3rd party analysis tools such as MS Excel, Matlab, etc.



Powerful Cognitive State Classification

QStates is a powerful cognitive state classification tool with a Partial Least-Squares (PLS) core algorithm for rapid and intuitive subject-specific or normative model training. Seamless integration with QStreamer allows real-time classification from EEG, ECG, EMG, and EOG data. QStates reliably classifies cognitive workload, engagement, and fatigue, and has been validated on numerous tasks in multiple environments.



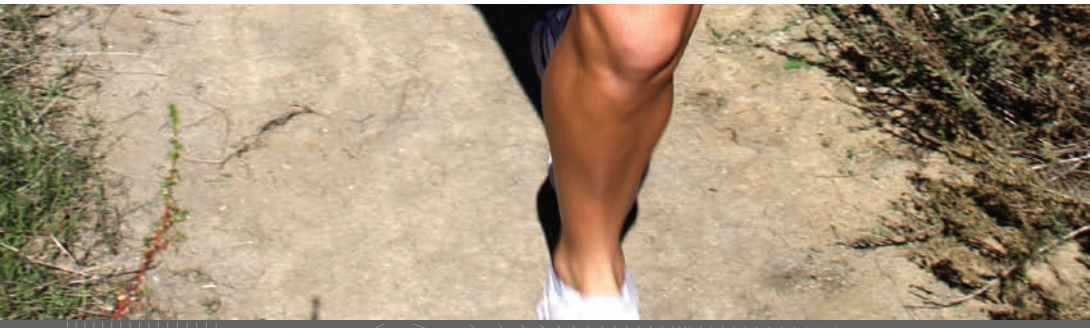
Software Specifications

Control EEG and PSM systems
Custom definable montages
Signal quality monitoring
Settable filters

Real-time interface between QStreamer and QStates
Real-time data streaming on TCP-IP socket
Export data to comma-separated-value (CSV) files
Windows Xp or 7 compatible

Integration with Other Physiological Recording Modalities

DSI 10/20 can synchronously record EMG signals from QUASAR's dry EMG sensors, and it operates seamlessly with QUASAR's Physiological Status Monitor (PSM) belt.



PSM Belt Spesifications

Fits chest sizes: XXS-XL (74-119cm)
Run-time: 24 hours
ECG: 2 differential hybrid dry sensors
Monitors: Skin temperature, 3-D accelerometers
Calculates: Heart rate and body orientation

Quantum Applied Science & Research (QUASAR) is a world leader in noninvasive biosensing technology. Our systems integrate revolutionary sensors with precision hardware and sophisticated algorithms to analyze cognitive and physiological states.

QUASAR has a successful track record of funding from NIH, NSF, and DoD and a history of innovative R&D collaborations with major academic and medical research institutes. We always welcome new scientific collaborations, and look forward to discussing your applications.

QUASAR

QUASAR, Inc.
5764 Pacific Center Drive
San Diego, CA 92121
www.quasarusa.com