# Introduction

Thank you for purchasing Avisoft UltraSoundGate 116Hnb. 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:
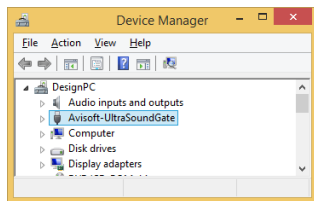
Getting started

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 116Hnb
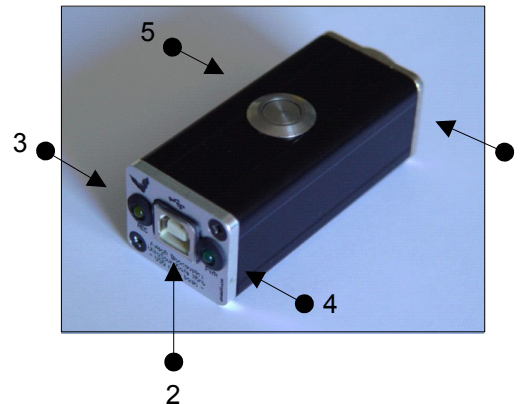
1 XLR input connector

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

1 Ground
2 Positive input
3 Negative input
4 +5V supply voltage (max current 20 mA)
5 +200V polarization voltage

differential source

single-ended source
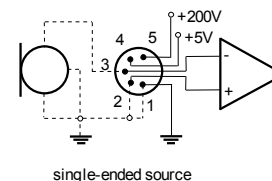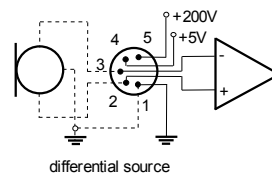
2 USB 2.0 interface

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 the 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 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 inversed : 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

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Number of channels	1
ADC type	Delta-Sigma architecture with integrated adaptive anti-aliasing filter
Resolution	16 bit
Sample rates [kHz]	300, 250, 214, 187.5, 166.6, 150, 125, 100, 75, 62.5, 50
Frequency response (-3dB)	20 Hz - 300 kHz
Input sensitivity (max trim)	-25.2 dBV = -23 dBu = 0.07 Vrms
Input sensitivity (min trim)	0.8 dBV = 3 dBu = 1.1 Vrms
Gain adjustment potentiometer	26 dB continuous range
Input impedance	50 kOhm
Analog input connector	female XLR-5 socket
Computer interface	USB 2.0, isochronous high-speed mode
Supply current (drawn from the USB)	130 mA
Physical dimensions (W/H/D)	31 x 41 x 80 mm
Weight	104 g

RECORDER USGH Settings

The configuration dialog box can be launched from the menu Options/Configuration... or through the button 🔳
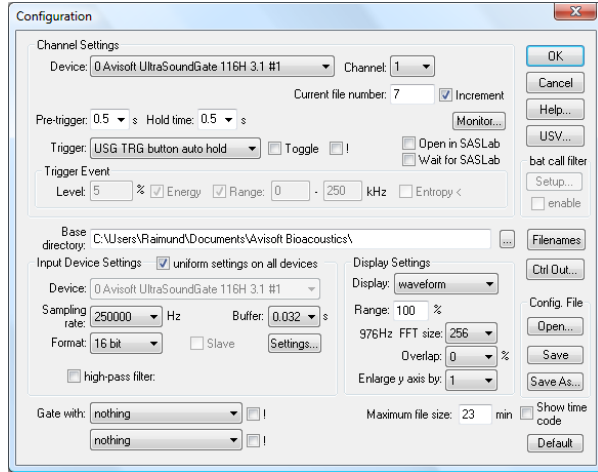
The input sample rate can be selected from the *Input Device Settings* section. Available sample rates are 750, 500, 375, 300, 250, 214, 187, 166, 150, 125, 100, 75, 62 and 50 kHz.

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 option :

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

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

Enable low power mode The A/D converter chip 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 116Hn.

Monitor undersampling ratio This option has no effect on the model 116Hn

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).

The menu **Options/Configurationmanagement/Presets** provides a number of default settings that might help to configure the system for a specific task.

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

Bat detector mode

The RECORDER USGH software includes a number of acoustic monitoring options that allow listening to the incoming ultrasounds through the PC sound card. This can be setup from the **Configuration** dialog box button labeled **Monitor..**.

The **broad-band HF monitoring** option represents an undersampling mechanism that transforms the entire ultrasonic frequency range into the audible range, which is useful to cover all species of bats.

The **selective heterodyne HF monitoring** option shifts a selected frequency band into the audible range, which is similar to a classic heterodyne bat detector. The center frequency of the bandpass filter can also be tuned by dragging its graphic representation on the real-time spectrogram display.

If you use the UltraSoundGate on a Tablet PC with a capacitive touchpad, it might be useful to activate the main window option Options/Large buttons.

Avisoft **ULTRASOUNDGATE**

User's Guide Model 116Hnb