



Wireless StimTrigger

This manual contains general operating instructions, precautionary measures, maintenance instructions, and information for use of the CGX Wireless StimTrigger.

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 Wireless StimTrigger, developed in partnership with Cedrus, wirelessly provides 16 bit event marker data with millisecond precision.

The Wireless StimTrigger is ideally suited for ERP studies in high-precision research laboratories and field environments, and can be used for synchronizing multiple systems for large scale group studies.

Built in functionality includes: the onset of visual stimuli via light sensors, key response via response pad (pad not included), the onset of auditory stimuli via line-in, the onset of vocal response, and stimulus software event codes via USB.

This flexible product works with most popular software and devices. Custom solutions can be developed using Cedrus open-source software.

Warnings

The Wireless StimTrigger is intended to be used to collect event marker data 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

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 the product.
- The Wireless StimTrigger 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.

Follow These Advisories To Keep Your Wireless StimTrigger In Good Working Order

- Do not immerse in liquid.
- Do not expose to direct sunlight or heat source, moisture, vibration, mechanical shock, excessive dust, or humidity.
- Do not open, modify or disassemble the unit — this will void the warranty.
- Do not use if damaged.
- Do not use when wet.

Always Use Supplied Accessories

Using accessories other than those supplied with your Wireless StimTrigger system may result in damage or diminished efficacy of the system.

Device Overview

Wireless StimTrigger Overview

Event-related potential (ERP) is a subject's measured biometric response resulting from an evoked event. These events can include specific sensory, cognitive, or motor events.

Pairing the Wireless StimTrigger with a CGX device allows researchers to obtain bio-physiological data while syncing with visual and auditory stimuli, subject response (vocal and physical), software events and standard TTL inputs.

The Wireless StimTrigger includes the patented CGX wireless transmitter which

sends ERP data wirelessly to all CGX systems within range, which is then sent in a combined file to the recording computer.

m-pods

Cedrus offers third party connectivity through a range of plug-and-play m-pods. m-pods provide a plug-and-play solution to your EEG, NIRS, eye tracker, and other data recorders. Contact Cedrus to purchase m-pods.

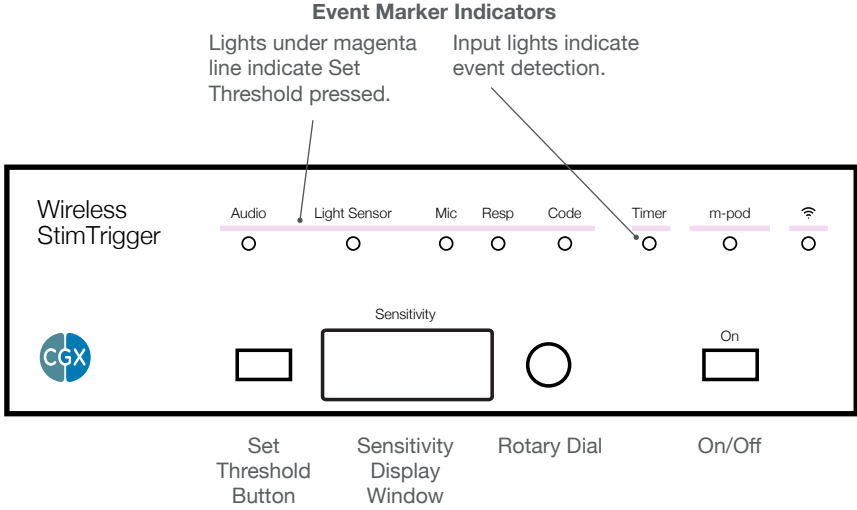
Device Overview

The Package Contains The Following Items

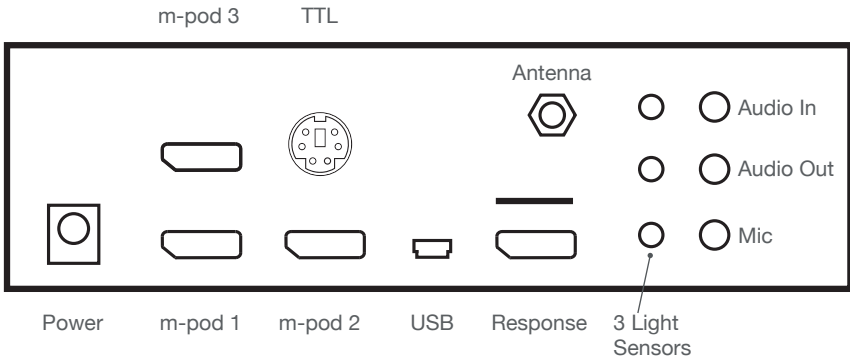
Wireless StimTrigger
Two Light Sensors with
Replacement Adhesives

