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

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

Installation procedure
First install the RECODER USGH softw are either from the supplied softw are installation media (navigate to the subfolder RECODER USGH and run setup.exe) or from the Avisoft Bioacoustics website (www.avisoft.com/downloads.htm or directly www.avisoft.com/RECODER USGH.exe). This installation program will install both the RECODER 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\RECODER USGH\Drivers and finally click at Next. The completed device driver installation will then look like this:

Installation procedure

Components of the UltraSoundGate 116Hnm

1 USB 2.0 interface
Insert here the supplied Micro-B USB cable and connect the other end to the computer.

2 REC indicator
This amber colored LED will flash once the device is connected to the PC. It will be switched off once the RECODER USGH softw are is running in the monitoring mode. In this mode, the REC LED will indicate when the RECODER softw are is recording the incoming data onto disk.

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

Specifications

<table>
<thead>
<tr>
<th>Specification</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 w ith integrated adaptive anti-aliasing filter</td>
</tr>
<tr>
<td>Resolution</td>
<td>16 bit</td>
</tr>
<tr>
<td>Sample rates [kHz]</td>
<td>300, 250, 214, 187.5, 166.6, 150, 125, 100, 75, 62.5, 50</td>
</tr>
<tr>
<td>Computer interface</td>
<td>USB 2.0 Micro-B connector, isochronous high-speed mode</td>
</tr>
<tr>
<td>Supply current (drawn from the USB)</td>
<td>80 mA</td>
</tr>
<tr>
<td>Physical dimensions (W/H/D)</td>
<td>42 x 16 x 55 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>50 g</td>
</tr>
</tbody>
</table>

Getting started
The supplied RECODER USGH softw are can be launched from Start / All Programs / Avisoft Bioacoustics / RECODER USGH

On the first program start, a presets selection dialog box will be launched. Select here the option “Bat Monitoring using USG 116Hnm/Hnb/Hnbn”. The Configuration dialog box will then be launched showing the preset settings. Click at OK to confirm these settings (this can be changed later from the command Options / Configuration). 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 RECODER softw are see the Avisoft-RECODER manual and the section RECODER USGH Software Settings in this guide.

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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 300, 250, 214, 187, 166, 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 116Hnm.

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

- **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. This option should be activated.

- **Keep DI** This option should always be deactivated on the USG 116Hnm.

- **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 file sizes. Note that the frequency scale of the resulting WAV files will be reversed.

**Turn on the polarization voltage** This option has no effect on the model 116Hnm.

**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 116Hnm.

**Monitor undersampling ratio** This option has no effect on the model 116Hnm.

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

Manual recording with pre-trigger can be accomplished by selecting the Trigger option permanent with pretrigger and activating the pause button. Once the pause button is then released, the recording will start with the selected pretrigger duration. Another way to manually trigger a recording would be option left-click / touch window area, which will start a .wav file as soon as the RECORDER software window area below the button bar record is left-clicked or touched.

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 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 computer (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.

Note that the relatively low gain of the UltraSoundGate 116Hnm requires that the trigger threshold is set to a low level. For passive bat monitoring try the preset Options / Configuration management / Preset / Bat monitoring using USG116Hnm/Hnb/Hnbm. This will also activate the x10 option on the Display Settings section of the Configuration Dialog box that provides a better (more sensitive) real-time spectrogram display.

In order to facilitate the operation of the software on tablet PCs, the option Options/Display/Large buttons should be activated.

Please refer to the user's guide or the online help system for further details on the Avisoft-RECORDER software (http://www.avisoft.com/RECORDER.pdf).