CGX A Cognionics Company

Quick-32r

IN PARTNERSHIP WITH BRAIN PRODUCTS Solutions for neurophysiological research

This manual contains general operating instructions, precautionary measures, maintenance instructions, and information for use of the CGX Quick-32r.

Please read this manual carefully and familiarize yourself with the controls and accessories before using the product.

Note

- This is an investigational device designed for research and development efforts.
- It is not an FDA-approved medical device.
- There are no known side effects from the use of this product.

Description

The Quick-32r is a wireless, battery-operated EEG headset utilizing dry sensor technology. Channel positions are arranged in an enhanced 10-20 montage with 10 additional fixed EEG channels on the head, plus 2 variable-placement ExG channels.

The headset provides an integrated approach to the wireless acquisition of recorded of EEG signals. Wireless technology allows the subject to move about while real-time data is collected and displayed.

The headset obtains high-quality EEG with minimal scalp preparation. Patented mechanisms and replaceable dry sensors align to various head shapes and sizes, maintaining sensor positions in a standard montage.

EEG channels are sampled at a time resolution of 500Hz and converted to digital data at 24 bits of resolution.

The Quick-32r provides research-grade signal quality and is ideally suited for general-purpose EEG and ERP research in laboratory and field environments.

Warnings

The Quick-32r is intended to be used to acquire the electroenchephalogram (EEG) and transmit it wirelessly to a computer.

This Device Is Intended For Research Only.

It Is Not Intended For The Following Uses:

- monitoring of patients in a clinical environment
- use in medical diagnosis
- on subjects undergoing surgery
- use in sterile environments
- use with sleeping subjects

Do Not Use This Product In These Situations:

- near high-frequency surgical equipment
- if exposed to ionizing radiation
- in oxygen-rich environments (concentration > 25% at 1 atm)
- in wet environments
- in the presence of flammable anesthetics or gases

Precautions For The Practitioner

- Do not drop, sit on, step on, fold, push, pull or stretch the product.
- Check if your subject has a sensitive dermatological condition causing sensor intolerance.
- To avoid cross-subject contamination, do not use with subjects having open wounds or scalp infections.
- The Quick-32r headset is not a diagnostic tool. Any medical diagnosis related to the EEG should be derived by a certified physician.

Subject Considerations

- This device is intended for human use only.
- Subject should have a healthy scalp.
- This device fits teens and adults with a head circumference from 52 to 62 cm.
- Do not use with infants or neonates.
- Test subjects may or may not have hair.
- All sensors must be able to contact the subject's scalp.
- The entire headset may come into contact with the subject's skin.

Follow These Advisories To Keep Your Quick-32r In Good Working Order

- Do not immerse the headset in liquid.
- Do not expose the headset to direct sunlight or heat source, moisture, vibration, mechanical shock, excessive dust, or humidity.
- Do not open, modify or disassemble the headset — this will void the warranty.
- Do not use if the headset is damaged.
- Do not use when wet — if moisture penetrates the headset, remove the batteries and let it thoroughly dry prior to use.
- Do not use caustic or abrasive cleaners on the headset or sensors.
- Avoid sharply bending the legs.

Disposable Sensors May Be A Biohazard

- Store clean sensors in the provided jars.
- Clean sensors after each session following instructions on Page 13.
- Replace sensors at or before their stated lifecycle limits (Specifications, Page 26), or if they appear worn.

Always Use Supplied Accessories

Using accessories other than those supplied with your Quick-32r system may result in damage or diminished efficacy of the system.

The Quick-32r uses two AA Alkaline or NiMH batteries. Follow care and handling instructions provided by the battery manufacturer.

Avoid Cross-Subject Contamination

Clean the device and clean or replace sensors after use following the cleaning instructions on Page 13 to avoid cross-subject contamination.

Quick-32r Overview

EEG is the measurement — through the use of sensors and amplifiers — of scalp surface electrical potentials arising from activity in the cortex.

The Quick-32r follows an enhanced international 10-20 system standardizing 30 electrode placements across the scalp. The 10-20 system derives its name from measurements of 10% and 20% of the distance between landmarks on the head, specifically, the depression above the bridge of the nose (nasion), the bump at the back of the head (inion), and the depressions in front of each ear (preauricular points).

Sensors are labeled with a combination of letters and numbers indicating their respective locations, with even numbers on the right and odd numbers on the left side of the head. Midline locations are marked with a “z” for “zero.” For instance, Fz sits on the frontal midline, while F3 sits left of and F4 sits right of Fz.

The Quick-32r is sized to fit most adult head sizes. See sizing chart on Page 27.

The Quick-32r meets the mechanical, electrical, and sensor needs required to make an effective dry EEG system.

Conventional wet systems rely on electrolytic gels to penetrate hair, contact the skin, and provide a conductive path. The gel serves as a buffer filling in gaps between the sensor and skin.

No conductive gel is used in a dry system. The benefits are obvious: faster set-up, and no after-use clean-up required.

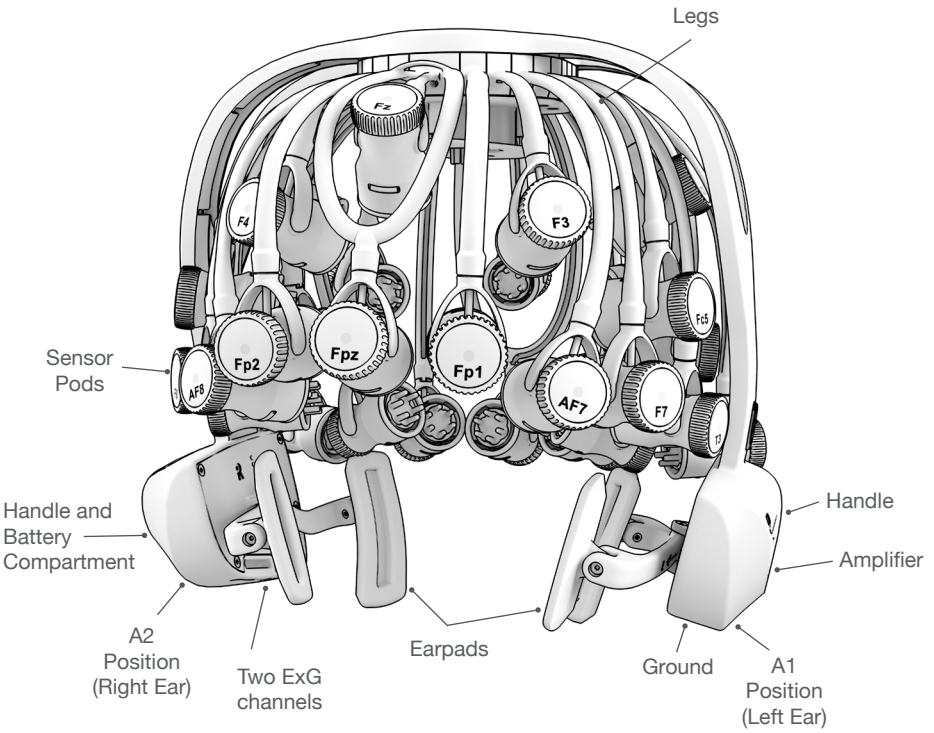
Yet, dry systems are subject to several challenges. First, the sensor must be designed to directly touch the scalp or skin, even through thick hair. Second, the sensor must remain securely in place to minimize artifacts and noise. Finally, the electronics must tolerate impedances up to 200 times higher than wet systems — while rejecting noise and interference. A high-end dry solution — like the Quick-32r — balances sensors, mechanics and electronics achieving virtually the same signal quality as a traditional wet cap for most EEG applications.

