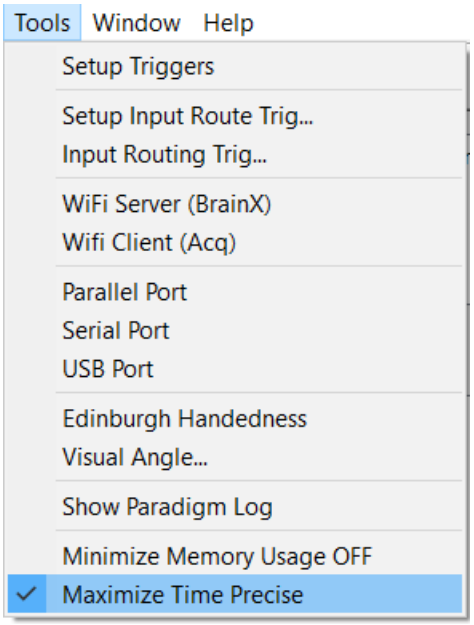
BrainX

Menu Tools



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).

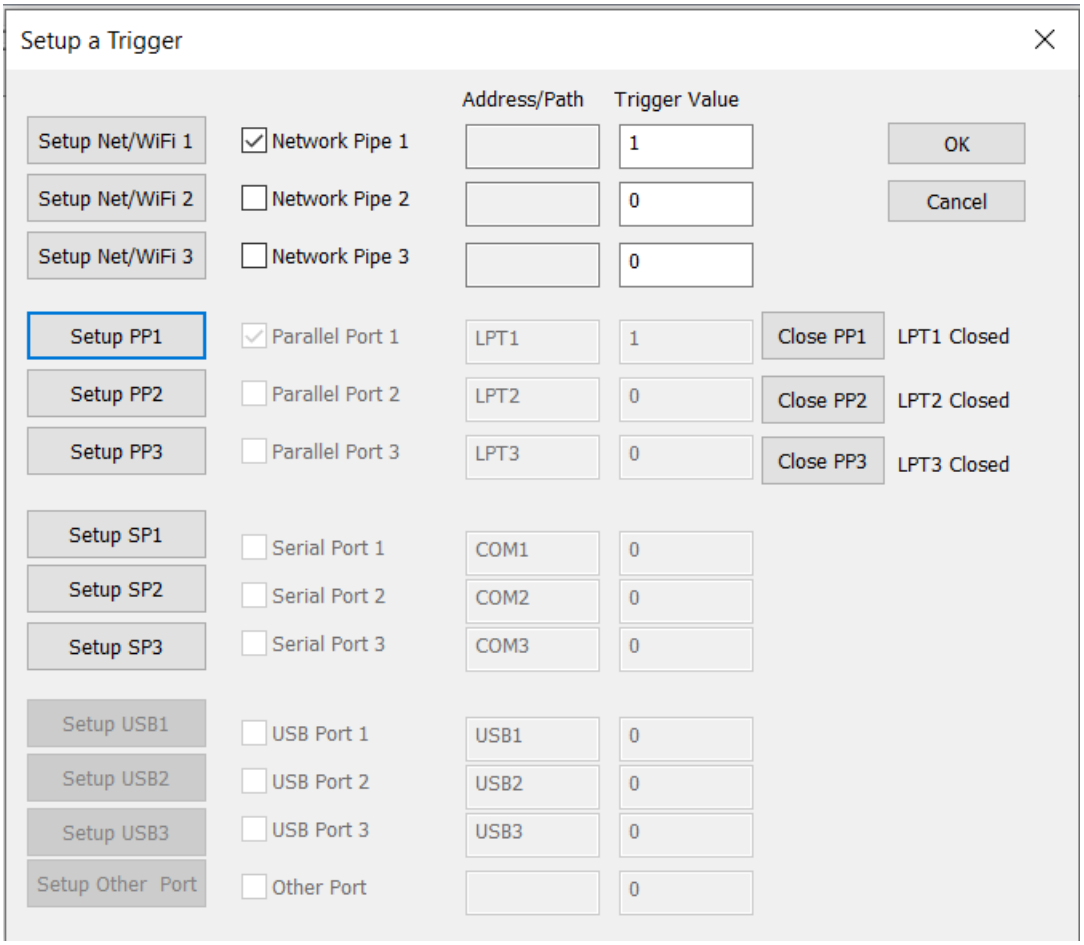
The following warnings and cautions appear in this guide. Please ensure you are aware of all the operations and interpretations.

General Information

The View menu includes all the tools for designing, controlling and preparing stimulation task/paradigm.

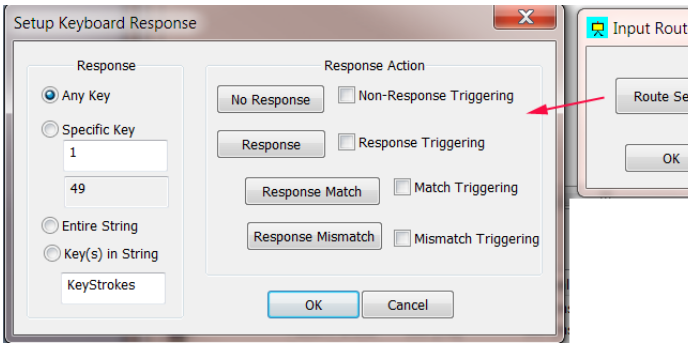
Setup Triggers

It shows a dialog for user to setup triggers. The program supports up to 9 ports for each stimulus.



