USB audio interface

Glensound CUB
Two Channel Interface Mixer For iPhones & Smart Devices

The Glensound CUB is a high specification audio device that provides a two input mixer with mic/line inputs and two headphone outputs. This input/output interface allows audio integration with Apple iPhones and other smart devices to use with software or app based IP codecs such as Luci Live, or with mobile recording software or apps.

Key Points

Mixer

• 2 channel mixer with mic/line/48v phantom inputs
• Inputs have Glensound Referee compressor/limiter system
• Inputs can be switched to output 1, 2 or both
• 2 x master outputs on XLR
• 2 channel audio input and output interface via USB
• 2 x headphone outputs on 6.35mm jack sockets
• Headphone monitoring with 3 sources (local inputs MIX, USB audio 1, USB audio 2)
• Headphone monitoring inputs have left/both/right switching
• Two line outputs on balanced XLR
• Audio routing configurable via USB
• 4 x AA batteries or external DC power

iPhone/Smart Device Interface

• Apple iPhone USB audio interface uses the Apple camera kit adaptor lead (included). 30 pin and lightning connectors available.
• Apple iPhone or smart device A type USB plug mounted on top for secure connections when in use
• Glensound Magic Pad grips phone on top panel to ensure it stays secure
• Side mounted B type USB socket for connection to notepads or PCs

Available now

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Includes:

LUCI **LIVE**

Glensound GS-GC5/USB
Commentary Mixer With USB Audio & Luci Live IP Codec

A 4 input commentator operated outside broadcast unit in the tradition of previous Glensound ISDN units. This time, the audio I/O is via USB. The GS-GC5/USB includes LUCI live, the leading software IP solution. Using the USB audio link to a PC or notepad, IP calls can be established using several high quality codecs including AAC, AAC-HE and MP2

Key Points

Commentary Mixer

- 4 channel mixer with mic/line/48v phantom inputs
- Inputs have Glensound Referee compressor/limiter system
- 4 x headphone outputs on 6.35mm jacks and 3.5mm jacks
- Headphone monitoring with 2 sources (MIX and CUE) with left/both/right switching
- Two line outputs on balanced XLR
- USB audio link to PC or notepad
- Includes USB to Ethernet converter to allow wired connection to network
- Internal Li-ion battery for 7 hours run time
- External 19v DC power

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IP Codec

- GS-GC5/USB includes the full version of the Luci Live IP codec for PCs and notepads
- Codecs: MP2, AAC, AAC-HE, AAC-HEV2, G711, G722, ULCC
- 24 bit ULCC audio codec, 44.1 to 384 kHz sample rate
- RTP or UDP low-delay streaming, including return channel
- SC-RTP allows audio to be transmitted via multiple circuits simultaeneously ie. wifi, LAN, 3G etc allowing for redundant links
- 1 way shoutcast/icecast streaming
- Record while broadcasting
- Play pre-recorded material while broadcasting
- N/ACIP compatible
- Sample rate from 44.1 to 384 kHz
- ASIO support on Windows

USB audio and IP

Glensound GS-GC5T/USB
Commentary Mixer With USB Audio For Connection to Apple IPads or Tablet PCs

A 4 input commentator operated outside broadcast unit in the tradition of previous Glensound portable units. The audio I/O is via USB. With the GS-GC5T/USB there is a USB audio link to an Apple iPad or tablet PC. IP calls or recordings can then be established using several of the tablet or software based apps including Luci Live.

Key Points

Commentary Mixer

- 4 channel mixer with mic/line/48v phantom inputs
- Inputs have Glensound Referee compressor/limiter system
- 4 x headphone outputs on 6.35mm jacks and 3.5mm jacks
- Headphone monitoring with 2 sources (MIX and CUE) with left/both/right switching
- Two line outputs on balanced XLR
- Includes USB to Ethernet converter to allow wired connection to network
- Audio routing configurable via USB configuration
- Internal Li-ion battery for 7 hours run time
- External 19v DC power

Notepad Interface

- Apple iPad USB audio interface uses the Apple camera kit adaptor lead (included). 30 pin and lightning connectors available.
- Mini USB for notepad/iPad audio connection and B type USB also included for audio with configuration.
- Integral stand for iPad or tablet PC

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Glensound USB Audio Interfaces
Mixers For iPhones, Smart Devices, Tablets, & Pcs

Overview
The CUB, GS-GC5/USB and GS-GC5T/USB portable audio broadcast units were designed to be very simple to operate for non-technical users yet have very sophisticated features available to engineers hidden beneath the surface. To this end they are built around a new and highly innovative digital architecture that provides ground breaking audio performance for the discerning engineer.

