

# P VD 5840 U/D

Multi-format  
SD/HD/3G

FLEXCARD - Dual Frame Sync + Image and Audio Processor

## FLEXCARD™

The P VD 5840 FLEXCARD offers a host of advanced functions in a single compact module. It functions primarily as a frame synchronizer plus image and audio processor, however it can be custom configured to address a multitude of applications.

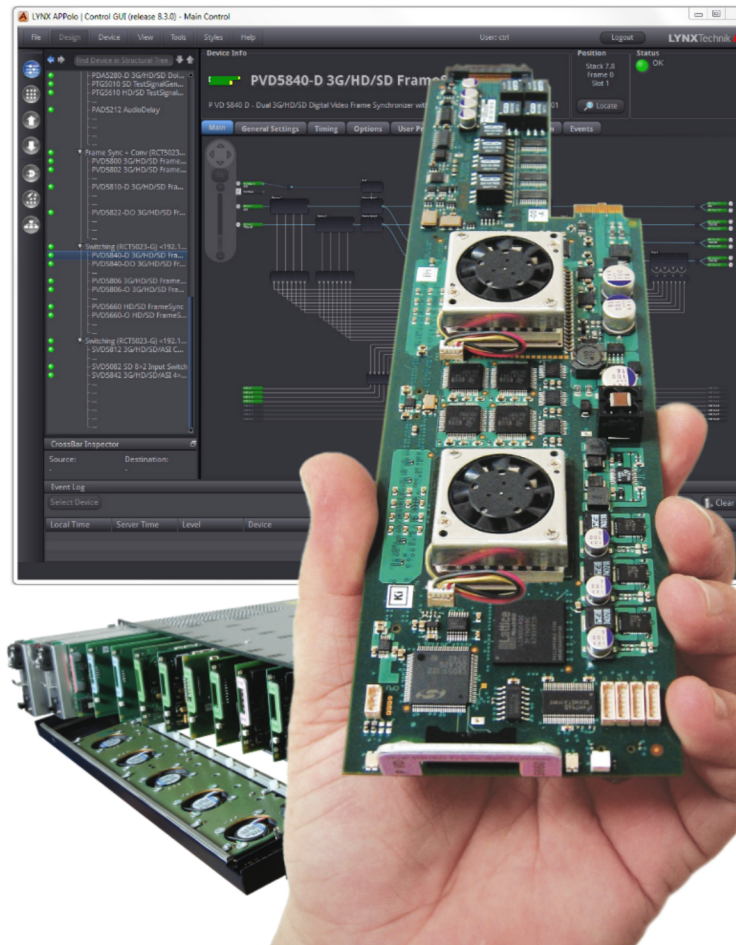
The basic module is a single channel multi-format frame synchronizer, providing four output channels each with its own video processor and audio embedder. Internal image processing resources include two ARC channels, a high quality up/down/cross converter, two noise reduction channels and two RGB color correction channels, all of which can be user-mapped using the internal signal router.

The audio processing capabilities are extensive. The module de-embeds all audio as well as providing support for eight external AES inputs or outputs. Multiple internal crossbars allow for extensive audio shuffling. The module also includes content aware audio processing, DolbyE synchronization, full audio processing as well as multiple adjustable user delays.

Options include a second input with a second frame synchronizer plus a second up/down/cross converter. There is also an option to support level B (DL) formats and also cross conversion between Level A and Level B. All options are pre-installed and activated through license codes.

