



TRIANGLE BIOSYSTEMS INC
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TBSI Wireless Stimulator

User's Guide V1.2



TRIANGLE BIOSYSTEMS INC
Wireless Simulation System
User's Guide

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Document Objectives

This document will demonstrate how to use the TBSI Wireless Stimulator system with the TBSI Demo front end and the CIO server. The system has the capability to generate stimulation patterns designed by the user via the stimulation headstage.

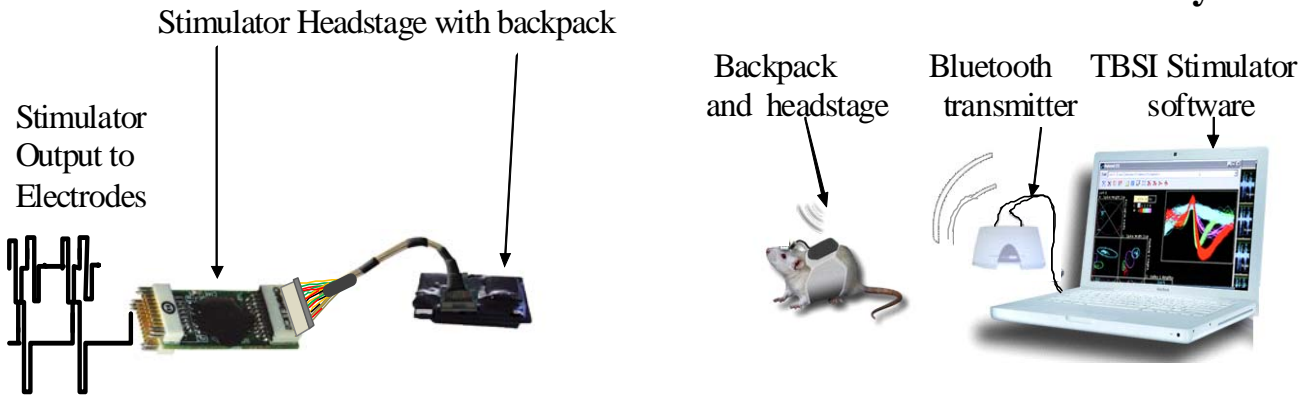
The system consist of two hardware components- The Bluetooth Server and the Remote Stimulator.

The Bluetooth Server connects to the PC via a local area network. The communication protocol is transparent to the using but there are indicators on the CIO screen to let the user setup the communication port, see that the unit is connected to the Bluetooth Server and that the TBSI Demo screen is link to the CIO.

The Remote Stimulator is battery powered. The Stimulation headstage connects via a custom cable the Remote Stimulator.

System of Components

Wireless Stimulator System



Ship List

32ch Stimulator headstage



Bluetooth Backpack receiver



Power supply for Transmitter



BLUETOOTH Transmitter



Electrode Mating Connector Omnetics
Male Dual row Nano 18 Pin Vertical



Power Charger for Backpack receiver



Headstage Signal cable for Testing



Backpack Rat Jacket



Stimulator Software CD





Software System Load

The PC software is delivered on a CD with the system. You should put the CD in your system and it should auto start. If not, go to CD directory and select auto load to start the software install.

The software will be installed in one directory with two subdirectories.

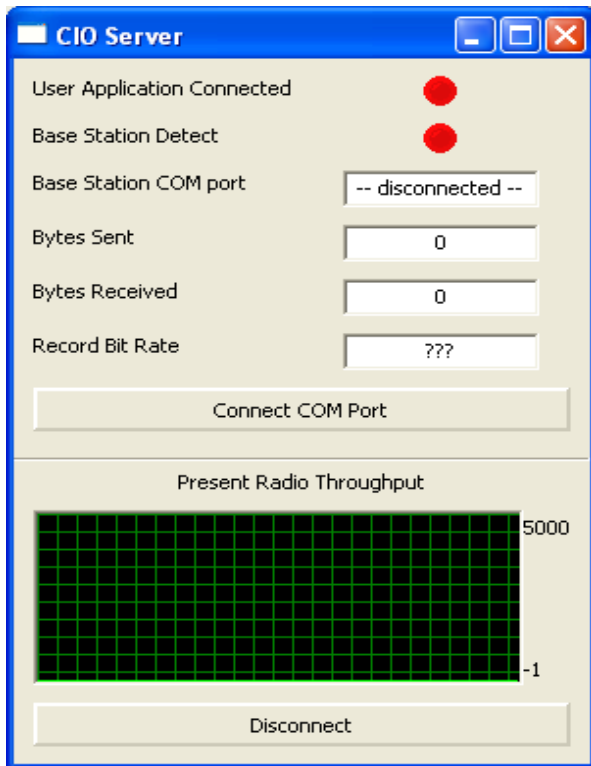
- TBSI Wireless Stimulator System
 - distDEMO
 - distSERVER
1. Open the “*distDEMO*” directory and right click on the file “*TBSI_DEMO.exe*” and select create shortcut on the menu. This will generate a file named “Shortcut to TBSI_Demo.exe” in the directory. Drag and drop this file to your desktop.
 2. Open the “*distSERVER*” directory and right click on the file “*TBSI_SERVER.exe*” and select create shortcut on the menu. This will generate a file named “Shortcut to TBSI_Server.exe” in the directory. Drag and drop this file to your desktop.

