Signal Server – UserManual

Release 1.0

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1 Introduction

The TOBI signal server describes a programm using TiA (TOBI interface A) to acquire and distribute raw biosignals. Implementation was done using C++, static and shared library packages are available for Debian based systems (32bit and 64 bit), Microsoft Windows Xp and Windows 7.

1.1 Supported hardware

- g.USBamp (Windows only)
- g.Mobilab
- g.BSamp
- BrainProducts Brainamp series (Windows only)
- generic joysticks
- software sine generator
- LifeTool IntegraMouse
- Generic mouses

1.2 Planned hardware support

- National Instruments DAQ cards
- Generic Keyboards
- NIRx NIRScout
- Neurosky MindSet
- Tunable EEG simulator

1.3 Planned extensions

- remote configuration
- client-based channel and sampling rate selection
- acquired data storage using .gdf files
- streaming of stored files

1.4 License

The TOBI signal server is licenced under the GPLv3.

1.5 Contact

For further information please contact SignalServer@tobi-project.org.

2 Hardware Requirements

- Run TiA with highest process priority possible PC requirements:
- CPU: at least 200 MHz (already tested on embedded systems)
- RAM: 32 MB

For networking usage:

- Ethernet min. 100 MBit (1 GBit recommended)

  (needed network connection varying by the sampling rate and the number of channels acquired)

3 Installation Instruction

3.1 Hardware Drivers

To use data acquisition devices as g.tec's g.USBamp, the respective drivers, provided by the manufacturer have to be installed first.

Drivers provided by the manufacturers:

- g.USBamp (Windows only)
- BrainProducts Brainamp series (Windows only)

3.2 Debian/Ubuntu

Download libtia.deb and signalserver.deb for your respective operating system and platform (32 or 64 bit). Install it with your preferred packet manager (e.g. synaptic). libtia.deb has to be installed first.

Done ;-)

All required files are available at www.tobi-project.org/download.

3.3 Windows

Download the Signal Server setup file and install it.

Done ;-)

All required files are available at www.tobi-project.org/download.

4 Using the Signal Server

4.1 Generic Usage

The Signal Server is shipped with two demo configuration files ("server_config_comments.xml" and "server_config.xml"). Those files are showing exemplary configurations of the Signal Server. The "_commets.xml" file is equipped with additional comments to facilitate understanding the configuration of the Signal Server.

The Signal Server can be started by a quickstart, where the file "server_config.xml" is automatically read (operating system dependent) or by passing an individual config file to the Signal Server.

Start Commands for individual config files:

```
signalserver your_config_file.xml
```

o r

```
signalserver -f your_config_file.xml
```

Commands while the Signal Server is running:

q ... stop

r ... restart (problems with various DAQ devices – bugfix in progress)

4.2 Debian/Ubuntu

With the first start of the Signal Server, a folder named "tobi_sigserver_cfg" is automatically created within the users home folder. Two files named "server_config_comments.xml" and "server_config.xml" are located inside this folder.

Starting the Signal Server without any parameters automatically reads and starts the "server_config.xml" inside the "tobi_sigserver_cfg" folder (quickstart).

4.3 Windows

Starting the Signal Server without any parameters (quickstart) the program automatically reads and starts the "server_config.xml" inside the folder where the Signal Server is installed (e.g. C:Program FilesTOBI SignalServerserver_config.xml).

To use a different configuration, an other .xml file can be handed to the Signal Server either using the commandline or just dragging the respective file on the Signal Server executable or a link to it.

5 The XML Configuration File – Basics

5.1 Subject Information

5.2 Server Settings

5.3 The Hardware sections

Mode

- Master
- Slave
- Aperiodic

Device Settings

- Sampling Rate
- Blocksize
- Measurement Channels

Channel Settings

- Selection

6 Specific Hardware Configuration with the XML Config File

6.1 Sine Generator

6.2 g.USBamp

6.3 g.Mobilab

6.4 g.BSBamp

6.5 Brainamp Series

6.6 EEG Simulator

6.7 Generic Joysticks

6.8 IntegraMouse + Generic Mouses