

# P VD 5840 UO/DO

## FLEXCARD - Dual Frame Sync + Image and Audio Processor

**Multi-format  
SD/HD/3G**

### FLEXCARD™

The P VD 5840 FLEXCARD offers a host of advanced functions in a single compact module. It functions primary 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, two noise reduction channels and two RGB color correction channels, which can be user-mapped using the internal signal router.

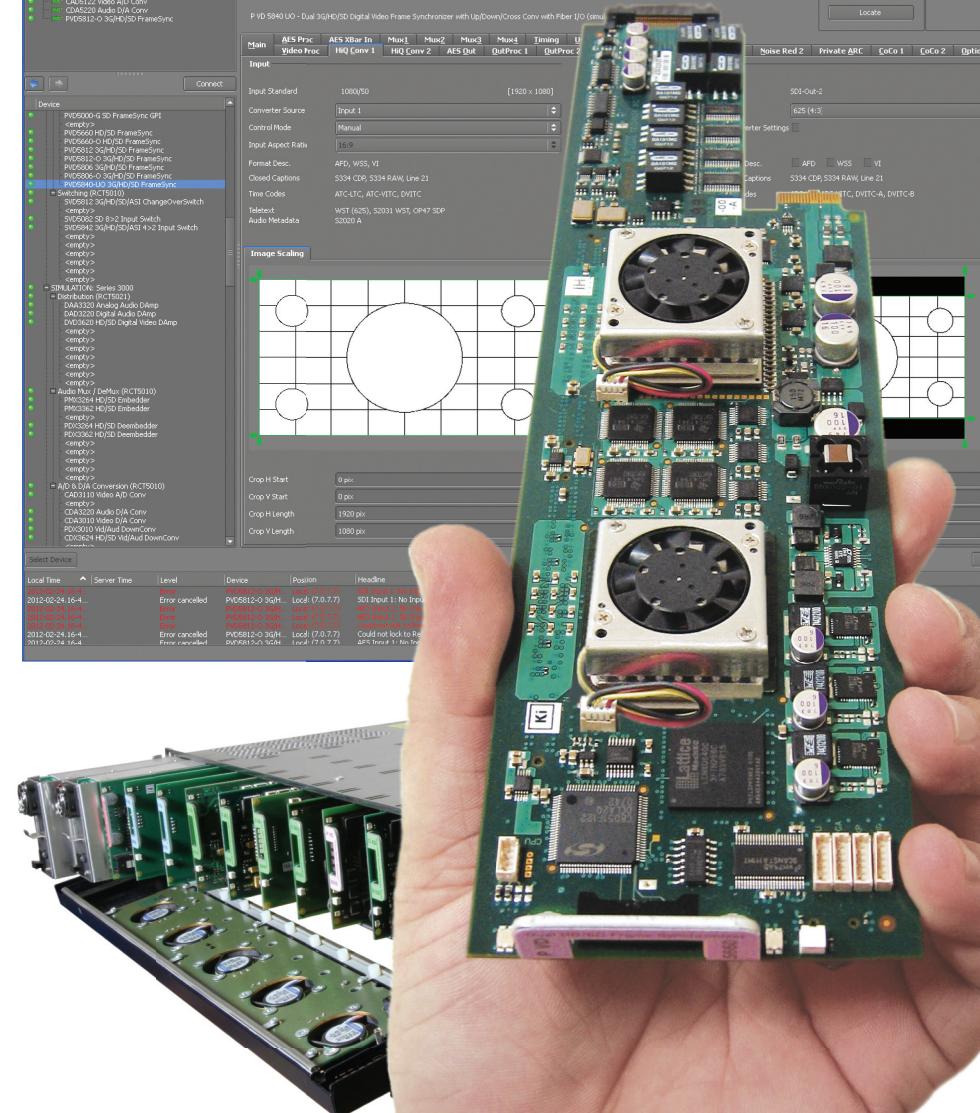
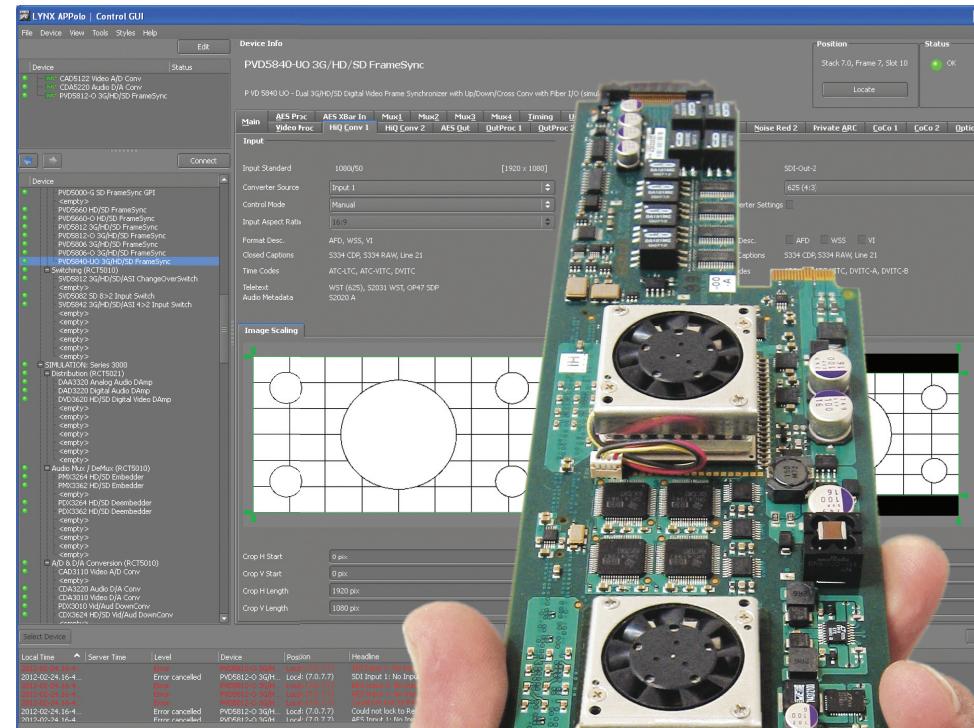
The audio processing capabilities are extensive. The module de-embeds all audio as well as providing support for eight external AES inputs or outputs. Multiple internal crossbars allow for extensive audio shuffling. It also provides content aware audio processing, DolbyE synchronization, full audio processing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