Now your software load is complete on your PC.

Connect System Components

1. Connect the Stimulator Cable to the Remote Stimulator, next connect the Stimulator Headstage to the other end of the cable. Remember when connecting the headstage that logo matches with logo on the connectors.
 2. Then connect the headstage to the signal source, either the test animal or the Stimulator Test Board supplied in the ship kit.
 3. Turn on the Remote Stimulator using the on-board switch. The battery should be fully charged.
 4. Connect the Bluetooth Server to the Same LAN that contains the PC where the software was installed.
 5. On the PC Desktop, start the CIO_Server_App. On the drop down box select the COM Port. Click on the Connect button and the Bluetooth Server Detect light should go from RED to GREEN.
 6. On the desktop, start the TBSI_DEMO. The light on the CIO_Server_App User Application Connected should go from RED to GREEN when ready.
 7. Now you have everything connected and ready to go.
-

Figure 1 CIO Server



How to Run Stimulation

Steps to run Stimulation

The steps for Stimulation are as follows:

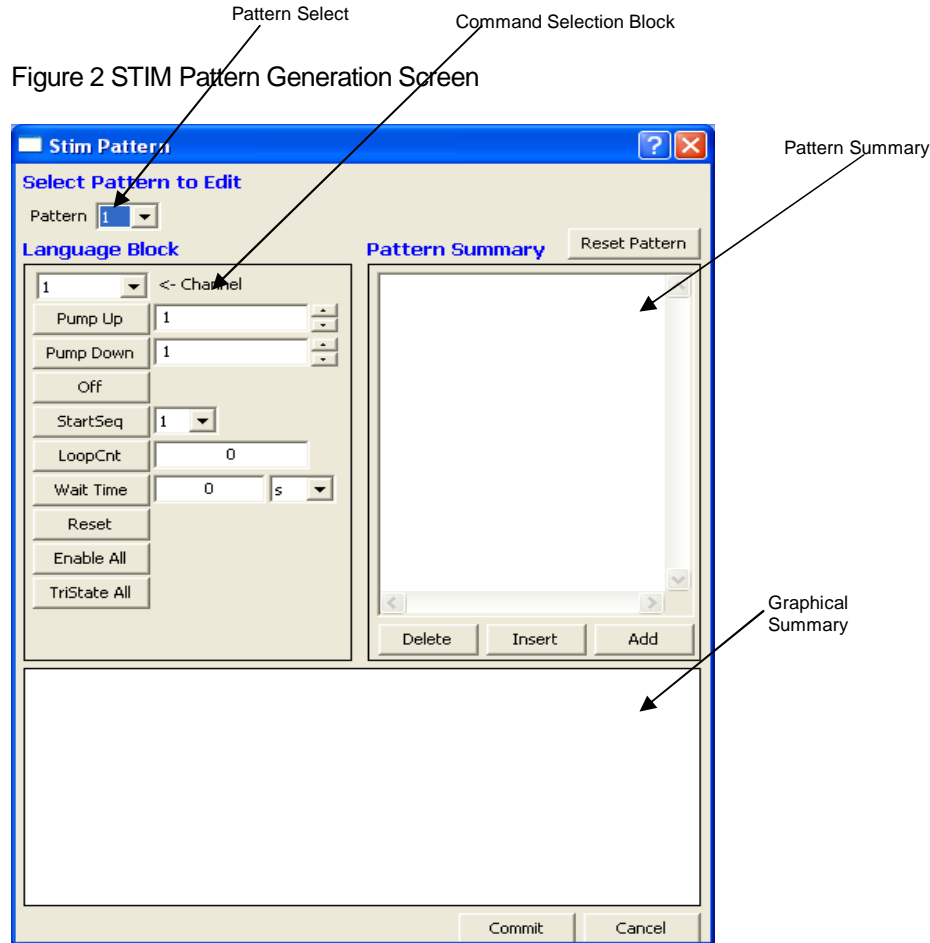
1. If you have a pattern stored, skip to step 6.
 2. On the TBSI Demo Panel (Table 1) click on the Open Button.
 3. Next to the file name space type the name of the pattern, you want to generate.
 4. Click on the open button.
 5. Go to the “Pattern Generation” (Figure 2) on page 8 of this manual.
 6. Click on the open button on the TBSI Demo. Select the saved pattern you want to run.
 7. You can either edit the pattern or send the pattern to the Implant Box. To edit the pattern go to the “Pattern Generation” (Figure 2) on page 8 of this manual.
 8. To send the pattern to the Implant Box, the “Download” button on the TBSI Demo Panel.
 9. You will see a progress window. When the progress window closes it show success or failure of the download. If it failed, go to step 8.
 10. Click on the “STIM Control” button on the TBSI Demo Panel. A popup window will be displayed. Select the pattern and click the “STIM Start” button. There are three ways to stop a stimulation:
 - a. Stop – will stop at the end of a pattern selected by number.
 - b. STIM All Stop – will stop all patterns currently running at the end of the patterns.
 - c. STIM E-Stop – will stop all patterns at the current spot in the pattern. Caution should be observed here the current could be still applied to the electrodes.
-