One 3.5mm Audio Cable
mini-USB Cable
Power Adapter
Carrying Case
Manual

Front Panel



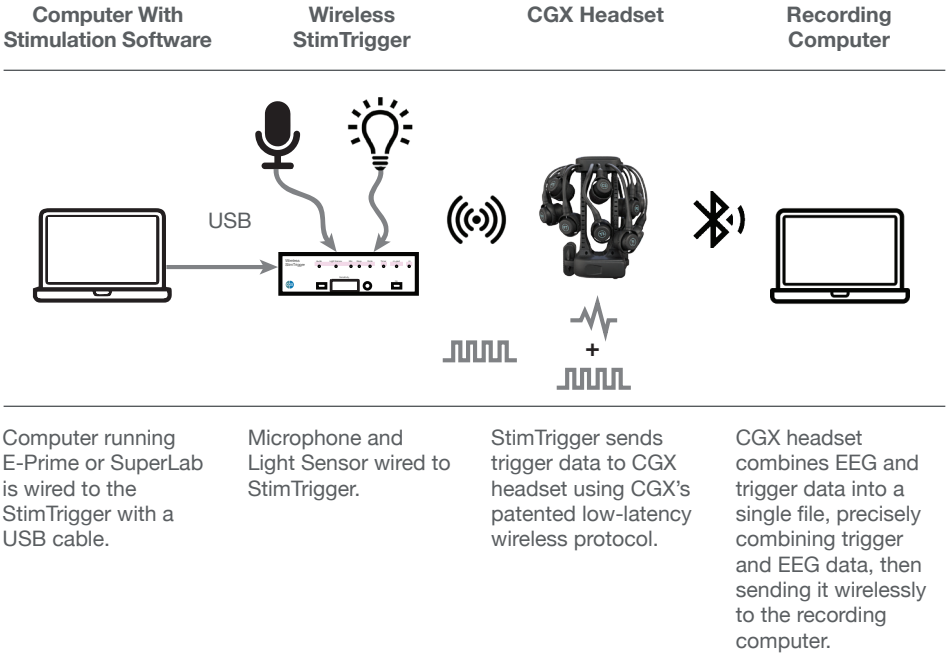
Back Panel



Device Overview

Typical System Combination

This is a typical use scenario, EEG is combined with stimulation software, a microphone to record verbal responses, a light sensor measuring visual response, and USB connection to record event codes from the computer.



Preparation

- Connect the power cable to the power supply.
- Plug the power supply into the 9v port on the back panel. Note: The Wireless StimTrigger is not powered by USB connected from the computer.
- Screw the antenna onto the coaxial port on the back panel.
- Press the **On** power button on the front of the device. The blue power LED and wireless LED will both light up.

The Wireless StimTrigger is now ready for connection of inputs and outputs.



Attach antenna and bend up at joint.

The Wireless StimTrigger accepts up to five input sources.

- You do not need to use all inputs and outputs at all times.
- Refer to the respective section below for individual input set-up instructions.

USB

Install USB drivers in your computer to send event markers — typically from stimulus presentation software — to the Wireless StimTrigger.

Links for installing USB drivers are [here](#):

<https://cedrus.com/support/stimtracker>

Response Pad

Connect to an RB-x40 response pad using a DisplayPort cable, not included.

The cable connects the response pad to the Wireless StimTrigger's Response connector.

The Wireless StimTrigger can detect key presses on all keys. You can have each key press correspond to one output line, or you can have all keys map to a single output line. See m-pod's [Configuring Pin Assignments on Cedrus'](#) support page for more information.

The response pad must be connected to the computer via a USB cable. This provides dual output capability: when a key is pressed on the response pad, information goes out simultaneously to the Wireless StimTrigger for precise marking and via USB to the stimulus presentation software.

Light Sensors

You can have the Wireless StimTrigger detect and mark the onset of visual stimuli.

Two light sensors are included with the Wireless StimTrigger. For convenience, one has a white housing, the second has a black housing. See [here](#) for detailed instructions:

https://cedrus.com/support/stimtracker/tn1908_onset_visual.htm

Audio In

You can route an audio stimulus signal through the Wireless StimTrigger, which passes audio without lag or alteration.

- Connect an audio cable from **Audio Out** to the speakers.
- Connect an audio cable between the audio output on your computer and the **Audio In** on the Wireless StimTrigger.

