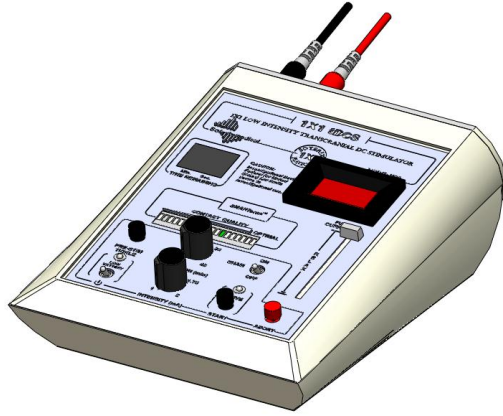


# 1x1 Transcranial Direct Current (tDCS) Low-Intensity Stimulator

Model 1300A



Operator's Manual



## NOTICE

THE FOLLOWING MATERIAL IN THIS MANUAL IS EXCLUSIVELY FOR INFORMATIONAL PURPOSES. THE CONTENT AND THE PRODUCT IT DESCRIBES ARE SUBJECT TO CHANGE WITHOUT NOTICE. IN NO EVENT WILL **SOTERIX MEDICAL INC.**, BE LIABLE FOR THE DAMAGES ARISING FROM OR RELATED TO THE USE OF THIS MANUAL OR THE PRODUCT IT DESCRIBES.

## CAUTION

As an ultimate user of this apparatus, you have the responsibility to understand its proper function and operational characteristics. This operator's manual should be thoroughly read and all operators given adequate training before attempting to place this unit in service.

Awareness of the stated cautions and warnings and compliance with recommended operating parameters – together with maintenance requirements – are important for safe and satisfactory operation. The unit should be used for its intended application. Recommended accessories should be used while using this system.

*This page is left intentionally blank to provide an insertion place of any changes subsequent to the printing of this document.*

# Contents

## Page Title Page

- iii. Notice
- iv. Caution
- vi. Contents

## Introduction

- 2. Overview
- 4. Getting to Know the Product
- 5. Use of This Manual

## Health and Safety

- 7. Precautions and Warnings
- 10. Regulatory Statements

## Product Description

- 12. Items Supplied
- 13. Front Panel
- 14. Back Panel
- 15. Control Keys

## Device Operation

- 17. Inserting and Replacing the Batteries
- 19. Description of Special Features
- 21. Pre-Stimulation Setup
- 25. Stimulation Procedure

## Specifications and Warranty

- 28. Specifications
- 29. Electrical and Operating Characteristics
- 28. Storage and Operating Conditions
- 29. Warranty
- 29. **Soterix Medical** Limited Warranty
- 30. Obtaining Warranty Service

## Further Information

- 32. Bibliography
- 44. Contact Information

# Introduction

Overview - 2

Getting to Know the Product - 4

Use of this Manual - 5

---

This chapter introduces you to the basics required to use this manual fully as well as operate the **Soterix Medical** 1x1 tDCS line of stimulators.

## **Overview:**

This section gives a description of the process of transcranial Direct Current Stimulation.

## **Getting to Know the Product:**

Read this section to learn what sets the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator apart from the rest.

## **Use of this Manual:**

Refer to this section for information on how this manual is organized as well as an explanation of the symbols used throughout the manual.

## Overview

Transcranial Direct Current Stimulation (tDCS) is a non-invasive procedure in which a device sends a small Direct Current (DC) across the scalp to modulate brain function. The **Soterix Medical** 1x1 line tDCS Low-Intensity Stimulator sends a low-level current from the positive electrode, anode, to the negative electrode, cathode. When the extremely low level current passes from the anode to the cathode, it may simultaneously increase the activity of the brain by the anode and decrease the activity of the brain near the cathode.

**tDCS mechanisms** are considered to result from the ability of very weak DC currents to safely induce reversible changes in cortical plasticity. The induction of lasting changes in cortical excitability can, under some conditions, reversibly modify behavior and interact with normal learning. Such findings have driven a large number of studies examining whether tDCS might induce functionally significant changes in patients with a large variety of neurological and psychiatric disorders.

**tDCS dose** can be defined as: 1) The size and position of the electrodes on the body and 2) The duration (in minutes) and intensity (in mA) of current passed across the electrodes. **Soterix Medical** tDCS systems allow precise reproduction of tDCS doses commonly used in medical literature. **Soterix Medical** engineers and scientist can work with you to determine the best configuration for your application. **Note:** tDCS is an investigational technique and it is the responsibility of the operator to determine the appropriate tDCS dose.

**tDCS safety** is supported by medical literature to have common side effects limited to mild and reversible skin irritation, when using standard tDCS protocols and guidelines. **Soterix Medical** tDCS stimulators and electrodes are uniquely designed to minimize skin irritation – for example, the exclusive SMARTscan™ feature provides a simple indicator to the operator of the contact conditions before, during, and after stimulation. **Note:** tDCS is an investigational technique and it is the responsibility of the operator to identify and follow the most appropriate safety protocols.

**tDCS comfort** can be controlled by the operator by using devices, such as the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator, which are specifically designed for clinical tDCS. For example, the unique PRE-STIM

TICKLE and RELAX features available on all **Soterix Medical** 1x1 models are designed to condition the skin prior to stimulation and allow the operator to accommodate subject feedback without stopping stimulation.

**tDCS protocol, clinical results, and safety data** can be better understood by consulting the papers found in the bibliography at the end of this manual.

## Getting to Know the Product

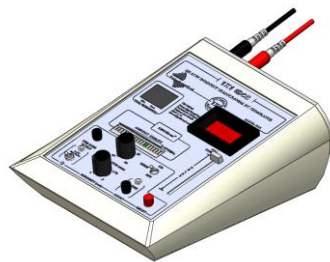
Thank you for purchasing a **Soterix Medical 1x1** Transcranial Direct Current Low-Intensity Stimulator. Unlike other stimulators, the **Soterix Medical 1x1** line of stimulators is simple to use and designed especially for tDCS.

The **Soterix Medical 1x1** line of low-intensity tDCS stimulators is designed to generate low levels of DC current between one anode and one cathode placed on the body. The anode is the positive electrode from which current from the device enters the body, while the cathode is the negative electrode from which current exits the body and returns to the device. The provided **Soterix Medical** tDCS accessories allow for simple and comfortable positioning of the electrodes on the body. The operator must set the intensity of current (in units of mA) and duration of stimulation (in minutes) before initiating the stimulation. For both duration and intensity, there are four settings.

Clinicians and researchers choose the **Soterix Medical 1x1** to:

- 1) Ensure reproducible and precise tDCS operation across subjects and time.
- 2) Provide for simple and comfortable tDCS set-up and stimulation.
- 3) Conduct clinical studies with state-of-the-art control and safety features.

The **Soterix Medical 1x1** tDCS line of stimulators includes several proprietary features to enhance tDCS safety and subject comfort including TRUE CURRENT™, SMARTscan™, RELAX, and PRE-STIM TICKLE. By reading this manual and understanding these unique features, operators of the **Soterix Medical 1x1** can enhance the efficacy and comfort of tDCS.



## Use of This Manual

This manual contains details of installation, setup, and operation of the **Soterix Medical 1x1** unit and its accessories. This manual must be read in its entirety before commencing any stimulation with the **Soterix Medical 1x1** unit. If the instructions in this manual are not precisely followed, the performance of this product and/or the safety of the user and/or patient may be compromised. If you have any questions, comments, or concerns, please contact **Soterix Medical** before starting use of the device.

The consequences that could result from failure to observe the precautions listed in this section are indicated by the following symbol:



This icon marks warnings, information that should be read before using this **Soterix Medical** product to prevent possible injury.



Precautions and  
Warnings - 7

Regulatory  
Statements - 10

## Health and Safety

---

This chapter dictates the required precautions for both you and your patient's safety.

### **Precautions and Warnings:**

Read this section for the important list of precautionary measures required to operate this device.

### **Regulatory Statements:**

This is where you will find the regulatory statements for certain countries, which determines how you may use this device under federal law.

## ***Precautions and Warnings***

To prevent damage to your **Soterix Medical** product or injury to yourself or to others, read the following safety precautions in their entirety before using this equipment. Keep these safety instructions where all those who use the product can easily access them.

- Environment and Moisture
  - Do not immerse the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator in water or any other fluids.
  - The **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator should not be used in a moist environment or if any parts of the stimulator are damp or wet.
  - The **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator is not certified for use in the presence of a flammable anesthetic mixture with air or oxygen or nitrous oxide. The consequences of using the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator near flammable atmosphere are unknown.
  - The **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator is not certified for use in an environment with strong magnetic fields (including, but not limited to, MRI). The consequences of using the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator in a strong magnetic environment are unknown.
  - Do not use the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator if it was transported or stored at temperatures outside of the specific range indicated in this manual. The consequences of using the **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator after it is been transported or stored at temperatures outside of the specific range are unknown.
- External Damage
  - Do not drop the device.
  - The **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator should not be used if there are any signs of external damage.
  - Carefully inspect the device on arrival and prior to each use.