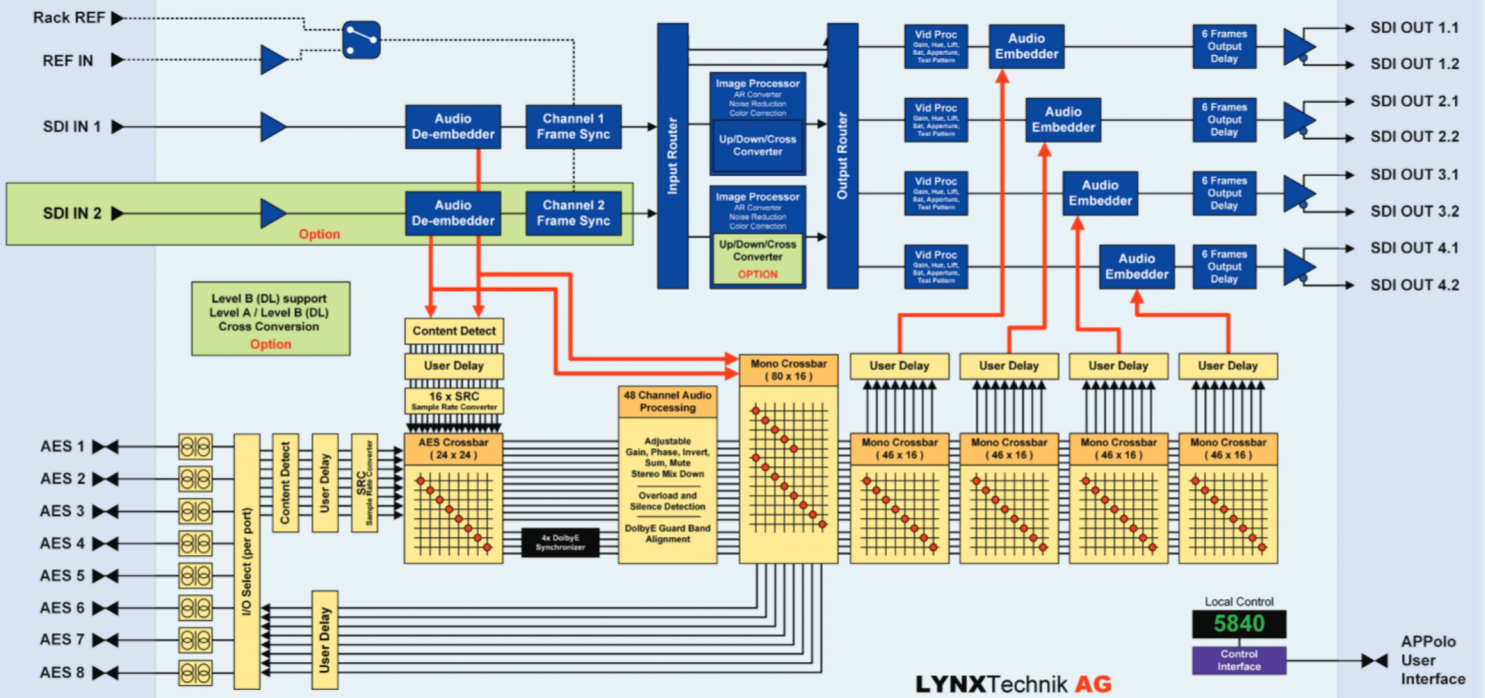
The P VD 5840 FLEXCARD is driven using the LYNX APPolo control system, which provides an intuitive graphical visualization for the status, control, monitoring and configuration of the module.

- the possibilities are endless -



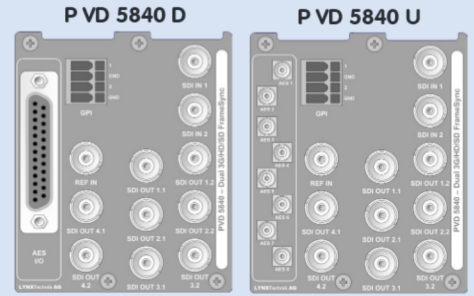
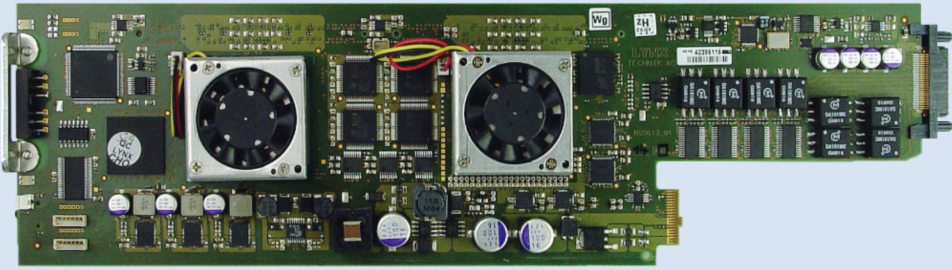
# P VD 5840 FLEXCARD

## P VD 5840 U/D – FLEXCARD Dual 3G/HD/SD Frame Sync + Image and Audio Processor



**Content Aware Audio Processing:** The PVD 5840 features automatic detection of the audio content and distinguishes between standard PCM / DolbyE and other compressed bitstreams. If a compressed audio bitstream such as DolbyE is detected, the module automatically disables the sample rate converters and any audio processing functions in the selected channel to prevent corruption of the bitstream. Operators are also alerted in the APPoL Control System of potential conflicts.

