Gstreamer Video-Mixer

We want the functionality of a classic hardware video-mixer board implemented in software based on the gstreamer framework.

The system shall consist of

- 4 Full HD video inputs, most likely provided by Blackmagic Intensity Pro HDMI cards.
- Each card provides one HDMI input and one HDMI output.
- The input inquests Full HD video into the mixer software.
- The input shall be sent directly to the cards output for Full HD input monitoring.
- Each input is connected to two Buses: Bus A and Bus B.
- Bus A and Bus B are the inputs for the gstreamer SMPTE mixer plugin.
- You can select one input source for each Bus (can be the same on both).
- With the SMPTE mixer you can transition from Bus A to Bus B.
- The transition can be done manually, by moving a scrollbar.
- Or the transition can be triggered by hitting a button.
- Transition time can be set with via GUI (number, adjustable with knob and textfield).
- The transition type can be selected from a number of images or set by (number).
- The GUI should provide visual indication, which Bus is currently active.
- The GUI should provide visual indication, which input is selected on each bus.
- Selecting an other input on the active Bus will switch to this input with no soft transition.
- On an active transition, the Bus we are fading to is blinking.
- The Bus, which is currently active, is lit.
- Also the Bus we are transitioning form is lit until the transition is over.
- Audio comes from an extra audio input premixed on an analog mixer.
- HDMI Audio is discarded.
- Consumer cameras have a significant delay/lag on their HDMI output.
- Therefore we need to be able to add the same delay/lag to the audio stream.
- Audio delay/lag can be adjusted via GUI (number, adjustable with knob and textfield).
- Audio is muxed in after video mixing.
- The final mix is sent out via HDMI for Full HD output monitoring.
- The final mix is encoded in H264 in Full HD and saved to disk.
- The final mix is scaled to a smaller size, encoded in H264 and streamed to the internet.
- Small previews of all inputs and the final mix are shown above the mixer GUI

Signal flow diagram