- If any controls or displays are not working as indicated in this manual, do not use the **Soterix Medical 1x1 tDCS Low-Intensity Stimulator**. Immediately return the device to **Soterix Medical Inc.** for repair.
- Cables
  - When connecting cables to the output jacks, use only the cables provided or sold by **Soterix Medical Inc.** to maintain compliance with product regulations.
  - Make sure all cables are fully inserted in the correct receivers before operating the **Soterix Medical 1x1 tDCS Low-Intensity Stimulator**.
- Irritation
  - Use only approved **Soterix Medical Inc. EASYpads™** indicated for use with the **Soterix Medical 1x1 tDCS Low-Intensity Stimulator**. Do not modify the **EASYpads™**. Do not reuse **EASYpads™** that are indicated only for single use.
  - The **Soterix Medical 1x1 tDCS Low-Intensity Stimulator** may cause minor irritation, discomfort and redness at the electrode sites. If irritation occurs, consult your clinician.
  - Do not place the **Soterix Medical 1x1 tDCS** electrodes or sponges over previously irritated, burnt, or damaged skin.
- Internal Parts
  - Do not disassemble. Touching the product's internal parts could result in injury. In the event of a malfunction, only a qualified technician should repair the product from **Soterix Medical Inc.** Should the product break open as the result of a fall or other accident, remove the batteries and return the product to **Soterix Medical Inc.** for repairs.
- Batteries
  - Observe proper precautions when handling batteries. Be sure the product is off before replacing batteries.
  - Use only batteries approved for use in this equipment. Do not attempt to insert batteries upside down or backwards.

- Electronic Monitoring
  - Electronic monitoring equipment (such as ECG monitors, ECG alarms) may not operate properly when tDCS stimulation is in use.
- Technique
  - The **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator must only be used with appropriate supervision and by a trained operator. Even experienced operators must carefully read and fully follow all the following instructions and guidelines.
  - All operators must ensure that **Soterix Medical** 1x1 tDCS Low-Intensity Stimulator is applied within local and federal or country guidelines as relevant.
  - The **Soterix Medical** 1x1 Low-Intensity Stimulator should not be used in combination with any other implanted or external electrical stimulation device.
- Disposal
  - Return the device to **Soterix Medical Inc.** for disposal when the device is no longer functional.

## ***Regulatory Statements***

Transcranial Direct Current Stimulation (tDCS) is an investigational technique. It is limited by Federal law to investigational use under appropriate Institutional Review Board guidelines.

### USA:

**CAUTION: The Soterix Medical 1x1 Low Intensity DC Stimulator is an investigational device. Federal (or United States) law limits device to investigational use.**

# Product Description

Items Supplied - 12

Front Panel - 13

Back Panel - 14

Control Keys - 15

This chapter is comprised of the following sections:

**Items Supplied:**

This section gives a checklist of the items that are found in every package sent out with the 1x1 tDCS Low-Intensity Stimulator as well as any items that could be sent out additionally to the standard package.

**Front Panel:**

This section contains an illustration of the front panel with every button labeled numerically.

**Back Panel:**

This section contains an illustration of the rear panel with every button labeled numerically.

**Control Keys:**

Basic description of all the controls and display functions indicated in the previous two sections.

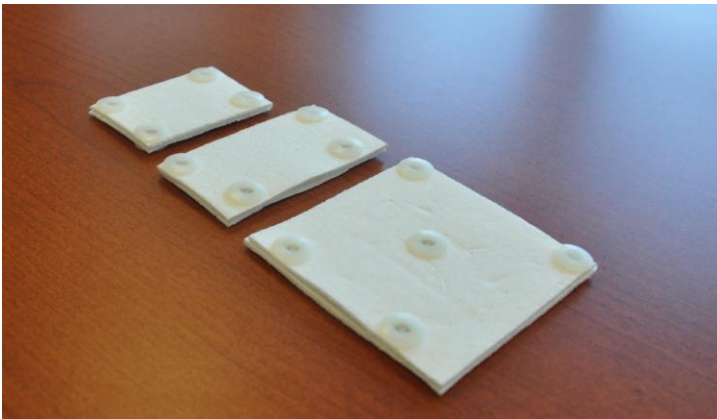
## ***Items Supplied***

- 1 **Soterix Medical** 1x1 Transcranial Direct Current Low-Intensity Stimulator
- 2 **Soterix Medical** *EASYpads*™ (2x rubber electrode, 2x sponge)
- 1 Red anode cable
- 1 Black cathode cable
- Elastic fasteners (one long, one short) with plastic joints (2x)

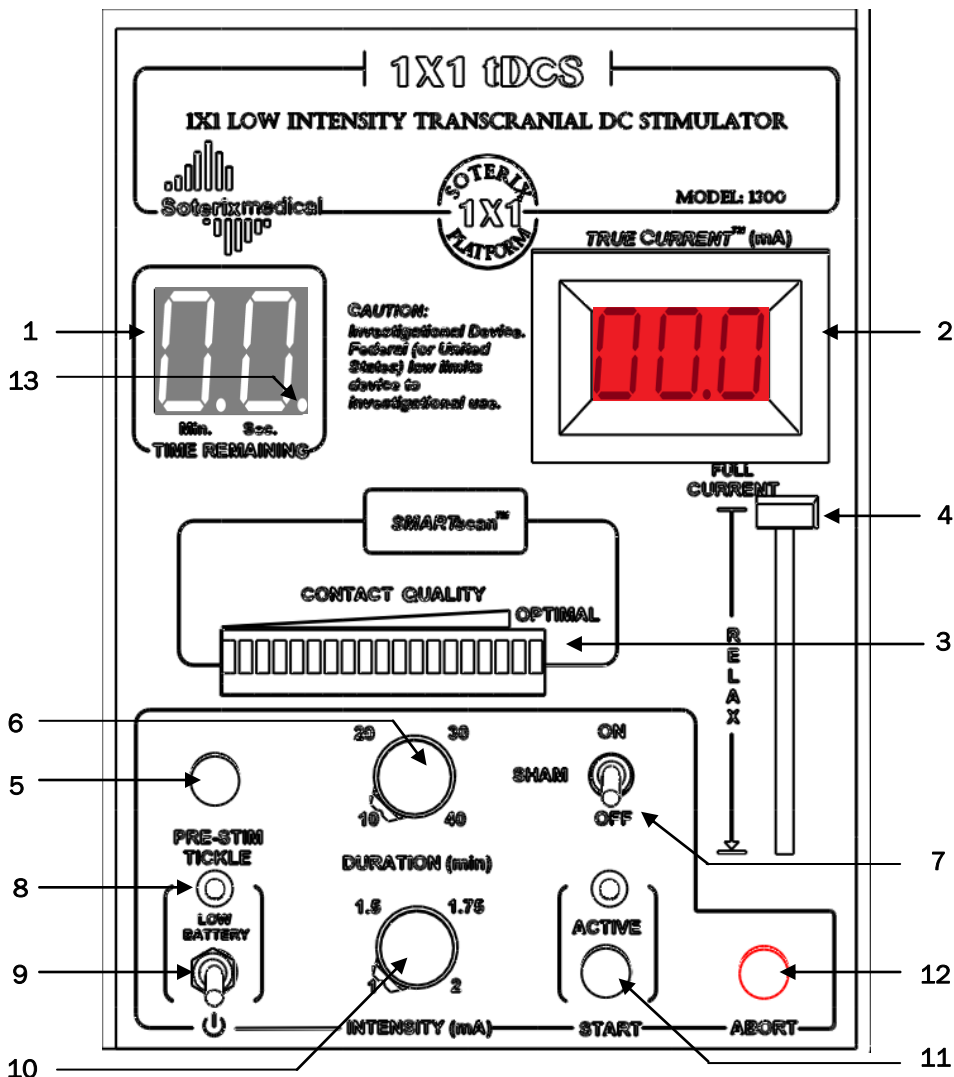
## ***Items Supplied Separately***

- Soterix Medical** 718™ stimulation fluid (500 mL, 1 L)
- 100 Replacement **Soterix Medical** Sponges

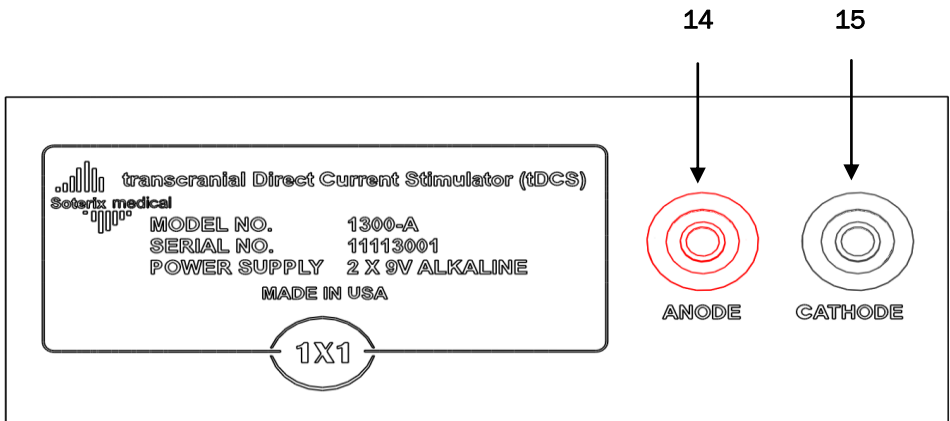
Standard sizes shown (5x7cm, 5x10 cm, 10x10 cm); Not shown (3x5cm)