Setup Input Route Trig

The Input Route Trigger is special kind of triggers, which do not belong to a specific stimulus or stimuli. In other words, this function will set a way to get the inputs (pressing of keyboard) to the trigger ports. Typically, this function is used to use input to triggering the MEG/EEG/fMRI systems.

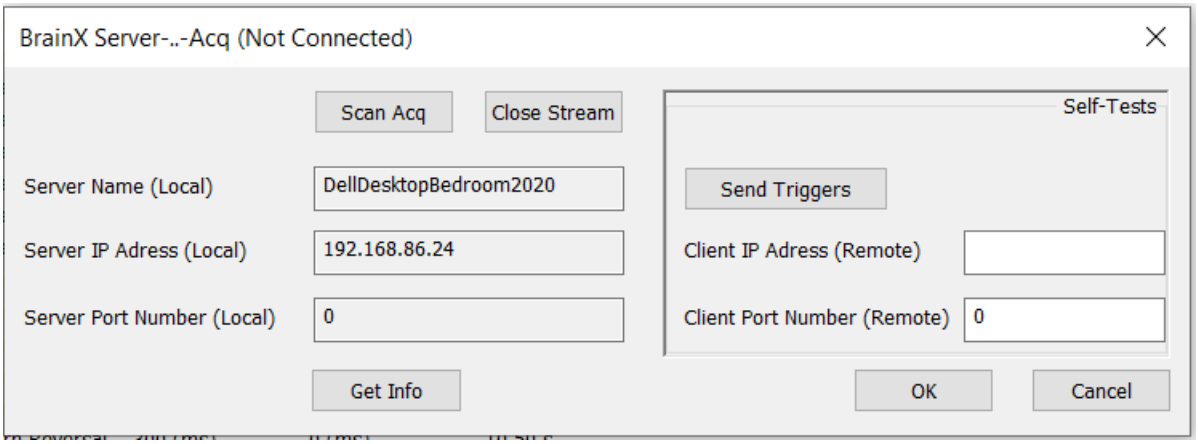


Input Routing Trig

It enables or disables the route triggering.

WiFi Server (BrainX)

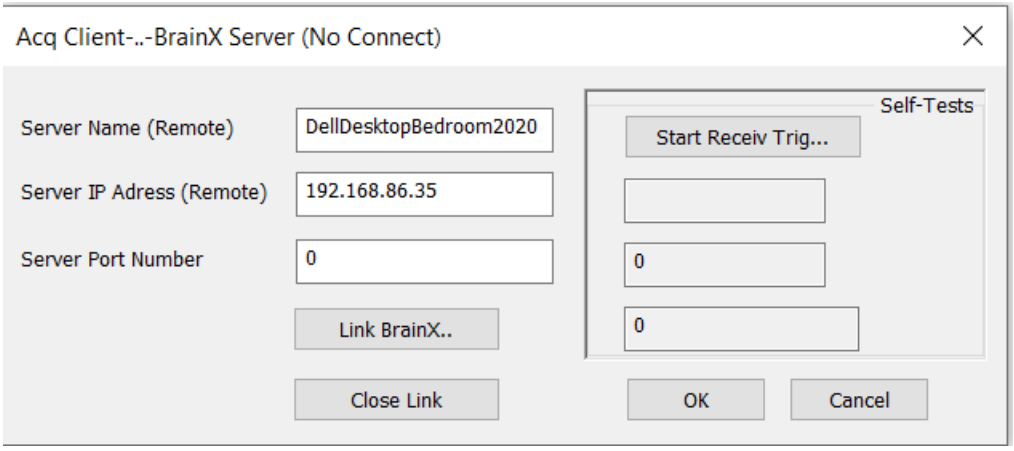
To synchronize stimulation (presentation) along with data acquisition, the stimulation software plays a role as a "server", which is listening and accepting connection request from data acquisition software. Once a connection is established, BrainX will send triggers to the acquisition software to synchronize the stimulation and recordings.



WiFi Client (Acq)