Device Overview

The Package Contains The Following Items

Quick-32r Headset with 2 ExG Channels and Bluetooth Dongle
30 Drypad Sensors
60 Flex Sensors
10 Drypad Ear Sensors
A1 Earclip (left ear)
A2 Earclip (right ear)
3 Active Lead Wires
3 Passive Lead Wires
30 Skintact Sensors
5 Alcohol Wipes
4 Rechargeable AA Batteries
Battery Charger
Carrying Case
Manual

Quick-32r Headset



Device Overview

Amplifier

Wireless amplifier collects signals and transmits to Bluetooth Dongle.

Bluetooth Dongle

High-speed receiver dongle plugs into your computer's USB port.

Drypad Sensor

Drypad sensors make direct skin contact for ECG and EEG recordings.

Flex Sensor

Flex sensors slide through hair for high-quality scalp contact.

Drypad Ear Sensor

Dedicated Drypad sensors for use with Earclips.

A1 Earclip

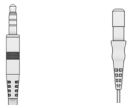
A1 left ear earclip has two sensor locations: Reference and Ground.

A2 Earclip

A2 right ear earclip is used in linked-ears configurations.

Lead Wires

Active Passive



Active lead wire (3.5mm connector) for Reference/A1 and A2.

Passive lead wire (touchproof connector) for Ground and ExG.

Preparation

1. Install The Software

Note: CGX Acquisition software runs on Windows only.

- Navigate to CGXSystems.com
- Select **Downloads** from the top navigation menu.
- Select **Click Here For Acquisition Software**
- Choose the latest version link under “Downloading and Installing the Software.”
- Extract the zipped file to your desktop.
- Run CGX Setup and follow the instructions.
- If you see a security warning, select **More Info** and **Run Anyway**
- The software will create a shortcut on your desktop.

Download the latest software from CGXSystems.com

2. Select Sensors

Choose the appropriate sensor for your application.

Drypad Sensors

Use Drypad sensors in positions where the subject has no hair (forehead and bald areas).

Drypad Sensor for direct skin contact

Flex Sensors

Use Flex sensors to penetrate hair.

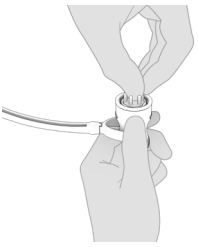
Flex Sensor for hair

3. Attach Sensors

Sensors have a round flower pattern on the mating end that aligns with a recessed flower pattern on the snap connector.

- Lightly rotate the sensor until it begins to lock into the snap connector.
- Push firmly at the center of the sensor when installing.
- For Flex sensors, do not apply pressure to, or bend the sensor tips.
- When removing sensors, pry between the sensor and the connector.
- Do not pull on the tips of the Flex sensors.

Sensor footprint matches snap connector



Attach sensor

It may require extra pressure to insert a sensor due to variability in surface coating. Try that sensor in an alternate pod location in case of a particularly tight fit.

4. Assemble The A1 Earclip

1. Pinch the earclip to opne.
2. Insert a Drypad Ear Sensor into each hole.
3. Attach the Passive and Active Lead Wires to either snap on the earclip.
4. Attach the Passive Lead Wire to the touchproof connector on the A1 handle.
5. Attach the Active Lead Wire to the 3.5mm connector on the A1 handle.

Drypad Ear Sensor

A1 Earclip

Insert the Drypad Ear Sensor into the Earclip with snap facing out. Attach lead wire to snap as shown.

4a. (Optional) Assemble The A2 Earclip

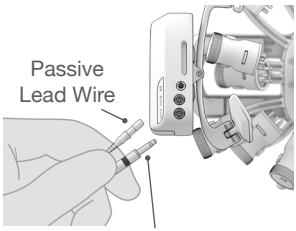
Use the A2 Earclip for recordings requiring both ears.

6. Pinch the earclip to expose the single snap connector and attach a Drypad Ear Sensor.
7. Attach the Active Lead Wire (3.5mm connector) to the snap on the earclip.
8. Attach the Active Lead Wire to the 3.5mm connector on the A2 handle.

A1 uses a touchproof lead wire for Ground and the 3.5mm audio jack lead wire for Reference

4b. (Optional) Attach The ExG Lead

For additional biometric data acquisition, attach a passive lead wire to the touchproof connector on the A2 handle.

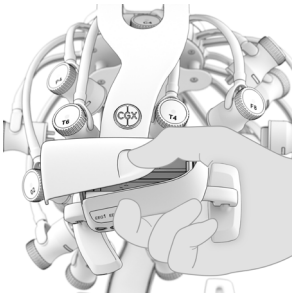


Plug Passive Lead Wire (touchproof connector) and Active Lead Wire (3.5mm connector) into headset, matching orientation as shown

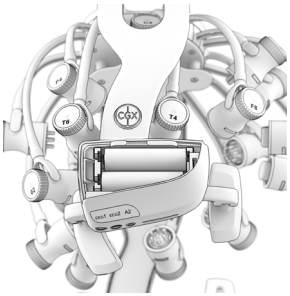
5. Charge And Insert The Batteries

Use fresh alkaline batteries, or if using NiMH batteries, fully charge before using.

- Open the battery door on the A1 handle.
- Place the batteries in the correct configuration following the markings inside the battery housing.



Slide to open battery door



Insert 2 AA batteries as shown

6. Check Power Status and Trigger Status Lights On Top Of Amplifier

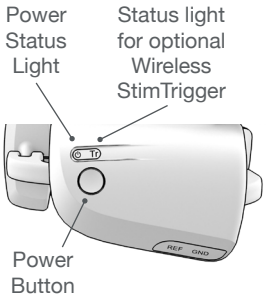
Power Light	Status
Off	Headset Off
Green	Headset On
Yellow	Low Battery
Red	Critically Low Battery (replace immediately)

Trigger

The Trigger Status Light is for use with the optional CGX Wireless StimTrigger, and indicates when the headset is receiving trigger signals from the StimTrigger unit.

Trigger Light	Status
Off	Trigger Out Of Range
Blue	Trigger In Range

Amplifier



7. Insert Bluetooth Dongle

Plug the dongle into your computer and Windows should automatically install the correct drivers. Verify driver installation by checking the Device Manager for problems, marked by a yellow exclamation mark.

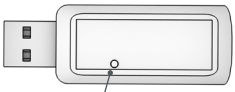
- The dongle is specific to each headset.
- For best performance, ensure a clear line of sight between the dongle and the front of the headset

  If Windows did not successfully install the driver for the dongle, refer to the FTDI driver installation manual on our website.

Each Quick-32r is permanently paired to a receiver dongle. The pair automatically discover and initiate a connection when both are powered on and within a 10m range.

The light on the dongle indicates its current state:

Dongle



Indicator light

8. Start The Acquisition Software

Once you've established a connection, data should begin to stream.

Double click on the CGX Acquisition software icon. You should see **CGX Quick-32r** under **Discovered Devices.**

If you do not see the name CGX Quick-32r, remove and re-insert the dongle and restart the software.

