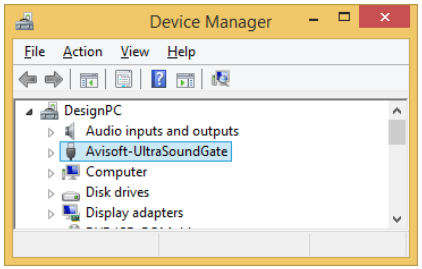
Introduction

Thank you for purchasing Avisoft UltraSoundGate Player 116. This bus-powered USB device provides a 16 bit D/A converter, a power amplifier and a bias voltage generator for electrostatic speakers. The accompanying recording software Avisoft-RECORDER USGH can play standard .wav files acquired by the Avisoft-UltraSoundGate ultrasound recording interfaces or other third-party equipment.

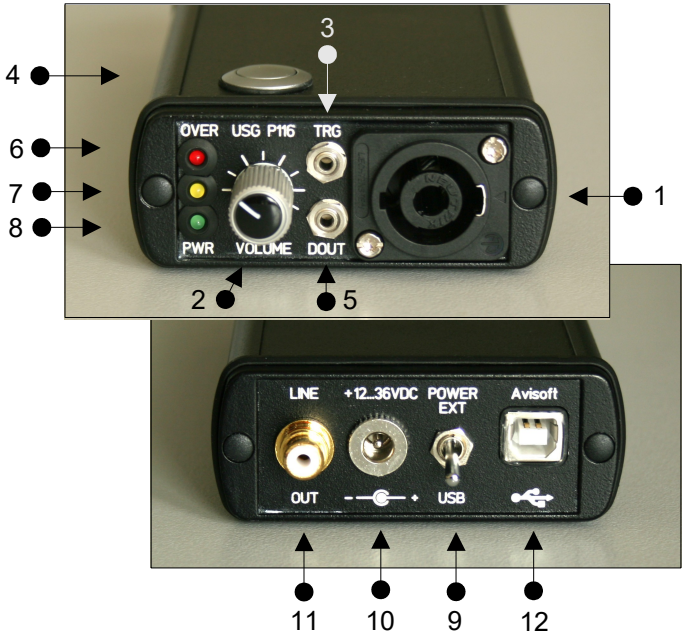
Installation procedure

First install the RECORDER USGH software either from the supplied software installation media (navigate to the subfolder **RECORDER USH** and run **setup.exe**) or from the Avisoft Bioacoustics website (www.avisoft.com/downloads.htm or directly www.avisoft.com/RECORDER USGH.exe). This installation program will install both the RECORDER USGH application (rec_usgh.exe) and the required device drivers (usgh_xx16h.inf, usgh.sys) for the UltraSoundGate xx16H devices. When the installation procedure has completed, the UltraSoundGate unit can be connected to the computer. The device should then be detected as “Avisoft-UltraSoundGate Player” and the pre-installed driver should be finally activated.

Under some circumstances it might happen that the silent installation of the device driver fails. If that happens, navigate to the *Windows Control Panel* > *Hardware and Sound* > *Device Manager* and right-click at the entry *Other devices* > *Avisoft UltraSoundGate 116H* and select the *Update Driver Software...* option. The click at *Browse my computer for device driver software,* click at *Browse* and navigate to the folder *C:\Program Files (x86)\Avisoft Bioacoustics\RECORDER USGH\Drivers* and finally click at *Next*. The completed device driver installation will then look like this:



Components of the UltraSoundGate Player 116



1 Speaker Output Connector

The 4-pole Speakon connector provides the analog speaker output and a 200V bias voltage for driving electrostatic speakers. The connector scheme is as follows:

1- Speaker ground
1+ Speaker output signal
2- Unconnected
2+ +200V bias voltage

2 Playback volume adjustment knob

This control knob adjusts the analog output level of the power amplifier. In addition to that, the output level can be attenuated in the RECORDER USGH software from the command Play/Playback volume...

3 TRG input

This 2-pole (mono) 2.5 mm mini-jack connector is electrically connected to the TRG button (4) and allows connecting an external trigger. This input is TTL compatible (there is additionally an internal pull-up resistor of 10 kOhm to Vcc). Pulling this input to ground (for instance by closing a simple switch) will activate the logic ***TRG button***. For a reliable electrical connection, a Switchcraft 0.01” Micro Plug (part number 850X) is recommended.

4 TRG button

This button represents a logic game controller button that can be used to start the playback of .wav files in the RECORDER USGH software (command Play/Settings/”ext trigger” = “joystick b2”).

Joystick b1 (auto hold) : Pressing the button for more than 2 seconds will activate an auto hold mechanism on the logic joystick button #1. If the button is pressed again, the logic button #1 will be reset.
Joystick b2 : The logic joystick button #2 represents the original state of the physical button (1:1 relation). This option should be used for normal applications.
Joystick b3 (Inverse): The logic joystick button #3 represents the inverse state of the physical button.
Joystick b4 (Toggled): The logic joystick button #4 provides a toggle mode, which will activate the logic button permanently after pressing the physical button. Pressing the button again will reset the logic button.