# P VD 5840 FLEXCARD



P VD 5840 D  
Balanced AES3 Audio  
25 pin SubD Connector

P VD 5840 U  
Unbalanced AES3d Audio  
Mini Din 75Ω Connectors

## CONNECTION PANEL OPTIONS

Note: Double width panels - occupies two rack slots

## Features

- Compact dual channel frame synchronizer
- Support for SDI video formats up to 3Gbit
- Optional fiber I/O, basic fiber or CWDM with 18 wavelength selections
- Bi-level or tri-level reference input, auto detect, cross lock compatible
- Robust "flywheel" frame synchronizer functionality
- Seamless switching between input sources (with second input option)
- Integrated Image processing includes:
  - 2 channel aspect ratio converter
  - 2 channel noise reduction
  - 2 channel RGB gain and lift color correction
- Firmware plug in options:
  - **OC-5840-SCND** - Second Input Option
  - **OC-5840-UPXD2** - UP/DOWN/CROSS conversion channel 2
  - **OC-5840-3G-LEVELB-DL** - Level B (DL) support and A<->B conversions
- 4 independent SDI outputs, user mapped to any internal resource
- Each output (4) has independent 10 bit digital video processing providing:
  - Adjustable gain, saturation, black level and hue
  - Adjustable aperture correction
  - Color space conversion ( 601 > 709 or 709 > 601 )
  - Integral test pattern generator with multiple patterns
  - Adjustable output timing delay (3 frame)
- Automatically detect audio content PCM / DolbyE / compressed bitstream
- De-embed complete audio payload from each SDI input (16 channels)
- 8 x external AES Inputs and / or outputs (transformer coupled)
  - 24 x 24 AES audio input crossbar
  - Individually selectable sample rate converters (on/off) for de-embedded audio and external audio inputs
  - Selectable audio pathways through synchronizer
    - 20 x AES - Internal
    - 4 x AES - Through 4 x DolbyE synchronizers
    - 8 x AES bypass channel synchronized to SDI input 1
    - 8 x AES bypass channels synchronized to SDI input 2
  - 48 channel audio processing with adjustable gain / phase / mute / sum
  - 48 channel overload and silence detection
  - Audio is delayed to track video synchronizer automatically
  - User adjustable audio delays in multiple zones
  - DolbyE synchronizers automatically maintain guard band timing
  - No "pops and clicks" in audio even when frames are dropped / added
  - 4 independent output embedders (16 channel) for each output
  - 4 independent 48 x 16 mono output crossbars
  - 80 x 16 mono crossbar for external AES outputs
  - Store 7 module user presets, and switch between four with GPI
  - Two external GPI inputs, user configurable:
    - Seamless switch between inputs (with second input option)
    - Freeze input 1 (or 2 with second input option)
  - AFD / WSS / VI / Closed Caption and Timecode metadata transcoding
  - Powerful and intuitive user interface using APPulo control system
  - SNMP error reporting if used with RCT 5031 Master Controller option
  - Hot swappable

# Specifications

## SDI Video Inputs / Outputs

Signal Type	Serial digital video SMPTE 292M, 424M, 259M Automatic video format and standard detection
Supported Formats	SDI formats up to 3Gbit/s* (see table)
No. of Inputs	2 (second input optional)
Connector / Impedance	BNC, 75 Ohms
Return Loss	> 15dB (270Mbit/s), > 10dB (2.97Gbit/s)
No. Of Outputs	6 (one for channels 1 and 2, plus two for channels 3 and 4)
Signal Type	Serial digital video SMPTE 292M, 424M, 259M
Jitter	< 0.20 UI (270Mbit/s) < 1.0 UI - Timing, < 0.20 UI - Alignment (1.485Gbit/s) < 2.0 UI - Timing, < 0.30 UI - Alignment (2.97Gbit/s)

## AES Audio Inputs / Outputs

No. of Inputs / Outputs	8 (individually assign 8 external channels as inputs or outputs)
Signal	P VD 5840 U = 8 x AES3id unbalanced (single ended) P VD 5840 D = 8 x AES3 balanced
Connectors	P VD 5840 U = Mini DIN1.0/2.3, 75 Ohm P VD 5840 D = Female 25 pin SubD, 110 Ohm balanced
Output Level	P VD 5840 U = 1 v peak to peak nominal P VD 5840 D = 4 v peak to peak nominal
Coupling	Transformer (isolated) inputs or outputs