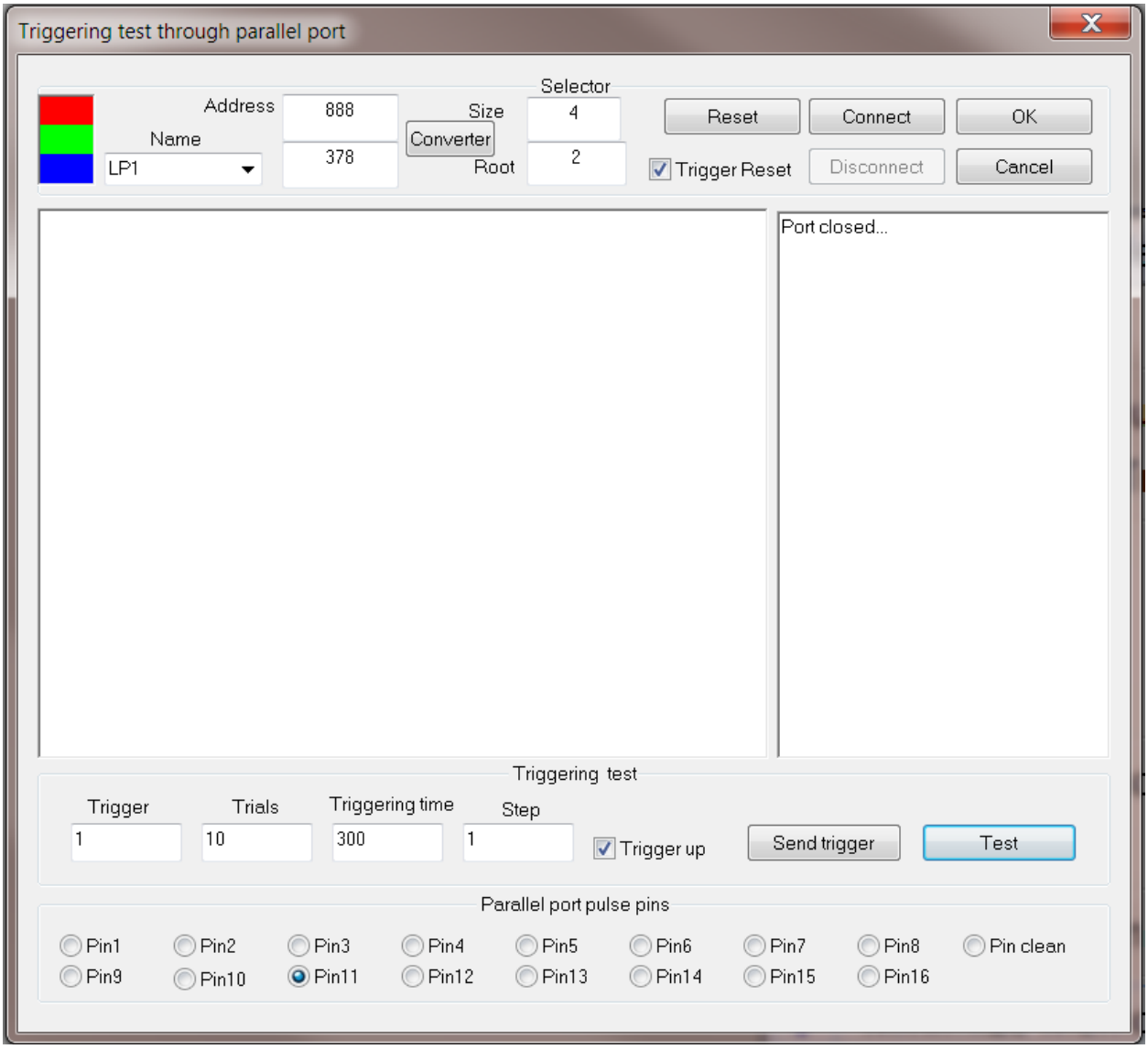
The Wi-Fi Client is designed to test the connection. Typically, the Wi-Fi server will send triggers from the BrainX to the data acquisition software (WiFi Client) during experiments. One well-tested data acquisition software is AcqManager, which has built-in Wi-Fi Client similar to the Wi-Fi Client in BrainX. When BrainX's Wi-Fi Server is started listening and accepting, the Wi-Fi Client in the AcqManager will request a connection.

Of note, Wi-Fi Client in AcqManager and Wi-Fi Server in BrainX Server are typically in two computers. The two computers can be wireless connected through the two functions.



Parallel Port

It shows a dialog for user to setup, test and define the parallel port for triggering.



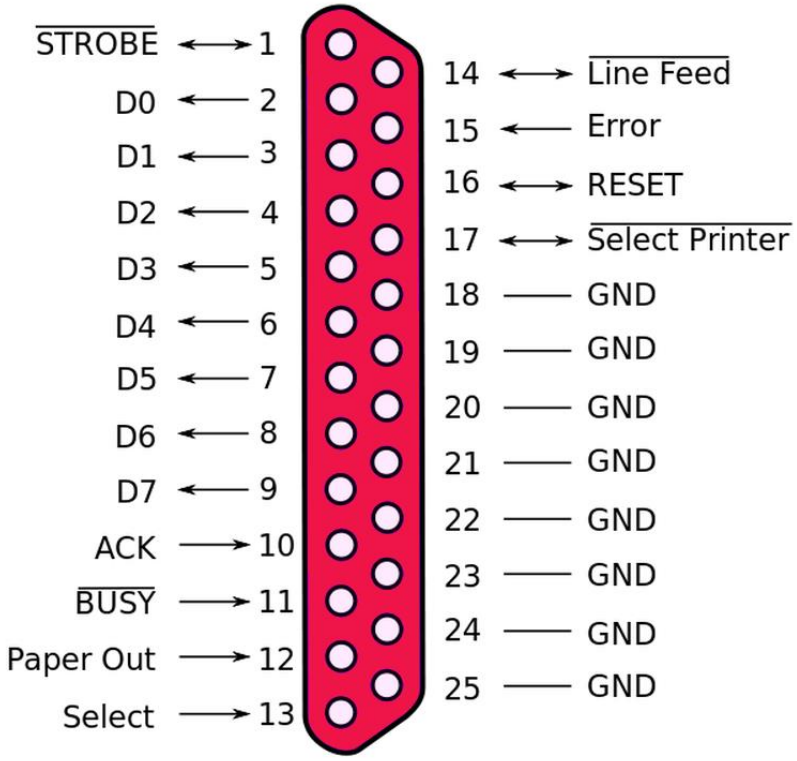
Most PC-compatible systems have one to three ports, with communication interfaces defined like this:

