



User manual

xp.engine

xp.engine is a m4l (max-for-live) device. It comes inside the *xp.devices* bundle under the file name *xp.engine.amxd*.

It is an essential part of XP environnement. The *xp.engine* is the place where the project is dynamically configured and will make the Ircam-Spat library accessible in Ableton through a comprehensive format for a beginner or regular Live users. It's also a multichannel audio bus, rendering the audio scene accordingly to set up specifications.

What does the engine?

Only one xp.engine is required and must be loaded in second, after xp.visual, in a new project

xp.engine displays a menu to navigate through interfaces : Configure, Route, Record

The device is fully dynamic, and it will adjust in cascade the interfaces configurations. It is from the track on which the device is loaded that the sound of the scene is processed. It turns this initially stereo track into a multichannel audio bus which is reproduced by the arrangement of Hp.

Important and very practical feature, the xp.engine offers a multichannel recording/playing interface that adapts to the current configuration and record the sound of the project on the fly and/or in binaural. In the case of an hoa spatialization type, it's also possible to record encoded components, simultaneously with the classic rendering.

Loading

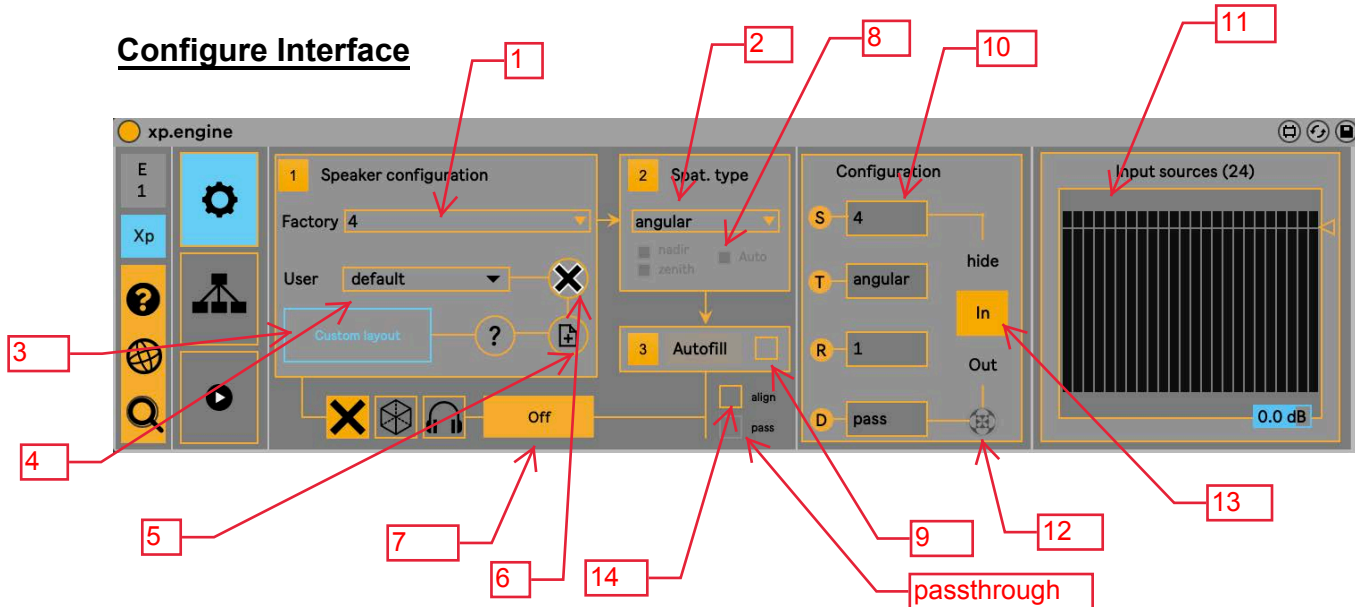
Load a xp.engine on a new and empty audio track. The title of that track will change for xp.engine.