### Front Panel



## Back Panel



## ***Control Keys***

- 1.** A display, which indicates the amount of time remaining in the stimulation. The display reads in minutes unless the seconds light (13) is illuminated.
- 2.** A display that indicates the amount of current being produced by the device.
- 3.** A display which indicates how “good” the contact quality of the leads are.
- 4.** Modulates the current value being produced by the device.
- 5.** Starts the PRE-STIM TICKLE.
- 6.** Adjusts the duration of the stimulation (10, 20, 30, or 40 minutes) prior to the start of stimulation.
- 7.** Activates or deactivates SHAM.
- 8.** Indicates if there is low battery by illuminating red.
- 9.** Turns on or off the device.
- 10.** Adjusts the current (1, 1.5, 1.75, 2 mA) prior to the start of stimulation.
- 11.** Starts the stimulation.
- 12.** Stops the stimulation.
- 13.** A light that, when illuminated, indicates the TIME REMAINING display (1) is representing seconds as opposed to minutes.
- 14.** The connector for the anode cable.
- 15.** The connector for the cathode cable.

# Device Operation

Inserting and Replacing  
the Batteries - 17

Description of Special  
Features - 19

Pre-Stimulation  
Setup - 21

Stimulation  
Procedure - 25

This chapter outlines the steps needed to operate your **Soterix Medical 1x1 tDCS Low-Intensity Stimulator**

## **Inserting and Replacing the Batteries:**

This section explains how you must insert the batteries into the device. It also explains how to replace them and when it is required.

## **Description of Special Features:**

This section gives an in-depth description of all the special features that come with your purchase of this **Soterix Medical 1x1 tDCS Stimulator** device.

## **Pre-Stimulation Setup**

Here you are provided with information about the first steps you must take to prepare the device and subject prior to stimulation.

## **Stimulation Procedure**

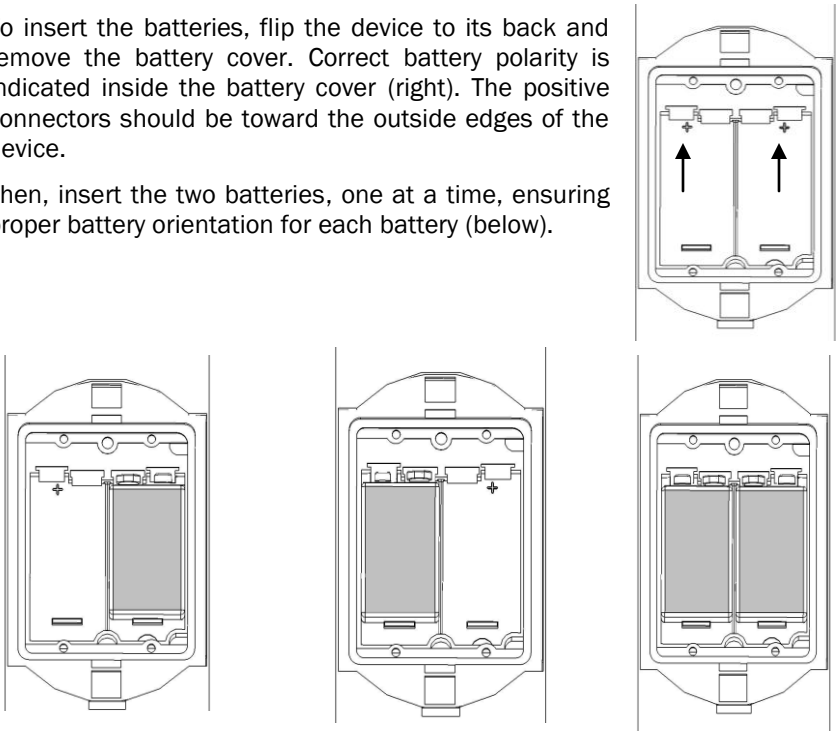
This section contains the procedure for the tDCS. Additionally it gives a list of what the operator must do and provides information about what the device does during stimulation.

## Inserting and Replacing the Batteries

The 1x1 tDCS Low-Intensity Stimulator operates on two 9V alkaline batteries. **Duracell is recommended for use.**

To insert the batteries, flip the device to its back and remove the battery cover. Correct battery polarity is indicated inside the battery cover (right). The positive connectors should be toward the outside edges of the device.

Then, insert the two batteries, one at a time, ensuring proper battery orientation for each battery (below).



After the batteries are in place, replace the battery compartment lid by sliding the lid back into its place and pressing it down until it “snaps” into place. Immediately after battery insertion, power up the 1x1 tDCS Low-Intensity Stimulator to ensure correct battery placement. If the 1x1 tDCS Low-Intensity Stimulator does not power up, check that the batteries are good and inserted correctly.

*Note: Batteries should be removed from the 1x1 tDCS Low-Intensity Stimulator if it is not likely to be used for an extended period of time.*



Please observe the proper direction of the battery's polarity as indicated by the stickers inside of the battery compartment. When facing the back of the device, *both* the positive connectors must be toward the outside of the device and *both* the negative connectors toward the inside.

Batteries should be replaced every 3 hours of use or when the low battery indicator is illuminated. Do not use abrasive cleaners on the battery contacts.

To replace the batteries, first remove the old batteries by removing the bottom of the battery first. Take out the batteries one-at-a-time. Then insert the new batteries.



Dispose of depleted batteries in accordance with local regulations.

*Note: When the device is not in use, turn the power off to save battery life.*

## Description of Special Features

**TRUE CURRENT™:** The TRUE CURRENT™ display is active whenever the device is on. TRUE CURRENT™ always indicates the actual value of current (in mA) being supplied by the device to the electrodes – regardless of device settings. TRUE CURRENT™ thus functions as a fully independent and redundant safety feature when monitored by the operator.

*Note: It is recommended the TRUE CURRENT™ be monitored for the entire duration of stimulation.*

**SMARTscan™:** The SMARTscan™ feature provides a constant display of electrode contact quality before, during, and after stimulation. There is no “best” SMARTscan™ level that applies to every tDCS configuration. With experience, operators can determine ideal, tolerable, and cautionary levels.



SMARTscan™ is a feature intended to assist in the set-up and operation of tDCS. It is not intended to substitute or replace operator judgment and protocol. Each set-up and operation should be independently monitored and verified by a trained operator following best tDCS protocols. Any issues or concerns identified by the operator should be addressed regardless of the SMARTscan™ reading.

**Stimulation ABORT:** At any point during stimulation, the operator may terminate the stimulation by pressing the ABORT button. The operator is responsible for determining when aborting the stimulation is appropriate.

*Note: Pressing ABORT will ramp down the current to zero and terminate the entire stimulation run.*

**RELAX:** At any point during stimulation, the operator may use the RELAX slider to decrease the set level of current from the maximum (FULL CURRENT) value. TRUE CURRENT™ will indicate the reduced current value. Adjusting the RELAX amount will have no effect on the duration of stimulation. The operator is responsible for determining when to use the RELAX feature, for example, based on a subject's discomfort level. **It is**

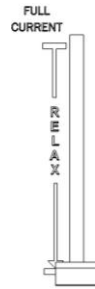
important that the RELAX amount is decreased and increased slowly, to avoid any sudden current changes.



RELAX feature is disengaged. Full set current supplied



RELAX feature is engaged. Set current is reduced as slider is lowered



With RELAX slider fully lowered, minimal current is supplied. **Note:** The current does not reduce to zero.



Rapid changes in current level, either decreasing or increasing, should be minimized. When using the RELAX feature, always monitor the TRUE CURRENT™ display and adjust slider gradually.

**PRE-STIM TICKLE:** When the device is turned on and after the electrodes are placed on the subject, but before stimulation is initiated, the PRE-STIM TICKLE button may be pressed to activate an approximately 30 second, 1 mA current. During PRE-STIM TICKLE, the TIME REMAINING display will indicate “PR” and the TRUE CURRENT™ display will indicate the current. The operator is responsible for determining when it is appropriate to use PRE-STIM TICKLE, for example, to condition the electrodes, skin, or the subject. Pressing the PRE-STIM TICKLE button during stimulation will have no effect.

