Introduction
Thank you for purchasing Avisoft UltraSoundGate 116Hn. This bus-powered USB device supports single-channel high-speed data acquisition at sampling rates of up to 750 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 116Hn

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

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:

Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of channels</td>
<td>1</td>
</tr>
<tr>
<td>ADC type</td>
<td>Delta-Sigma architecture with integrated adaptive anti-aliasing filter</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 bit</td>
</tr>
<tr>
<td>Sample rates [kHz]</td>
<td>750, 500, 300, 250, 214, 187.5, 166.6, 150, 125, 100, 75, 62.5, 50</td>
</tr>
<tr>
<td>Frequency response [-3dB]</td>
<td>20 Hz - 300 kHz</td>
</tr>
<tr>
<td>Input sensitivity (max trim)</td>
<td>-25.2 dBV = -23 dBu = 0.07 Vrms</td>
</tr>
<tr>
<td>Input sensitivity (min trim)</td>
<td>0.8 dBV = 3 dBu = 1.1 Vrms</td>
</tr>
<tr>
<td>Gain adjustment potentiometer</td>
<td>26 dB continuous range</td>
</tr>
<tr>
<td>Input impedance</td>
<td>50 kOhm</td>
</tr>
<tr>
<td>Analog input connector</td>
<td>female XLR-5 socket</td>
</tr>
<tr>
<td>Computer interface</td>
<td>USB 2.0, isochronous high-speed mode</td>
</tr>
<tr>
<td>Supply current (drawn from the USB)</td>
<td>130 mA</td>
</tr>
<tr>
<td>Physical dimensions (W/H/D)</td>
<td>31 x 41 x 80 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>104 g</td>
</tr>
</tbody>
</table>

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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 options:

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

- **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.

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/Configuration management/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.