Logical parallel port 1: I/O port 0x3BC, IRQ 7 (usually in monochrome graphics adapters)

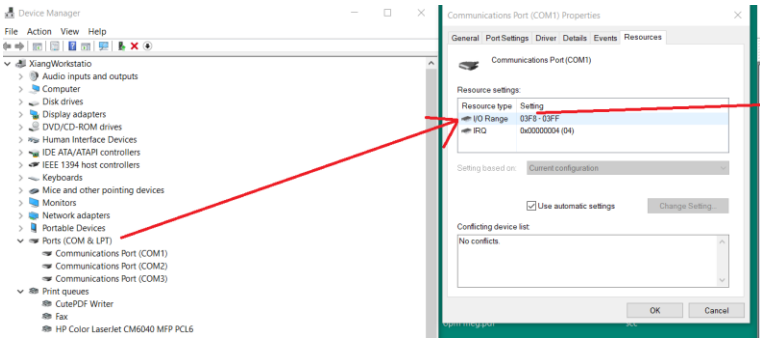
Logical parallel port 2: I/O port 0x378, IRQ 7 (dedicated IO cards or using a controller built into the mainboard)

Logical parallel port 3: I/O port 0x278, IRQ 5 (dedicated IO cards or using a controller built into the mainboard)

If no printer port is present at 0x3BC, the second port in the row (0x378) becomes logical parallel port 1 and 0x278 becomes logical parallel port 2 for the BIOS. Sometimes, printer ports are jumpered to share an interrupt despite having their own IO addresses (i.e. only one can be used interrupt-driven at a time). In some cases, the BIOS supports a fourth printer port as well, but the base address for it differs significantly between vendors. Since the reserved entry for a fourth logical printer port in the BIOS Data Area (BDA) is shared with other uses on PS/2 machines and with S3 compatible graphics cards, it typically requires special drivers in most environments. In Microsoft Windows, the logical parallel ports are typically called LPT1, LPT2, LPT3 (and optionally LPT4).



The new version of BrainX has the most advanced setup dialog as following

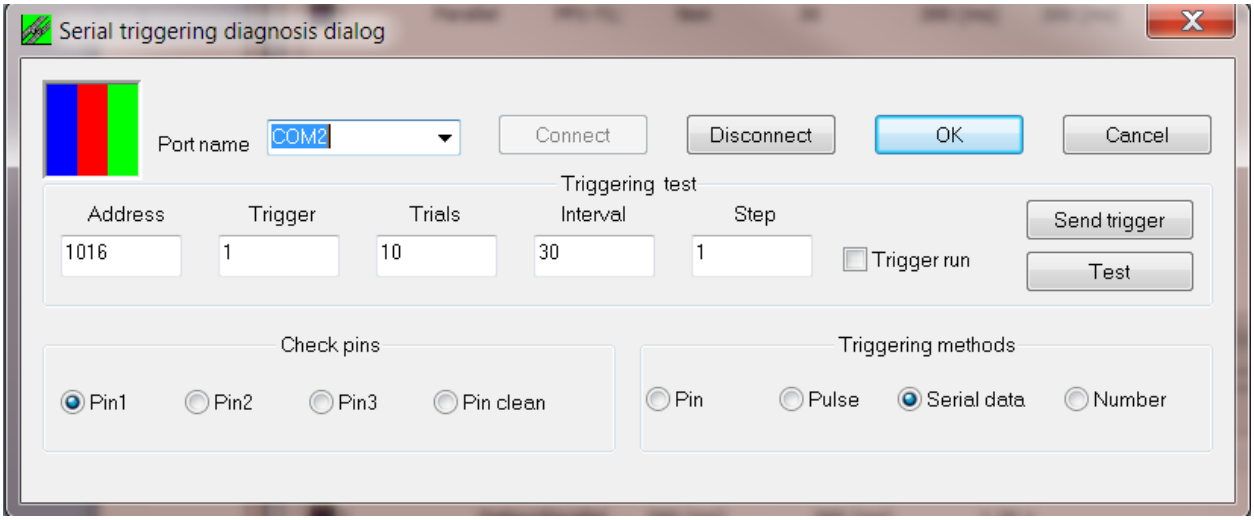


The address of the parallel port should be obtained from the working computer, the settings, which may vary from computer to computer, must be specified checked and carefully tested.

Of note, the trigger can be sent with pin-to-pin (0-8) or with parallel numbers (0-255). This depends on the data acquisition system (typically, MEG/EEG/fMRI system).

