

# Manual

# AD 480

ACOUSTICS DESIGNER

Version 1.30  
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This guide will be updated regularly as the software itself is further improved and developed.

Check for updates and other information at

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### 1. Preface

The AD 480 Reverb is a professional reverberation app for iOS. It lets you simulate any kind of acoustic space you can imagine. Play live, practice, record or mix with the acoustics you where always dreaming about. The AD 480 Reverb comes in three sizes, the AD 480 free, the AD 480 basic and the AD 480 pro. The free version lets you check out the sound as standalone and inside Audiobus with your favority synths or DAW. It comes with four finely crafted acoustic spaces. The basic version extends the free versions functionality by letting you have access to all the reverb parameters so that you can experience the full range of sonic possibilities. The pro version is the ultimate solution for reverberation on iOS, giving you 108 beautiful presets and full access to everything you need in your studio, live on stage or wherever you go. This manual only describes the functions of the pro version since the other two versions are subsets of it.

### 2. Usecases

The AD 480 Reverb can be used in many ways.

As a standalone app it uses the internal audio system or an externally connected audio interface. Supported are all interfaces connected directly to the audio IO of the iDevice (headphone jack), all interfaces with Mfi (connected to 30pin or lightning) and many USB class compliant interfaces. In this way it can be integrated easily in any studio or live setup. It is a flexible way of replacing any hardware reverberation unit and provides an extremely flexible use because of software updates and other effect apps which can be used parallel to the AD 480. The extensive routing capabilities of the AD 480 Reverb make it very easy to configure it exactly for your needs. The MIDI input and output capabilities let you automate and control your AD 480 Reverb remotely, for example with your preferred DAW/sequencer on your iDevice or external.

With the new feature called Dynamic Upgrade it is possible to run up to three AD 480 Reverb pro instances on your iDevice (depending on it's processing power). With this you have 3 independent reverb units which can also be combined to provide even up to 5.1 or 6.0 surround reverberation (with an appropriate audio interface).

Additionally the AD 480 Reverb provides full Interapp Audio support via Audiobus. It can be placed anywhere in the Audiobus processing chain and therefore gives you the greatest possible flexibility.

From iOS 7 on the AD 480 Reverb can act as an Interapp Audio node and thereby be integrated into the signal flow of any Interapp Audio host, almost like a plugin.

### **3. Signal Flow**

The AD 480 Reverb has one stereo input and 3 stereo outputs which can be routed freely. The mixed output gives you the wet and the dry signal mixed by the „mix“ fader. The wet output gives you the wet signal only without attenuation. The dry out gives you the dry signal, also without attenuation. This means that the mixfader has no influence on the volume of dry and wet output.

The input signal is delayed by „pre delay“ and then fed into the reverb algorithm and to the delay of „dry distance“ in parallel. Additionally the input signal can be fed channel swapped to the input of the reverb algorithm attenuated by „cross feed“ and delayed by „cross delay“.

A peak meter shows the the input level before processing as well as the levels on the three output lanes mix, wet and dry right after the processing stage.

### **4. Parameters**

The following list describes the sound adjusting parameters in detail.

- MUTE: The whole audio running through the app is muted, although it is still processing (currently only on iPad).
- IN BYPASS: All audio at the reverbs input is muted. The reverb tail fades out naturally and the dry signal part remains audible.
- OUT BYPASS: The wet signal part is muted, but the reverb still processes incoming audio. The dry signal part remains audible.
- Preset ->> / Preset <<-: With these buttons you step through the presets in the currently loaded bank, discarding any adjustments you may have made to the sound before. The load preset function on the setup page on the other hand checks this before loading a new preset.

## Faders:

- „size“: This parameter adjust the reflections to simulate the desired size of the virtual space. When adjusting, all buffers get flushed to prevent unpleasant noise.
- „rev. length“: This adjusts the how hard the spaces boundaries (e.g. walls) are reflecting the sound in the virtual space. The higher the value the harder the reflection which results in a longer reverberation time depending on „size“.
- „pre delay“: Delay time in milli seconds between dry and wet signal.
- „cross feed“: Since the reverberation algorithm of the AD 480 Reverb consists of two separate mono reverberation units, which are correlated to each other, it can be used as two mono reverbs by feeding different signals to the left and the right input. However if you desire to have a consisten stereo reverb for mono signals which are not in the middle of the mix you can use „cross feed“ to additionally adjust the amount of how much the left input is fed to the right reverb and the right input to the left reverb. If this parameter is at its maximum (1.0) you are feeding L+R to both mono reverb units.
- „cross delay“: With this parameter you can add a delay to the „cross feed“ signal. This means the left input to the right reverb and the right input to the left reverb are delayed by the amount of „cross delay“ in milli seconds. By using this parameter you can fine tune the AD 480 Reverb’s behaviour for signals coming from different directions.
- „dry distance“: Adjust the delay of the dry signal. With this parameter you can practically move the dry signal further into the room. The actual delay time also depends on „size“.
- „spread“: This parameter adjusts the relative volumes of Mid/Side in the signal. A value of 0 makes the reverb mono, 0.5 is full stereo and higher values lower the Mid part of the signal and can be used for special effects.
- „hi damp frq“: Frequency of the dampening filter for high frequencies. This filter is cumulative which means that the high frequencies are more and more dampened the closer you get to the end of the reverb tail.
- „hi damp lvl“: Amount of high frequency dampening. A value of 0 means no dampening and the lower the value the higher the dampening.
- „lo damp frq“: Frequency of the dampening filter for low frequencies. This filter is cumulative which means that the low frequencies are more and more dampened the closer you get to the end of the reverb tail.

