

PHYSIO INSTRUCTIONS

(Last update on Thursday, February 03, 2005)

General Information.....	1
Where and how to place the SCR/GSR sensors.....	2
How to connect the sensors to the device	2
How to connect the device to the PC	3
Log in on the machine.....	3
Modify the config file	3
How to start the VRPN SERVER.....	3
How to start the VRPN CLIENT	4
How to mark events during the experiment.....	4
How to export the data.....	4
Another format of the data.....	5
Contacts.....	6
References.....	6
Figure 1: Placement of the GSR sensors.....	2
Figure 2: Sensor plugging in the device.	2
Figure 3: Events file format.	5
Figure 4: Data file format.	6
Table 1: Specify the group folder for the data.	3
Table 2: Export more then one file in a single session.	5

General Information

The physiological device has 3 types of sensors:

- ECG/EKG (to be plugged in the socket A);
- SCR/GSR (to be plugged in the socket D);
- RESPIRATION (to be plugged in the socket E).

All the sensors must be put on the volunteer before running the software.

Where and how to place the SCR/GSR sensors

The GSR sensor has two short leads that extend from the circuit box. At the end of each lead is an electrode snap similar to those on the extender cables. The electrode strap must be fastened around a finger tightly enough so the electrode surface is in contact with the finger pad.



Figure 1: Placement of the GSR sensors.

The standard procedure is to put the sensors on the non-dominant hand, to avoid interference in the case of the volunteer has to use a joystick or mouse during the experiment.

How to connect the sensors to the device

The sensors have to be connected with the device in specified channels:

- SCR/GSR in the channel D;

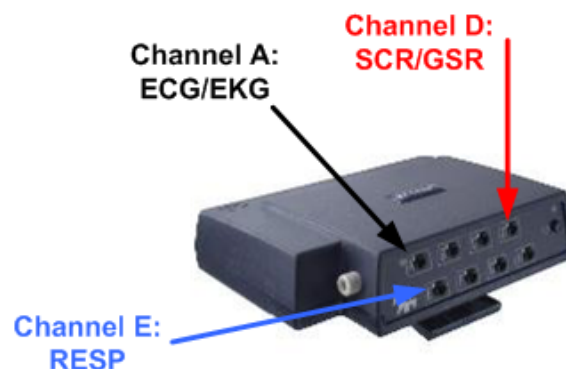


Figure 2: Sensor plugging in the device.

How to connect the device to the PC

An optical fiber has to be connected to the white side plug of the device. The other end of the fiber has to be plugged in the connector coming out from the serial port on the back of the PC.

Log in on the machine

You're going to run server and client on the same machine, named CRACKERS, placed in the VR room. The login must be done with the account:

Name: rmstudy

Password: rmstudy

Modify the config file

You need to modify the config file (procomp.cfg) to set up the proper folder for the data, specifying the folder of your group.

Table 1: Specify the group folder for the data.

<i>logfile</i>	<i>C:\RMstudy\Data\group_1\</i>
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The entire log file will be saved in that directory.

How to start the VRPN SERVER

Before switching on the device you must connect the sensor. The ProComp box must be turned on before running the server: keep pressed the small black button until the blue light gets on. If the server switches off after pressing R (real time session), this indicates that the sensor device is switched off or the batteries have run out.

1. go to C:\RMstudy\physio (it's set as MyDocuments)
2. Double-click: ***server_vrpn_procomp.exe***
3. **R** (selects real mode)
4. **2** (selects the right com-port)
5. Check that channel D say "YES"
6. **N** (listen for events)

Don't worry about the warning you get.

How to start the VRPN CLIENT

Before running the client, the experimenter must be sure that the physio-server is running.

1. C:\RMstudy\physio
2. Double-click: *client_vrpn_procomp.exe*
3. **A** (selects mode) and press enter
4. Press **Enter**

There is a problem in the code, so the Visual gives an error: ignore it, pressing the IGNORE button (twice ...).

After roughly 10 secs, the openGL window shows the physiological channel running. See the VRPN instructions for the interface commands.

IMPORTANT:

To stop the client, **PRESS ESC**, keeping the mouse on the active openGL window. If the experimenter stops by closing the window, ALL THE DATA WILL BE LOST !!!