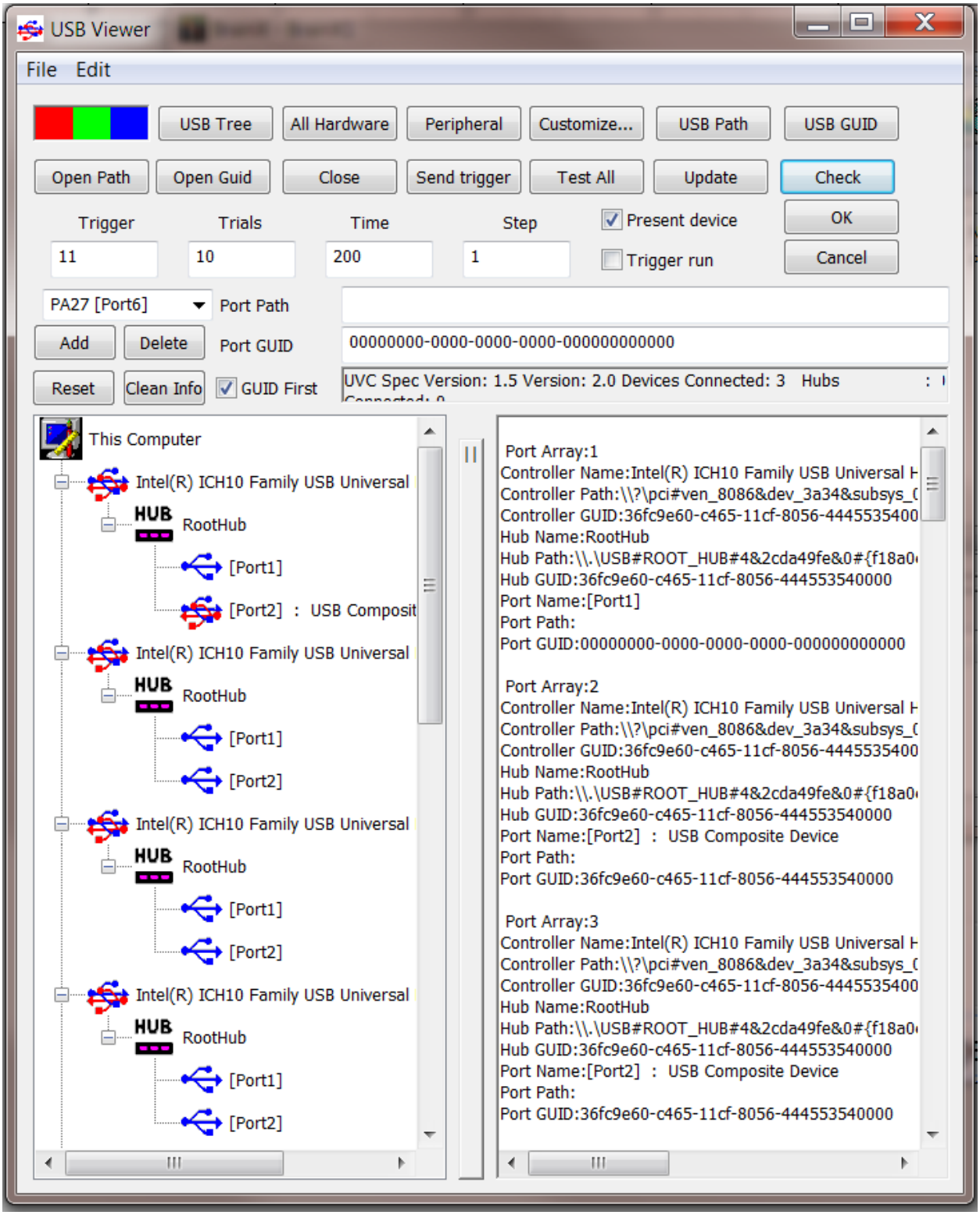
Serial Port

It shows a dialog for users to setup, test and define serial ports for triggering. In computing, a serial port is a serial communication physical interface through which information transfers in or out one bit at a time (in contrast to a parallel port, which sends several bits at a time). Throughout most of the history of personal computers, data was transferred through serial ports to devices such as modems, terminals and various peripherals.