## Pre-Stimulation Setup

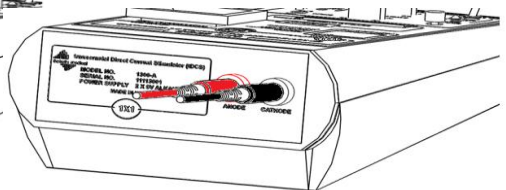
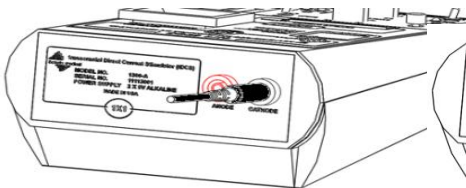
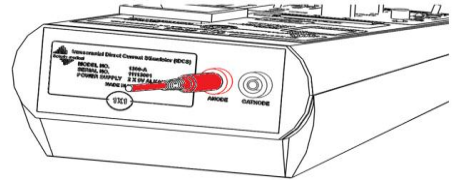
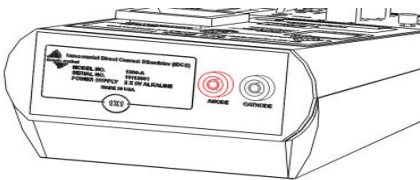
1) Turn the POWER switch **ON**. The TRUE CURRENT™ display will illuminate and indicate “00.0”. The SMARTscan™ display will illuminate indicating a low quality.



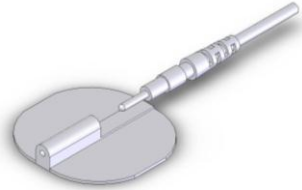
When the subject is connected to the device, turning the power on or off is not recommended.

2) If LOW BATTERY is illuminated, do not proceed with stimulation. Replace both batteries with new batteries. Make sure both batteries are inserted in the correct polarity, as indicated inside the battery compartment.

3) Connect the provided cables to the device using the banana plugs on the back of the device. To attach the cables, take the long plastic end and insert it into the similarly colored receiver. The red wire must be inserted into the red receiver labeled “anode” and the black wire inserted into the grey receiver labeled “cathode” (below).



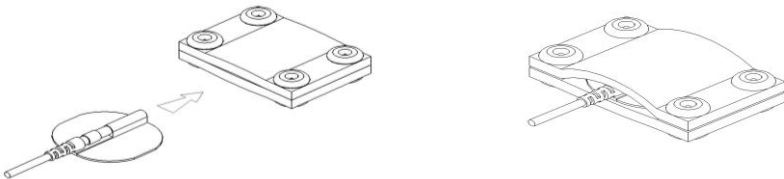
4) Clean the surface of the skin to remove any signs of lotion, dirt, etc. and allow it to dry. Inspect the rubber insets and sponges for wear. If there is any evidence of deterioration, throw out the dirty components and use a new electrode.



5) Insert the connector cord pin securely into the opening of the receptacle on the rubber inset. (right)

6) Each side of the sponge should be soaked with approximately 7 mL of **Soterix Medical 718™** electrolyte or saline solution (total of 14 mL per sponge). **Be careful not to over soak the sponge.** Avoid fluid leaking across the subject.

7) Then slide the rubber inset fully into the sponge EASYpad™. (5x7 cm EASYpad™ shown below)



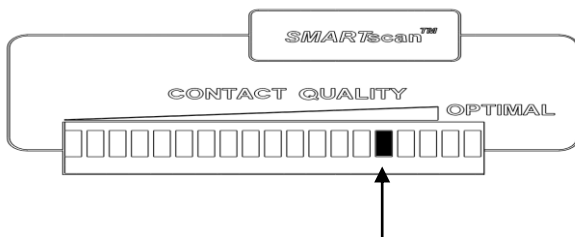
8) **Use only appropriate accessories to fix the sponge to the subject** including **Soterix Medical** elastic fasteners. Apply the electrodes to the treatment site by firmly pressing down the center of the pad and then smoothing down towards the electrode edges. **Verify there is a smooth and even contact with the skin.**

*Note: Both sponges must remain evenly moist across the entire surface for the duration of the procedure.*

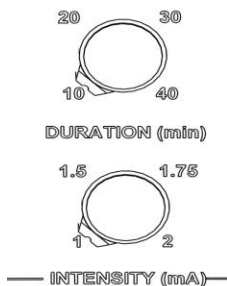


Electrode sponges should remain moist across the entire surface for the duration of stimulation. If the sponges are dry, do not start stimulation. If any irritation or discomfort occurs, discontinue use and consult a clinician

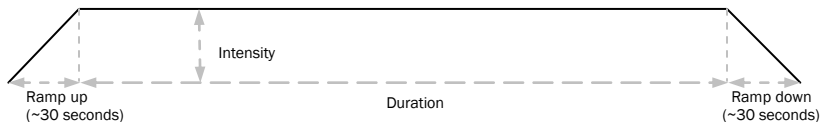
9) The SMARTscan™ contact quality meter will now indicate the quality of the electrode contact. There is no single “best” reading for all applications; however, generally a higher quality reading indicates a “better” electrode-skin contact. It is the responsibility of the operator to ensure the SMARTscan™ quality reading is appropriate for a given application prior to stimulation. If the quality reading is not in the desired range, adjust one or both of the electrode contacts. The SMARTscan™ will constantly update showing the current electrode quality during adjustments.



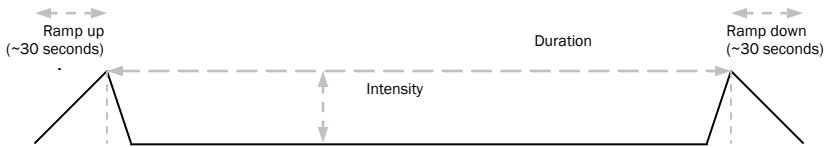
10) Once the SMARTscan™ reading is in the desired range, set the CURRENT INTENSITY to the desired current value (in mA) and set DURATION to the desired duration value (in minutes). It is the responsibility of the operator to ensure that the current and duration values are appropriate and safe for the application (right).



*Note: The duration value does not include an approximately 30 second ramp up time at the start of stimulation and an approximately 30 second ramp down time at the end of stimulation (normal waveform shown on next page).*



- 11) Select either SHAM ON or OFF using the switch (right). (SHAM ON waveform show below)



- 12) Ensure the RELAX slider is set to FULL CURRENT (right).



- 13) Now would be the time to activate the PRE-STIM TICKLE if desired. To do so, press the PRE-STIM TICKLE button (below). It is the responsibility of the operator to determine if it is appropriate to use the PRE-STIM TICKLE.



PRE-STIM  
TICKLE

## Stimulation Procedure

- 1) Confirm that both the intensity and duration are set to the desired values, SHAM is set to its desired setting, and the RELAX slider is set to full current.
- 2) Start the stimulation by pressing the START button (right)

*Note: Once the START button is pressed and tDCS begins, changing the duration and intensity knobs will have no effect on the ongoing stimulation. These knobs are to be set before the start of the stimulation to allow for proper tDCS.*



- 3) The stimulation ACTIVE light will first flash for a period of approximately 30 seconds while the current is ramping up. The TRUE CURRENT™ display will show the current ramping up to the set INTENSITY value.
- 4) Once the ramp up is complete, the stimulation ACTIVE light will stop flashing and remain illuminated. The TIME REMAINING display will now indicate the time remaining in the stimulation session. The value will start at the time selected in DURATION and count down. The value will initially show the amount of minutes remaining.
- 5) The TRUE CURRENT™ display constantly shows the current delivered to the subject. The operator should monitor this display. If there is any deviation from the expected current, as set by the operator and described in this manual, stimulation should be aborted.
- 6) The SMARTscan™ feature indicates contact quality during stimulation. The operator should monitor this display during stimulation. It is typical for electrode quality to decrease during stimulation, while an increase may indicate a problem with the electrodes. The stimulator will *not* automatically shut down during stimulation. It is the responsibility of the operator to ensure that the SMARTscan™ quality reading is appropriate for a given application during stimulation.



During tDCS, tampering with the placement of the sponges is not recommended.

- 7) The RELAX feature can be used at any point during the stimulation, generally, the RELAX feature is used to accommodate individual subjects by moving the RELAX slider down, away from FULL CURRENT, the current supplied by the device will decrease to the value shown in the TRUE CURRENT™ DISPLAY.
- 8) When there is 1 minute remaining in the stimulation, the TIME REMAINING display will switch to seconds. It will count down the final 60 seconds. This will be indicated by the illumination of the light adjacent to “Sec” below the TIME REMAINING display.
- 9) When the TIME REMAINING reaches zero, the display will turn off and the current will ramp down for approximately 30 seconds. During the ramp down, the stimulation ACTIVE light will flash.
- 10) Once the ramp down is complete, the stimulation ACTIVE light will turn off.
- 11) tDCS is now complete.
- 12) Disconnect the electrodes from the subject.
- 13) Turn the POWER switch OFF.

*Note: If during the course of stimulation, it is desired to stop the stimulation manually, it is recommended that the ABORT feature be used instead of the power being switched off.*



When the subject is connected to the device, turning the power on or off is not recommended.

Specifications – 28

Warranty – 29

## Specifications and Warranty

---

This chapter is comprised of the following sections:

**Specifications:**

This section contains a list of the details of the device specification.