- „lo damp lvl“: Amount of low frequency dampening. A value of 0 means no dampening and the lower the value the higher the dampening.
- „high cut“: This parameter represents the frequency of the high cut filter for the entire wet signal part. This filter is not cumulative.
- „low cut“: This parameter represents the frequency of the low cut filter for the entire wet signal part. This filter is not cumulative.
- „mix“: This parameter determines the mix levels of the dry and wet signal on the mixed output path.
- „out volume“: The global output volume of the all outputs. This is the only fader parameter not saved in presets.

#### Buttons:

- „dry distance“: This button switches on and off the dry distance delay. It gives you the possibility to A/B check the setting of the „dry distance“ fader.
- „cross feed“: This button lets you switch on and off the entire cross feed function.
- „cross phase L“: By switching this on the phase of the signal from the left channel which is fed to the right reverberation unit by the cross feed function is inverted.
- „cross phase R“: By switching this on the phase of the signal from the right channel which is fed to the left reverberation unit by the cross feed function is inverted.

## 5. Setup Page

On the setup page you can adjust all parameters needed for the professional use of the AD 480 Reverb. There you can decide on your MIDI and audio routing, sample rate and latency as well as the preset management for reverb settings, MIDI and audio routing. On iPad the AD 480 Reverb has one page containing all those parameters while on iPhone/iPod parameters are split on two pages which you can switch with the button „>>“.

#### Parameters in detail:

- sample rate: The sample rate shown in the box is always the actual sample rate the system is working with. When you touch the area of this box a dialog opens and lets you choose a desired sample rate. The AD 480 Reverb then is trying to change the sample rate in the iOS audio system.

The result is shown in the box afterwards. It is possible that the AD 480 Reverb cannot change the systems sample rate to your liking, mostly because of two causes. One is, that the system may not support the desired sample rate. For example when you are using the iDevices internal audio output (headphone jack) then the maximum possible sample rate is currently 48kHz. The other possible cause is that another audio app was running before you started the AD 480 Reverb and this app dictates the system sample rate.

- latency: This box shows the actual buffer length of the AD 480 Reverb's audio engine and the input and output channels of the current audio route (it changes automatically when you connect an external audio interface with a different channel count to your iDevice). Each audio buffer cycle the value gets updated. If you want to change the latency just touch the boxes area and a dialog opens to select the desired latency. After selecting the latency the AD 480 Reverb tries to adjust the audio system accordingly and afterwards the result is shown in the box. If the value isn't what you selected the latency is most probably dictated by another audio App started prior to the AD 480 Reverb. If you experiences audio stutters or drop outs, it usually helps to increase the latency.
- MIDI in/out settings: There are two options which let you choose the input and the output interface for MIDI signals as well as the respective MIDI channel. You can safely choose the same interface and channel for both input and output since the AD 480 Reverb has implemented an algorithm to prevent MIDI feedback loops.
- MIDI parameters: With the two rotating selectors you can assign a MIDI controller to each reverb parameter. Be careful about this because it is possible to assign one controller to various parameters of the AD 480 Reverb.
- Presets: You can manage your MIDI and audio routing as presets to have access to different configurations quickly. Your reverb settings are also managed as presets which are organized in bank files. Bank names must be unique while names for reverb, audio routing and MIDI routing presets don't have to.
- background Audio: When you send the AD 480 Reverb the background by pushing the home button or because another app comes into the foreground, the AD 480 Reverb stop audio processing (not with Audiobus!). To have the AD 480 Reverb process audio also in background you simply need to activate this function with the respective button.
- audio routing matrix: In the audio routing matrix you can select the audio inputs and outputs. The number of available buttons is automatically adjusted to the available inputs and outputs. This includes also Audiobus functionality.

If you select two input channels they are fed into the reverb as stereo signal. If you select only one input channel, this channel is fed into both left and right reverb unit. There are three different output lanes for which the channels can be selected, mono or stereo. The mixed lane contains the mixed signal of both wet and dry. The wet and the dry lane are not affected by the mix fader. This gives you the possibility to mix them outside the AD 480 Reverb.

- The section about around “audio file“ with the four buttons load, delete, import and export will be explained in point 9.