## Video Processing

Delay adjustment range	Up to 3 frames of programmable delay in pixel/line/frame increments Separate delay provided for each output channel (4)
Nominal Processing Delay	1 frame (frame sync mode) 0.5 line (line sync mode)
Video adjustments	Gain / Saturation / Hue / Black level per output channel
ARC	2 channels of HQ aspect ratio conversion (SDTV mode only)
Up/Down/Cross Conversion	1 x high quality up/down/cross converter (2nd Optional)
Noise reduction	2 x high quality noise reducers (mosquito, block artifact, 2D/3D recursive)
Color Correction	2 x RGB color correction stages with adjustable gain and black level

## Audio Processing

De-embedding	All audio (16 channels) de-embedded from each SDI input
Input audio crossbar	De-embedded and external AES on 24 x 24 AES input matrix
Audio Processing	48 channels with adjustable gain/mute/phase invert and stereo mixdown and overload and silence detection
Embedder output crossbar	16 channel mono matrix for each SDI output channel (4) (Source only from audio pathway 1 and 2 below)
Sample rate converters	Selectable ON/OFF (24) for each incoming AES (de-embedded and external)
Audio delay + sync	Automatic (tracking) with user offset adjustments
Audio Pathway 1	20 x AES wide with full audio processing functions
Audio Pathway 2	4 x AES wide with full audio processing functions + 4x DolbyE synchronizers
Audio Pathway 3	Two 8 x AES wide per SDI input. Synchronized from the SDI inputs without audio processing
External AES output matrix	Select up to 8 x AES from any audio pathway
User adjustable audio delay	Up to 1.3s (1300ms) total - provided via individually adjustable delays in various areas of processing path (refer to diagram) <b>Note:</b> These adjustments are offsets to the auto tracking delay timing compensation.

## Operating Modes

Frame Sync	Dual channel frame synchronizer with full audio support. 1 frame min delay
Line Sync	Dual channel line synchronizer with full audio support. 0.5 frame min delay

## Control

Local Controls	Local alphanumeric display with integrated menu system for setting "basic" module parameters. Use of the APPolo control system is <b>mandatory</b> for the operation of this module.
Remote Control	Comprehensive remote control and status monitoring supported when using the APPolo control system
External GPI Input	2 x GPI inputs (function configurable)
Store user settings	Store up to 7 sets of user settings in module flash ram, switch between any four sets with external GPI input or APPolo control system

## Electrical Specifications

Operating Voltage	12 VDC
Power Consumption	34 W
Safety	IEC 60950/ EN 60950/VDE 0805

## Mechanical

Size	283mm x 78mm
Weight	Card module 200g (7 oz), connector plate 125g (4.4 oz)

## Ambient

Temperature	5°C to 40°C (41 F to 104 F) maintaining specifications
Humidity	90% Maximum, non-condensing

## \* Supported Video Standards

Bits / Color	10 Bit / 4:2:2 (Y,Cr,Cb)
Formats : SDTV	<b>525</b> / 59.94Hz, <b>625</b> / 50Hz
Formats : 1.5 Gbit	<b>720p</b> / 60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98 Hz <b>1080i</b> / 60 / 59.94 / 50 Hz <b>1080p</b> / 30 / 29.97 / 25 / 24 / 23.98 Hz <b>1080p60</b> / 25 / 24 / 23.98 Hz
Formats : 3.0 Gbit	<b>1080p</b> / 60 / 59.94 / 50 Hz (Level A) - Level B (IDU support is optional)

**Note:** The use of the APPolo control system is **mandatory** for full control of this module. The local controls provide access to basic setup and configurations only.

## Ordering Information

Model	Description
<b>P VD 5840 UO</b>	FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (unbalanced AES)
<b>P VD 5840 DO</b>	FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (balanced AES)
<b>OC-5840-SCND</b>	<b>Option:</b> Second input firmware option (license code)
<b>OC-5840-LPX02</b>	<b>Option:</b> UP / DOWN / CROSS conversion for channel 2 (license code)
<b>OC-5840-3G-LEVELB-DL</b>	<b>Option:</b> Level B (IDU support including Level A and Level B (IDU) cross conversion



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