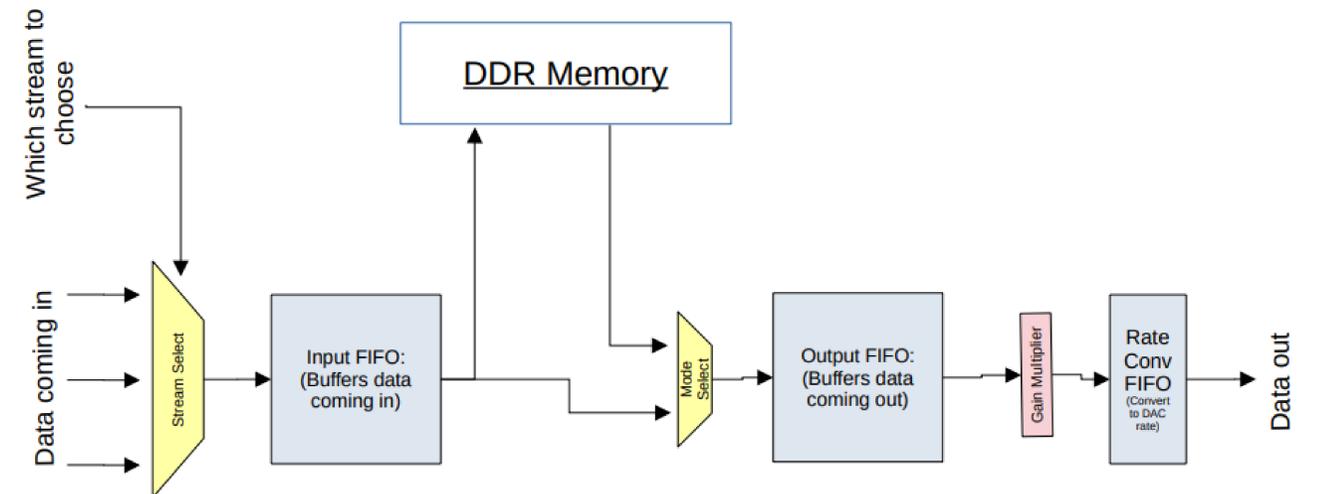


Digital Radio Frequency Memory

Project

- The DRFM was created at the request Blackwire Signals, a local company.
- A DRFM is a device that is typically used in a variety of different signal processing functions.
- A Digital Radio Frequency Memory (DRFM) is a system that takes in a signal, delays it a user-specified amount, modifies it as needed, and retransmits it.
- A DRFM can be used in a variety of different signal processing applications.
- The goal was to make an FPGA design of a DRFM that is modular and could be integrated with other designs at Blackwire Signals.

System

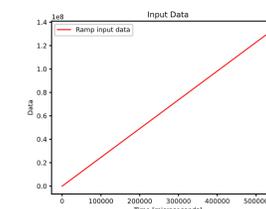


Methods

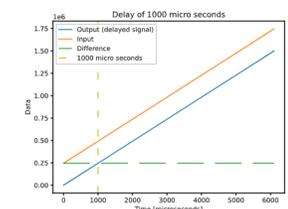
- The longer the delay needed, the more memory is required to store the data.
- Short delays can be accomplished with just FIFOs.
- Bypass mode used if only FIFOs are needed for delay specified.
- Longer delays interface with DDR memory.
- Gain is given to signal before it is transmitted to allow some user-specified signal processing.
- Able to select from multiple different streams of data.

Conclusion

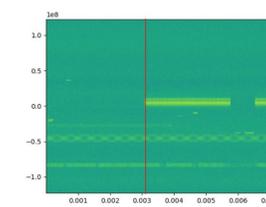
- The resulting DRFM worked as anticipated, resulting plots are seen below.



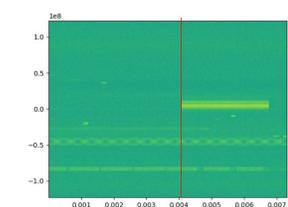
The input data used for testing (ramp)



The delayed output and input plotted



Spectrogram plot of live DRFM input



Spectrogram plot of output DRFM data