Inputs

When wired this way, the Wireless StimTrigger monitors the auditory level and sends an event marker to the EEG recorder when the volume rises above a preset threshold. The Wireless StimTrigger monitors the auditory level for each of the right and left channels independently.

See below for information on setting the threshold.

Microphone

Any PC-compatible microphone can be plugged into the **Mic** jack on the back of the Wireless StimTrigger.

By default, voice key information is delivered as a TTL signal via m-pod or via the **TTL Output** connector.

The Wireless StimTrigger can also deliver voice key information via USB. The Wireless StimTrigger continuously monitors the participant's voice level, and generates an event marker when the level rises above a threshold you specify using the Setting and Modifying Input Thresholds instructions below.

Setting and Modifying Input Thresholds

There are two rows of LED lights on the front face of the Wireless StimTrigger:

In the top row, there are white LEDs embedded in the magenta line. They light up in turn when you press the **Set Threshold** button.

The bottom row has blue LEDs that flash each time an event is detected and an event marker is generated.

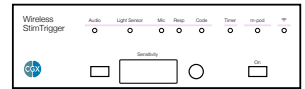
The Wireless StimTrigger can adjust the monitoring threshold of analog inputs. These include light sensors, audio channels, and the voice key microphone.

To modify thresholds:

- Press the **Set Threshold** button. A white LED lights up above the current input and the blue numeric display lights up to show the current setting.
- Press **Set Threshold** to cycle through each input.

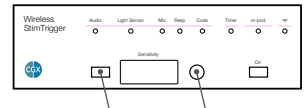
When you have reached the desired input:

- Turn the rotary dial to the right or left to adjust the input threshold. A lower threshold generally means higher sensitivity.
- As you turn the dial, the blue LED beneath the input gives immediate feedback when the Wireless StimTrigger detects the input.



White LEDs light up when Set Threshold button is pressed.

Blue LEDs flash when an event marker is generated



Set Threshold Rotary Dial
button

Light Sensor vs. Microphone Input

The Microphone input can be used either as a microphone or as a fourth light sensor.

To enable the fourth light sensor:

- Cycle through the inputs on the front panel using the **Set Threshold** button until you reach Light Sensor 4, which by default will read **OFF** in the sensitivity display.
- Turn the dial in either direction to switch Light Sensor 4 to **ON** and then pause briefly. The display will show the sensitivity value of the newly-activated input.
- Use the same process to activate the microphone in place of Light Sensor 4.

When you've cycled through all the analog inputs, the blue numeric display turns off. Note: the Wireless StimTrigger will exit **Set Threshold Mode** after 30 seconds of inactivity.

m-pod Trigger Codes

Customizing Output Signals

You can reassign any input signal to any output line. You can also assign multiple signals to the same output line.

The table describes the factory default. If you require different output, Cedrus provides a free utility which saves your configuration to flash memory.

To set USB codes, refer to the Cedrus website [here](#)

Trigger Value	For
Bit 0	Light sensor 4
Bit 1	Light sensor 3
Bit 2	Light sensor 2
Bit 3	Voice key / mic
Bit 4	Any participant key press
Bit 5	Audio – left
Bit 6	Audio – right
Bit 7	Light sensor 1
Bit 8	USB bit 0
Bit 9	USB bit 1
Bit 10	USB bit 2
Bit 11	USB bit 3
Bit 12	USB bit 4
Bit 13	USB bit 5
Bit 14	USB bit 6
Bit 15	USB bit 7

Specifications

Inputs	<ul style="list-style-type: none">• Four (4) light sensors (4th light sensor can be used for microphone)• Microphone for onset of vocal response• Audio in/out pass-through for auditory stimulus• Cedrus RB-x40 response pad• USB Input for event codes• External TTL input
Resolution	16-bit simultaneous Event Marker data
Timing and Latency	<2ms
Wireless Protocol	Proprietary 2.4 GHz
Range	20 meters

Compatibility	Compatible with all CGX systems
Built-in Outputs	<ul style="list-style-type: none">• Direct TTL output• Audio in/out pass-through• Time-stamped output via USB• Configurable output• Compatible with over a dozen popular recording devices via Cedrus m-pods with support for up to 3 simultaneous m-pods
Input Power	100-240V AC, 50-60hz, 1.0-0.5A
Output Power	9V DC, 2.0A
Weight	525g
Dimensions	17.5 x 13.5 x 6cm



Warranty and Service

Wireless StimTrigger

1 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 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, #104
San Diego, CA 92121



CGX A Cognionics Company

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