Simultaneous Streaming (PCI-816XF2)

The simultaneous streaming feature is available on StreamStor PCI-816XF2 recorders to provide simultaneous record and read (playback) functionality. This feature can be used to capture real-time data streams while simultaneously reading data for processing or analyzing in a "first-in, first-out" fashion. The StreamStor controller will manage the internal resources to insure an uninterrupted recording stream while still allowing the data to be read or played back in the order received. Note that the simultaneous operation of a record and read stream will decrease the total recording bandwidth available. As data is read the disk space will be reclaimed to continue the recording. An overflow condition can occur if the recording operation is adding data faster than the read operation and the free disk space is exhausted. Recording will stop when an overflow condition occurs.

Setting FIFO mode

The StreamStor card utilizes multiple software applications that are downloaded to the card on the first call to the `XLROpen` function. The simultaneous streaming feature is one of these applications. The `XLRSetAppID` function sets the environment so that the appropriate application is downloaded to the card (application id = `SS_APP_1`).

Unlike most StreamStor API commands, `XLRSetAppId` must be called before a call to `XLROpen` has been made. The prototype is:

```
XLRSetAppID (IN UINT Index, IN UINT appID);
```

Note that the first parameter is the card index, not the card handle. So, to set the application id for StreamStor card one, you would call it like so:

```
XLRSetAppID (1, SS_APP_1);
```

The download occurs only on the first call to `XLROpen` after a reset or power cycle but the `XLRSetAppID` function will reset the card automatically if it is required. `XLRSetAppID` simply modifies the operation environment so that the requested application is used during the next download.

Recording data

The simultaneous streaming application is designed to accept data for recording from the FPDP port while also allowing data to be read on the PCI bus. The mode needs to be selected using `XLRSetMode` with the parameter `SS_MODE_EXT_TO_PCI_FIFO`. The normal port definition functions such as `XLRSetFPDPMode` can be used to configure the FPDP port for incoming data. The standard `XLRRecord` function call is used to put the recorder into record mode and begin data recording to disk. Data is routed to StreamStor in FIFO mode in exactly the same manner as in standard mode. The recording will

continue until all available disk free space is exhausted or the system is stopped using XLRStop.

Reading data

Reading data back is very similar to reading data in default mode. The function XLRReadFifo is provided to read data sequentially from the StreamStor system. Data is always read in a "first-in, first-out" fashion. Once the data has been read from the recorder, the space is reclaimed for recording new data.

The XLRGetLength function can be used to determine how much data is currently recorded. If a read request is made before enough data is available in the StreamStor on-board RAM buffer, the XLRReadFifo function will delay until there is enough data to fulfill the request for data. If no data becomes available for several seconds, the function will return XLR_FAIL and the last error will be set to XLR_ERR_EMPTY.

If an overflow condition is encountered, XLRReadFifo will fail and return an error of XLR_ERR_EXT_TO_PCI_OVERFLOW. You may then continue calling XLRReadFifo until all available data has been read.

The XLRStop function should not be used until all desired data has been read using XLRReadFifo. The data in the FIFO is not preserved after the XLRStop function has been executed.

Supported Functions

Many functions are not supported while running the simultaneous stream application. The supported functions are listed below. See the StreamStor user manual for more detailed descriptions of these commands.

FUNCTION	DESCRIPTION
XLRApiVersion	Report version of API library in use.
XLRCardReset	Reset a StreamStor card.
XLRClose	Close device and releases exclusive access.
XLRDeviceFind	Report number of StreamStor cards present in system.
XLRGetBaseAddr	Get base address (physical) of StreamStor data window.
XLRGetBaseRange	Get size of StreamStor data window.
XLRGetChassisType	Get the chassis type.
XLRGetDeviceInfo	Retrieve hardware configuration information.
XLRGetDeviceStatus	Get status of device.
XLRGetDriveInfo	Get information on an individual disk drive.
XLRGetErrorMessage	Get error string for supplied error code.
XLRGetLastError	Return error code of last failure.

FUNCTION	DESCRIPTION
XLRGetLength	Return number of available bytes.
XLRGetMode	Return the input/output mode of the board.
XLRGetSystemAddr	Return the kernel address of StreamStor data window.
XLRGetVersion	Report version of StreamStor firmware components.
XLRGetWindowAddr	Get user virtual address of StreamStor data window.
XLROpen	Open the device for exclusive access.
XLRReadFifo	Read data during a FIFO operation.
XLRRecord	Start recording.
XLRReset	Reset and close an open device.
XLRSetAppId	Set the application to be downloaded.
XLRSetFPDPMode	Set the operating mode of the FPDP data port.
XLRSetMode	Set input/output mode of the board.
XLRSetPortClock	Set the clock speed of the external port.
XLRStop	Stop recording.