

Getting started with the RECORDER USGH software

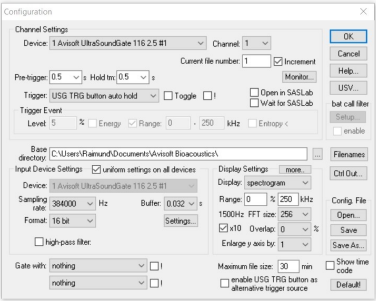
The RECORDER USGH software can be launched from **Start / All Programs / Avisoft Bioacoustics / RECORDER USGH**. On the first program start, the configuration dialog box will be launched automatically (otherwise it is available from **Options / Configuration**). Select the desired **Sampling rate** from 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.

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 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. Note that the relatively low gain of the UltraSoundGate 116Un 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**. It is also recommended to activate the option **x10** on the Display Settings section of the Configuration Dialog box that will provide a better (more sensitive) real-time spectrogram display.

To become familiar with the RECORDER USGH software use the online help system that can be accessed through the drop-down menu **Help > Help...**, the **Help...** buttons on the individual dialog boxes or the website at <http://www.avisoft.com/Help/RECORDER/content.htm>



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 384, 256, 192, 128, 96 and 48 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 116Un.

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

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 Activate this option if the DI input is being used.

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

Enable band-pass mode At a few sample rates (48, 96 and 192 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 has no effect on the model 116Un.

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 re-started, which is desired in long-term monitoring applications.

TRG out mode This option allows to change the I/O direction of the TRIGGER input/output socket. If activated, the socket will be configured as a digital output for sending TTL pulses to external devices.



UltraSoundGate 116Un

Generic USB Audio Device



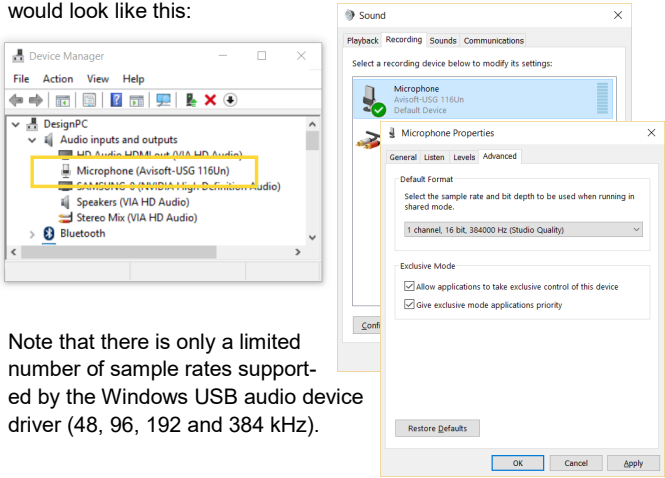
Introduction

Thank you for purchasing the Avisoft UltraSoundGate 116Un. This generic USB audio device supports sampling rates of up to 384 kHz. Thanks to its class-compliant USB audio interface design, it can be used with third-party / custom software on various operating systems including Windows, Linux, Android and OS X. In addition to that it can also be used with the included Avisoft-RECORDER USG/USGH recording software on Windows XP / Vista / 7 / 8 / 8.1 / 10 / 11.

Installation procedure on Windows

A) Using the USB audio device driver of the operating system

When the Avisoft UltraSoundGate 116Un is connected to the computer at the first time it will be recognized as a Generic USB Audio device (Microphone) and the required device driver will be installed automatically. There is no further installation required except of the selection of the desired sample rate. On Windows 10 it would look like this:



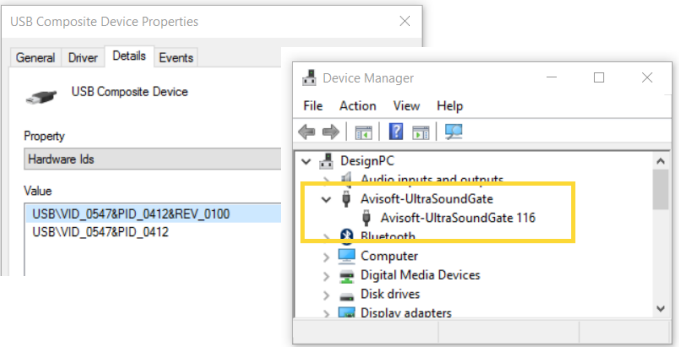
Note that there is only a limited number of sample rates supported by the Windows USB audio device driver (48, 96, 192 and 384 kHz).

B) Using the proprietary USGH.SYS device driver in combination with the Avisoft-RECORDER USGH software on Windows

In order to use the Avisoft-RECORDER USGH software (which supports all sample rates up to 384 kHz on all Windows versions) this software must first be installed either from the Avisoft Bioacoustics website (www.avisoft.com/downloads or directly www.avisoft.com/RECORDER%20USGH.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.