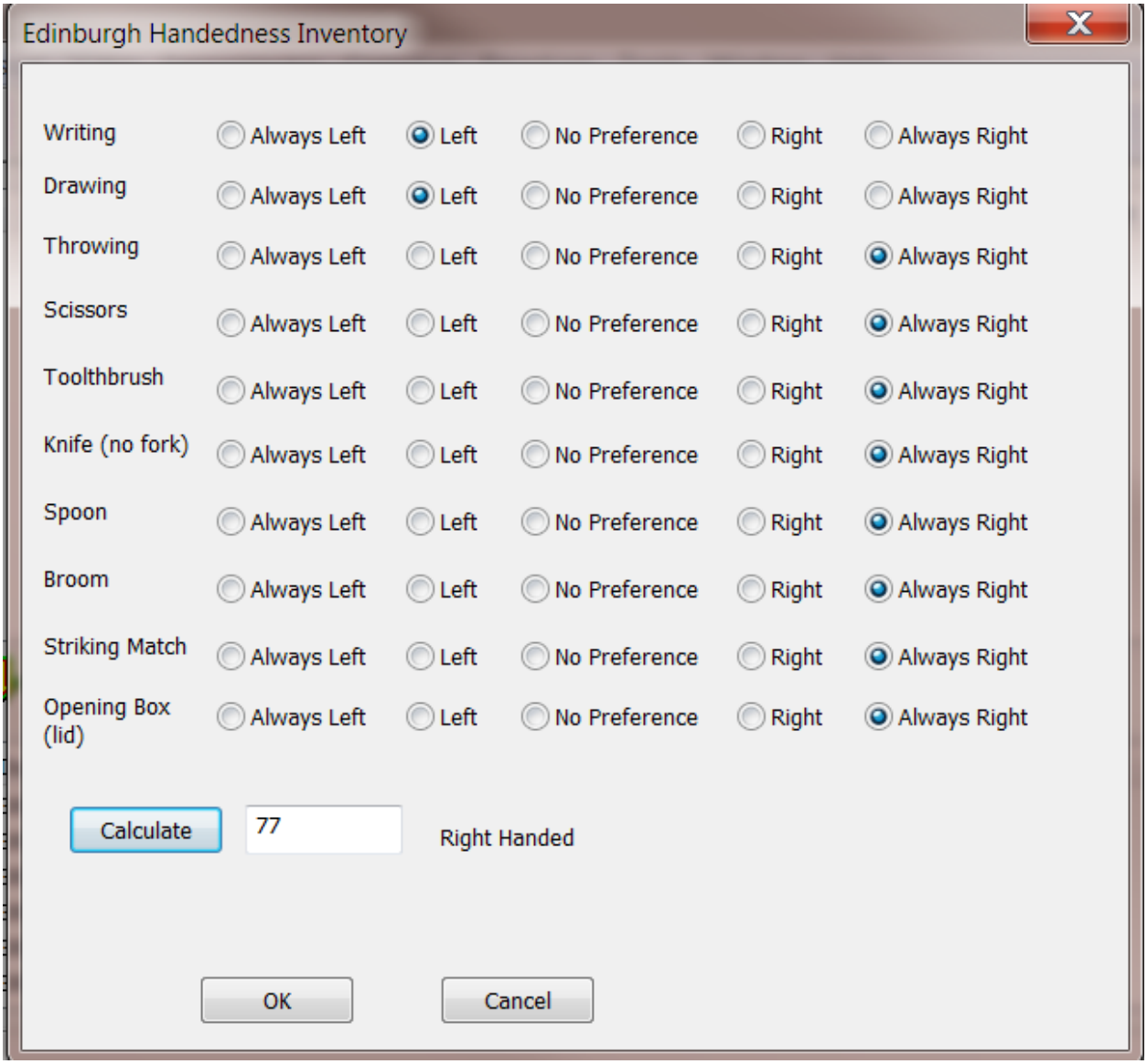
USB Port

It shows a dialog for users to setup, test and define USB ports for triggering. USB (Universal Serial Bus) is an industry standard that defines the cables, connectors and communications protocols used in a bus for connection, communication, and power supply between computers and electronic devices. USB was designed to standardize the connection of computer peripherals (including keyboards, pointing devices, digital cameras, printers, portable media players, disk drives and network adapters) to personal computers, both to communicate and to supply electric power. It has become commonplace on other devices, such as smartphones, PDAs and video game consoles. Both wired and wireless versions of the USB standard exist, although only the wired version involves USB ports and cables. USB has effectively replaced a variety of earlier interfaces, such as serial and parallel ports, as well as separate power chargers for portable devices.


USB Viewer
File Edit
USB Tree
All Hardware
Peripheral
Customize...
USB Path
USB GUID
Open Path
Open Guid
Close
Send trigger
Test All
Update
Check
Trigger
Trials
Time
Step
Present device
OK
11
10
200
1
Trigger run
Cancel
PA27 [Port6]
Port Path
Add
Delete
Port GUID
00000000-0000-0000-0000-000000000000
Reset
Clean Info
GUID First
UVC Spec Version: 1.5 Version: 2.0 Devices Connected: 3 Hubs
This Computer
Intel(R) ICH10 Family USB Universal
RootHub
[Port1]
[Port2] : USB Composit
Intel(R) ICH10 Family USB Universal
RootHub
[Port1]
[Port2]
Intel(R) ICH10 Family USB Universal
RootHub
[Port1]
[Port2]
Intel(R) ICH10 Family USB Universal
RootHub
[Port1]
[Port2]
Port Array:1
Controller Name:Intel(R) ICH10 Family USB Universal H
Controller Path:\\?\pci#ven_8086&dev_3a34&subsys_(
Controller GUID:36fc9e60-c465-11cf-8056-4445535400
Hub Name:RootHub
Hub Path:\\.\USB#ROOT_HUB#4&2cda49fe&0#{f18a0
Hub GUID:36fc9e60-c465-11cf-8056-444553540000
Port Name:[Port1]
Port Path:
Port GUID:00000000-0000-0000-0000-000000000000
Port Array:2
Controller Name:Intel(R) ICH10 Family USB Universal H
Controller Path:\\?\pci#ven_8086&dev_3a34&subsys_(
Controller GUID:36fc9e60-c465-11cf-8056-4445535400
Hub Name:RootHub
Hub Path:\\.\USB#ROOT_HUB#4&2cda49fe&0#{f18a0
Hub GUID:36fc9e60-c465-11cf-8056-444553540000
Port Name:[Port2] : USB Composite Device
Port Path:
Port GUID:36fc9e60-c465-11cf-8056-444553540000
Port Array:3
Controller Name:Intel(R) ICH10 Family USB Universal H
Controller Path:\\?\pci#ven_8086&dev_3a34&subsys_(
Controller GUID:36fc9e60-c465-11cf-8056-4445535400
Hub Name:RootHub
Hub Path:\\.\USB#ROOT_HUB#4&2cda49fe&0#{f18a0
Hub GUID:36fc9e60-c465-11cf-8056-444553540000
Port Name:[Port2] : USB Composite Device
Port Path:
Port GUID:36fc9e60-c465-11cf-8056-444553540000

Edinburgh Handedness

It shows a dialog for users to assess the handedness of subjects with the Edinburgh Handedness Inventory.