Connecting Stimulation Components

1. Connect the Stimulator Cable to the Remote Stimulator. Then connect the Stimulator Headstage to the other end of the cable. Remember when connecting the headstage that logo matches with logo on the connectors.
 2. Then connect the headstage to the signal source.
-

Pattern Generation



Pattern Language Description

The language for the pattern generation is straight forward in the functions that allow the user full control of the process. The ten commands will be explained below from top to bottom of the language block.

- o **Channel Select**



- Select the channel that is to be controlled by this pattern. It is possible to have control of one or more channels in a pattern.
 - **Pump Up**
 - Select the pump up selected channel to level from 1 to 7
 - **Pump Down**
 - Select the pump down selected channel to level from 1 to 7
 - **Off**
 - The off command is the command to turn off the current to the electrode and the off command should be the last command in the pattern. This is important because if the STIM pattern is stopped, the last command will be an off. This way no current will be supplied to the electrode.
 - **Start Seq**
 - The start sequence is the command to start a nested sequence if more than one sequence. You can have up to 32 different sequences in a pattern.
 - **Loop Cnt**
 - The loop counter command controls the number of times the pattern will execute. A pattern without a loop count will run infinite times. A count of zero will be infinite times.
 - **Wait Time**
 - This is the time between statements that a wait is desired before the next transition of current. This can be looked at the current duration also. The time units are selectable in seconds, milliseconds and microseconds.
 - **Reset**
 - The reset will reset all channels to the zero level.
 - **Enable All**
 - Enables all the outputs to the same pattern.
 - **Tristate All**
 - Tristates all the outputs at one time.
-