How to mark events during the experiment

The operator/experimenter can mark events with the keyboard (in the server window), and these are forwarded to the graphics client and logged with the physio data. The server window must be active. Events are marked with a number, which is its ASCII decimal code.

How to export the data

The VRPN client saves a log files for the physiological sensor in the directory specified in the config file (i.e., C:\RMstudy\Data\group_1\). The exporting of the physiological signals can be done using the same client.

Before running the client, open with an editor the config file (procomp.cfg) and check the following fields:

- The file to export must be in the directory specified in the **logfile** (top of the file);
- **replayrate** value is recommended at 10;
- **analyse_file** must have the name of the file you want to export, i.e. physio.pilot1.030923165421.log;
- **export_raw_data** must be YES (bottom of the file).

Run the client and choose the option **C**. You can export more the one files in the single session, adding more lines for the analyse_file field:

Table 2: Export more then one file in a single session.

```
# the rate at which the file will playback during replay or batch modes
replayrate      10
#
# Enter the list of files to analyse when in batch mode
# These files should reside in the logfile directory set above
analyse_file     physio.11111.050203112759.log
analyse_file     physio.12211.050203113228.log
analyse_file     physio.21212.050203113358.log
analyse_file     physio.23212.050203113626.log
```

The software will save 2 different files, one with all the signals inside sampled at 32 Hz, another with only the EKG sampled at 256 Hz. See the VRPN instructions for all the details.

Another format of the data

For the students of the research method course:

I can take your files and export all of them in the following formats. Let me know if you are interested in or you just take the files exported from the client software (one per volunteer).

11111	12211	21212	23212	Volunteer ID
115.000	115.000	104.000	121.000	ASCII code of the pressed key
77.250	9.563	20.531	24.094	
115.000	32.000	105.000	116.000	Time (in seconds) when the key has been pressed
85.031	17.625	34.875	26.531	
	116.000	32.000	109.000	
	19.219	39.656	29.438	
	116.000	106.000	99.000	
	19.313	43.781	30.938	
	106.000		121.000	
	20.906		32.063	
			105.000	
			32.719	

Figure 3: Events file format.

You can convert the timing in samples just multiplying seconds per frequency:

i.e.:

$$77.250 * 32 = 2472$$

11111	11121	11211	11221	12111	Volunteer ID
18790	21021	18293	17455	20699	
1.694	1.54	1.794	1.014	0.85	Number of occurrences
1.694	1.54	1.794	1.019	0.85	
1.689	1.54	1.794	1.019	0.845	Data @ 32 Hz 1 sample every 1/32 secs (0.03125)
1.689	1.53	1.794	1.014	0.85	
1.689	1.535	1.789	1.009	0.85	
1.679	1.54	1.789	1.014	0.845	
1.689	1.535	1.784	1.014	0.855	
1.684	1.54	1.794	1.019	0.845	
1.679	1.535	1.784	1.014	0.845	
1.689	1.54	1.784	1.009	0.84	
1.684	1.54	1.784	1.014	0.845	
1.684	1.53	1.789	1.019	0.835	
1.684	1.535	1.784	1.009	0.845	
1.684	1.535	1.779	1.014	0.845	
1.684	1.535	1.779	1.019	0.845	
1.684	1.53	1.784	1.014	0.845	
1.684	1.535	1.779	1.014	0.845	
1.679	1.53	1.779	1.019	0.845	
1.684	1.53	1.774	1.009	0.84	
1.684	1.53	1.779	1.014	0.845	
1.679	1.535	1.774	1.014	0.845	
1.679	1.53	1.774	1.009	0.845	
.....	

Figure 4: Data file format.

Contacts

For any problems and questions:

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References

“VRPN Physiological Software”, Michael J. Meehan and Sharif Razzaque, University of North Caroline at Chapel Hill, USA.

(<http://www.cs.unc.edu/research/vrpn>)

“VRPN Physiological Software”, Michael J. Meehan and Sharif Razzaque, University of North Caroline at Chapel Hill, USA. – Modified by Andrea Brogni (UCL) and named “VRPN Instructions”.

“Sensor User Manual – tech note 009”, by Thought Technology Ltd..

(<http://www.thoughttechnology.com>)