

## STMEPM-MRI – ELECTRICAL STIMULATION SYSTEM DESIGNED FOR MRI OR FMRI

The STMEPM-MRI Programmable Stimulation System for E-Prime allows a user to interface the STM100C Stimulator with E-Prime to control the stimulus frequency and stimulus intensity for real-time stimulus delivery changes based on a subject's responses. It is also possible to hardcode the stimulus intensity levels in the presentation so that predefined stimulus levels are delivered during the E-Prime presentation. This MRI system is similar to the standard STMEPM but adds requisite elements to make it fully functional for stimulation requirements in fMRI and MRI.



The **STMEPM-MRI System** includes

- STM100C Stimulator Module
- STMISOC Stimulus Isolation Adapter
- Measurement Computing USB 4-ch D/A Unit
- Software Utility (STM100C<--> E-Prime) with sample E-Prime experiment
- IPS100C Isolated Power Supply
- MECMRI-STMISO MRI Filter/Cable Set
- Interface Cables: CBLEPM for E-Prime; CBL100 3.5 mm
- CBLCFMA Current Feedback Cable
- LEAD108C Electrode Leads (2)
- EL509 Disposable Dry Electrodes
- GEL104 Salt-free, Chloride-free Electrically Conductive Gel

The sample E-Prime experiment provides the necessary interface commands to communicate with the D/A unit. The D/A unit provides the STM100C with the appropriate voltage levels to stimulate a subject. The system supports up to four STM100C (and includes one).

### SPECIFICATIONS

STM100C Stimulator Module: see specs [here](#)

STMISOC Stimulus Isolation Adapter: see specs [here](#)

IPS100C Isolated Power Supply: see specs [here](#)

MECMRI-STMISO MRI Filter/Cable Set: see specs [here](#)

CBLCFMA Current Feedback Cable: see specs [here](#)

CBLEPM connection cable x 4: 3.5 mm to 2 x tinned wire (STMISOLA to D/A card)

D/A Unit: High-speed multifunction module with eight 13-bit, 1 MS/s analog inputs and four 12-bit, 1 MS/s analog outputs

- Four 12-bit,  $\pm 10$  V analog outputs with 1 MS/s update rate
- USB-bus powered (type: 2.0 high speed; compatibility: 1.1 or 2.0)
- 8 single-ended/4 differential analog inputs
- 13-bit resolution
- 1 MS/s sample rate
- Single-ended ranges:  $\pm 10$  V,  $\pm 5$  V,  $\pm 2.5$  V or 0 to 10 V
- Differential ranges:  $\pm 20$  V,  $\pm 10$  V, or  $\pm 5$  V
- 16 digital I/O lines
- Two 32-bit counters
- One 32-bit PWM timer output

LEAD108C Electrode Lead: see specs [here](#)

EL509 Disposable Electrode: see specs [here](#)

GEL104 Conductive Gel: see specs [here](#)

STMEPM-MRI is not subject to the same possible errant stimulation issues as the standard [STMEPM](#) might be if suitable patch panel filtering is not constructed. STMEPM-MRI setup is restricted in terms of pulse width (2 ms max) and only voltage controlled voltage stimulation is possible; stimulation of differing intensity can be generated under E-Prime control.

For implementation of subject electrical stimulation in the fMRI and MRI for the purposes of psychophysiological research, see [Application Note 282](#).

**IMPORTANT!** Read [Safe Use of Electrical Stimulators](#) - Application Note 257 for Comprehensive Safety Guidelines for Performing Electrical Stimulation on Subjects.