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Title:
Streaming Infrastructure for Frequency Multiplexed Sensors

The recent development of a firmware, Qick (Quantum Instrumentation Control Kit), has brought the need for the continuous streaming of data from devices utilizing it. It was initially created for the readout and control of frequency multiplexed sensors called Microwave Kinetic Inductance Detectors (MKID). A number of larger scale projects have begun utilizing the firmware, and it is beneficial to provide remote data streaming. To address this, I have programmed a Field Programmable Gate Array (FPGA) board to take in data produced by the memory buffer, have it packetized, then sent over the network using User Datagram Protocol (UDP). The lack of handshaking involved in this communication protocol is what makes it ideal for transferring large amounts of data from a device, as it would drastically reduce transport time. This process required that I develop a basic server to capture the data from the buffer, so that it may be sent to a client device.