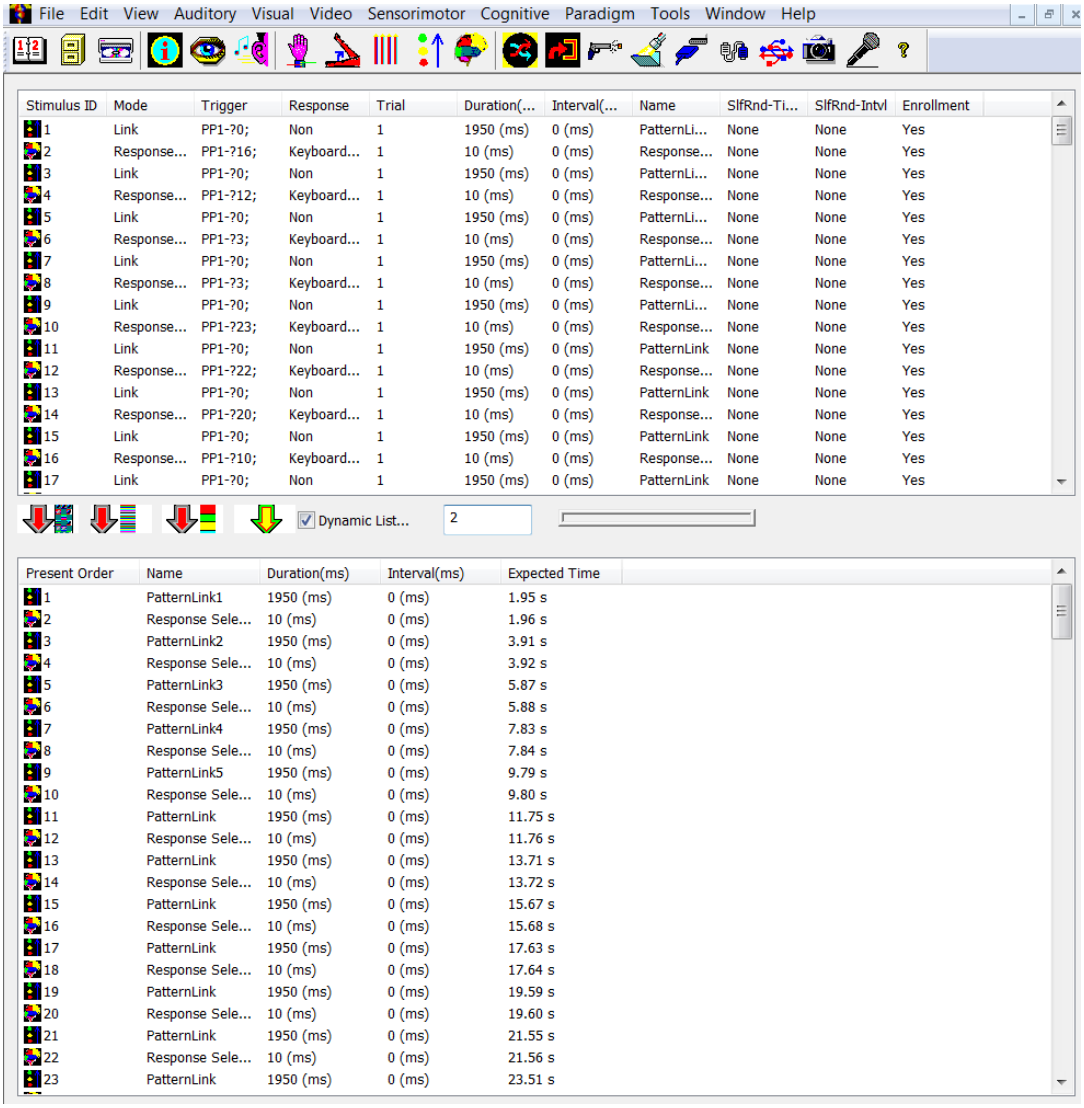
BrainX

Introduction (*Professional, Intuitive and Powerful*)



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 designed to be professional, intuitive and power. To reach the goals, all the stimulation modules have been tested by professional researchers/scientists/clinicians. The graphic user interface (GUI) has been optimized so that who are not familiar with EEG, MEG and fMRI can also use it.

What is BrainX?

BrainX is a stimulus delivery, experimental control and performance assessment software system for neuroscience and clinical assessments. BrainX runs on Windows and uses standard or customized computer hardware. BrainX was designed for behavioral and physiological experiments that collect fMRI, EEG (ERP), MEG (ERF), reaction time, and electrophysiological (e.g. single neuron) data. At the same time, BrainX is very flexible and has many features that make it applicable to a diverse range of applications (see Features). BrainX is designed to provide the best possible timing accuracy and timing verification on standard hardware (see Timing Overview). BrainX can be used to design sophisticated paradigm with a few clicks.

The strength of BrainX

In comparison to other similar software packages, BrainX has unique strength in timing, productivity and powerful.

Timing

Functional brain data (e.g. evoked potential or evoked magnetic fields) typically requires precise time. For example, accurate information about the actual time of events is often critical for data averaging. BrainX is optimized to provide precise time. To obtained precise time, BrainX uses system kernel drivers to:

(1) Directly control the hardware (video cards, audio cards, serial ports, parallel ports)

(2) Multi-threads to handle operating system and device drivers

(3) Monitor all input and output events

(4) Check and disable “interruption programs” such system background activity.

Productivity

BrainX has been developed and tested more than 20 years. It has many internal modules that have been well tested and debugged. Therefore, those modules can be used without any programming. Users can make a paradigm with a few clicks.

Powerful

BrainX has unique “stimulation patterns”, which includes parallel pattern, link pattern and response-pattern. Those patterns can include visual, auditory, video, somatosensory and motor stimuli. In addition, link pattern can include a parallel pattern and the response-pattern can include parallel and

link patterns. Furthermore, a response-selection pattern can include another response-selection pattern.

BrainX and DirectX

BrainX uses DirectX (version 9.0 and later) on windows. DirectX is a software library available for free from Microsoft. If you are unable to run BrainX and receive the error message you need to install DirectX.

The goal of the development of BrainX

Our design goals for BrainX is to extend support to Windows XP/Vista/7/8, enhance the power of the product, improve usability, and maintain compatibility with past releases in order to ensure an enticing and smooth upgrade path. We want to make BrainX an essential tool for anyone conducting fMRI/EEG/MEG and computer-based behavioral research. Towards these ends, BrainX 4 include the following new features: (1) Native support for 64-bit Windows; (2) Support for parallel port (PCI, PCI Express), serial port and USB port signaling. (3) Dynamically create and modify the timing and content of stimulus sequences. (4)Full support Unicode (e.g. Asian, Arabic, and Hebrew script). (5) Easy and flexible randomization. (6) Support joystick (DirectX compatible) for paradigms.