DSP Core
It is common for high end broadcast audio products to use a digital signal processor (DSP) for complex audio tasks within a product however very few devices use these in battery powered portable equipment due to the power consumption of the devices. Glensound USB audio devices solve this by implementing a combination of the latest low current DSP technology and the latest battery technology.

Microphone Amplifiers with low noise & extended headroom
With all digital audio products the initial microphone amplifier is an analogue device whose output is fed into an analogue to digital converter (ADC) chip. The ADC chips have a specific noise floor and applying too much gain in the digital signal after the ADC will bring the noise floor up to an extent that it will be heard. The ADC chips also have a maximum input level and setting the output of the mic amp too high (normally done to keep the noise floor low) will reduce the amount of headroom available. Headroom is the amount of extra input level available on top of the line up of the mic amp and it is very important particularly in commentary systems as when the commentator gets excited the output level of their mic will rise a lot and if the audio electronics does not have enough headroom the audio will clip.

The traditional approach to get the best performance out of the mic amp and ADC when only a single gain/fader control is available to the user is to pick an optimal mic amp gain that leaves as much headroom as possible while leaving the noise floor as low as possible. This is far from ideal as the final equipment either has too much noise or not enough headroom.

We spent a lot of time developing a very clever mic amp and ADC arrangement that solves the issues of headroom and noise. The system provides a constant 30dB of headroom (enough for even the most excited of commentators) while also providing a constantly variable front end gain (thus reducing noise). This is done by utilising the latest variable gain microphone amplifier which can change its gain in approximately 3dB steps and syncing its 3dB gain changes with 3dB steps within the DSP. The gain changing between the DSP and mic amp is very accurately synced and the DSP changes its gain settings at the exact point that the first audio sample arrives from the mic amp after it has changed its gain thus keeping the output level perfect. Although the syncing of the mic amp and DSP is in 3dB steps the DSP provides fully adjustable gain control in minute steps so there are no horrible jumps as the gain control is operated. This all may sound very simple even logical however the knowhow and technology to make this work seamlessly is really advanced and we are the first broadcast manufacture to be able to offer this advanced technology.

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Compressors both RMS & Peak

Broadcast audio mic amps (especially commentary ones) need compressors to keep the output level from distorting or getting too loud when there are sudden spikes on the input. The compressors within the CUB are controlled within the DSP. There is one compressor chain for each audio input of the unit thus eliminating the issues caused by a high peak on one input reducing the correct level on another.

The compressors used within the system are a combination of a look ahead peak compressor whose job it is to catch the really fast transients that are missed by the slower but much more natural sounding RMS compressor. The combination of the 2 compressors with the peak compressor only being used to catch the very fast peaks and the RMS compressor for 'normal' compressing, offers further technical advances on the standard broadcast RMS only compressors which sound great but fail to catch the fast peaks.

Because the compressors are within the DSP it is possible to provide a specific curve or compression style tailored to meet a customers' exact requirement, please email sales@glensound.co.uk for more details.

USB digital audio

There are many USB audio interface chipsets on the market and they vary in quality drastically with most of the chipsets found in the domestic USB audio interfaces being far below the standards expected by broadcasters.   After a trial of many chips we finally selected a chipset with a combination of great audio performance, ease of PC connectivity and advanced features for the discerning engineer.

As standard we have set the USB audio interface to work as class 1 fixed at 48kHz 24 bit, this has been done specifically to make connection to a windows computer seamless and hassle free for users.

For the engineer or audiophile there are more possible USB settings available. Class 1 audio drivers are built into windows and do not need to be installed and as such are great because they just work, however windows class 1 drivers add delay, to improve this the firmware that we have written for the USB audio chipset also works with ASIO drivers. ASIO drivers bypass the standard windows drivers and provide much lower delay into & out of the pc. We do not supply our own Glensound ASIO driver but our firmware was written to work with the free and widely available ASIO 4 ALL drivers.

As well as being able to run with ASIO drivers it is possible to set our USB interface chipset to work as USB audio class 2. USB audio class 2 is supported natively in Apple products and the higher bandwidths supported by class 2 can sometimes be advantageous, however currently windows PC's need specific class 2 drivers (which we do not supply).

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Headphone Amps which drive both Low & High Impedances without killing the battery

 Historically broadcasters have used headphones with high impedances (200 Ohms +) however over the last decade there has been a shift to more broadcasters using lower impedance headphones of 32 – 80 Ohms. For outside broadcast equipment it is important to design the headphone amplifiers to have enough drive to provide enough level into high impedance headphones, the problem is that when low impedance headphones are used on these circuits they draw a lot of current and greatly reduce the battery life of portable equipment.