1. First, click the device name in this window to select the Quick-32r.
2. Then click **Connect.**

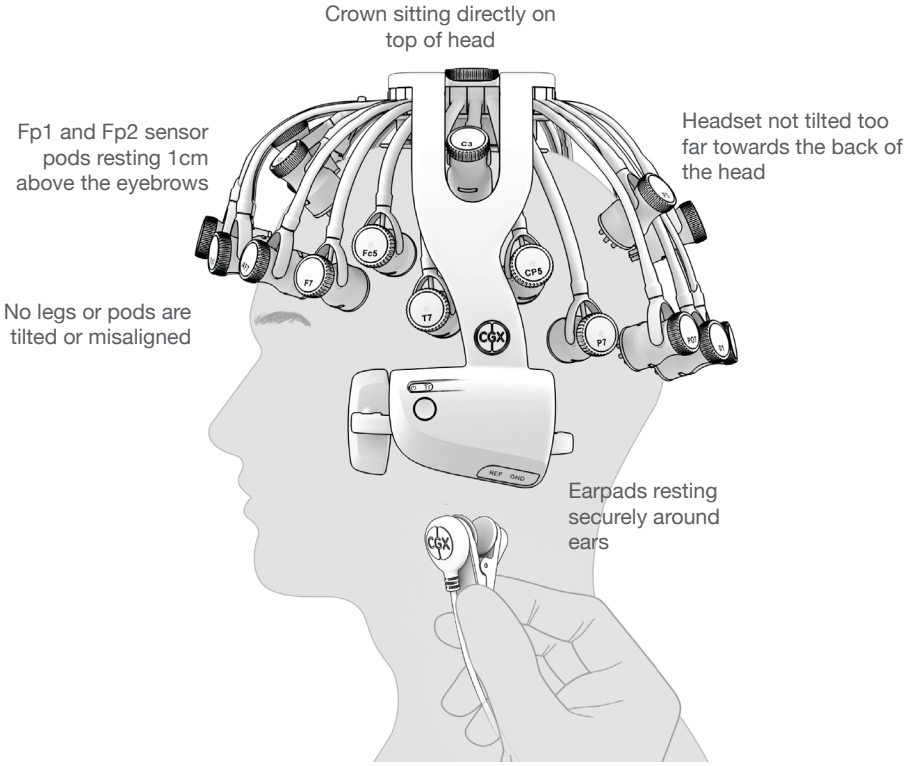
You should now see the device configuration window.

If you do not, double check to make sure the Quick-32r is powered on.

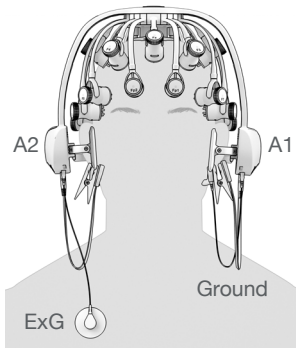
Click **Start Device.**

You will now see data streaming into the display. Click the **Channels** tab on the top right-hand side of the program. This will bring you to the impedance check. You are now ready to use the device.

Optimal Headset Placement



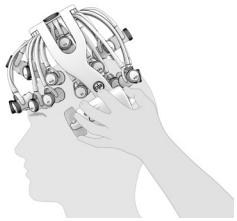
Ask the subject for any areas of discomfort and reposition the sensors to lay flat on the head, if necessary.



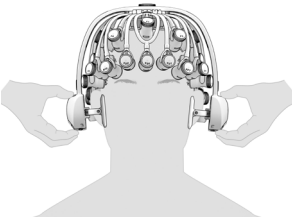
Both earclips fully populated

9. Place The Quick-32r On The Subject's Head

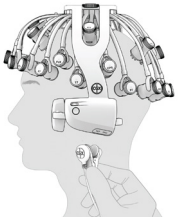
1. Grasp each handle and gently pull them apart to open the headset.
2. Slide the headset over the subject's head.
3. Adjust the position of the headset so the earpads fit around the subject's ears.
4. Brush aside excess hair near and underneath the earpads.
5. Position Fp1 and Fp2 to sit 1cm above the eyebrows.
6. Reorient misaligned legs and pods.
7. Grasp and rotate each pod so the sensor is perpendicular to the subject's head.
8. Push the headset downward so the sensor at the crown (Cz) makes firm contact with the subject's head.
9. Ensure pods lie flat on the subject's head.
10. Brush aside excess hair on the forehead and any other positions where Drypad sensors are installed.
11. Lift the earpad to access the ear lobe and clean with alcohol.
12. Clip the A1 earclip to the left earlobe.
13. Option: Attach the A2 earclip to the right earlobe.
14. Option: Attach ExG passive lead wire on the A2 handle for additional biometric measurements.
15. Verify headset is properly positioned on the subject's head.



Don headset front-to-back, positioning Fp1 and Fp2 1cm above the eyebrows



Pull down on handles until Cz makes firm contact with the top of the head



Apply A1 earclip to left earlobe

10. Optimize Sensor Contact

After properly positioning the headset on the subject, obtain direct contact on all sensors before recording.

The Quick-32r has impedance-level LEDs on the top of each sensor pod. The LEDs live-check the system's impedance and have a threshold of 2,500 kΩ.

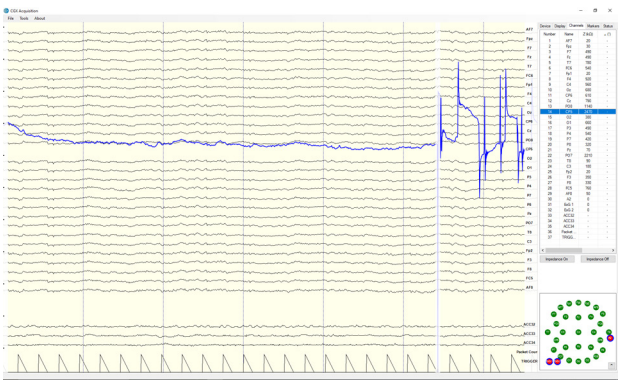
Use the LEDs to assist in making contact with the scalp on each position. Then bring up the impedance check in the CGX Data Acquisition software under the **Channels** tab. The impedance check presents a color-coded map of the sensors on the device, corresponding to contact level:

Red	Impedance out of range (>2,500 kΩ default)
Green	Impedance within range (<2,500 kΩ default)

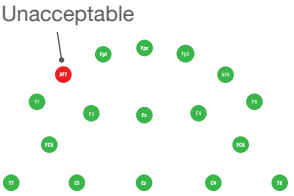
The range of impedances with dry sensors may be higher than what you are accustomed to when working with conventional wet sensor amplifiers. CGX devices utilize a combination of advanced electronics, shielding, and mechanics to obtain EEG signals even when contact is poor, and can tolerate sensor impedance up to 2,500 kΩ.

Threshold Spikes

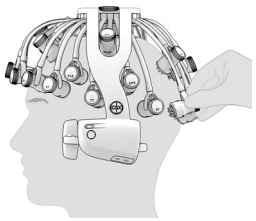
You may see a brief glitch in the EEG signal when electrode impedance nears 2,500 kΩ. This is a natural effect when the LED on the pod changes colors. Continue adjusting the electrode until the impedance is below the threshold and the artifact will disappear.