**Warranty:**

Here is the Limited Warranty. It dictates under what circumstances your 1x1 Transcranial Direct Current Low-Intensity Stimulator is repaired free of charge. It also explains how to obtain your warranty service.

## Specifications

### Electrical and Operating Characteristics

Power source: 2, 9V Alkaline batteries  
 Battery life (with fresh batteries): 3, hrs.  
 Length: 7.91 in.  
 Width: 2.83 in.  
 Height: 5.9 in.  
 Connector type: shielded banana

### Storage and Operating Conditions

Parameter	Storage	Operating
<i>Minimum temperature</i>	50 °F	55 °F
<i>Maximum temperature</i>	80 °F	85 °F
<i>Maximum humidity</i>	70% non-condensing	70% non-condensing
<i>Minimum atmospheric pressure</i>	20.7 in. Hg (700 hPa)	20.7 in. Hg (700 hPa)
<i>Maximum atmospheric pressure</i>	31.3 in. Hg (1060 hPa)	31.3 in. Hg (1060 hPa)

\*All measurements are approximated

## Warranty

### Soterix Medical Limited Warranty

- A.** This Limited Warranty provides the following assurance to the first purchaser of the **Soterix Medical Inc.** 1x1 tDCS Low-Intensity Stimulator Model 1300A, hereafter referred to as "Equipment":
- (1) Should the Equipment fail to function within normal tolerances due to a defect in materials or workmanship within a period of one (1) year, commencing with the delivery of the Equipment to the purchaser, **Soterix Medical** will at its option: (a) repair or replace any part or parts of the Equipment; (b) issue a credit to the purchaser equal to the Purchase Price against the purchase of the replacement Equipment or (c) provide a functionally comparable replacement Equipment at no charge. The Equipment must be returned to **Soterix Medical Inc.**, carriage paid and insured, in the most appropriate method as determined by **Soterix Medical Inc.**
  - (2) As used herein, Purchase Price shall mean the lesser of the net invoiced price of the original, or current functionally comparable, or replacement Equipment.
- B.** To qualify for Limited Warranty set forth in Section A(1), the following conditions must be met:
- (1) The Equipment must be returned to **Soterix Medical** within thirty (30) days after discovery of the defect, (**Soterix Medical** may, at its option, repair the Equipment on site).
  - (2) The Equipment must not have been repaired or altered outside of **Soterix Medical's** factory in any way, which, in the judgment of **Soterix Medical**, affects its stability and reliability. The Equipment must not have been subjected to misuse, abuse, or accident. This warranty does not apply to any exterior appearance item of the Equipment which has been damaged or defaced, which has been subject to misuse and abuse, abnormal service or handling, or which has been altered or modified in design or construction.
  - (3) This warranty does not apply to any interconnection cables supplied with the Equipment.
- C.** This Limited Warranty is limited to its expressed terms. In particular:
- (1) Except as expressly provided by this Limited Warranty, **SOTERIX MEDICAL IS NOT RESPONSIBLE FOR ANY DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES BASED ON ANY DEFECT FAILURE OR MALFUNCTION OF THE EQUIPMENT, WHETHER THE CLAIM IS BASED ON WARRANTY, CONTRACT, TORT, OR OTHERWISE.**

- (3) This Limited Warranty is made only to the purchaser of the Equipment. AS TO ALL OTHERS, **SOTERIX MEDICAL INC.** MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM, OR OTHERWISE. NO EXPRESS OR IMPLIED WARRANTY TO THE PATIENT SHALL EXTEND BEYOND THE PERIOD SPECIFIED IN A(1) ABOVE, THIS LIMITED WARRANTY SHALL BE THE EXCLUSIVE REMEDY AVAILABLE TO ANY PERSON.
- (4) The exclusions and limitations set out above are not intended to, and should not be construed so as to contravene mandatory provisions of applicable law. If any part or term of this Limited Warranty is held to be illegal, unenforceable, or in conflict with applicable law by a court of competent jurisdiction, the validity of the remaining portions of the Limited Warranty shall not be affected, and all rights and obligations shall be construed and enforced as if this Limited Warranty did not contain the particular part or term held to be invalid. This Limited Warranty gives the purchaser specific legal rights. The purchaser may also have other rights, which vary within specific regions.
- (5) No person has any authority to bind **Soterix Medical Inc.** to any representation, condition, or warranty except this Limited Warranty.

## Obtaining Warranty Service

Warranty service of this Equipment can be obtained by returning the Equipment, carriage paid and insured, to **Soterix Medical**. Prior authorization before shipping the product is advised for the most expedient service.

Bibliography – 32

Contact Information –  
44

## Further Information

---

In this chapter, you can find:

**Bibliography:**

Here is a selection of peer-reviewed articles that **Soterix Medical** has found to be relevant to tDCS practices.

**Contact Information:**

This section houses a list of all the ways **Soterix Medical** can be contacted.

## ***Bibliography***

The following bibliography includes a selection of peer-reviewed publications. This is not a comprehensive list of all tDCS studies, but includes a representative list as of the date of the publication of this manual. The inclusion of these reports in this bibliography does not in any way imply an endorsement of the protocol or results reported in these studies by **Soterix Medical**. It remains the responsibility of the device user to remain informed of all current, relevant tDCS practices. **Note:** tDCS is an investigational medical technique and has not been cleared by the FDA and therefore can only be used for research under appropriate Institutional Review Board guidelines.

1. Antal A, Brepohl N, Poreisz C, Boros K, Csifcsak G, Paulus W. Transcranial direct current stimulation over somatosensory cortex decreases experimentally induced acute pain perception. *Clin J Pain*. 2008;24(1):56-63
2. Antal A, Nitsche MA, Kruse W, Hoffmann K-P, Paulus W: Visuomotor coordination is improved by transcranial direct current stimulation of the human visual cortex. *J Cog Neurosci* 2004;16:521-527
3. Antal A, Nitsche MA, Paulus W. Transcranial direct current stimulation and the visual cortex. *Brain Res Bull*. 2006;68(6):459-63.
4. Antal A, Paulus W. Transcranial direct current stimulation and visual perception. *Perception*. 2008;37(3):367-74
5. Arul-Anandam AP & Loo CK. Transcranial direct current stimulation: a new tool for the treatment of depression? *Journal of Affective Disorders* 2009; 117 (3): 137-145.
6. Arul-Anandam AP, Loo CK, Mitchell P. Induction of hypomanic episode with transcranial direct current stimulation. *Journal of ECT* 2010; 26:68-69
7. Arul-Anandam AP, Loo CK, Martin D, Mitchell PB. Chronic neuropathic pain alleviation after transcranial direct current stimulation to the dorsolateral prefrontal cortex; *Brain Stimulation* (2009) 2, 149–51
8. Boggio PS, Castro LO, Savagim EA, Brite R, Cruz VC, Rocha RR, Rigonatti SP, Silva MT, Fregni F. Enhancement of non-dominant

- hand motor function by anodal transcranial direct current stimulation. *Neurosci Lett*. 2006;404(1-2):232-6.
9. Boggio PS, Ferrucci R, Rigonatti SP, Covre P, Nitsche M, Pascual-Leone A, Fregni F. Effects of transcranial direct current stimulation on working memory in patients with Parkinson's disease. *J Neurol Sci*. 2006;249(1):31-8.
  10. Boggio PS, Khoury LP, Martins DC, Martins OE, de Macedo EC, Fregni F. Temporal cortex direct current stimulation enhances performance on a visual recognition memory task in Alzheimer disease. *J Neurol Neurosurg Psychiatry*. 2009;80(4):444-7.
  11. Boggio PS, Nunes A, Rigonatti SP, Nitsche MA, Pascual-Leone A, Fregni F. Repeated sessions of noninvasive brain DC stimulation is associated with motor function improvement in stroke patients. *Restor Neurol Neurosci*. 2007;25(2):123-9.
  12. Boggio PS, Rocha RR, da Silva MT, Fregni F. Differential modulatory effects of transcranial direct current stimulation on a facial expression go-no-go task in males and females. *Neurosci Lett*. 2008;447(2-3):101-5.
  13. Boggio PS, Rigonatti SP, Ribeiro RB, Myczkowski ML, Nitsche MA, Pascual-Leone A, Fregni F. A randomized, double-blind clinical trial on the efficacy of cortical direct current stimulation for the treatment of major depression. *Int J Neuropsychopharmacol*. 2008;11(2):249-54.
  14. Boggio PS, Sultani N, Fecteau S, Merabet L, Mecca T, Pascual-Leone A, Basaglia A, Fregni F. Prefrontal cortex modulation using transcranial DC stimulation reduces alcohol craving: a double-blind, sham-controlled study. *Drug Alcohol Depend*. 2008;92(1-3):55-60.
  15. Boggio PS, Zaghi S, Fregni F. Modulation of emotions associated with images of human pain using anodal transcranial direct current stimulation (tDCS). *Neuropsychologia*. 2009;47(1):212-7.
  16. Boggio PS, Zaghi S, Lopes M, Fregni F. Modulatory effects of anodal transcranial direct current stimulation on perception and pain thresholds in healthy volunteers. *Eur J Neurol*. 2008;15(10):1124-30.
  17. Boggio PS, Ferrucci R, Mameli F, Martins D, Martins O, Vergari M, Tadini L, Scarpini E, Fregni F, Priori A. Prolonged visual memory enhancement after direct current stimulation in Alzheimer's disease. *Brain Stimul*. 2011 Jul 27.

