

Introduction

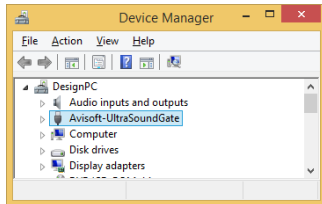
Thank you for purchasing Avisoft UltraSoundGate 116He. This bus-powered USB device supports single-channel high-speed data acquisition at sampling rates of up to 300 kHz.

The accompanying recording software Avisoft-RECORDER USGH provides either continuous or triggered direct-to-disk recording with real-time spectrogram displays.

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 116H" and the pre-installed driver should be finally activated.

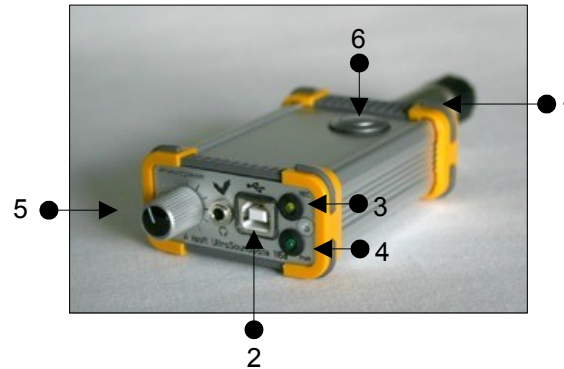
Under some circumstances it might happen that the silent installation of the device driver fails. If that happens, navigate to the *Windows Control Panel > Hardware and Sound > Device Manager* and right-click at the entry *Other devices > Avisoft UltraSoundGate 116H* and select the *Update Driver Software...* 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:



Getting started

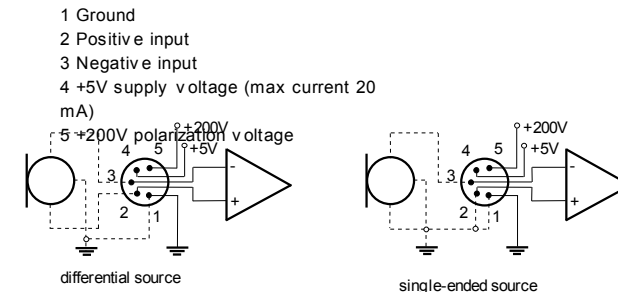
The supplied RECORDER USGH software can be launched from **Start / All Programs / Avisoft Bioacoustics / RECORDER USGH**. On the first program start, the configuration dialog box will be launched automatically (otherwise it is available from **Options / Configuration**). Select the desired **Sampling rate** from the **Input Device Settings** section and click at **Ok**. Then click at the Pause button (**Monitoring/Pause**) and the Start button (**Monitoring/Start**). You will then see the real-time spectrogram displaying the incoming signals. For details on the operation of the RECORDER software see the Avisoft-RECORDER manual and the section **RECORDER USGH Software Settings** in this guide.

Components of the UltraSoundGate 116He



1 XLR input connector

The 5-pole XLR input connector represents the analog inputs of the recording device and provides power supply voltages for external amplifiers and microphones. The connector scheme is as follows:



2 USB 2.0 interface

3 REC indicator

This amber-colored LED will flash once the device is connected to the PC. It will be switched off once the RECORDER USGH software is running in the monitoring mode. In this mode, the REC LED indicates whether the RECORDER software is recording the incoming data onto disk.

4 POWER indicator

This green LED indicates that the unit is connected to the USB power supply.

5 GAIN control knob

This control knob adjusts the analog input recording level.

6 TRG button

This button can control the .wav file recording process in the RECORDER software. To enable this mode of operation, one of the following *Trigger* source options must be selected from the configuration dialog box:

USG TRG button auto hold : Pressing the button for more than 2 seconds will activate an auto hold mechanism (the recording continues after releasing the button and will stop once the button is pressed again). If the button is pressed for less than two seconds, it will only record as long as the button is being pressed.

USG TRG button : The software will record as long as the button is pressed.

USG TRG button inverted : The software will record as long as the button is not pressed (or as long as the external TRG signal is not active (logic high)).

USG TRG button toggled : The software will start recording once the button is pressed and continues until the button is pressed again.


