

DVB Master™ Dual/i FD-RS PCIe

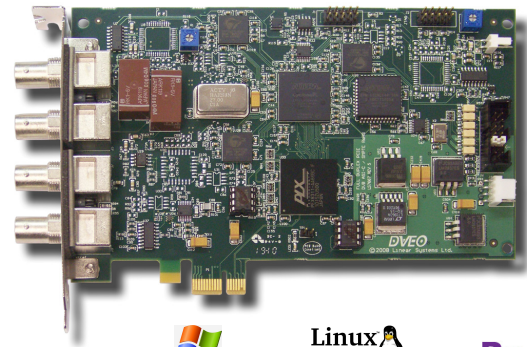
Full Duplex, Redundant Output, Single or Dual Input, DVB-ASI PCI Express Send and Receive Interface Card with Accurate Clock, Jitter Management, Packet Arrival Timestamping, Unlimited PID Filtering, Secondary Input via Header, and Failover Relay

Features

- 270 Mbits/sec DVB ASI transmitter and receiver on one card
- Two DVB ASI inputs; secondary input via header
- A/B input selection is software controlled
- Two buffered ASI outputs
- 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
- Single lane PCI Express interface
- Signal quality sensing support in hardware
- 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
- Control Interface port
 - 6 GPI optically isolated inputs
 - External override input for the mechanical bypass relay
 - Status output for firmware loop back
 - Rx and Tx status indicator outputs
 - One general purpose control output
- Watchdog timer based on a 40 MHz 32-bit counter
- Silicon serial number
- Firmware is field upgradeable
- Software selectable transmit clock source

Applications

- Video servers
- Datacasting and monitoring
- Electronic Program Guides (EPGs)
- Interface DVB MPEG-2 transport streams to the PCIe bus
- PID filtering of transport streams
- IP – DVB interfaces
- Data over DVB
- Interface DVB to ATSC



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.

Our **DVB Master Dual/i FD-RS PCIe** is our second-generation Full Duplex DVB-ASI card with the enhanced bandwidth of single lane (x1) PCIe. It has many features necessary to create high availability systems that can be safely deployed in on-air applications. With this new design the PC can become the platform of choice for many mainstream applications such as Electronic Program Guides, Data Encapsulators, and video servers.

Highlights

- Integration of both transmitter and receiver on the same 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



Computer Modules, Inc.

11409 West Bernardo Court
San Diego, CA 92127

Tel: (858) 613-1818 Fax: (858) 613-1815

www.dveo.com

DVB Master Dual/i FD-RS PCIe™

Capabilities

- **Transmitter and Receiver on the Same Card:** Two MPEG-2 transport streams can be received, processed and re-transmitted in real time by the host system.
- **Mechanical Bypass:** A relay will bypass the ASI input directly to the output on power failure.
- **Signal Quality:** DVB Master Dual/i FD-RS PCIe provides you with information on signal quality so decisions can be made about switching to a secondary input signal if necessary.
- Single Lane (x1) PCIe 1.0a 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 Dual/i FD-RS 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 green “Rx Data” and “Sync” LEDs will be illuminated.
- **Packet Arrival Timestamping:**

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. (Check on availability when ordering)
- **Automatic Packet Size Detection:**

The DVB Master Dual/i FD-RS 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 (S) – indicates that the receiver has synchronized 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 Dual/i FD-RS PCIe 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 Tx buffers and gives minimum latency.
- **High Stability Oscillator:**

The DVB Master Dual/i FD-RS 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. 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.
- **Conformity to DVB Standards:**

The DVB Master Dual/i FD-RS PCIe 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.
- **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 PCI bus.
- **GPI:**

Six general purpose optically isolated inputs and one open collector output are available for monitor and control applications. The DVB Master Dual/i FD-RS PCIe has a failsafe timer, firmware bypass and watchdog, but no GPO.
- **Secondary Input:**

A secondary input is available as a bulkhead BNC connector attached to an on-board connector. Selection of primary/secondary input is under software control.
- **PCR Pacing:**

Software 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.
- **EMI Standards:**

CE Marking in accordance with EN50081-2: 1993 and EN50082-1:1997. FCC Part 15, Subpart B, Class A.