18. Bolognini N, Pascual-Leone A, Fregni F. Using non-invasive brain stimulation to augment motor training-induced plasticity. *J Neuroeng Rehabil.* 2009;6:8.
19. Bolognini N, Vallar G, Casati C, Latif LA, El-Nazer R, Williams J, Banco E, Macea DD, Tesio L, Chessa C, Fregni F. Neurophysiological and behavioral effects of tDCS combined with constraint-induced movement therapy in poststroke patients. *Neurorehabil Neural Repair.* 2011 Nov-Dec;25(9):819-29.
20. Borckardt JJ, Bikson M, Frohman H, Reeves ST, Datta A, Bansal V, Madan A, Barth K, George MS. A Pilot Study of the Tolerability and Effects of High-Definition Transcranial Direct Current Stimulation (HD-tDCS) on Pain Perception. *J Pain.* 2011 Nov 18.
21. Boros K, Poreisz C, Münchau A, Paulus W, Nitsche MA. Premotor transcranial direct current stimulation (tDCS) affects primary motor excitability in humans. *Eur J Neurosci.* 2008;27(5):1292-300.
22. Brunoni AR, Valiengo L, Zanao T, de Oliveira JF, Bensenor IM, Fregni F. Manic psychosis after sertraline and transcranial direct-current stimulation. *J Neuropsychiatry Clin Neurosci.* 2011 Summer;23(3):E4-5.
23. Brunoni AR, Fregni F, Pagano RL. Translational research in transcranial direct current stimulation (tDCS): a systematic review of studies in animals. *Rev Neurosci.* 2011;22(4):471-81. Review.
24. Chadaide Z, Arlt S, Antal A, Nitsche MA, Lang N, Paulus W. Transcranial direct current stimulation reveals inhibitory deficiency in migraine. *Cephalalgia.* 2007;27(7):833-9.
25. Cogiamanian F, Marceglia S, Ardolino G, Barbieri S, Priori A. Improved isometric force endurance after transcranial direct current stimulation over the human motor cortical areas. *Eur J Neurosci.* 2007;26(1):242-9.
26. Csifcsak G, Antal A, Hillers F, Levold M, Bachmann CG, Happe S, Nitsche MA, Ellrich J, Paulus W. Modulatory effects of transcranial direct current stimulation on laser-evoked potentials. *Pain Med.* 2009;10(1):122-32.
27. Datta A, Baker JM, Bikson M, Fridriksson J. Individualized model predicts brain current flow during transcranial direct-current stimulation treatment in responsive stroke patient. *Brain Stimul.* 2011 Jul;4(3):169-74.

28. Edwards DJ, Krebs HI, Rykman A, Zipse J, Thickbroom GW, Mastaglia FL, Pascual-Leone A, Volpe BT. Raised corticomotor excitability of M1 forearm area following anodal tDCS is sustained during robotic wrist therapy in chronic stroke. *Restor Neurol Neurosci.* 2009;27(3):199-207.
29. Elmer S, Burkard M, Renz B, Meyer M, Jancke L. Direct current induced short-term modulation of the left dorsolateral prefrontal cortex while learning auditory presented nouns. *Behav Brain Funct.* 2009;5(1):29.
30. Faber M, Vanneste S, Fregni F, De Ridder D. Top down prefrontal affective modulation of tinnitus with multiple sessions of tDCS of dorsolateral prefrontal cortex. *Brain Stimul.* 2011 Oct 5.
31. Ferrucci R, Mameli F, Guidi I, Mrakic-Sposta S, Vergari M, Marceglia S, Cogiamanian F, Barbieri S, Scarpini E, Priori A. Transcranial direct current stimulation improves recognition memory in Alzheimer disease. *Neurology.* 2008;71(7):493-8.
32. Ferrucci R, Marceglia S, Vergari M, Cogiamanian F, Mrakic-Sposta S, Mameli F, Zago S, Barbieri S, Priori A. Cerebellar transcranial direct current stimulation impairs the practice-dependent proficiency increase in working memory. *J Cogn Neurosci.* 2008;20(9):1687-97.
33. Fecteau S, Knoch D, Fregni F, Sultani N, Boggio P, Pascual-Leone A. Diminishing risk-taking behavior by modulating activity in the prefrontal cortex: a direct current stimulation study. *J Neurosci.* 2007;27(46):12500-5.
34. Fecteau S, Pascual-Leone A, Zald DH, Liguori P, Théoret H, Boggio PS, Fregni F. Activation of prefrontal cortex by transcranial direct current stimulation reduces appetite for risk during ambiguous decision making. *J Neurosci.* 2007;27(23):6212-8.
35. Frank E, Schecklmann M, Landgrebe M, Burger J, Kreuzer P, Poepl TB, Kleinjung T, Hajak G, Langguth B. Treatment of chronic tinnitus with repeated sessions of prefrontal transcranial direct current stimulation: outcomes from an open-label pilot study. *J Neurol.* 2011;
36. Fregni F, Boggio PS, Lima MC, Ferreira MJ, Wagner T, Rigonatti SP, Castro AW, Souza DR, Riberto M, Freedman SD, Nitsche MA, Pascual-Leone A. A sham-controlled, phase II trial of transcranial direct current stimulation for the treatment of central pain in traumatic spinal cord injury. *Pain.* 2006;122(1-2):197-209.

37. Fregni F, Boggio PS, Mansur CG, Wagner T, Ferreira MJL, Lima M, Rigonatti, Marcolin MA, Freedman SD, Nitsche MA, Pascual-Leone A: Transcranial direct current stimulation of the unaffected hemisphere in stroke patients. *Neuroreport* 2005;16:1551-1555.
38. Fregni F, Boggio PS, Nitsche M, Berman F, Antal A, Feredoes E, Marcolin MA, Rigonatti SP, Silva MTA, Paulus W, Pascual-Leone A: Anodal transcranial direct current stimulation of prefrontal cortex enhances working memory. *Exp Brain Res* 2005;166: 23-30.
39. Fregni F, Boggio PS, Santos MC, Lima M, Vieira AL, Rigonatti SP, Silva MT, Barbosa ER, Nitsche MA, Pascual-Leone A. Noninvasive cortical stimulation with transcranial direct current stimulation in Parkinson's disease. *Mov Disord.* 2006;21(10):1693-702.
40. Fregni F, Gimenes R, Valle AC, Ferreira MJ, Rocha RR, Natalle L, Bravo R, Rigonatti SP, Freedman SD, Nitsche MA, Pascual-Leone A, Boggio PS. A randomized, sham-controlled, proof of principle study of transcranial direct current stimulation for the treatment of pain in fibromyalgia. *Arthritis Rheum.* 2006;54(12):3988-98.
41. Fregni F, Liebetanz D, Monte-Silva KK, Oliveira MB, Santos AA, Nitsche MA, Pascual-Leone A, Guedes RC. Effects of transcranial direct current stimulation coupled with repetitive electrical stimulation on cortical spreading depression. *Exp Neurol.* 2007;204(1):462-6.
42. Fregni F, Liguori P, Fecteau S, Nitsche MA, Pascual-Leone A, Boggio PS. Cortical stimulation of the prefrontal cortex with transcranial direct current stimulation reduces cue-provoked smoking craving: a randomized, sham-controlled study. *J Clin Psychiatry.* 2008;69(1):32-40.
43. Fregni F, Orsati F, Pedrosa W, Fecteau S, Tome FA, Nitsche MA, Mecca T, Macedo EC, Pascual-Leone A, Boggio PS. Transcranial direct current stimulation of the prefrontal cortex modulates the desire for specific foods. *Appetite.* 2008;51(1):34-41.
44. Furubayashi T, Terao Y, Arai N, Okabe S, Mochizuki H, Hanajima R, Hamada M, Yugeta A, Inomata-Terada S, Ugawa Y. Short and long duration transcranial direct current stimulation (tDCS) over the human hand motor area. *Exp Brain Res.* 2008;185(2):279-86.
45. Galea JM, Jayaram G, Ajagbe L, Celnik P. Modulation of cerebellar excitability by polarity-specific noninvasive direct current stimulation. *J Neurosci.* 2009;29(28):9115-22.