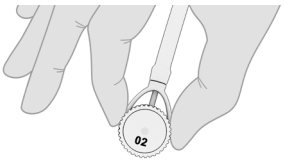
Impedance Map
Under The Channels Tab



A1 Reference and Ground earclip must be applied for impedance check to operate.



Grasp pod on sides to reposition



Gently twist swivel mechanism without displacing pod

11. Adjust Pods, If Required, To Improve Impedance Measurements

Check for acceptable impedance measurements on each channel.

To ensure good impedance measurements:

Final Steps

- Gently pull down on the handles until the Cz position reports adequate contact.

  It is important the headset is seated properly in the correct position and all legs and pods are aligned with the subject's head before pulling down. Failure to do so may result in poor contact at the Cz position.
- Lift the pod slightly to move hair aside.
- Lower the pod back in place, keeping the sensor aligned to the subject's head.
- Gently twist the sensor adjustment back and forth to help move the sensor through the subject's hair.
- Lightly press down on the pod, holding for 5 seconds, then gently release the pod.

12. Record An EEG

After you have acceptable impedance levels, click **Record** under the Device tab to begin your recording. To end the recording, under the same tab, click **Stop Recording**.

13. End The Session

Close out the current file in the software if one is active and exit the program. Press the power button once to turn off the device.

The headset should be placed either upside down, with the top of the headset resting on a table top, or back into the carrying case.

Position Of The Subject During EEG

Use the Quick-32r headset for subjects in an upright position. Do not let the subject lie or sleep on the headset. It may damage the headset.

Cleaning And Maintenance

To avoid cross-subject contamination, follow the cleaning instructions to clean sensors and headset after each use.

This device is not intended to be sterilized in an autoclave.

Cleaning Sensors

- Use hand sanitizer or alcohol wipes to clean all sensors.

Cleaning The Sensor Pods And Legs

- Use alcohol wipes to clean sensor pods and legs.

Battery Storage

Remove the batteries when headset is not in use.

Disposal Instructions

To protect the environment, always follow local law, rules, and policies regarding electronic and battery disposal. You may also return the headset to CGX for proper disposal.

Use the supplied carrying case when transporting the headset.

It is not recommended to leave the Quick-32r in the carrying case for long term storage since the legs may become compressed. This will not affect functionality, but may cause the headset to be excessively tight on larger heads.

To restore the shape of your headset, place on a mannequin head for several hours until the legs relax.

Obtaining Clean EEG Data

The most important aspect of EEG recording is that output data is only as good as the recording input. While algorithms exist to remove artifacts, poorly recorded data cannot be fixed in post processing.

Recording good EEG data requires preparation of the participant for optimal sensor contact:

1. Participants should have their hair recently washed and fully dried before recording. Wet hair, hair gel, conditioners, and hair spray may cause interference and degrade signal quality.
2. Clean each sensor location on the head with a cotton swab soaked with alcohol.
3. In the event of difficulty establishing good contact, apply a small amount of water between the sensor and scalp to create an electrical bridge.
4. It is important for subjects to reduce tension in the head, neck, and shoulders during readings.

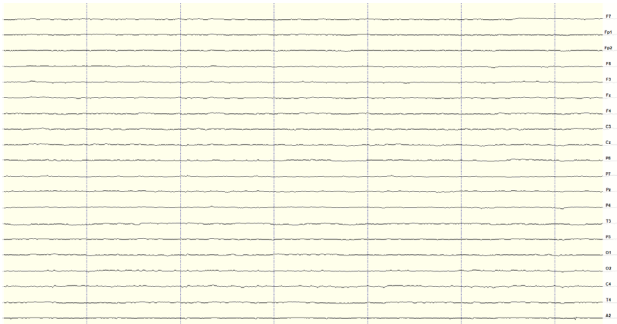
Quick-32r sensor locations lie within 1.0 centimeters on the vast majority of hand-measured enhanced 10-20 placements on heads sized from 52-62 centimeters.

See sizing chart on Page 27.

Typical Clean Data Recording

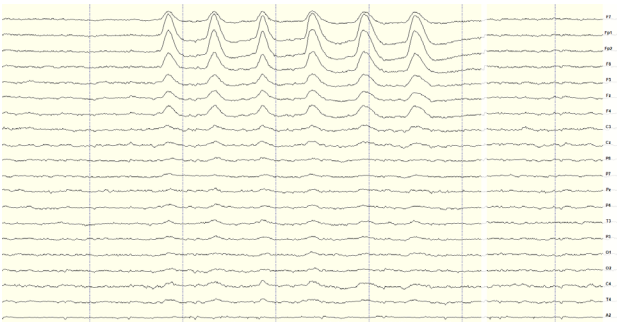
This is a representation of a clean data recording.

Clean Data At Default Scale



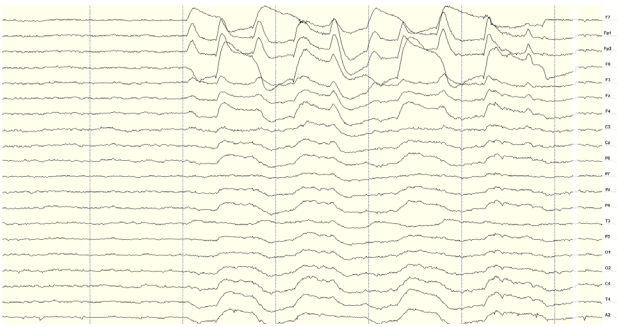
Traces are thin and deviate minimally from the axis.

Blinks



Eye blinks will generate muscle artifacts in the frontopolar locations (Fp1 and Fp2) and less so in frontal sensors (F3/F4, F7/F8), overshadowing brain activity in EEG recordings.

Eye Movement

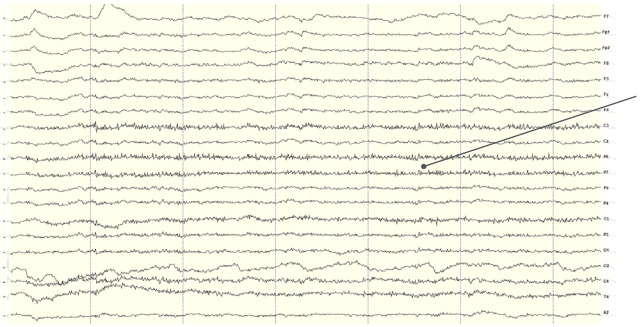


Moving the eyes will generate muscle artifact in the forehead and front of the head. A high concentration of neurons in the eyes generate strong electromagnetic fields, so eye movement causes disruptions in the EEG recording.

Muscle Artifact: Jaw Clench

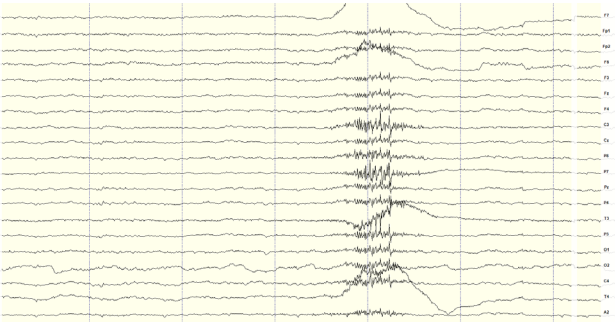
Jaw clenching may affect most or all channels, especially if clenching hard. Light jaw clenching or tightness can be observed in F7/F8, T3/T4. Take note of any temporomandibular joint disorders: these can cause artifact without typical clenching.