The Edinburgh Handedness Inventory is a measurement scale used to assess the dominance of a person's right or left hand in everyday activities, sometime referred to as laterality. The inventory can be used by an observer assessing the person, or by a person self-reporting hand use. The latter method tends to be less reliable due to a person over-attributing tasks to the dominant hand. Users can complete the inventory by checking the radio buttons. Once all the buttons are checked, click the "Calculate" to compute the handedness.

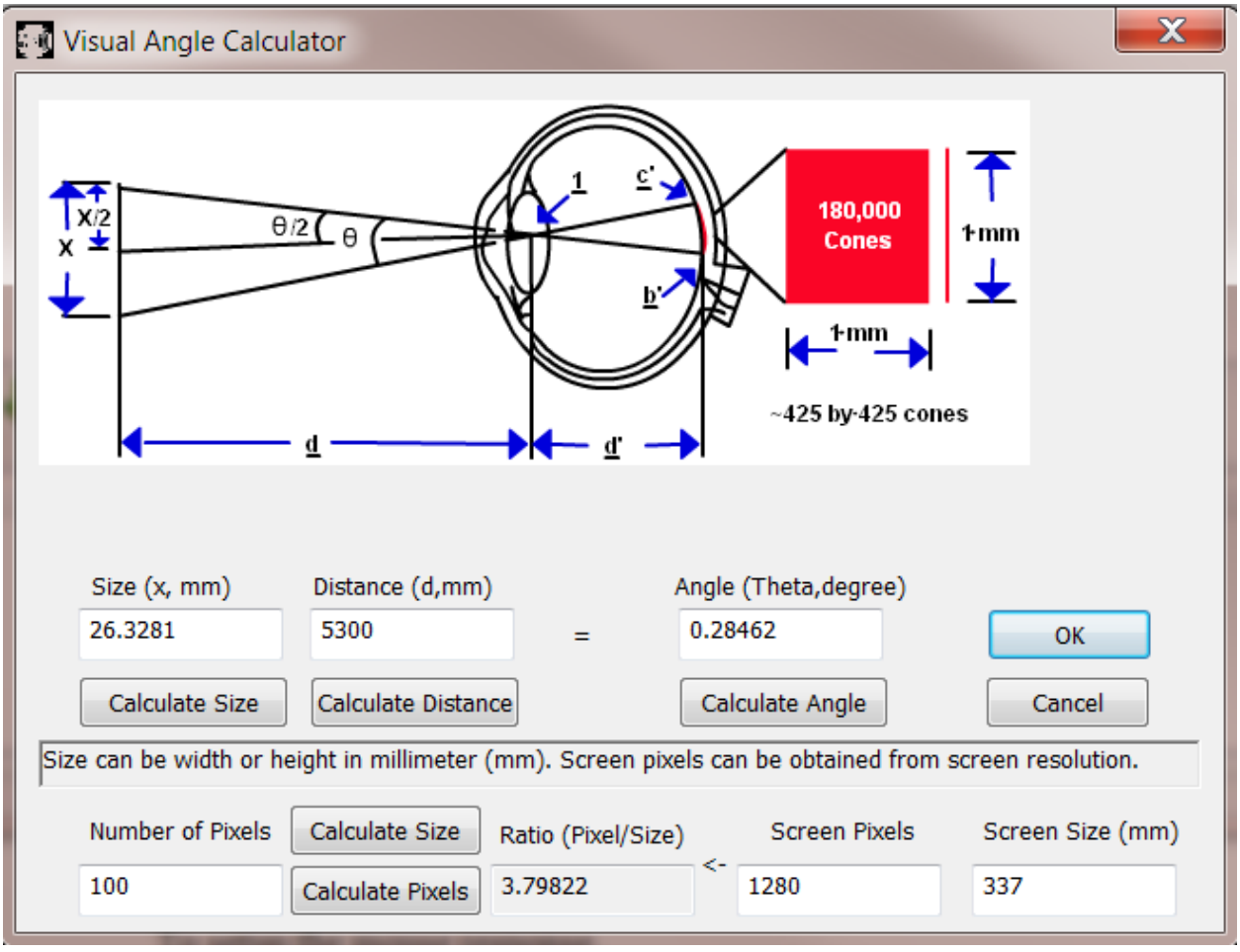
Laterality
Index (LI)Decile

LI = −100	
10^{th} left	−100 ≤ LI < −92
9^{th} left	−92 ≤ LI < −90
8^{th} left	−90 ≤ LI < −87
7^{th} left	−87 ≤ LI < −83
6^{th} left	−83 ≤ LI < −76
5^{th} left	−76 ≤ LI < −66
4^{th} left	−66 ≤ LI < −54
3^{d} left	−54 ≤ LI < −42
2^{d} left	−42 ≤ LI < −28
1^{st} left	−28 ≤ LI < 48
Middle	48 ≤ LI < 60
1^{st} right	60 ≤ LI < 68
2^{d} right	68 ≤ LI < 74
3^{d} right	74 ≤ LI < 80
4^{th} right	80 ≤ LI < 84
5^{th} right	84 ≤ LI < 88
6^{th} right	88 ≤ LI < 92
7^{th} right	92 ≤ LI < 95
8^{th} right	95 ≤ LI < 100
9^{th} right	LI = 100
10^{th} right	