46. Galvez V, Alonzo A, Martin D, Mitchell P, Sachdev P, Loo C. Hypomania induction in a bipolar II patient with transcranial Direct Current Stimulation (tDCS). *Journal of ECT* 2011; 27(3):256-258
47. Giglia G, Mattaliano P, Puma A, Rizzo S, Fierro B, Brighina F. Neglect-like effects induced by tDCS modulation of posterior parietal cortices in healthy subjects. *Brain Stimul.* 2011 Oct;4(4):294-9.
48. Grundmann L, Rolke R, Nitsche MA, Pavlakovic G, Happe S, Treede RD, Paulus W, Bachmann CG. Effects of transcranial direct current stimulation of the primary sensory cortex on somatosensory perception. *Brain Stimul.* 2011 Oct;4(4):253-60. Epub 2011 Jan 8.
49. Hammer A, Mohammadi B, Schmicker M, Saliger S, Münte TF. Errorless and errorful learning modulated by transcranial direct current stimulation. *BMC Neurosci.* 2011 Jul 22;12:72.
50. Hasan A, Nitsche MA, Herrmann M, Schneider-Axmann T, Marshall L, Gruber O, Falkai P, Wobrock T. Impaired long-term depression in schizophrenia: a cathodal tDCS pilot study. *Brain Stimul.* 2011 Sep 5.
51. Hesse S, Werner C, Schonhardt EM, Bardeleben A, Jenrich W, Kirker SG. Combined transcranial direct current stimulation and robot-assisted arm training in subacute stroke patients: a pilot study. *Restor Neurol Neurosci.* 2007;25(1):9-15.
52. Hesse S, Waldner A, Mehrholz J, Tomelleri C, Pohl M, Werner C. Combined transcranial direct current stimulation and robot-assisted arm training in subacute stroke patients: an exploratory, randomized multicenter trial. *Neurorehabil Neural Repair.* 2011 Nov-Dec;25(9):838-46.
53. Hunter T, Sacco P, Nitsche MA, Turner DL. Modulation of internal model formation during force field-induced motor learning by anodal transcranial direct current stimulation of primary motor cortex. *J Physiol.* 2009;587(Pt 12):2949-61.
54. Jacobson L, Ezra A, Berger U, Lavidor M. Modulating oscillatory brain activity correlates of behavioral inhibition using transcranial direct current stimulation. *Clin Neurophysiol.* 2011;
55. Jacobson L, Koslowsky M, Lavidor M. tDCS polarity effects in motor and cognitive domains: a meta-analytical review. *Exp Brain Res.* 2011;
56. Jang SH, Ahn SH, Byun WM, Kim CS, Lee MY, Kwon YH. The effect of transcranial direct current stimulation on the cortical activation by

- motor task in the human brain: an fMRI study. *Neurosci Lett.* 2009;460(2):117-20.
57. Javadi AH, Cheng P, Walsh V. Short duration transcranial direct current stimulation (tDCS) modulates verbal memory. *Brain Stimul.* 2011;
  58. Javadi AH, Walsh V. Transcranial direct current stimulation (tDCS) of the left dorsolateral prefrontal cortex modulates declarative memory. *Brain Stimul.* 2011 Jul 26.
  59. Jeffery DT, Norton JA, Roy FD, Gorassini MA. Effects of transcranial direct current stimulation on the excitability of the leg motor cortex. *Exp Brain Res.* 2007;182(2):281-7.
  60. Jo JM, Kim YH, Ko MH, Ohn SH, Joen B, Lee KH. Jo JM, Kim YH, Ko MH, Ohn SH, Joen B, Lee KH. Enhancing the working memory of stroke patients using tDCS. *Am J Phys Med Rehabil.* 2009;88(5):404-9.
  61. Kalu UG, Sexton CE, Loo CK, Ebmeier KP. Transcranial direct current stimulation in the treatment of major depression: a meta-analysis; *Psychological Medicine*, Page 1 of 10.
  62. Keiser D, Meindl T, Bor J, Palm U, Pogarell O, Mulert C, Brunelin J, Möller HJ, Reiser M, Padberg F. Prefrontal transcranial direct current stimulation changes connectivity of resting-state networks during fMRI. *J Neurosci.* 2011 Oct 26;31(43):15284-93.
  63. Kim CR, Kim DY, Kim LS, Chun MH, Kim SJ, Park CH. Modulation of cortical activity after anodal transcranial direct current stimulation of the lower limb motor cortex: a functional MRI study. *Brain Stimul.* 2011;
  64. Kincses TZ, Antal A, Nitsche MA, Bártfai O, Paulus W: Facilitation of probabilistic classification learning by transcranial direct current stimulation of the prefrontal cortex in the human. *Neuropsychologia* 2003;42:113-117.
  65. Knoch D, Nitsche MA, Fischbacher U, Eisenegger C, Pascual-Leone A, Fehr E. Studying the neurobiology of social interaction with transcranial direct current stimulation--the example of punishing unfairness. *Cereb Cortex.* 2008;18(9):1987-90.
  66. Kwon YH, Ko MH, Ahn SH, Kim YH, Song JC, Lee CH, Chang MC, Jang SH. Primary motor cortex activation by transcranial direct current stimulation in the human brain. *Neurosci Lett.* 2008;435(1):56-9. Lang N, Nitsche MA, Paulus W, Rothwell JC,

- Lemon R: Effects of transcranial DC stimulation over the human motor cortex on corticospinal and transcallosal excitability. *Exp Brain Res* 2004;156:439-443.
67. Ladeira A, Fregni F, Campanhã C, Valasek CA, De Ridder D, Brunoni AR, Boggio PS. Polarity-dependent transcranial direct current stimulation effects on central auditory processing. *PLoS One*. 2011;
  68. Lang N, Siebner HR, Chadaide Z, Boros K, Nitsche MA, Rothwell JC, Paulus W, Antal A. Bidirectional modulation of primary visual cortex excitability: a combined tDCS and rTMS study. *Invest Ophthalmol Vis Sci*. 2007;48(12):5782-7.
  69. Leite J, Carvalho S, Fregni F, Gonçalves ÓF. Task-specific effects of tDCS-induced cortical excitability changes on cognitive and motor sequence set shifting performance. *PLoS One*. 2011;
  70. Liebetanz D, Fregni F, Monte-Silva KK, Oliveira MB, Amâncio-dos-Santos A, Nitsche MA, Guedes RC. After-effects of transcranial direct current stimulation (tDCS) on cortical spreading depression. *Neurosci Lett*. 2006;398(1-2):85-90.
  71. Loo CK, Sachdev P, Martin DM, Pigot M, Alonzo A, Malhi GS, Lagopoulos J, & Mitchell P. A double-blind, sham-controlled trial of transcranial direct current stimulation for the treatment of depression. *International Journal of Neuropsychopharmacology* 2010; 13:61-69.
  72. Loo CK, Martin DM, Alonzo A, Gandevia S, Mitchell PB, Sachdev P. Avoiding Skin Burns with Transcranial Direct Current Stimulation: Preliminary Considerations. *International Journal of Neuropsychopharmacology*, 2011;14(3):425-6.
  73. Loo CK, Alonzo A, Martin DM, Mitchell PB, Galvez V, Sachdev P. Transcranial direct current stimulation for depression: 3-week, randomised, sham-controlled trial. *British Journal of Psychiatry* 2012; 200: 52-59.
  74. Mattai A, Miller R, Weisinger B, Greenstein D, Bakalar J, Tossell J, David C, Wassermann EM, Rapoport J, Gogtay N. Tolerability of transcranial direct current stimulation in childhood-onset schizophrenia. *Brain Stimul*. 2011 Oct;4(4):275-80.
  75. Marshall L, Molle M, Hallschmid M, Born J: Transcranial direct current stimulation during sleep improves declarative memory. *J Neurosci* 2004;24:9985-9992.

76. McKinley RA, Bridges N, Walters CM, Nelson J. Modulating the brain at work using noninvasive transcranial stimulation. *Neuroimage*. 2012 Jan 2;59(1):129-37.
77. Monti A, Cogiamanian F, Marceglia S, Ferrucci R, Mameli F, Mrakic-Sposta S, Vergari M, Zago S, Priori A. Improved naming after transcranial direct current stimulation in aphasia. *J Neurol Neurosurg Psychiatry*. 2008;79(4):451-3.
78. Mordillo-Mateos L, Turpin-Fenoll L, Millán-Pascual J, Núñez-Pérez N, Panyavin I, Gómez-Argüelles JM, Botia-Paniagua E, Foffani G, Lang N, Oliviero A. Effects of simultaneous bilateral tDCS of the human motor cortex. *Brain Stimul*. 2011;
79. Murphy DN, Boggio P, Fregni F. Transcranial direct current stimulation as a therapeutic tool for the treatment of major depression: insights from past and recent clinical studies. *Curr Opin Psychiatry*. 2009;22(3):306-11.
80. Nakamura-Palacios EM, de Almeida Benevides MC, da Penha Zago-Gomes M, de Oliveira RW, de Vasconcellos VF, de Castro LN, da Silva MC, Ramos PA, Fregni F. Auditory event-related potentials (P3) and cognitive changes induced by frontal direct current stimulation in alcoholics according to Lesch alcoholism typology. *Int J Neuropsychopharmacol*. 2011 Jul 22:1-16.
81. Nitsche MA, Doemkes S, Karaköse T, Antal A, Liebetanz D, Lang N, Tergau F, Paulus W. Shaping the effects of transcranial direct current stimulation of the human motor cortex. *J Neurophysiol*. 2007;97(4):3109-17.
82. Nitsche MA, Paulus W: Excitability changes induced in the human motor cortex by weak transcranial direct current stimulation. *J Physiol* 2000;527:633-639.
83. Nitsche, MA, Paulus W: Sustained excitability elevations induced by transcranial DC motor cortex stimulation in humans. *Neurology* 2001;57:1899-1901.
84. Nitsche MA, Schauenburg A, Lang N, Liebetanz D, Exner C, Paulus W, Tergau F: Facilitation of implicit motor learning by weak transcranial direct current stimulation of the primary motor cortex in the human. *J Cog Neurosci* 2003;15:619-626.
85. Nitsche MA, Seeber A, Frommann K, Klein CC, Nitsche MS, Rochford C, Liebetanz D, Lang N, Antal A, Paulus W, Tergau F: Modulating parameters of excitability during and after transcranial direct

