ARINC 818 Stream IP Core
Streaming IP Core for ARINC 818

Applications

Real-time protocol conversions to/from ARINC 818

ARINC 818 data generation for hardware offload

Real-time ARINC 818 processing

## Benefits

RX (Receive) and TX (Transmit) functionality included

User-configurable frame rates, line rates, and ADVB frame spacing

Built-in timing engine controls/regulates timing in hardware

Features

Flexible video pixel bus input with synchronization signals (video_active, vsync, hsync) that supports a wide range of pixel depths and number of parallel pixels.

Compatible with all FC line rates up to 10G (incl. non-standard rates).

Core handles synchronization and clock crossing into the FC clock domain. User clock can be asynchronous to the FC clock.

Automatic creation of the Object 0 and container header.

8b/10b encoding/decoding of FC data. Core manages K-Characters and running disparity.

TX Core

ARINC 818 TX Stream Core

RX Core
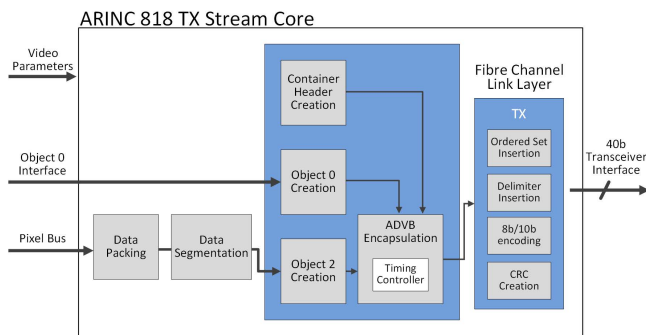
ARINC 818 RX Stream Core
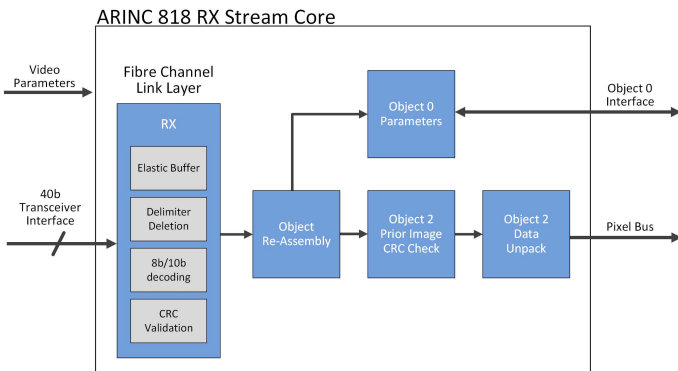
Overview

TX Core
The New Wave DV Streaming Pixel-Bus to ARINC 818 IP Core provides a streaming conversion from a pixel bus into an ARINC 818 formatted FC serial data stream.

All aspects of maintaining a fibre channel link is handled by the core. As the incoming data is converted into FC packets, the core adds the necessary header, delimiters (SOF, EOF) and calculates and inserts the FC CRC. FC headers are calculated and updated for each frame by the core. The core also manages inserting IDLE characters in between packets as needed and when the link is unused. The core will convert the outgoing data stream into 8b/10b encoding (automatically managing running disparity). No user intervention is required to establish and maintain a fibre channel link.

The core will maintain and regulate timing parameters including frame rate, video line rate, and FC packet spacing. Timing parameters are flexible and can be user adjusted in single clock cycle increments. The core supports all standard Video Rates (30Hz, 50Hz 60Hz, etc.) and non-standard video rates are possible as well. Configurable line rates and inter-fc packet spacing allows the designing adjust the utilized throughput of the FC link to match their system.

While the core will automatically calculate and maintain the ARINC 818 Object 0 container header, the Object 0 ancillary data can be user controlled. Memory space is allocated for users to create and update the Ancillary data and can be done completely asynchronously from the video transfer. The total size of the ancillary data (up to the limits of a FC frame) is user defined allowing the user the flexibility to include custom meta data in their ARINC 818 stream.

RX Core
The New Wave DV ARINC 818 to Streaming IP Core provides a streaming conversion from ARINC 818 formatted FC data into a pixel bus.
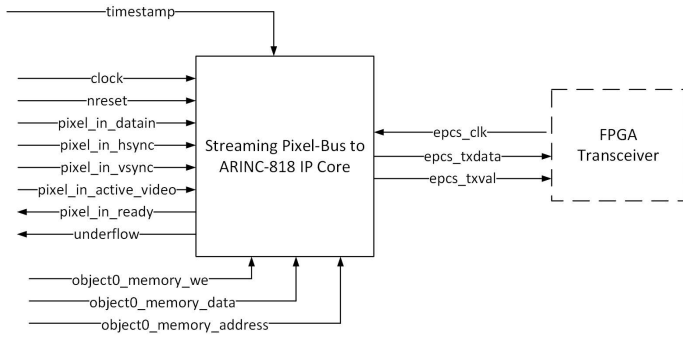
All aspects of maintaining a fibre channel link are handled by the core. The incoming data is decoded, parsed, and unpacked. A timing engine in the core adds flags to indicate the start of a frame (vsync) and the start of each row (hsync).