Muscle Artifact: Tongue Movement



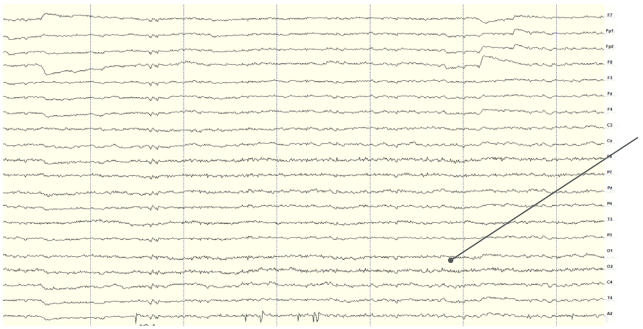
The tongue is a large polarized muscle, with the tongue's tip negative with respect to the base of the tongue. When the tongue moves around the mouth, it generates a moving field causing recording disruptions. Disruptions may be seen down the midline (Fz, Cz, Pz). Tongue movement during talking can be seen on many channels.

Muscle Artifact: Swallowing



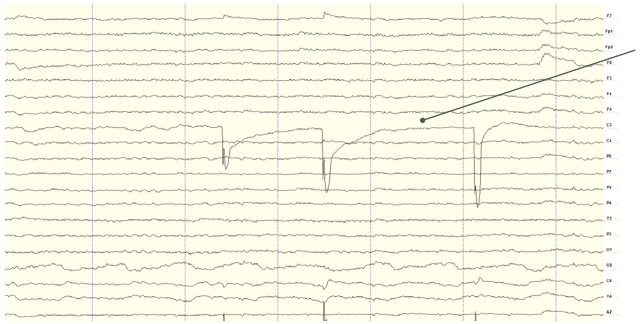
Swallowing invokes movement of several muscles in the mouth, including the tongue, causing disruption of many channels. Ignore swallowing if infrequent, but frequent swallowing may limit usable data.

Muscle Artifact: Neck Tension



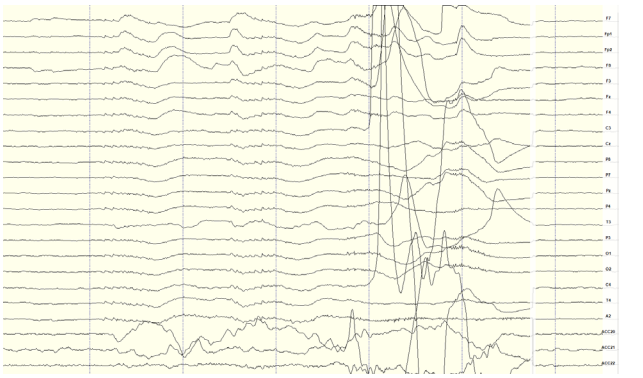
Neck tension may affect channels on the back of the head, predominantly O1/O2, but also in parietal sensors (Pz/P3/P4, P7/P8). Subjects should be comfortably seated, with appropriate bracing at the back and neck. Avoid slouching.

Headset Or Electrode Disruptions: Sensor Pops



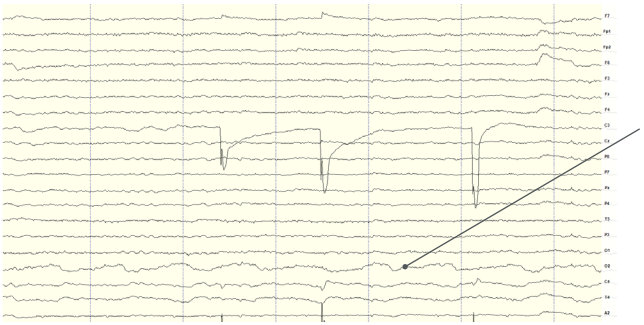
Brief disruptions in contact between sensor and scalp may cause “sensor pops” on recordings. Occasional pops can usually be ignored in processing, but if the problem persists, check the contact between the sensor and scalp. Wipe popping locations with a small amount of alcohol on the sensor.

Headset Or Electrode Disruptions: Head Movement



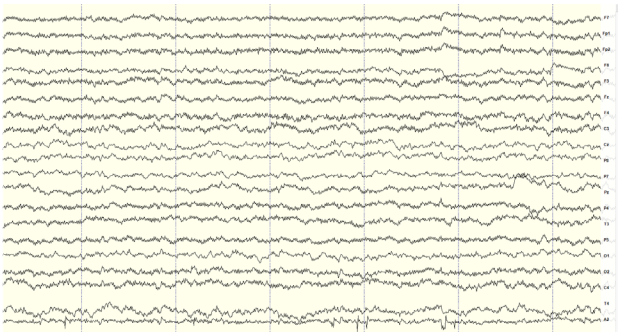
Excess or quick movement of the head may disrupt connection between sensors and scalp causing data artifacts as shown.

Pulse Artifact



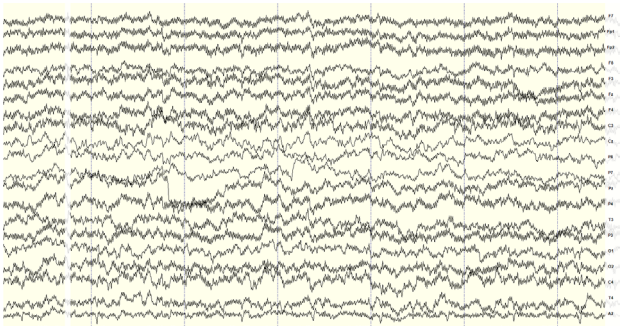
EEG sensors are sensitive enough to detect small electrical signals on the cortex. Occasionally, sensors may lie directly atop a blood vessel. When this occurs, sensors may detect the subject's pulse. Slightly move the sensors to reduce pulse artifacts.

Mild Power Line Artifact



Power lines operate between 50 and 60 Hz. Unsecure power sources may leak electromagnetic frequencies. Because EEG records frequencies from 1hz to about 40hz, power line noise may negatively impact recordings on all channels. This is especially the case when connection between sensor and scalp is poor.

Strong Power Line Artifact



To avoid power line artifacts, have subjects sitting at least 3 feet from power cords, plugged-in devices, and lighting or overhead fluorescent lights. The Quick-32r shields the sensors from environmental noise, but issues can still occur with poor skin contact. If power line artifacts appear on all channels, lightly wet A1 Reference Drypad Ear Sensor.