Initialization

The first thing to do after loading, is to configure the project accordingly three parameters all available in the Configure interface : 1)Speaker configuration 2)Spat. type 3)Autofill

The application should display in the 3d scene the speaker arrangement, and datas about the chosen configuration as well (see xp.app documentation)

Configure Interface



This is where the specifics of the project must be settled. On a first load, the device does not show the right part of the interface. After having correctly configured the project, the right part is enabled, giving user access to the output features. If the right part remains invisible, it indicates that the instancing didn't happen, and therefore the xp.engine isn't going to process audio.

- 1 : Speakers layouts (factory preset)
- 2 : List of available spatialization type
- 3 : Custom speakers layout (see 12)
- 4 : List of previously saved user's custom layout
- 5 : Save the user's custom speaker layout as a user preset
- 6 : Delete the current selected preset
- 7 : Output mode: off, sound field, or binaural
- 8 : In case of vbap3d or vbip3d, phantom speaker features
- 9 : Autofilling the routing interface with the current sound-card configuration (details below)
- 10 : display the current configuration (s : speakers, T: type, T:rooms, D: decoding)
- 9 : Current config. Sums up the current user configuration
- 11 : input and output monitors (from I / O buttons)
- 12 : show/hide hoa configuration features
- 13 : show/hide monitoring panels (input/output)
- 14 : enable/disable speaker alignment (delays/gains) /

Click "?"

Help about writing custom speaker arrangement file (with an example)

About "Autofill" feature

This will automatically fill the route panel with the channels in ascending order available in the currently selected soundcard. If the option is not selected, it will have to be done manually at each startup.

Passthrough

From version 1.12, it is possible in the case of ambisonics spatialization type (hoa2d or hoa3d) to select the passthrough feature.

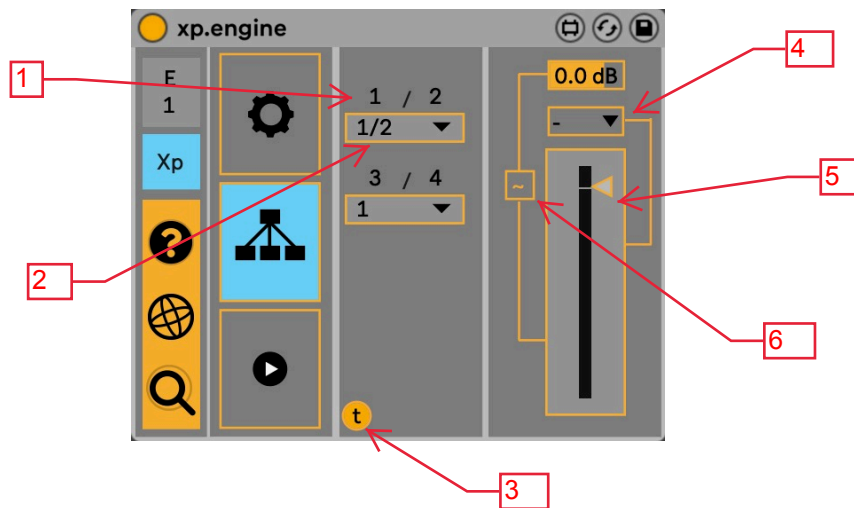
In this case, the decoding of the ambisonics stream is not done anymore by XP and leaves that operation in the hands of user's system.

This implies that the number of speakers indicated in the configuration panel on the right (s) corresponds actually to the ambisonics components for that stream.

In this situation also, from the routing interface, the channels to be routed to the audio interface correspond to the ambisonics components as well.

Be sure to use that feature only if you know exactly what you are doing.

Route Interface



- 1: output number of the current master/multichannel bus
- 2: list of the available output of the current selected output device (Ableton preference)
- 3: show/hide the channel test tool
- 4: select the channel to be test
- 5: gain of the channel to be tested
- 6: enable test

It allows to assign the multichannel output by creating pairs of audio outputs when the project is instantiated in *configure* interface. If *autofilling* is enable, then the audio outputs of the interface will be filled according to the current sound card. If disable, user will have to fill it manually each time the project is loaded, as this is not saved with the project in Ableton.