5 DOUT

This 2-pole (mono TS) 2.5mm mini-jack connector carries the state of the LSB (bit 0) of the 16-bit data words of the 16 bit .wav file that is currently played. The digital output does not work when playing 8 bit .wav files. This digital signal can be used to synchronously control (trigger) other external devices while playing a .wav file. The Avisoft SASLab Pro/Lite drop-down menu File/Specials/UltraSoundGate DIO can be used to edit the DO bits of the .wav files to be played.

The connector scheme is as follows:
Tip : DO, Sleeve : GND

For a reliable electrical connection, a Switchcraft 0.01” Micro Plug (part number 850X) is recommended.

6 OVERload indicator

The red OVERload LED indicates clipping. Clipping occurs when the power supply voltage for the power amplifier section is not high enough to reproduce the input signal at the current playback volume setting without distortion. If this happens, the playback volume (2) should be reduced or the external power supply voltage (connected to 10) should be increased.

7 PLAY LED

This amber LED indicates the playback of a .wav file (permanent light). The LED flashes when currently no file is being played.

8 POWER indicator

This green LED indicates the presence of the power supply voltage for the power amplifier section of the unit.

9 POWER source selector

This switch allows to select the power supply source for the power amplifier section of the device. If the switch is at the ***USB*** position (down), the amplifier will be powered from the USB. Due to certain power constraints, the maximum playback power will be limited in this case to about 1 W. At the ***EXT*** position (up), the amplifier is powered from an externally attached supply voltage (10).

10 External power supply socket (+12...36V)

This 2.1 mm coaxial power supply socket allows to connect an external supply voltage in order to increase the playback power capabilities. The voltage should be between 12 and 36V DC. At 12V, the available power is about 1W, at 36V it is about 10W.

11 LINE OUT

The LINE OUT cinch socket provides the analog output signal directly from the D/A converter output (level: 4Vpp).

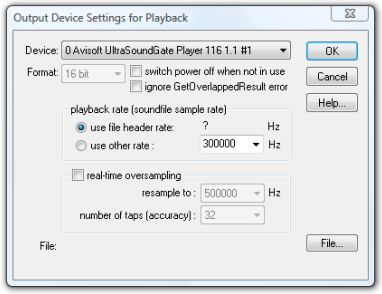
12 USB 1.1 interface

Getting started

After installing the Avisoft-RECORDER USGH Software and connecting the UltraSoundGate Player to the computer, the RECORDER USGH software can be launched from the Windows Start menu **All Programs / Avisoft Bioacoustics / RECORDER USGH**.

The playback functionality of the RECORDER software is located on the Play menu.

First go to the command ***Play/Device***... and select the Avisoft UltraSoundGate Player 116 from the ***Device*** listbox at the top of the dialog box and select the playback rate. The default ***playback rate*** setting "use file header rate" will use the file header sample rate of the .wav file, which will ensure that the file is being played at the correct speed. Note that the USG Player only supports a limited number of sample rates (500, 384, 375, 300, 250 kHz, ...). If the original .wav file to be played has a different sample rate, it is necessary to either resample it to one of these sample rates in advance (Avisoft-SASLab Pro command "Edit"/"Format"/"Sampling Frequency Conversion...") or to select the option ***real-time oversampling***, which will perform the required sample rate conversion in real-time. The list box titled ***number of taps (accuracy)*** will determine the accuracy of the conversion. Higher values will increase the accuracy but will also increase the CPU usage. Slower PC's may be unable to process the data in real-time (which can be recognized by a distorted playback and the inability of the RECORDER software to respond to user inputs during the playback). Under these circumstances, it is therefore recommended to resample the sound files in advance in Avisoft-SASLab Pro/Lite.



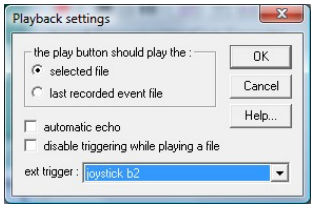
In the bus-powered operation mode, the option "***switch power off when not in use***" (not available on Windows XP) will reduce the current drawn from the USB while no file is being played (the power amplifier will be switched off between playbacks). However, switching on and off the amplifier at the begin and end of each file can create an undesired noise. If this noise is unacceptable, the option should be disabled.

There are several ways to play a .wav file:

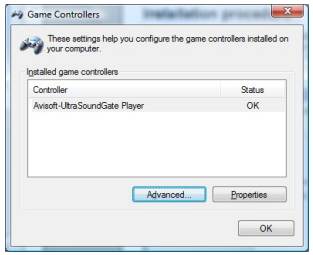
a) Select the desired file from the command Play/File...
b) Locate the desired file on a Windows folder and drag it into the RECORDER USGH window.
c) Prepare a list of files from the command Play/Playlist... and play the selected files according to the settings made there.