DVB Master Dual/i FD-RS PCIe™

Configuration Options

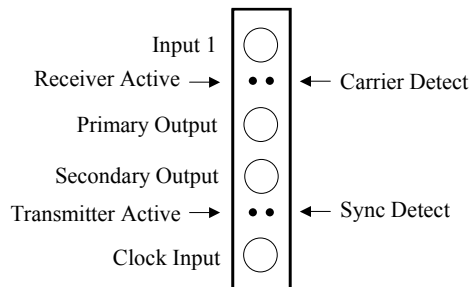
- DVB Master Dual/i FD-RS PCIe Standard board
 - - RS Includes the Mechanical bypass relay and the Secondary Input (via header)
 - - H Add the High Stability Oscillator
- The transmitter function has an option for a high stability oscillator with less than 2.5 ppm drift, meeting ATSC specifications
- Customizability – we can add custom features for your application requirements

GPIO Connector

Pin	Function	Pin	Function
1.	GPI # 0	8.	GND
2.	GPI # 1	9.	Forced Bypass input
3.	GPI # 2	10.	GND
4.	GPI # 3	11.	Rx LED Driver
5.	GPI # 4	12.	Tx LED Driver
6.	GPI # 5	13.	Firmware Bypass LED
7.	GND	14.	GND

Note: The DVB Master Dual/i FD-RS PCIe has a failsafe timer, firmware bypass and watchdog, but no O/C (open collector) output.

Connector Diagram



Development Software

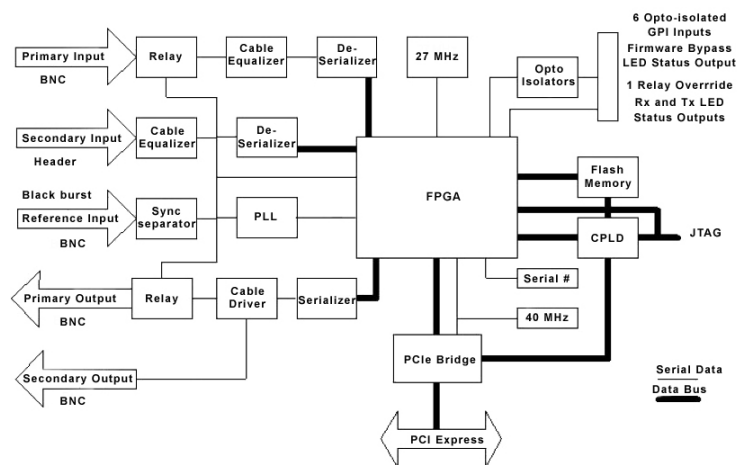
- Drivers for Windows® 7 – 32 and 64 bit, Server 2003, Server 2008, Windows® 2000, Windows® XP, and Linux®
- Linux Master Driver and SDK
- StreamBed™ Middleware from DVEO
- Synchronous API – API for Windows
- DirectShow® filter

© 2012 Computer Modules, Inc. DVEO, DVB Master, and StreamBed are trademarks of Computer Modules, Inc. All other trademarks and registered trademarks are the properties of their respective owners. All rights reserved. Specifications are subject to change without notice.

Specifications

Board 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
GPIO Connector	14 Pin AMP 103308
External Clock Input	Black Burst (NTSC or PAL)
Data Input/Output	DVB ASI Coaxial, DVB Transport Stream
Typical Power	12 V and 3.3 V
Operating Temperature	0 to 55° C
Operating Humidity	To 90%, Non-condensing
Status LED Indicators	Tx, Rx, Sync, Carrier
Receive FIFO Size	2.5 KB
Bus Interface	Single Lane (x1) PCIe 1.0a
Standard Oscillator Stability	± 25 ppm
Optional High Stability Oscillator	± 2.5 ppm

Block Diagram



Ordering Info

DVB Master Dual/i FD-RS PCIe
(Model 139)

DVB Master Dual/i FD-RS PCIe with High Stability
Oscillator
(Model 139-HSO)

DVEO
Broadcast Division

Computer Modules, Inc.

11409 West Bernardo Court

San Diego, CA 92127

Tel: (858) 613-1818 Fax: (858) 613-1815

www.dveo.com