Improper Setup: No Connected Reference

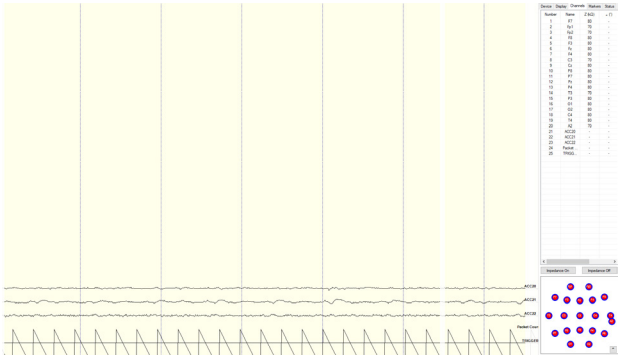


fig. 1

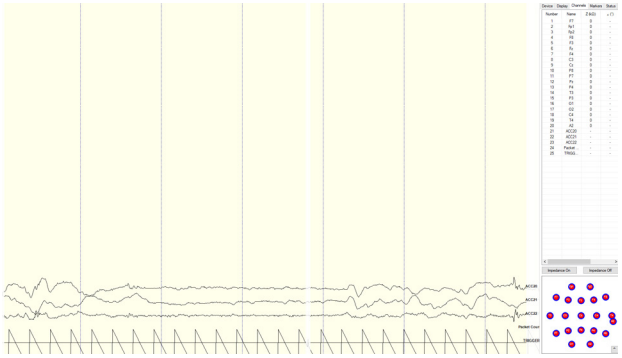


fig. 2

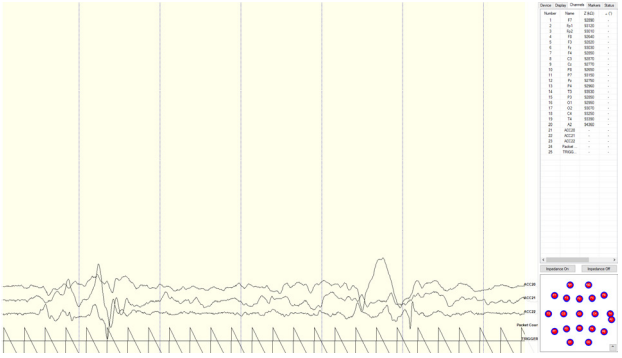


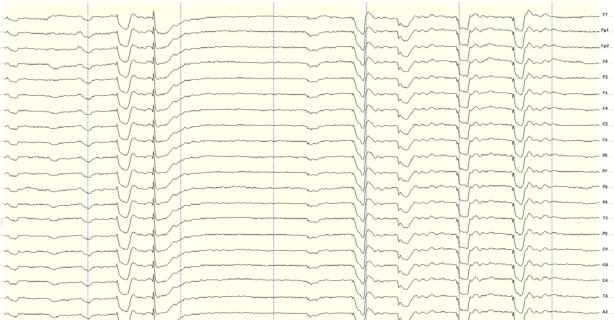
fig. 3

There are a multitude of recording errors when the A1 reference earclip is not connected to the subject.

The most common are:

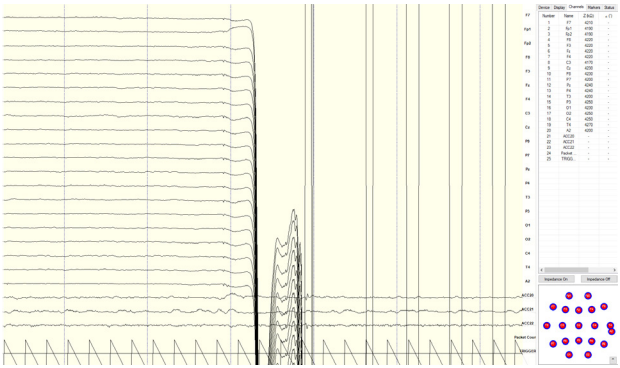
- Impedances match or nearly match at a low value but do not appear on the display or in the impedance head map. (fig. 1)
- No traces appear and impedance values are zero. (fig. 2)
- No traces appear and impedance values are high. (fig. 3)

Improper Setup: Reference Contact



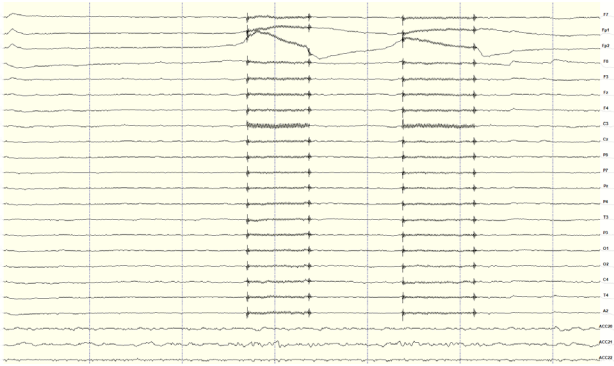
When the reference channel is touched or jostled, all channels will be affected. Avoid disrupting the A1 Reference earclip during use.

Improper Setup: Reference Disruption



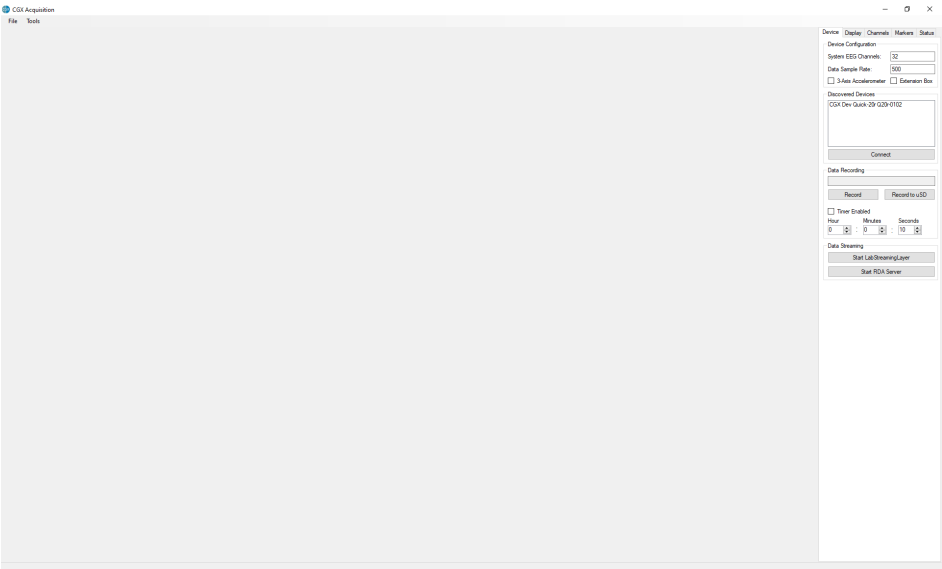
When the reference is disconnected, all channels will disconnect as well.

Improper Setup: Ground Disruption



If the ground has poor contact, all channels will be impacted. Avoid disrupting the connection of the A1 Ground earclip during use. For best results, lightly wet A1 Reference Drypad Ear Sensor.

