NeuroLynQ

INTRODUCTION

NeuroLynQ by Shimmer is a complete solution that uses scientifically validated GSR and ECG data to provide unprecedented insight into the unconscious emotional responses of individuals or a group of people.

PRODUCT OVERVIEW

NeuroLynQ is an innovative solution that integrates both hardware and software and has been developed to serve the emerging demand for body worn wearable sensors within the field of neuroscience.

Utilizing Shimmer's **award winning,** scientifically validated sensing platform, GSR and ECG data capture are combined within a single NeuroLynQ sensor. NeuroLynQ can be configured to measure the emotional response of an audience of up to 45 people simultaneously.

NeuroLynQ's easy to use, complementary software allows for data to be collected and analyzed both in real-time and post-session. The software has a range of features and its straightforward user interface ensures trials can be run efficiently without the need for advanced technical skills.

SOFTWARE FEATURES

- Simultaneous live streaming on up to 45 participants
- Designed to streamline the management of all your NeuroLynQ Sensors and the collected data.
- Visualization of live streamed GSR and ECG data @ 5Hz
- Import high resolution raw data, logged to internal SD card @ 256 Hz
- Data stored in a SQL database
- Event annotation capability within software - moments of interest can be highlighted as they occur
- Export of raw and processed data from database in multiple format such as .csv for further processing
- Analytics module that provides the ability to easily aggregate multiple sessions of data, the ability to add demographics and segment audiences, z-scoring metrics, peak counting and enhanced export features.

APPLICATIONS

- Focus Groups
- Movie Screenings
- Mock Jury Trials
- Video Ad Testing
- Athletic Events
- Pilot Screenings
- Live perfromances
- Workforce Training

NeuroLynQ Comprises of 4 Components

1. NeuroLynQ software
2. Individual NeuroLynQ Sensors (Up to 45)
3. Span (a USB dongle with an IEEE 802.15.4 radio)
4. Base (up to 3x Base15)

shimmer
DISCOVERY IN MOTION

NeuroLynQ

NeuroLynQ

TECHNICAL SPECIFICATIONS - NEUROLYNQ SENSOR

Microcontroller	MSP430 (24 MHz, 16- bit)
Storage	Integrated microSD card slot with an 8 GB card included (supports up to 32 GB)
Communication	IEEE 802.15.4.GHz radio 16 operating channels in the frequency range 2.405-2.480 MHz Up to 10m range[1]
Battery	450mAh rechargeable Li-ion, >8 hours continuous use
Data Rate	Streaming to the PC: 5Hz [2] Logging to the SD CARD: 256 Hz
Weight	Ultra-lightweight (<30 grams)
Dimensions	65 x 32 x12mm

TECHNICAL SPECIFICATIONS - GSR

Measurement Range[3]	10k-470MΩ (0.2µS - 100µS) ± 10% 22k-680kΩ (1.5-45µS) ± 3%
Frequency Range[4]	DC-15.9Hz
Bias Voltage across GSR Input	0.5 V
Resolution	12-bit resolution over the full 0-3V input range

TECHNICAL SPECIFICATIONS - ECG

Gain	Preset = 6 (gains of 1, 2, 3, 4, 6, 8, 12 available via customisation)
Resolution	24-bit resolution over the full 0-3V input range
input differential dynamic Range[5]	Approx 800 mV (for gain = 6)
Bandwidth[6]	8.4 kHz

1. Line-of-sight along with direction and distance from the Span receiver is key factor for achieving optimal transmission range
2. This is the configured streaming rate but the packet reception rate varies and is dependent on environmental factors and the quality of 2.4GHz channel in use (i.e., if third party devices are using the same IEEE 802.15.4 channel)
3. Error % is a tabulated average across the measurement range
4. Calculated specification, exact value subject to environmental and component variation
5. Calculated specification; exact value subject to environmental and component variation. ADS1292R is optimized for power with a differential input signal of approx. 800 mV when gain = 6
6. Calculated specification from ADS1292R datasheet; exact value subject to environmental and component variation

NEUROLYNQ BASE

- Allows charging, updating firmware, configuration and data import of up to 15 NeuroLynQ sensors simultaneously per Base, in a fast and efficient manner
- Seamless import of data from the SD cards of the NeuroLynQ sensors to the MySQL database

NEUROLYNQ SPAN

- One radio channel assigned per Span*
- Up to 8 NeuroLynQ sensors can be paired per Span (i.e., per channel)
- Up to 7 Spans can be plugged per USB hub to a Windows PC**

* Total number of supported Spans and NeuroLynQ sensors depends on the quality of the available radio channels and whether other third party devices (e.g., any WiFi, Bluetooth, or other IEEE 802.15.4 based devices) are utilising the same radio frequency bands.
**In addition, Windows PCs typically have a limit on maximum number of connected USB devices. This limit is motherboard specific and should be taken into account

CONNECTIONS

Connections	All connections via Hospital-Grade, 1.5mm touchproof IEC/EN 60601-1 DIN42-802 jacks
GSR Input	2 x Green
ECG Input	ECG Left Arm (Black), ECG Right Arm (White), ECG reference* (Red)
Input Protection	RF/EMI filtering Current limiting Inputs include defibrillation protection (survive only, not repeat)

* Reference electrode should not be connected if measuring GSR

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