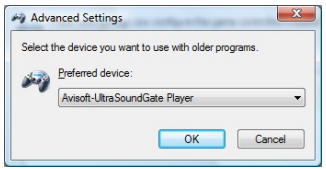
Once a .wav file has been selected (according to the above option a or b), this file can be played several times either by executing the command Play/Start (Shift+Space bar), by clicking at the Play button ► or by pressing the physical trigger button on the device.

The latter option requires that the "joystick b2" option has been selected as the "ext trigger" from the command Play/Settings...



Additionally, it might be necessary to activate the USG Player game controller from the Windows Control Panel (Hardware and Sound > Game Controllers) in order to get it work with the RECORDER USGH software:





When simultaneously playing via the USG Player and recording via an UltraSoundGate xx16 at the same time, it is necessary to launch a separate instance of the RECORDER USGH software for the playback task. Otherwise, the recording and playback procedures might disturb each other (gaps might occur in the data streams)

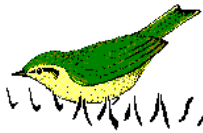
Another issue related to the simultaneous playing and recording with an UltraSoundGate 116 or 416 is the limited USB 1.1 full-speed bus bandwidth when both devices are connected to the same roots HUB of the computer and the sample rates exceed 250 kHz (at 16 bit resolution). This constraint can be resolved by connecting one of the devices through an USB 2.0 HUB to the computer. This will convert the full-speed mode of the device to the high-speed mode and both devices can be operated at the same time from a single USB 2.0 port.

For best results, the bit depth of the .wav files to be played should be 16 bits and the sample rate as high as possible (500 kHz). A high sample rate will avoid aliasing effects by shifting potential aliasing products towards higher frequencies. Use the SASLab Pro command "Edit"/"Format"/"Sampling Frequency Conversion..." to increase the sample rate.

Avisoft ULTRASOUNDGATE

USG Player 116

User's Guide



Specifications

Number of channels	1
Resolution	8 or 16 bit
Sample rates [kHz]	1000 (8 bit only), 750(8 bit only), 500, 384, 375, 300, 250, 214, 192, 187.5, 166.6, 150, 125, 100 Note: The bundled RECORDER USGH software provides a real-time oversampling option that allows to play .wav files with any sample rate below 500 kHz.
Output power	1.5 W (USB bus-powered) or 10 W (with external 36V power supply)
DC bias voltage for electrostatic speakers	200 V
Frequency range	1 ... 125 kHz
Slew rate	8 V / µsec
Overload indicator (red LED)	yes
Volume adjustment potentiometer	yes
Speaker output connector	4-pole Speakon connector
Other inputs	external trigger (TTL-compatible), digital output (TTL-compatible)
Computer interface	USB 1.1, isochronous full-speed data transfer mode
Supply current	400 mA (drawn from USB) or up to 1A from an external 12...36 V
Housing	compact aluminium enclosure
Physical dimensions (W/H/D)	85 x 35 x 190 mm
Weight	350 g
Included software	Avisoft-RECORDER USGH

Computer requirements

Windows PC with at least one USB 1.1 or 2.0 port,
running Windows Vista / 7 / 8 / 10

Avisoft Bioacoustics e.K.
Schönfließer Str. 83
16548 Glienicke/Nordbahn
Germany

Phone: +49 (0)33056 426086
Fax: +49 (0)33056 426087
www.avisoft.com

sales@avisoft.com

Real-time playback visualization

The currently played waveforms can be visualized by selecting the option **Playback** from the **Device** listbox on the Configuration dialog box (**Options / Configuration...**) Once this has been done, the currently played waveform will be visualized either on the spectrogram or waveform display mode. In order to prevent creating (triggering) new .wav files, the monitoring pause button (**Monitoring / Pause**) should be activated.

End-user Agreement

This a legal agreement between Avisoft Bioacoustics and the buyer. By operating this device and the accompanying software, the buyer accepts the terms of this agreement.

1.The Device and the accompanying software is warranted to perform substantially in accordance with the operating manual fora period of 24 months from the date of shipment.

2.EXCEPT AS SET FORTH IN THE EXPRESS WARRANTY ABOVE, THE DEVICE IS PROVIDED WITH NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE VENDOR EXCLUDES ALL IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE.

3.The Vendor’s entire liability and the Buyer’s exclusive remedy shall be, at the Vendor’s SOLE DISCRETION, either (1) return of the device and refund of purchase price or (2) repair or replacement of the device.

4. THE VENDOR WILL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES HEREUNDER, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS, LOSS OF USE, OR LOSS OF DATA OR INFORMATION OF ANY KIND, ARISING OUT OF THE USE OF OR INABILITY TO USE THE DEVICE IN NO EVENT SHALL THE VENDOR BE LIABLE FOR ANY AMOUNT IN EXCESS OF THE PURCHASE PRICE.

5. This agreement is the complete and exclusive agreement between the Vendor and the Buyer concerning the device.