- current stimulation of the human motor cortex. *J Physiol* 2005;568: 291-303.
86. Ohn SH, Park CI, Yoo WK, Ko MH, Choi KP, Kim GM, Lee YT, Kim YH. Time-dependent effect of transcranial direct current stimulation on the enhancement of working memory. *Neuroreport*. 2008;19(1):43-7.
  87. Palm U, Schiller C, Fintescu Z, Obermeier M, Keeser D, Reisinger E, Pogarell O, Nitsche MA, Möller HJ, Padberg F. Transcranial direct current stimulation in treatment resistant depression: a randomized double-blind, placebo-controlled study. *Brain Stimul*. 2011;
  88. Peña-Gómez C, Vidal-Piñeiro D, Clemente IC, Pascual-Leone Á, Bartrés-Faz D. Down-regulation of negative emotional processing by transcranial direct current stimulation: effects of personality characteristics. 2011;6(7)
  89. Peña-Gómez C, Sala-Lonch R, Junqué C, Clemente IC, Vidal D, Bargalló N, Falcón C, Valls-Solé J, Pascual-Leone A, Bartrés-Faz D. Modulation of large-scale brain networks by transcranial direct current stimulation evidenced by resting-state functional MRI. *Brain Stimul*. 2011;
  90. Plazier M, Joos K, Vanneste S, Ost J, De Ridder D. Bifrontal and bioccipital transcranial direct current stimulation (tDCS) does not induce mood changes in healthy volunteers: a placebo controlled study. *Brain Stimul*. 2011 Aug 5.
  91. Power HA, Norton JA, Porter CL, Doyle Z, Hui I, Chan KM. Transcranial direct current stimulation of the primary motor cortex affects cortical drive to human musculature as assessed by intermuscular coherence. *J Physiol*. 2006;577(Pt 3):795-803.
  92. Ragert P, Vandermeeren Y, Camus M, Cohen LG. Improvement of spatial tactile acuity by transcranial direct current stimulation. *Clin Neurophysiol*. 2008;119(4):805-11.
  93. Quartarone A, Lang N, Rizzo V, Bagnato S, Morgante F, Sant'angelo A, Crupi D, Battaglia F, Messina C, Girlanda P. Motor cortex abnormalities in amyotrophic lateral sclerosis with transcranial direct-current stimulation. *Muscle Nerve*. 2007;35(5):620-4.
  94. Reis J, Fritsch B. Modulation of motor performance and motor learning by transcranial direct current stimulation. *Curr Opin Neurol*. 2011 Dec;24(6):590-6.

95. Riedel P, Kabisch S, Ragert P, von Kriegstein K. Contact dermatitis after transcranial direct current stimulation. *Brain Stimul.* 2011;
96. Roche N, Lackmy A, Achache V, Bussel B, Katz R. Effects of anodal tDCS on lumbar propriospinal system in healthy subjects. *Clin Neurophysiol.* 2011 Oct 18.
97. Rogalewski A, Breitenstein C, Nitsche MA, Paulus W, Knecht S: Transcranial direct current stimulation disrupts tactile perception. *Eur J Neurosci* 2004;20:313-316.
98. Roizenblatt S, Fregni F, Gimenez R, Wetzel T, Rigonatti SP, Tufik S, Boggio PS, Valle AC. Site-specific effects of transcranial direct current stimulation on sleep and pain in fibromyalgia: a randomized, sham-controlled study. *Pain Pract.* 2007;7(4):297-306.
99. Rosenkranz K, Nitsche MA, Tergau F, Paulus W. Diminution of transient motor cortex plasticity by weak transcranial direct current stimulation in the human. *Neurosci Lett* 2000;296:61-63.
100. Schlaug G, Renga V, Nair D. Transcranial direct current stimulation in stroke recovery. *Arch Neurol.* 2008;65(12):1571-6.
101. Schlaug G, Renga V. Transcranial direct current stimulation: a noninvasive tool to facilitate stroke recovery. *Expert Rev Med Devices.* 2008;5(6):759-68.
102. Schlaug G, Marchina S, Wan CY. The use of non-invasive brain stimulation techniques to facilitate recovery from post-stroke aphasia. *Neuropsychol Rev.* 2011 Sep;21(3):288-301.
103. Siebner HR, Lang N, Rizzo V, Nitsche MA, Paulus W, Lemon RN, Rothwell JC.: Preconditioning of low-frequency repetitive transcranial magnetic stimulation with transcranial direct current stimulation: evidence for homeostatic plasticity in the human motor cortex. *J Neurosci* 2004;24:3379-3385.
104. Sparing R, Dafotakis M, Meister IG, Thirugnanasambandam N, Fink GR. Enhancing language performance with non-invasive brain stimulation--a transcranial direct current stimulation study in healthy humans. *Neuropsychologia.* 2008;46(1):261-8.
105. Tanaka S, Hanakawa T, Honda M, Watanabe K. Enhancement of pinch force in the lower leg by anodal transcranial direct current stimulation. *Exp Brain Res.* 2009;196(3):459-65.
106. Tanaka S, Sandrini M, Cohen LG. Modulation of motor learning and memory formation by non-invasive cortical stimulation of the

- primary motor cortex. *Neuropsychol Rehabil.* 2011 Oct;21(5):650-75.
107. Teo F, Hoy KE, Daskalakis ZJ, Fitzgerald PB. Investigating the Role of Current Strength in tDCS Modulation of Working Memory Performance in Healthy Controls. *Front Psychiatry.* 2011;2:45.
108. Terney D, Bergmann I, Poreisz C, Chaieb L, Boros K, Nitsche MA, Paulus W, Antal A. Pergolide increases the efficacy of cathodal direct current stimulation to reduce the amplitude of laser-evoked potentials in humans. *J Pain Symptom Manage.* 2008;36(1):79-91.
109. Vanneste S, Langguth B, De Ridder D. Do tDCS and TMS influence tinnitus transiently via a direct cortical and indirect somatosensory modulating effect? A combined TMS-tDCS and TENS study. *Brain Stimul.* 2011 Oct;4(4):242-52.
110. Vanneste S, De Ridder D. Bifrontal transcranial direct current stimulation modulates tinnitus intensity and tinnitus-distress-related brain activity. *Eur J Neurosci.* 2011 Aug;34(4):605-14.
111. Varga ET, Terney D, Atkins MD, Nikanorova M, Jeppesen DS, Uldall P, Hjalgrim H, Beniczky S. Transcranial direct current stimulation in refractory continuous spikes and waves during slow sleep: a controlled study. *Epilepsy Res.* 2011 Nov;97(1-2):142-5.
112. Venkatakrisnan A, Sandrini M. Combining Transcranial Direct Current Stimulation and neuroimaging: Novel insights in understanding neuroplasticity. *J Neurophysiol.* 2011 Aug 10.
113. Vines BW, Cerruti C, Schlaug G. Dual-hemisphere tDCS facilitates greater improvements for healthy subjects' non-dominant hand compared to uni-hemisphere stimulation. *BMC Neurosci.* 2008;9:103.
114. Webster BR, Celnik PA, Cohen LG. Noninvasive brain stimulation in stroke rehabilitation. *NeuroRx.* 2006;3(4):474-81.
115. Zaehle T, Beretta M, Jäncke L, Herrmann CS, Sandmann P. Excitability changes induced in the human auditory cortex by transcranial direct current stimulation: direct electrophysiological evidence. *Exp Brain Res.* 2011 Nov;215(2):135-40.

## ***Contact Information***

Soterix Medical Inc.  
160 Convent Avenue  
Room ST-142  
New York, NY 10031  
Fax: 212-315-3232  
[www.SoterixMedical.com](http://www.SoterixMedical.com)  
[contact@soterixmedical.com](mailto:contact@soterixmedical.com)

Thank you for purchasing a **Soterix Medical 1x1** Transcranial Direct Current Model 1300A Low-Intensity Stimulator.



If you arrive at a problem, or have any questions, comments, or concerns, please feel free to contact us at [SoterixMedical.com](http://SoterixMedical.com)