Sample Pattern

Figure 3 Stim Pattern Example 1

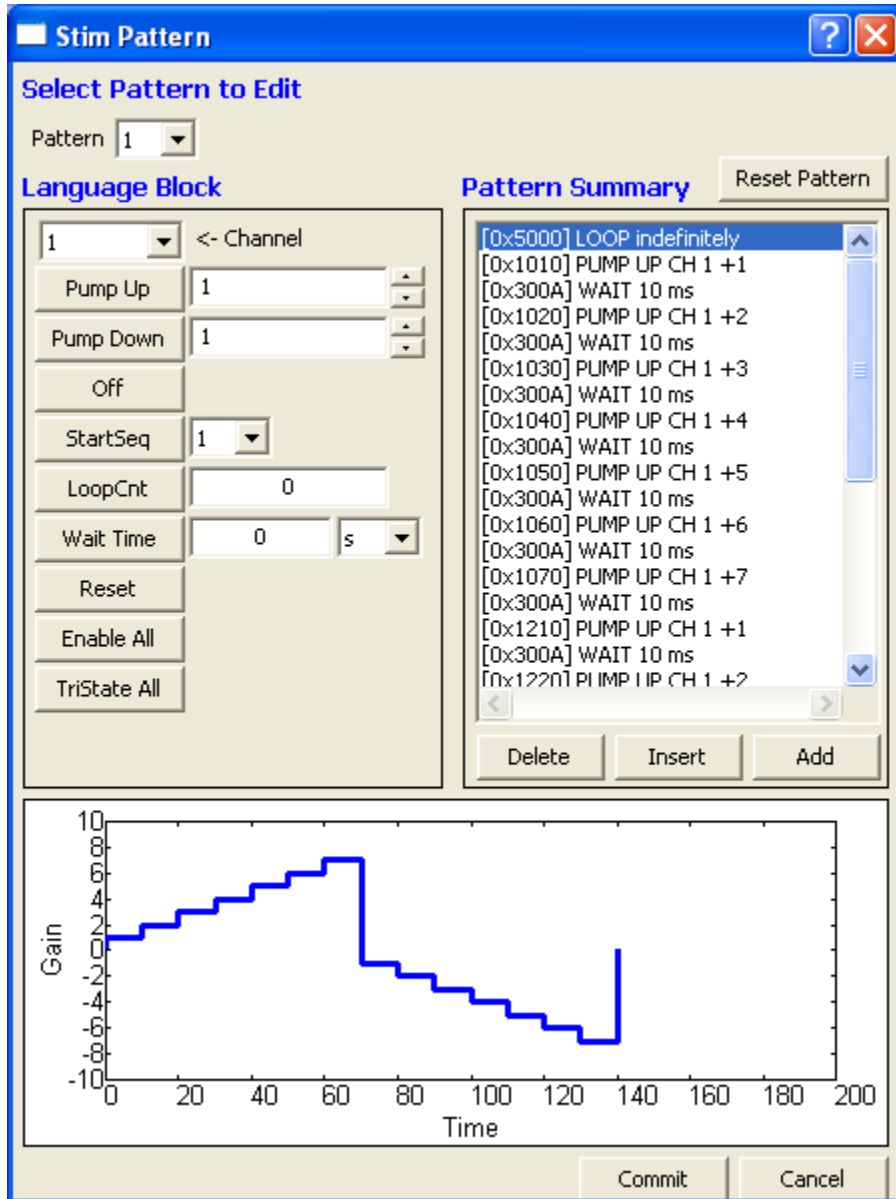
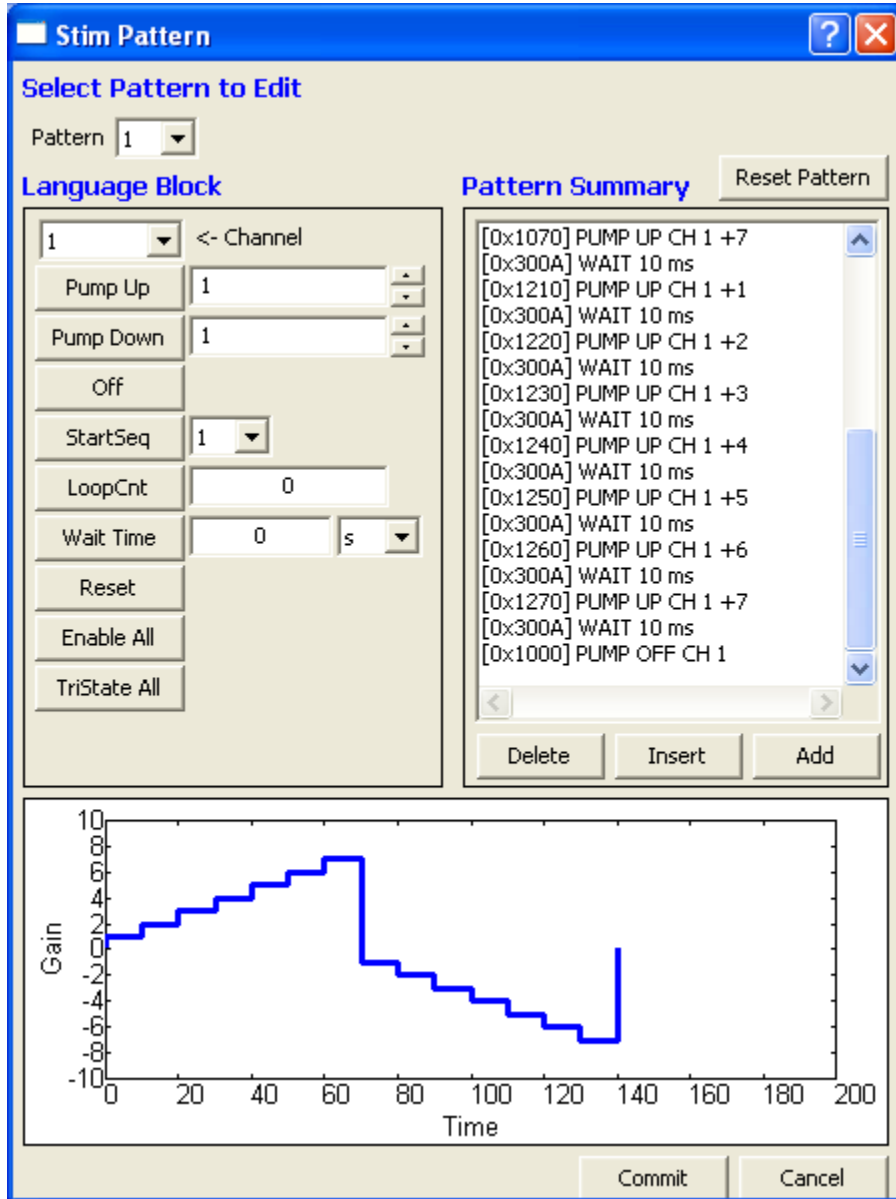


Figure 4 STIM Pattern Example 2





Problem Reporting and Support

All problems and questions on the system should be communicated to TBSI.

Contact Information – Phone - 919.361.2663,

Fax - 919.544.3061,



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