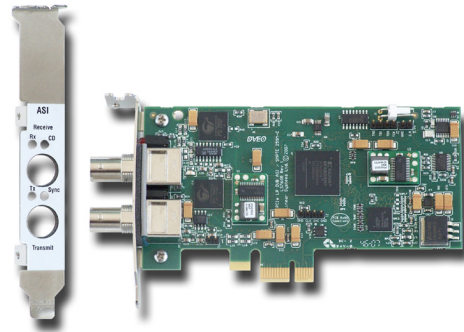


DVB Master™ FD PCIe LP

**Advanced Full Duplex DVB-ASI PCIe
Send and Receive Low Profile Interface
Card with Black Burst Sync Input in a
Low Profile Card with Accurate Clock,
Jitter Management, Packet Arrival
Time Stamping, and Unlimited PID
Filtering**



Features

- 213 Mbps DVB-ASI transmitter and receiver on one card
- Low Profile PCIe card form factor
- Drivers for Windows® 7 32 and 64 bit, Server 2003, Server 2008, Windows® 2000, Windows® XP, and Linux®
- Windows® XP/Server 2003/Server 2008/ Linux® API
- DirectShow® filter
- PCI Express 1.1 compliant interface bus
- DVB-ASI input and output
- External clock input via NTSC or PAL black burst signal
- Firmware controlled support for bypass mode
- “Snoop” function allows access to input data while in bypass mode
- Watchdog timer
- Software readable, unique serial number on each board
- Firmware is field upgradeable
- Software selectable transmit clock source
- Compliant with DVB standard A010 Rev1 and EN 50083
- LED status bits for Tx, Rx, Sync, and Carrier
- Accurate 25 ppm clock standard
- Automatic Null Bit Insertion
- Scatter Gather DMA
- Hardware PID filtering
- Packet Arrival Time Stamping
- PCIe bit rate is 2.5 Gbps

Applications

- MPEG-2 Transport Stream Video Server I/O
- MPEG-2 Transport Stream Analyzer
- MPEG-2 Transport Stream Monitor
- MPEG-2 Transport Stream Repurposing
- SI Table Insertion

Overview

DVB-ASI is a physical interconnect standard created by the international standardization group known as the DVB Project (www.dvb.org). It is designed to carry MPEG-2 transport streams between devices at a maximum rate of 213 Mbps. The actual signaling rate of DVB-ASI is 270 Mbps, but there is overhead from the data encoding scheme and the maximum payload ends up being approximately 213 Mbps.

Transport streams are essentially packetized MPEG streams with tables embedded every 100 ms or so, which tell the ultimate MPEG decoder how to decode the stream.

Furthermore, transport streams may be combined or multiplexed to create multiprogram transport streams with separate PIDs, or program identifiers, that distinguish them as “channels” do in analog television.

We have incorporated as many features as possible into this low profile PCIe card. With all these features, our customers can create very powerful workstations that can process transport streams “on the fly” for applications such as broadcasting, cable TV, satellite links, video servers, and distance learning.

Highlights

- Integration of both transmitter and receiver on the same PCIe card gives a one-slot solution for most DVB processing applications
- Driver software is available for Windows XP, Windows Server 2003, Windows Server 2008, and Linux. The source code is available for the Linux driver.
- Optional high stability oscillator with less than 2.5 ppm drift, meeting ATSC specifications



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DVB Master FD PCIe LP™

Capabilities

- **Transmitter and Receiver on the Same Card:**

An input MPEG-2 transport stream can be received, processed and re-transmitted in real time by the host system.
- **PCIe compliant interface**
- **Advanced Receiver Capabilities:**
 - Synchronizes incoming packets to byte boundaries
 - Automatic 188 and 204 packet size detection
 - Interrupt on in/out of sync
 - Software selectable option to strip 16 bytes from 204 byte packets
 - Unlimited PID filtering (any number of PIDs may be selected)
- **Advanced Transmit capabilities:**
 - Enhanced transmit rate “Fine Tuning” control to <2.8ppm granularity
 - Optional High Stability Oscillator with <2.8ppm (*special order option*)
 - Software selectable option to add sixteen 0x00 bytes to 188 byte packets
 - External transmit clock input (black burst)
- **Receive Packet Synchronization:**