Device Tab



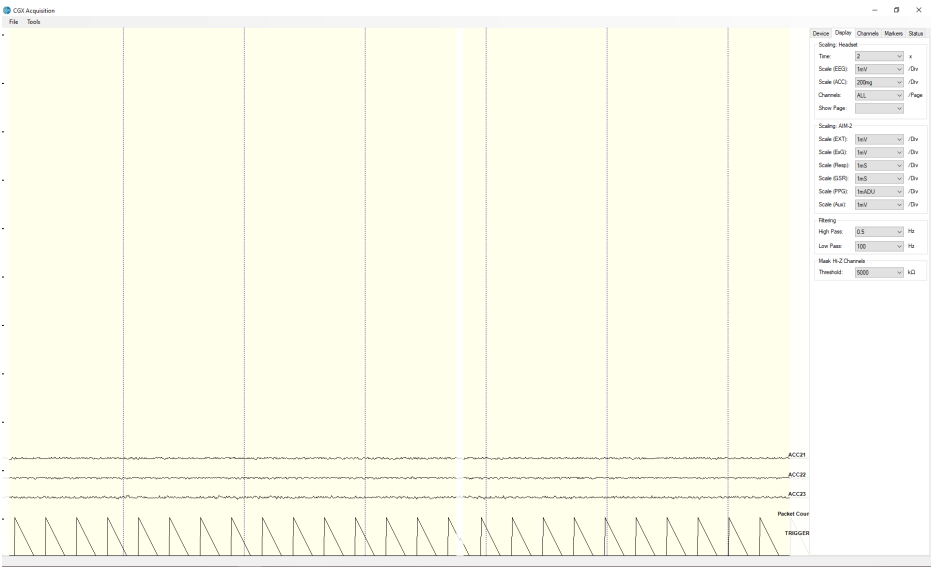
Device Configuration

- **Discovered Devices** Connected dongles will be listed here. Select the device name of your system and hit **Connect**.
- The software automatically connects to your device to retrieve stored settings.
- The **Device Configuration** window is only for your information; changing the settings will not change the configuration of the device. If you need to change device configuration, contact support at CGX.

Data Recording

- **Record** Click to open a file dialog. Select the desired location, file name, and file type. (CSV files have a time stamp built in). Recording begins when you press **OK**.
- **To Stop Recording** hit the button again. Elapsed time is shown in the box above the button.
- **Start LabStreamingLayer** Hit the **Start LabStreamingLayer** button.
- **Start RDA Server** To use the BCI2000 software with the Data Acquisition Software, click on this button. Then, connect to the application in BCI2000.
- **Timer** The timer allows you to limit file recording to a specific length.

Display Tab



The display tab controls scaling and other viewing parameters for the signals.

Scaling: Headset

- **Time** sets the x axis time window. By default, it is set to 2 seconds.
- **Scale (EEG)** sets the y axis vertical gain for the EEG channels on the head.
- **Scale (ACC)** sets the y axis vertical gain for the accelerometer channels.
- **Channels** sets the maximum number of channels displayed per screen. To flip through the pages of channels, use the option below.
- **Show Page** switches between different pages of channels.

Scaling: AIM-2 (Optional)

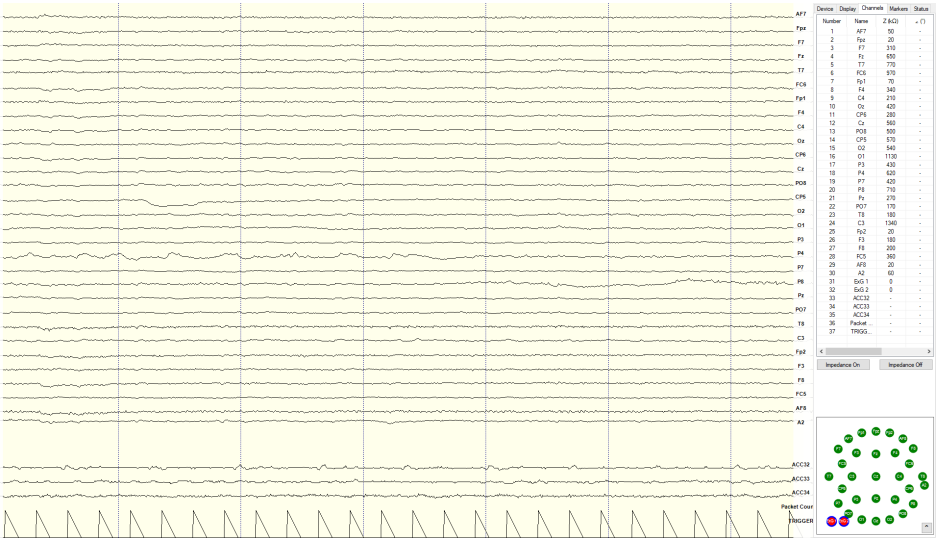
Filtering

- **High Pass** sets the floor (removes offsets and slow signals) corner frequency for the display.
- **Low pass** sets a ceiling (removes high frequency signals and noise) corner frequency for the display.
- Note: filtering is for display only. Data files are saved raw and unfiltered to preserve the maximum amount of information.

Mask Hi-Z Channels

Threshold hides channels with sensor impedances above the specified threshold from the display.

Channels Tab



The bottom half is a graphical map of sensor contact quality. Red circles indicate poor contact, whereas green circles indicate acceptable contact. The threshold for this contact quality is, by default:

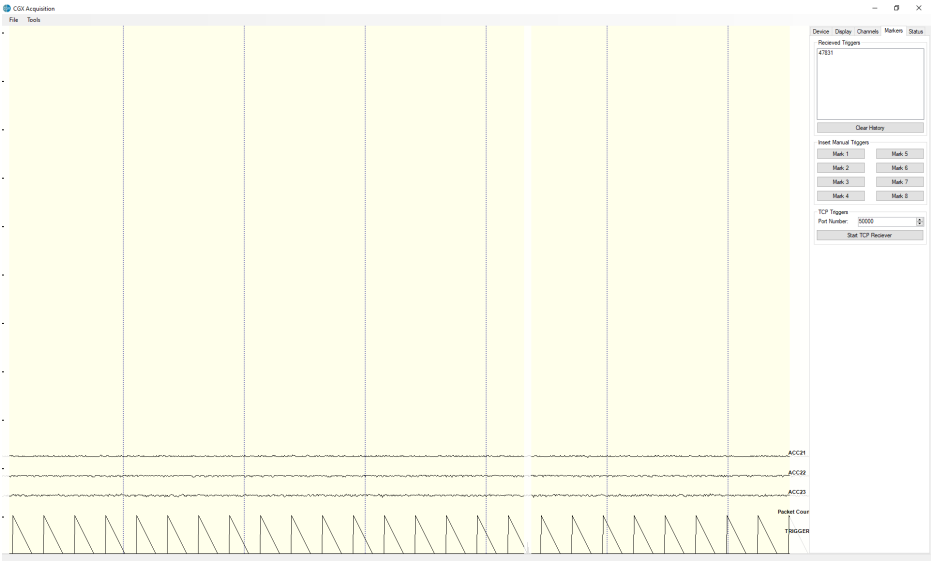
Red Above 2,500 kΩ

Green Below 2,500 kΩ

This threshold can be changed with the Mask Hi-Z menu Threshold for the Quick-32r is set at 2,500 kΩ.

The top half of the Channels tab contains a table displaying information about each channel in the system including its number, name, contact impedance (Z (kΩ)) and sensor offset (Off (mV)). The offset is calculated relative to the reference channel A1.

Markers Tab



Received Triggers

- The box shows all of the received triggers chronologically.
- If no trigger is in range, value received will be 47831 (in hex: 0xBAD7).
- **Clear History** This button will clear all of the triggers in the box. It will not delete triggers from the recording itself.