In order to use the RECORDER USGH software it is necessary to manually install the USGH.SYS driver. Navigate to the *Windows Control Panel > Hardware and Sound > Device Manager* and right-click at the **USB Composite Device** entry in the Universal Serial Bus controllers section. In case there is more than one composite device, select the one with the **Hardware Id** property "USB\VID_0547&PID_0412". This property can be viewed by right-clicking and selecting the popup menu option **Properties**. Select the **Details** tab and then the **Property** list box entry **Hardware IDs**.

To install the new driver select the popup menu option **Update Driver Software...** and then the option **Browse my computer for driver software**. 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:

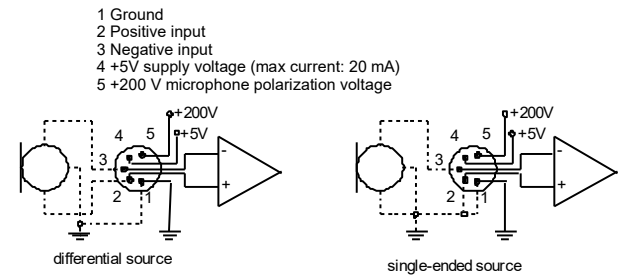


The USGH.SYS driver can be uninstalled from the Device Manager by right-clicking at the **Avisoft-UltraSoundGate 116** entry and selecting the popup menu item **Uninstall**. Make sure to activate the option **Delete the driver software for this device** in order to permanently remove the driver. After unplugging the USG 116Un it will be recognized again as an USB audio class device (Microphone) again.

Components of the UltraSoundGate 116Un

XLR input connector

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



TRIGGER button

This button can control the .wav file recording process in the RECORDER USG/USGH 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** (joystick button 1): 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** (joystick button 2): : The software will record as long as the button is pressed.
- USG TRG button inverted** (joystick button 3): : 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** (joystick button 4): : The software will start recording once the button is pressed and continues until the button is pressed again.

When the USG 116Un is operated as a generic USB audio device, the Trigger button and Trigger input will be exposed to the operating system as a generic HID-compliant game controller.

TRIGGER in/out

This 2-pole (mono) 2.5 mm mini-jack connector is electrically connected to the TRG button (7) 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 **USG TRG button**.

DIN socket

This 2-pole 2.5mm mini-jack connector allows to connect an external digital signal. The input is TTL-compatible (there is an internal pull-up resistor of 10 kOhm tied to Vcc). The status of this signal is stored in the LSB (bit 0) of the 16-bit data words that are transmitted over the USB and can be used as a sample-precise trigger source in the RECORDER software. It can be extracted afterwards by the Avisoft-SASLab Pro sound analysis software (e.g. for creating labels). Note that the DIN functionality will not function properly if there was any resampling or level adjustment mechanism applied to the generic USB audio device by the operating system.

MODE LED

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 MODE LED indicates whether the RECORDER software is recording the incoming data onto disk.

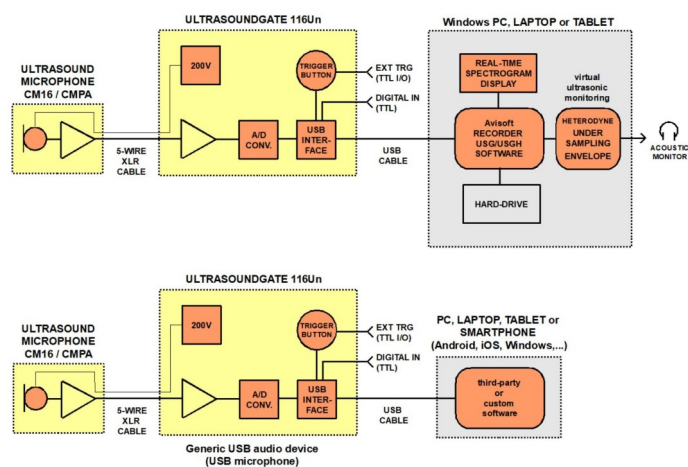
When the USG 116Un is being used as generic USB audio device without the RECORDER USGH software, the MODE LED will light permanently once the device is straming audio data over the USB.

PWR LED

This green LED indicates the presence of the power supply voltage provided by the USB bus.

Specifications

Number of channels	1
ADC type	Delta-Sigma architecture with integrated adaptive anti-aliasing filter
Resolution	16 bit
Sample rates [kHz]	384 , 256, 192 , 128, 96 , 48
Frequency response (-3dB)	20 Hz - 180 kHz
Input sensitivity	-9 dBV = -7 dBu = 0.35 Vrms
Input impedance	50 kOhm
Analog input connector	female XLR-5 socket
Computer interface	USB 1.1/2.0, isochronous full-speed mode
Supply current (drawn from the USB)	100 mA
Physical dimensions (W/H/D)	36 x 36 x 120 mm
Weight	170 g



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Using the UltraSoundGate 116Un on iOS devices or other operating systems with limited USB audio device class support

Due to the limited USB audio device class support on iOS 9, it is necessary to boot the UltraSoundGate 116Un in the single sample rate mode that provides only a fixed sample rate of 386 kHz. This mode of operation can be activated by pressing the trigger button while the unit is plugged into the iOS device.