Pure left hander -100
Mixed left hander -50
Neutral 0
Mixed right hander 50
Pure right hander 100

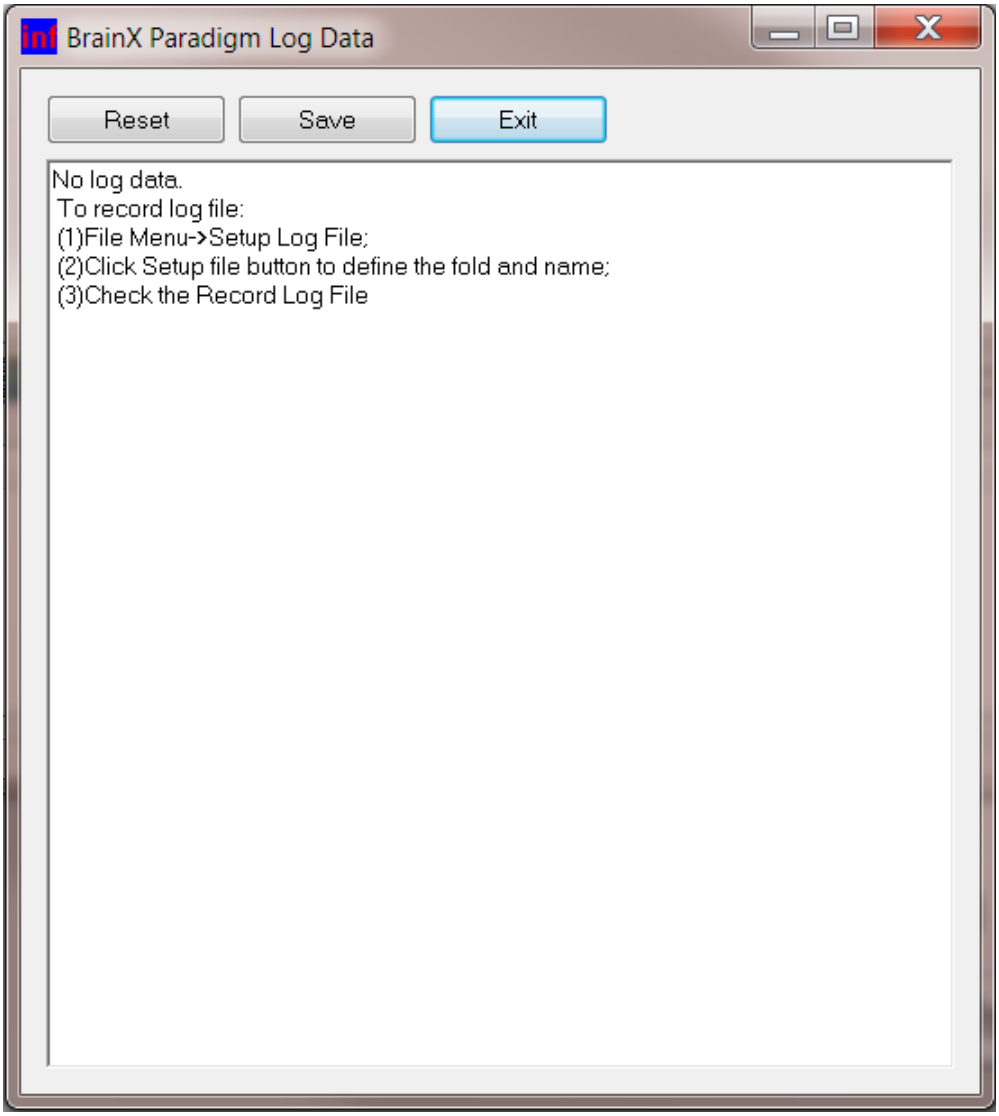
Visual Angle Calculator

It shows a dialog for users to calculate visual angle and other parameters. The dialog has advanced function for users to calculate the pixels or size of pictures if the users already know the visual angle and the size of the screen.



Show Paradigm Log

It shows a dialog for users to check how the paradigm/task has been done. The log data includes the stimulus name, presentation time, trigger as well as other information.



Minimize Memory Usage On

It minimizes the memory usage. This function is very useful if the paradigm is big (e.g. a cognitive task with a lot of pictures/sounds). In particularly, when the stimulation computer has limited memory (e.g. 32 Bits windows).

However, turning on the "Minimize Memory Usage" may negatively affect the performance of the task. It is recommended that if the computer is a 64 bit system and has more than 8 GB memory, it is a good idea to turn it off.