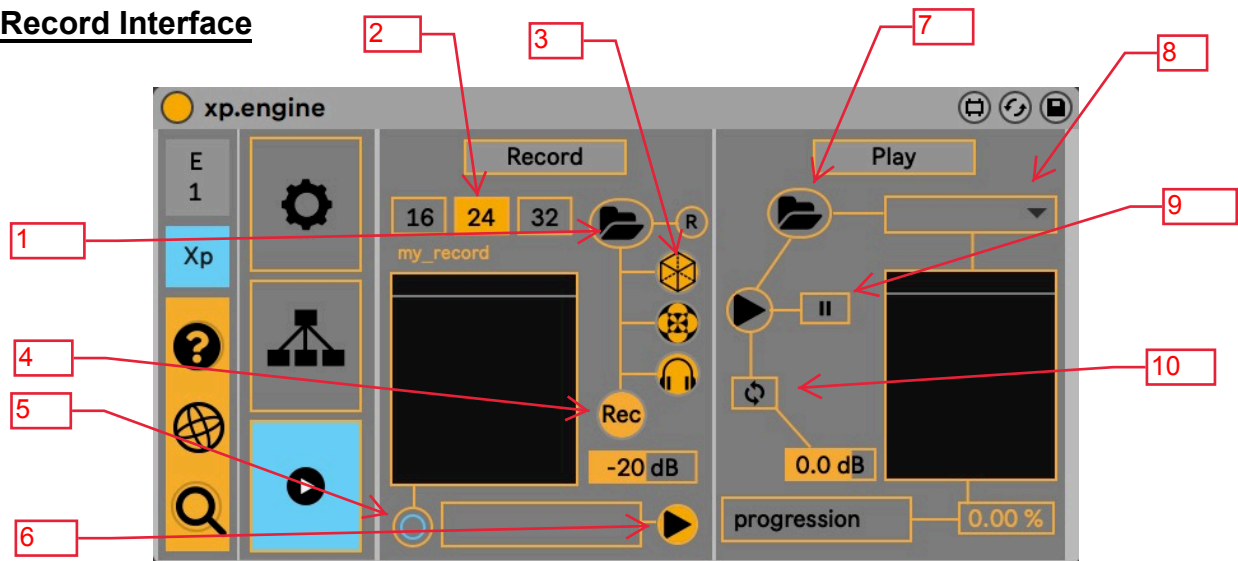
Working with XP assumes the user has a basic knowledge of multichannel audio routing. In this case, it assumes that the user is aware that the channel audio of one speaker should be numbered accordingly to the number of that speaker in the arrangement. Speaker 1 is channel one, Speaker 2 is channel 2, and so on. That the easiest way.

While Ableton Live is only supporting audio pairs for routing, it involves that user has to prepare his speaker arrangement routing accordingly before starting a project, and in the case of custom speaker arrangement to make sure that the order of speakers in the list of coordinates follows that rule.

Route interface is automatically create the outputs accordingly to speaker number and will offer it autofilling is enable to populate it with the current audio output device set in Ableton Preference. In that case, the user doesnt need to change anything in this interface.

Route interface has a channel test tool (pink noise) in order to check correlation between speaker and audio output routing. If inconsistency are observed, user must correct his audio routing in the hardware parameter.

Record Interface



This interface gives the user the possibility of recording in real time:

- the multichannel audio stream, whose properties will be those of the current configuration. If the project is set to a 4 speakers arrangement, the file recorded will be a 4 interleaved channels wave file. And so on.
- If the chosen type of spatialization is hoa (2d or 3d), it is possible to record an encoded version of the stream which will take the name of the file with the suffix `_hoa`.
- you can also record in binaural. The file will have suffix `_binaural`

To start to record, open and create a file, then press Rec. A blinking red light indicates on xp4l.app that a recording is in progress. To stop, press Rec again.

A second window, invisible by default, allows to immediately play the audio file recorded for verification or other multichannel files as long as they are in the format of the current sound configuration.

- 1 : File - open dialog box to create a file and enable recording
- 2 : Bit depth
- 3 : Select what format to record : multichannel, hoa, binaural
- 4 : Start/stop to record.
- 5 : Enable input monitoring display
- 6 : Show//hide play windows
- 7 : Select folder with audio to play
- 8 : list of available audio files of the chosen folder
- 9 : Start/pause/resume to play audio file
- 11: Pause/resume playing audio file
- 12 : Play in loop