Glensound USB Audio Interfaces
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Specifications 3 of 4

Recently our Chief Design Engineer Paul Grant, spent a long time coming up with some ingenious circuits to solve this problem. I won't tell you how they work (as no other broadcast manufacturers have been able to come up with a solution to this problem and we don't want them pinching our ideas (again)!) but needless to say with our USB audio devices you can use high or low impedance headphones and have the same long battery life when using either type.

Powerful DSP driven audio routing
As the internal architecture of the CUB is digital with its heart being a sophisticated DSP it is possible to change the routing of the audio circuits.

Out the box the units will just work effortlessly for the less technically able users in a traditional single program mode. However an engineer will be able to change the audio routing by dropping a different setup file via the USB port into the internal filing system. Initially there will be setups supplied for panned centre stereo working (default), panned left/ right stereo working, mono program and mono talkback and 2 separate mono programs. Other configurations will be able to be custom supplied by Glensound and if there is enough interest our software engineers will provide in the future a user configurable application to set up the routing.

Intelligent channel gain, input impedance & compressor setup
As well as the sophisticated mic amplifiers and ADC circuits the audio input circuits also provide a number of other useful & innovative features.
The most innovative is the ability of the input circuits to change their input impedance to the correct level. Mic input circuits generally need an impedance of 2kOhms while line input circuits need a high impedance ideally 100kOhms. The problem is that when a single input XLR is used for both mic inputs and line inputs the input impedance of the circuit cannot be right for both types and most manufacturers end up with slightly low mic impedances and very low line impedances. Our design engineers have come up with a great solution that allows the correct input impedances to be presented for both mic and line inputs even though there is only 1 physical XLR input for both input types. A very useful side effect of this input technology is that it also provides a much better than normal common mode rejection.
Another issue that affects input impedances is the phantom power supply, the normal way of supplying phantom power to a mic input is to have a pair of resistors connected to pins 2 & 3 of the input and the other end of these resistors connected to the internal phantom power supply volts. Most manufacturers turn the volts on/ off to the top of the resistors when turning phantom power on/ off, this leaves the resistors attached to the input and alters the input impedance when the phantom power is not on. Using similar technology to our new input impedance switching circuits our engineers can now completely remove the phantom power resistors when not in use.

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Specifications 4 of 4

Our intelligent channel gain circuits means that the initial microphone line up gain is different for dynamic and condenser microphones. This is because a condenser microphone (one that requires phantom power) has a much higher output level than a dynamic microphone (one that doesn't use phantom power). When the user turns the phantom power on/off our initial input lineup gains get set automatically to provide the best performance for both types of mics.

Compressors automatically turn off for line inputs. It may only be a minor point but if an input is selected to be line level then the system automatically switches the compressor circuits off for that input. This is because line inputs will be coming from a controlled output source and it is undesirable to have compressors affecting the level of the audio (that presumably someone has already taken time and effort into ensuring that it is at the correct level).

Battery powering
When designing the GC5-USB and GS-GC5T/USB, we spent a lot of time at the start working out current consumption and considering different battery powering options. When the figures were analysed there was only 1 real solution for battery technology in the larger units that would be able to provide the long on air talk time required by broadcasters and this was Lithium-ion.

Lithium-ion batteries are great but they cause 1 major problem that most broadcast manufacturers ignore and we decided to solve. The technical issue for Lithium-ion cells is working out accurately how much power there is left in them. For normal Alkaline cells an accurate enough measurement of remaining power can be ascertained from the batteries output voltage, this voltage measurement can be compared to standard discharge graphs and a fairly accurate estimate of remaining battery life based on the device's current consumption can be made. With Lithium-ion cells the output voltage remains constant until the battery is virtually fully discharged, giving very little time to provide an indication to a user that the battery is running low if the standard output voltage is used for determining battery life.

The solution is to count 'coulombs'. Coulombs are a measurement of the amount of energy stored within a battery. By developing coulomb counting circuits and pairing this with specifications based on carefully analysing the battery chosen for use in the units we are able to accurately determine the amount of charge left in the batteries. Therefore the simple looking battery meter on the GS-GC5/USB and GS-GC5T/USB is extremely reliable and won't let the users down by providing misleading information.

Updates via USB
Updating a devices firmware and software via USB isn't exactly an innovation as it is pretty much a perquisite on domestic products made for the mass market. However it is a detail that is often glossed over by broadcast manufacturers and as the minimum expected life cycle of our equipment is 20 years it is likely that a few updates will be released during this time and this feature will be very useful.

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