The DVB Master FD PCIe LP receiver will check the incoming transport stream for packet sync, and synchronize on it. Once synchronized, the packets will be stored on packet boundaries in memory. This makes further processing of the transport stream much easier for the host processor. When the board is synchronized on a valid stream the green “Rx Data” and “Sync” LEDs will be illuminated.
- **Packet Arrival Time Stamping:**

Under software control each packet is timestamped with an arrival time generated by an internal timer/counter.
- **Null Packet Insertion:**

Under software control but performed by hardware, “null packets” are automatically inserted into the bit stream.
- **Automatic Packet Size Detection:**

The **DVB Master FD PCIe LP** will automatically detect packet size and will indicate the current size in a status register. If packet size changes suddenly, it will lose synchronization, then resynchronize on the new packet size and indicate the new packet size in the status register. An interrupt will be generated on loss of sync and re-sync.
- **Indicator LEDs:**

Indicator LEDs are provided on the bracket to show card operation. Tx – indicates that data is being transmitted, Rx – indicates that data is being received, Sync (S) – indicates that the receiver is able to synchronize on the transport stream packets, and Carrier Detect (CD) – indicates that a signal is present.
- **In/Out of Sync Interrupt:**

An interrupt will be generated whenever synchronization is lost or recovered. Interrupts are generated when there are changes in the stream and indicate that the status of the stream should be checked.
- **16 byte Strip and Add:**

The 16 byte Stripping function will remove the extra 16 Reed-Solomon encoded bytes from the 204 byte packets to create 188-byte packets. Similarly, it can be used to add 16 bytes filled with zeros to 188-byte packets to create a 204-byte packet stream.
- **PID Filtering:**

This function allows you to select any number of PIDs from the total of over 8,000 possible PIDs to be filtered from the stream. The DVB Master FD PCIe LP receiver will block all PIDs that are not selected.
- **Transmitter Fine Tuning (FT):**

The normal inter-byte (IB) and inter-packet (IP) stuffing options available with the DVB ASI standard cannot be used for fine rate control. In some applications, such as reading files from a disk, it may be desirable to use stuffing to control the transmission rate of the stream in order to match the rate required by the Program Clock Reference (PCR) of a Transport Stream. Because of this, we have developed the Fine Tuning (FT) feature. Fine Tuning is accomplished by first setting the standard IP and IB to select a rate as close to the desired rate as possible. Then the FT parameter can be set to bring the rate within 2.5ppm of the target. This method of rate control works with small transmit buffers and gives minimum latency.
- **High Stability Oscillator:**

The DVB Master FD PCIe LP is normally shipped with a crystal-controlled oscillator with a clock accuracy of ± 25 ppm. This complies with the DVB ASI standard requirements but will not be accurate or stable for ATSC standards. ATSC standards require a clock accuracy of ± 2.8 ppm with a drift not exceeding 0.028 ppm/s. The High Stability Oscillator (+/- 2.5 ppm clock accuracy) is an extra cost option and must be ordered separately.
- **Clock Source Options:**

The transmit clock options include the External Clock, Recovered Clock, and Internal Clock. The external input accepts a black burst signal for either NTSC or PAL video and is available as an on-board header.
- **Conformity to DVB Standards:**

The DVB Master FD PCIe LP meets CENELEC EN50083-9: 1998 – Cable distribution systems for television, sound and interactive services – Part 9: Interfaces for CATV/SMATV headends and similar professional equipment for DVB/MPEG-2 transport streams.
- **Firmware Bypass:**

A firmware bypass function will pass the input to the output when the watchdog timer is allowed to reach its terminal count.
- **Snoop Function:**

When Firmware Bypass is in operation, the input ASI stream can be accessed by the host system through the PCIe bus.
- **PCR Pacing:**

Firmware support is available for releasing PCR packets at the correct PCR time. This method ensures that the transmit rate and PCR timing is the same as the original input stream.