Timing parameters such as frame rate and line rate do not need to be prespecified. The core will automatically adapt to the incoming data and pass through converted data at the rate that it is input to the core. The core is compatible with all standard video rates (30Hz, 50Hz, 60Hz, etc.) as well as non-standard rates.
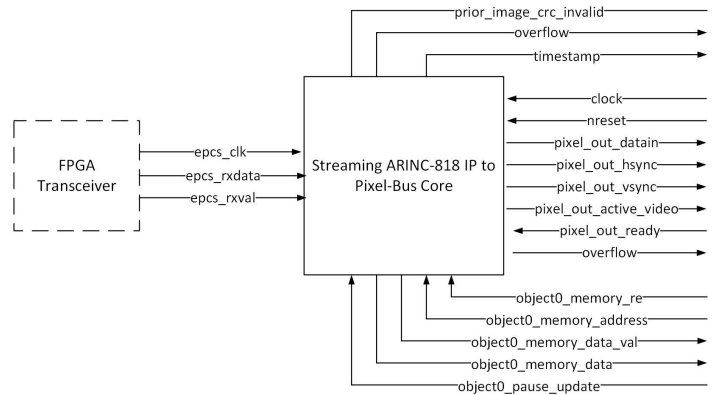
The core makes the entire Object 0 frame available to the user in memory space. The memory space will include the FC header, the container header, and any Object 0 ancillary data. The user can access this data at any time, asynchronously from the packet streaming process. The memory space will be updated with each new Object 0 frame.

ARINC 818 Stream IP Core
Streaming IP Core for ARINC 818

TX Core diagram ports:
- timestamp
- clock
- nreset
- pixel_in_datain
- pixel_in_hsync
- pixel_in_vsync
- pixel_in_active_video
- pixel_in_ready
- underflow
- object0_memory_we
- object0_memory_data
- object0_memory_address

Streaming Pixel-Bus to ARINC-818 IP Core

- epcs_clk
- epcs_txdata
- epcs_txval

FPGA Transceiver

> **Top-level Port Definition for TX Core**

RX Core diagram ports:

FPGA Transceiver
- epcs_clk
- epcs_rxdata
- epcs_rxval

Streaming ARINC-818 IP to Pixel-Bus Core

- prior_image_crc_invalid
- overflow
- timestamp
- clock
- nreset
- pixel_out_datain
- pixel_out_hsync
- pixel_out_vsync
- pixel_out_active_video
- pixel_out_ready
- overflow
- object0_memory_re
- object0_memory_address
- object0_memory_data_val
- object0_memory_data
- object0_pause_update

> **Top-level Port Definition for RX Core**

Complete Product Support Program

Our customers can attest to our exceptional support. New Wave DV provides an industry-standard warranty on its products, but it is the human factor that makes our support so valuable to our customers. Our team takes the time and effort to ensure a positive customer experience.

Our Commitment

New Wave DV is committed to providing the latest innovations in technology, architectures, and techniques to keep our customers one step ahead of the rest. Our products, complete with the Development Framework, are intended to offer our customers an entirely unique out-of-the-box experience.

New Wave DV ARINC 818 Cards

In addition to the ARINC 818 Streaming core, New Wave DV provides standard form factor ARINC 818 interface cards that incorporate the ARINC 818 interface along with high performance DMA engines and software drivers. Available in XMC/PCIe/PXIe/VPX form factors, New Wave DV ARINC 818 cards provide up to 16 ports in a single card. Reach us at info@newwavedv.com to ask about our ARINC 818 solutions.

Technical Specifications

Core is delivered in encrypted RTL format including constraint files.

SUPPORTED DEVICES
AMD (Xilinx): 7-Series, UltraScale, UltraScale+, Versal FPGAs
Intel (Altera): Stratix, Arria, Cyclone FPGAs
Microchip (Microsemi): SmartFusion2, Igloo2, PolarFire FPGAs

SUPPORTED RATES
User-definable up to FC 10x (8B/10B)

Ordering Information

700-AR100-00-00: ARINC 818 IP Core, includes Link Layer core, FC 1x to FC 10x rates (8B/10B)

Includes RX and TX cores.

Other product configurations are available. Please contact us.