## 6. Audiobus

The AD 480 Reverb offers maximum flexibility with Audiobus since you can insert it into any position you want. In the input position it receives audio from the system and feeds it into Audiobus, enabling you to process it further before output/recording. In the filter position (center) it processes the mixed audio of all sources connected to Audiobus in the input positions. In the output position the AD 480 Reverb processes the audio coming from the center position or if this is empty the mixed audio of all sources in the input positions and send it to the desired output of the system.

The current version (1.30) has been updated to the latest Audibus SDK V2.1.1 which now is based on Interapp Audio with improved latency. Since in this version now the filterport can be inserted into any slot, the input port implementation has been taken out. If you want to use the AD 480 Reverb in the input position automatically the filter port implementation is used and you have to select the system audio input in Audiobus instead of the AD 480 Reverb's routing matrix.

Also the new Audiobus 2 feature State Saving has been implemented for all AD 480 Reverb apps with activated pro features.

## 7. Interapp Audio

Apple introduced it's own technology for app to app audio with iOS 7 called Interapp Audio. Capable hosts can connect themselves with any node available. All versions of the AD 480 Reverb are Interapp Audio capable. Combined with the Dynamic Upgrade feature you can have up to three AD 480 pro running parallel for different reverbs within one host/mix.

At all pages except the setup pages there are three buttons (play, record, rewind) which are the usual remote control buttons for controlling the host the AD 480 Reverb is connected to directly from there. Also there is a display showing the play position the host is at and in the black square besides it the hosts icon appears when connected. This icon serves as a button to switch to the host.

## **8. Recording, Playback**

When the AD 480 pro is not connected to an Interapp Audio host, the three buttons play, record and rewind are used for the internal recording and playback function. The display shows the current recording or playback position.

Playback works only when an audio file is loaded and when feedback protection is not engaged. A file can be loaded on the setup page. After recording the recorded file is loaded automatically for playback. The file played back is always fed into the reverbs input. The file size for playback is only limited by device and format limitation since the file is streamed directly from disc. If the sample rate differs from the current audio sample rate the AD 480 Reverb is running with, automatically live sample rate conversion during playback occurs.

Recording works only when feedback protection is not engaged. Simply hitting the record button starts recording immediately. It can be paused by hitting the pause button and then resumed by hitting the same button which now shows up as play button. You can stop the recording by hitting the record button or the rewind button. Then a dialog pops up asking you to enter a name. If you cancel during this process the recording is discarded! If you want to keep the recording you must give it a valid name. Always the input signal without any processing is recorded and the format is a 32-bit float .wav file for maximum quality. Then afterwards you can adjust the reverb parameters to your liking and process and export the resulting audio. The sample rate of the recording is the current audio sample rate. Recording and playback works also inside Audiobus.

## **9. Importing, Exporting, iTunes Library Access, Offline Processing**

On the setup page(s) there is a section where you can manage your audio files. There you can load audio files from the local AD 480 Reverb directory or delete them to free up space on your iDevice.

The import function lets you import audio from three different locations. You can import audio from the pasteboard of the AudioCopy2 framework which many music apps have included as an option to copy and paste audio from one app to another. You can also import audio from AudioShare which itself is an app for managing your audiofiles across your music apps having implemented the AudioShare functionality. And last but not least you can load audio from your iTunes music library. This audio can be played and processed directly now.

The export function lets you process and export the loaded audio file to either AudioCopy2 or AudioShare. When hitting export you are asked to enter not only the destination but also the desired format. The sample rate will be the current sample rate of the AD 480 Reverb. You can choose to export the mixed signal or the wet only signal. Also you will be asked to choose the bit depth and if the processed signal shall be normalized to -3dB peak.



If you choose to let the processed signal being normalized you can be sure not to have any distortions since normalization is done before converting from 32-bit float processing values to 24-bit or 16-bit integer of the final output format. If you choose to export without normalization you should check first with the level meters that during the whole playback no distortion occurs. During offline processing of the file for export the online processing of the audio stream running through the AD 480 Reverb is switched off for maximum performance. Playback is also automatically stopped.

## **10. Dynamic Upgrade, Trial Period & IAP**

If there is no AD 480 Reverb with pro features present on your iDevice, the AD 480 free and/or the AD 480 basic offer one hour of testing all the features of the pro version. Another feature of the AD 480 Reverb apps is Dynamic Upgrade. It basically means that all installed versions of the AD 480 Reverb register themselves with the system once they have started for the first time after install. Then all present versions of the AD 480 Reverb run as the highest installed version. This means that if you have the AD 480 pro installed, all other versions also become pro automatically. If you have the AD 480 basic installed but not the pro, then the AD 480 free also becomes basic. As another option for upgrading the AD 480 basic can be upgraded to AD 480 pro via IAP (inApp purchase).

## **11. Accessing and sharing files across different versions of the AD 480 Reverb**

You can access the files of each AD 480 Reverb installation on your iDevice via iTunes file sharing from a connected computer. In this way you can copy your preset files from one AD 480 Reverb to another on the same or on different iDevices or share them with others also using the AD 480 Reverb. In the same way you can access the recorded or imported audio files and copy audio files into the AD 480 Reverb's local directory for later processing.