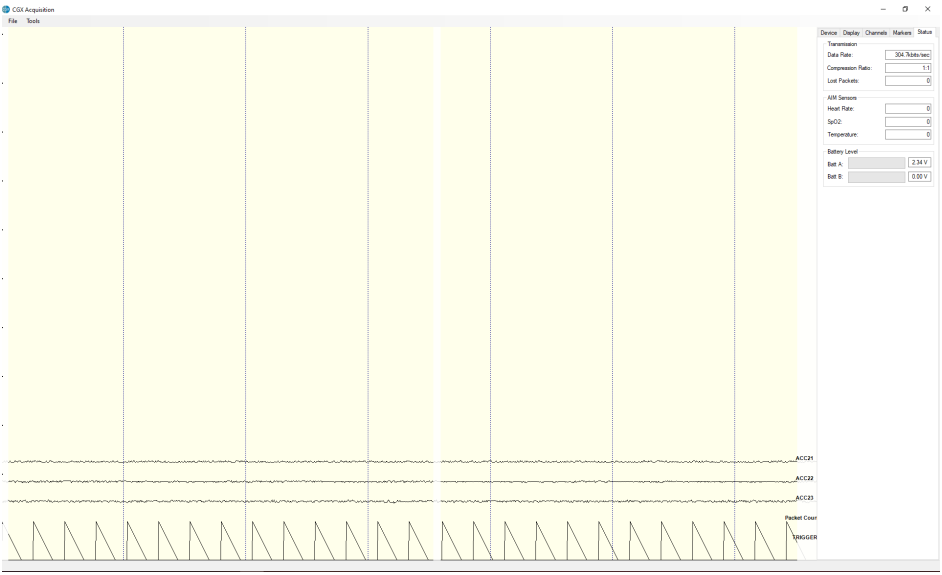
Insert Manual Triggers

- You have the option to select any one of eight trigger codes to insert into the recording. These will be inserted in the same way as a normal trigger sent from our Wireless StimTracker. However, we recommend only using the trigger for precision event marking, and to use these software triggers for general annotation.

TCP Triggers

- **Port Number** Allows you to choose which port to receive triggers.
- **Start TCP Receiver** Starts the receiving service.
- Do not use for precision event marking.
- For general annotation only.

Status Tab



Transmission

- **Data Rate** Allows you to see the bandwidth being used for the data being sent.
- **Compression Ratio** Shows you the ratio at which data is being compressed and sent to the computer.
- **Lost Packets** Shows the amount of information dropped in communications between the headset and the computer, increasing as the headset moves away from the computer.
- **AIM Sensors** (not applicable)
- **Battery Level** Battery status is displayed at the bottom of this tab. The Quick-32r only uses Batt: A.

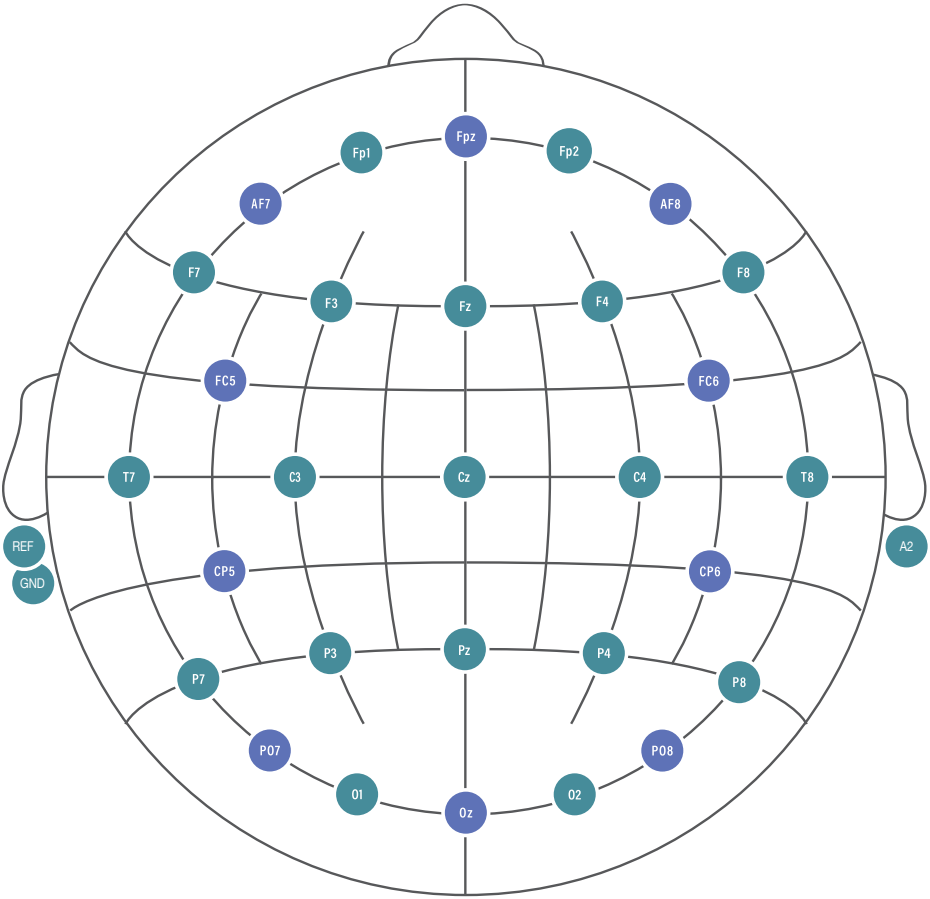
Specifications

A/D Resolution	24-bit simultaneous sampling analog-to-digital converters
Sampling Rate	500 samples per second
Bandwidth	0-131 Hz with true DC coupling
Accelerometer	3-axis measures head motion
Range	10 meters
Noise	<1.0 µV RMS from 1-50 Hz, shorted inputs
Drypad Ear Sensor	Part No: SEN-DE-40 200 uses
Drypad Sensor	Part No: SEN-DP-40 200 uses
Flex Sensor	Part No: SEN-FX-40 200 uses
Wireless Type	Bluetooth Low Energy
API	Full access to raw data via real-time streaming API
Impedance Check	On-board and on-screen continuous impedance check with real-time monitoring of all channels simultaneous with EEG

Export To	EDF, BDF, CSV
Compatible With	Brainvision Recorder, NeuroPype, LabStreaming Layer, EEGLAB, BCILAB, MATLAB, BCI2000, OpenViBE, NeuroGuide and more
Battery Type	Two AA Batteries
Battery Life	8 hours
Applied Part	Type BF
Minimum Computer Hardware Specifications	8th Generation Intel Core processor 8 GB DDR3 RAM 256 GB solid state drive Integrated graphics processor Microsoft Windows 10
Weight	646g
Fits Heads	Sized 52-62 cm
Dimensions	20 x 18 x 19 cm

CE UKCA

Quick-32r Headmap



Head Size Accommodation

Percentage of subjects per age range.

Age	Male	Female
9-12	75%	50%
13-16	95%	90%
17-20	95%	95%
21+	97%	99%

The Journal of Pediatrics 2010. United States head circumference growth reference charts: birth to 21 years. J. Rollins, J. S. Collins, K. Holden

Warranty and Service

Quick-32r Headset

3 year warranty on manufacturing defects. 90 day warranty on accessories and disposable parts. Warranty is void if the device has been opened or tampered with.

Returns

All units returned to CGX for repair and assessment must have an RA number issued by CGX.

CGX will pay outbound shipping costs only.

Ship all returns with an RA number to:

CGX
Attn: Service
8445 Camino Santa Fe, #213
San Diego, CA 92121

8445 Camino Santa Fe, #213
San Diego, CA 92121
858-864-9400
Sales@CGXSystems.com

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