Specifications

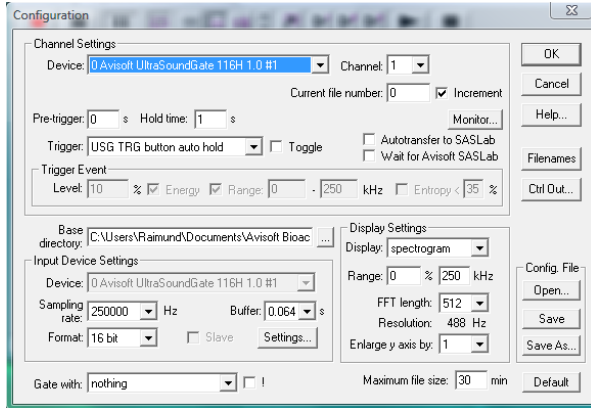
Number of channels	1
ADC type	Delta-Sigma architecture with integrated adaptive anti-aliasing filter
Resolution	16 bit or 8 bit
Sample rates [kHz]	300, 250, 214, 187.5, 166.6, 150, 125, 100, 75, 62.5, 50
Frequency response (-3dB)	20 Hz - 120 kHz
Input sensitivity (max trim)	-43.2dBV = -41 dBu = 6.9 mVrms
Input sensitivity (min trim)	-3.2dBV = -1 dBu = 0.69 Vrms
Gain adjustment potentiometer	40 dB continuous range
Input impedance	50 kOhm
Analog input connector	female XLR-5 socket
Computer interface speed	USB 2.0, isochronous high-speed mode
Supply current (drawn from the USB)	185 mA
Physical dimensions (W/H/D)	63 x 33 x 170 mm
Weight	220 g

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RECORDER USGH Settings

The configuration dialog box can be launched from the menu Options/Configuration... or through the button 



The input sample rate can be selected from the **Input Device Settings** section. Available sample rates are 300, 250, 214, 187, 166, 150, 125, 100, 75, 62 and 50 kHz.

The **Buffer** setting determines the USB transfer buffer size on the PC. Shorter durations will provide low real-time spectrogram display latencies but might lead to erroneous USB transfers under certain conditions.

The **Settings...** button in the **Input Device Settings** section launches the *Advanced USGH Device Settings* dialog box that provides several additional device-specific options:

Enable master/slave mode for synchronizing several devices This option has no effect on the model 116He.

Activate slave mode for this device This option has no effect on the model 116He.

Enable low power mode The A/D converter chips can optionally be operated in a power-saving mode that would increase the battery life in mobile laptop-based systems. The low-power mode slightly degrades the dynamic range performance.

Enable automatic offset compensation If activated, this option removes potential DC offset voltages from the input signal.

Enable band-pass mode At a few sample rates (50, 62.5, 75, 150, 187.5, 200 and 250 kHz), the A/D converter can be configured for a special band-pass mode in which the analog input bandwidth ranges from $fs/2$ to fs instead of the normal mode from 0 to $fs/2$. This option can be advantageous for monitoring applications that require minimal .WAV files sizes. Note that the frequency scale of the resulting .WAV files will be reversed.

Turn on the polarization voltage This option activates the internal 200V polarization voltage generator of the UltraSoundGate XX16H devices and must be activated when using the CM16/CMPA microphones.

Ignore GetOverlappedResult error By default, the *GetOverlapped Result* error message will stop the monitoring/recording process. If this option is activated, the monitoring procedure will be immediately restarted, which is desired in long-term monitoring applications.

TRG out mode This option has no effect on the model 116He.

Monitor undersampling ratio This list box allows to select the desired undersampling ratio of the acoustic monitoring output (5) from 2 to 30 in steps of two. The internal D/A converter will be clocked at a rate that is equal to the selected input (A/D converter) sample rate divided by the selected ratio. The resulting output sample rate is displayed behind the ratio (= xxx Hz). For instance, if you have selected an input sample rate of 250000 Hz and an undersampling ratio of 10:1, the resulting output sample rate will be 25000 Hz. All input signal components above the Nyquist frequency (half of the output sample rate = 12500 Hz) will be folded down to the range between zero and the Nyquist frequency. For instance, a 30 kHz input signal will appear at the monitor output at a frequency of 5000 Hz.

Sound-activated recording can be arranged by selecting the **Trigger** source option *level of this channel*.

The Pre-trigger duration should be kept as short as possible. Long pre-trigger settings can lead to data transmission errors if the sample rate and the number of channels is high.

In order to simplify the operation of the Avisoft-RECORDER software in the field, a link to **RECORDER USGH** may be added to the Windows **Startup folder** (*Start->All Programs->Startup*). Additionally, the Avisoft-RECORDER option **Monitoring/Autostart** should be activated. This arrangement will start the monitoring process automatically after booting the laptop (the UltraSoundGate device must be attached to the USB port prior to booting Windows).

Please refer to the users guide or the online help system for further details on the Avisoft-RECORDER software.



Avisoft ULTRASOUNDGATE