DVB Master FD PCIe LP™

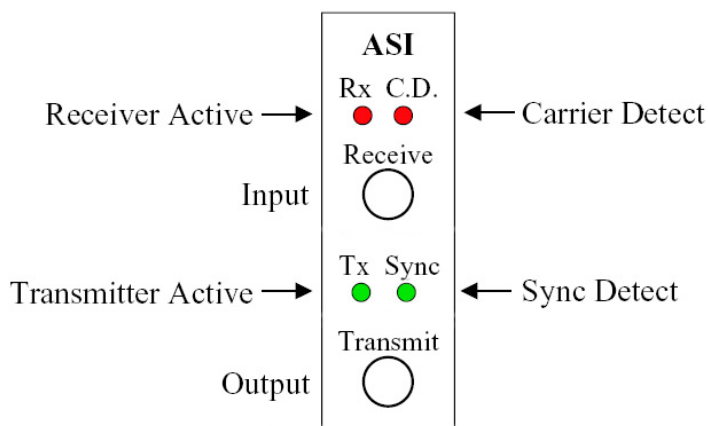
Configuration Options

- DVB Master FD PCIe LP Standard board
- DVB Master FD PCIe LP Standard board with long or short bracket
- The transmitter function has an option for a high stability oscillator with less than 2.8 ppm drift, meeting ATSC specifications
- Customizability – we can add custom features for your application requirements

Development Software

- Drivers for Windows® 7 32 and 64 bit, Server 2003, Server 2008, Windows® 2000, Windows® XP, and Linux®
- Linux® Master Driver SDK
- StreamBed™ Middleware from DVEO
- Synchronous API – API for Windows
- DirectShow® filter

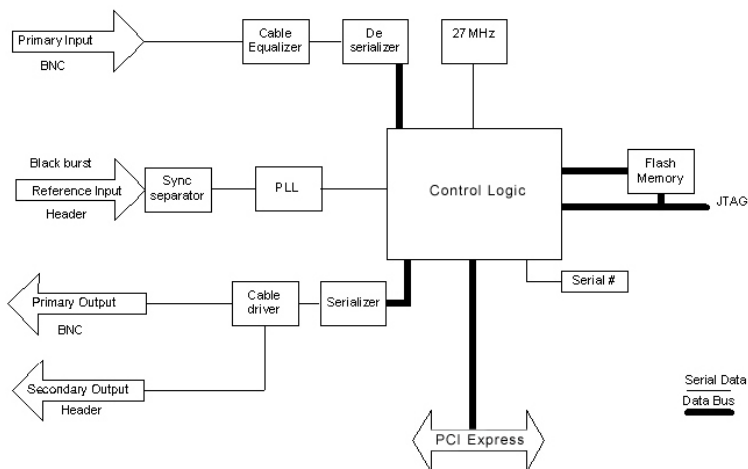
Connector Diagram



Specifications

Dimensions	
Width:	2.71 in. (6.89 cm)
Length:	4.72 in. (11.99 cm)
Thickness:	0.58 in. (1.47 cm)
Typical Weight	3.0 oz. (85 g)
Input/Output Connectors	75-ohm BNC
External Clock Input	Black burst (NTSC or PAL)
Data Input/Output	DVB-ASI Coaxial, DVB Transport Stream
Typical Power	1.9 A @ 3.3 V 60 mA @ 12 V
Operating Temperature	0 to 55°C
Operating Humidity	To 90%, Non-condensing
Status LED Indicators	Tx, Rx, Sync, Carrier
Receive FIFO Size	8 kilobytes
Bus Interface	Single Lane (x1) PCI Express 1.1
Standard Oscillator Stability	± 25 ppm
Optional High Stability Oscillator	± 2.5 ppm

Block Diagram



Ordering Info

DVB Master FD PCIe LP – Single ASI Input, Dual Output

DVB Master FD PCIe LP/HSO – High Stability Oscillator
(Model 143)

Note: Both ship with long and short brackets

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