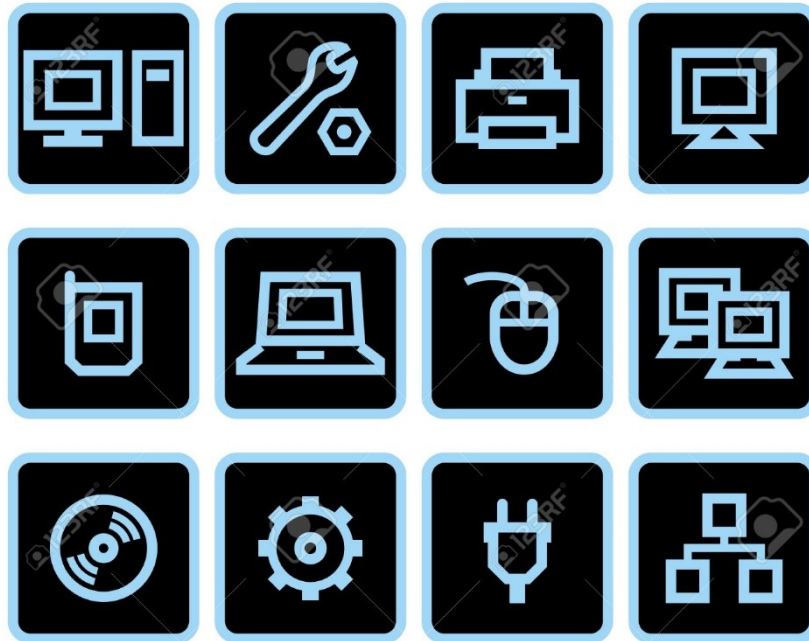# BrainX

Related Hardware

DISCLAIMER

We have used reasonable effort to include accurate and up-to-date information in this manual; it does not, however, make any warranties, conditions or representations as to its accuracy or completeness. We assume no liability or responsibility for any errors or omissions in the content of this manual. Your use of this manual is at your own risk. Under no circumstances and under no legal theory shall the authors be liable for any indirect, direct, special, incidental, punitive, exemplary, aggravated or consequential damages arising from your use of this manual.

Features and specifications of this software program are subject to change without notice. This manual contains information and images about BrainX, its user interface, GUI and its other signal processing algorithms, publications that are protected by copyright.

Sending Your Comments and Critiques: We'd like to hear from you. Your comments and suggestions for improving this document are welcome and appreciated. Please e-mail your feedback to BrainX@live.com

Thank you.

Contents

Warnings and Cautions

This software can be used to design paradigms for magnetoencephalography (MEG), electroencephalography (EEG) and functional resonance imaging (fMRI).

The following warnings and cautions appear in this guide. Please ensure you are aware of all the operations and interpretations.

Preface

BrainX is a powerful tool for designing and presenting tasks/paradigms/stimulations for MEG, EEG, fMRI, TMS. In addition, BrainX can also been used as a tool for designing and presenting tasks for psychology, psychiatry, neurology and other brain research. To complete all the works, a variety of hardware or peripheral devices may be involved. The hardware items or devices includes up to 8 parallel ports, serial ports, USB ports, specialized mice, keyboards, monitors, auditory monitoring system, video monitoring system, eye tracking systems, response boxes, etc.

Typical or special screens

Touchable and non-touchable screen can be used with BrainX. Touch screen events will generally appear as mouse clicks within BrainX. BrainX also has a special mode that should provide the touch location for most touch screens. We can provide compatible screen according users' specific task or requirements.

Typical or special keyboards

For typical task/paradigm/stimulation, a standard keyboard should work. However, in some specific condition (e.g. in operation room, infection room), some special keyboards may be necessary. Our company can provide some specialized keyboards for such kind of situation. BrainX has been designed to be able to customize for such kind of situation.

Typical or special mice

For typical task/paradigm/stimulation, a standard mouse should work. However, in some specific condition (e.g. in operation room, infection room), some special mice may be necessary. Our company can provide some specialized mice for such kind of situation. BrainX has been designed to be able to customize for such kind of situation.

Typical or special joysticks and game controllers

BrainX is based DirectX, which has been widely used for game programming. BrainX can access any DirectX compatible device. This includes almost all commercial game controllers and joysticks. You may use both button press responses and axis positions. In some specific condition (e.g. in operation room, infection room), some special joysticks and game controllers may be necessary. Our company can

provide some specialized mice for such kind of situation. BrainX has been designed to work with such kind of situation.

Typical or special auditory events

BrainX has powerful methods to record and check sound inputs. BrainX can monitor an auditory signal from a microphone and generate response events using a volume thresholding feature. You may also record the interval after each response to a file or send to other device wirelessly.

Standard serial port button devices

BrainX can support up to 8 serial ports, which means that up to 8 response devices can be supported. Button response devices using the standard serial port, which send unique codes either for each button event, or the complete state of the device as a single code for each button event, can be used by BrainX. BrainX enable user to check and monitor each port dynamically.

Standard Parallel digital I/O button devices

BrainX can support up to 8 serial ports, which means that up to 8 response devices can be supported. Button response devices which raise or lower the voltage on individual lines of a parallel digital cable can be used in BrainX when connected to either a standard parallel port, or digital I/O cards from National Instruments or Measurement Computing. For some parallel ports, BrainX can use hardware interrupts to handle response events.

Stimulators

BrainX's general port I/O facilities can be used to control some external devices. Port output can be produced on standard serial ports, standard parallel ports, digital output on National Instruments or Measurement Computing digital I/O cards, or analog output (not continuous waveforms) on National Instruments cards.

fMRI Scanners

BrainX can synchronize stimuli with port signals from external devices. BrainX's general port I/O facilities are used for this application, which includes standard serial ports, standard parallel ports (including interrupt mode for some ports), National Instruments or Measurement Computing digital I/O cards including pulse-triggered counters.

Eye Trackers

BrainX provides a general interface for controlling and accessing real time eye data from eye tracking systems. This interface must be implemented for each eye tracker in the form of a BrainX Eye Tracker Extension. To check the availability of an extension for you eye tracker, see the other tabs on this page, or contact your eye tracker manufacturer. In the event that no extension is available, some tracker data might be available using BrainX's general port I/O facilities, depending on the eye tracker.

Physiological Recording Systems

BrainX's general port I/O facilities can be used to send event information to physiological recording systems so that it can be embedded in the recorded data.

Matlab

BrainX provides an interface to Matlab which allows arbitrary execution of Matlab commands, and import of data into BrainX. Any devices supported within Matlab can potentially be used within BrainX this way.

External Software

BrainX provides a "plug-in" facility for interfacing BrainX to external software. These BrainX Extensions can be written by anyone and can be used to interface with devices not directly supported by BrainX. Details can be found in the BrainX documentation, and sample code is contained in the BrainX SDK available from the BrainX download page.

External Software