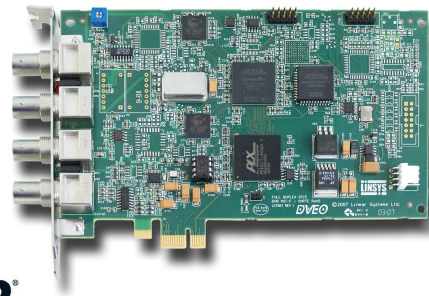


DVB Master™ FD-B PCIe

DVB ASI PCIe Send and Receive Interface Card with Black Burst Sync In, Dual Buffered Outputs, Accurate 25 ppm Clock, Unlimited PID Filtering, Jitter Management, and Optional High Stability Oscillator with 2.5 ppm Crystal



Features

- Compatible with DVB Standard A010 Rev 1 and EN 50083
- Single lane PCI Express interface
- Data rate up to 213.9 Mbps
- DVB ASI input and dual buffered outputs on one PCIe card
- LED status bits for Tx, Rx, Sync, and Carrier
- Black burst clock sync input
- Accurate 25 ppm clock standard
- Optional Null PID packet insertion
- Scatter gather DMA
- Tested at over 213 Mbps throughput
- Hardware PID filtering
- Packet arrival time stamping
- Jitter management
- 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
- Silicon serial number
- Software controlled Watchdog timer (with failover relay option)
- Optional high stability oscillator (2.5 ppm)

Applications

- MPEG-2 Transport Stream Video Server I/O
- MPEG-2 Transport Stream Analyzer/Monitor
- MPEG-2 Transport Stream Repurposing
- SI Table Insertion
- MPEG-2 archiving ("Video Mirror" applications)
- MPEG over IP
- ASI to IP conversion (IP over MPEG decapsulation)

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 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 PCI card gives a one-slot solution for most DVB processing applications
- Driver software is available for Windows® 7 – 32 and 64 bit, Server 2003, Server 2008, Windows® 2000, Windows® XP, 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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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.
- **Optional Mechanical Bypass:** A relay will bypass the ASI input directly to the output on power failure or when selected in software.
- **Single lane PCI Express interface**
- **Advanced Receiver Capabilities:**
 - Synchronizes incoming packets to byte boundaries
 - Automatic 188 and 204 packet size detection
 - Interrupt on in/out of sync
 - Converts 188 byte packets to 204 by adding 16 0x00 bytes
 - 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-B PCIe 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 “Sync” LED will be illuminated and the red “Rx Data” LED will flash. Packet synchronization can also be disabled to receive unsynchronized streams.
- **Hardware Based Packet Arrival Timestamping:**
Under software control each packet is timestamped with an arrival time generated by an internal timer/counter.
- **Null Packet Insertion:**
“Null packets” are automatically inserted into the bit stream when there is a transmit overrun, or to replace PID packets that are removed via the PID packet filtering option.
- **Automatic Packet Size Detection:**
The DVB Master FD-B PCIe 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 – indicates that the receiver is able to synchronize on the transport stream packets, and Carrier Detect (CD) – indicates that a valid DVB-ASI carrier 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-B PCIe receiver will block all PIDs that are not selected, or accept only the selected PIDs.
- **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 Tx buffers and gives minimum latency.
- **High Stability Oscillator:**
The DVB Master FD-B PCIe 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:**
An input BNC connector is provided for an external transmit clock. This clock is one of three optional transmit clock sources. The transmit clock options include the External Clock, Recovered Clock, and Internal Clock. The external clock input accepts a black burst signal.
- **Conformity to DVB Standards:**
Meets CENELEC EN50083-9: 1998 – Cable distribution systems for television, sound and interactive services – Part 9: Interfaced for CATV/SMATV headends and similar professional equipment for DVB/MPEG-2 transport streams.
- **EMI Standards:**
CE Marking in accordance with EN50081-2: 1993 and EN50082-1:1997. FCC Part 15, Subpart B, Class A verification.

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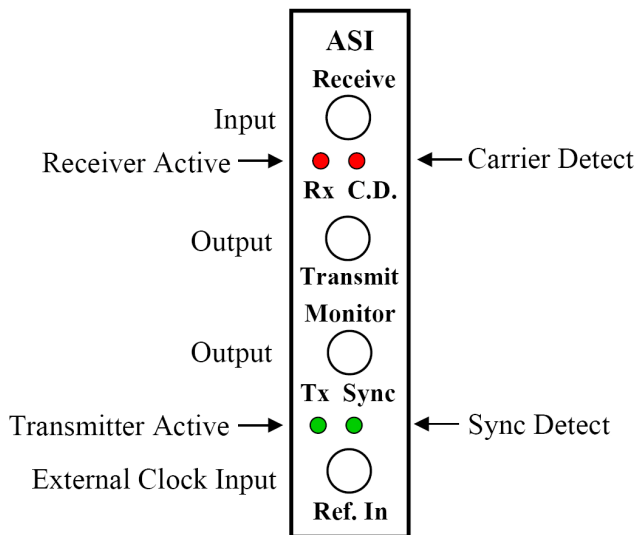
Configuration Options

- DVB Master FD-B PCIe Standard board
- Optional mechanical relay bypasses primary input to primary output on power failure, or when selected through software
- 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 and SDK
- StreamBed™ Middleware from DVEO
- Synchronous API – High Level API
- DirectShow® filter

Connector Diagram



Ordering Info

DVB Master FD-B PCIe	Single ASI Input, Dual Outputs
DVB Master FD-B PCIe/R	Optional Failover Relay
DVB Master FD-B PCIe/HSO	High Stability Oscillator
DVB Master FD-B PCIe/HSO	Optional Failover Relay Plus High Stability Oscillator

(Model 158)

Specifications

Dimensions	
Width:	4.376 in (11.115 cm)
Length:	6.6 in (16.765 cm)
Thickness:	0.6 in (1.51 cm)
Typical Weight	5.2 oz (147 g)
Input/Output Connectors	75 ohm BNC
External Clock Input	Black Burst
Data Input/Output	DVB ASI Coaxial, DVB Transport Stream
Power Requirements	390mA @ 5V
Operating Temperature	0 to 55° C
Operating Humidity	To 90%, Non-condensing
Status LED Indicators	Tx, Rx, Sync, Carrier
Receive FIFO Size	1.5 kB
Bus Interface	Single Lane (x1) PCIe 1.0a
Standard Oscillator Stability	± 25 ppm
Optional High Stability Oscillator	± 2.5 ppm

Block Diagram