Optional fiber optic Input and outputs are available, as well as CWDM support with 18 wavelength selections.

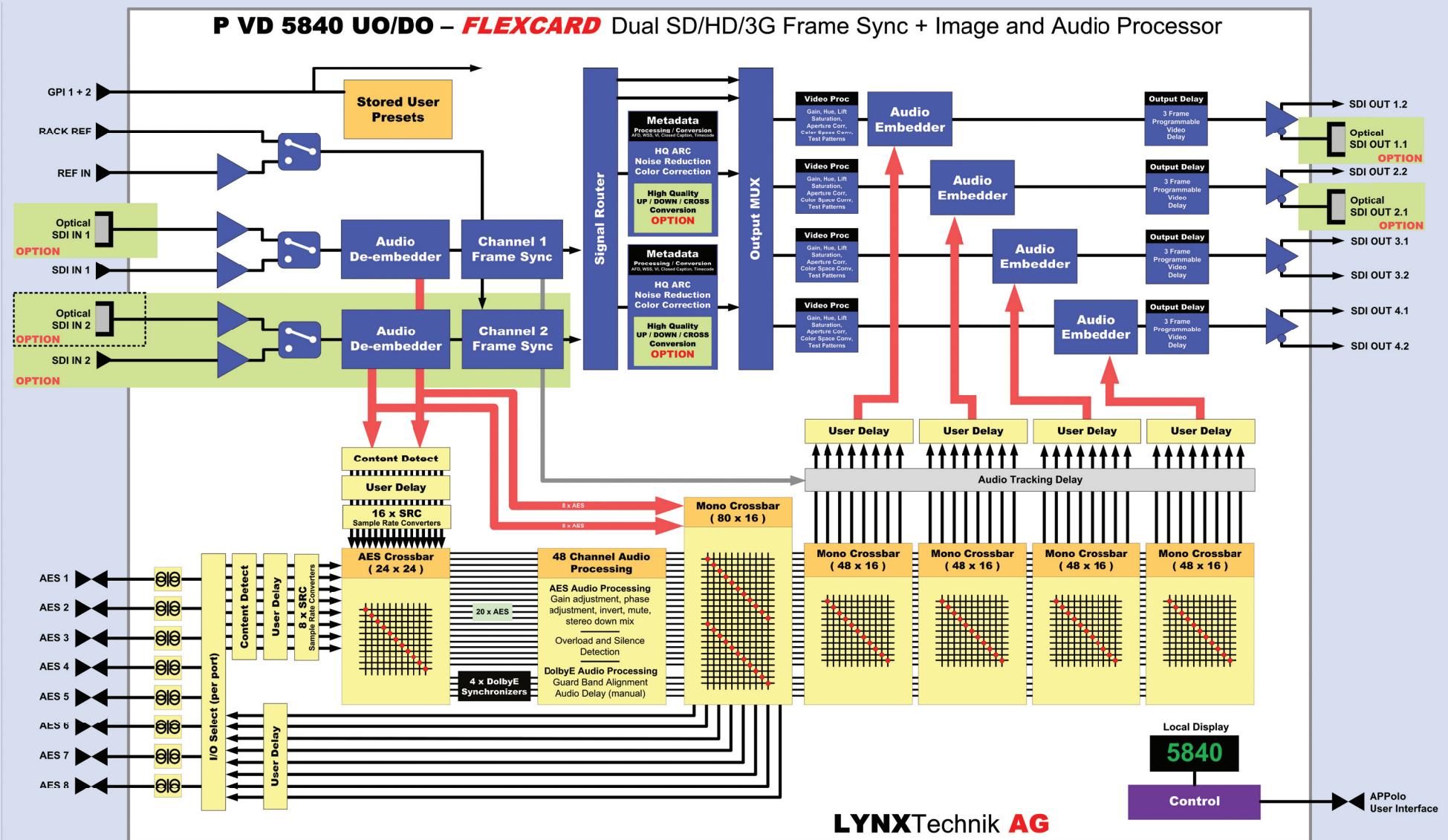
Options include a second input, two broadcast quality up/down/cross converters and fiber I/O which can be used to further expand the module's functionality. All modules are supplied "fiber ready" and fiber I/O can be added at any time by simply plugging in the SFP fiber module. The second input and up/down/cross converters are 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 -

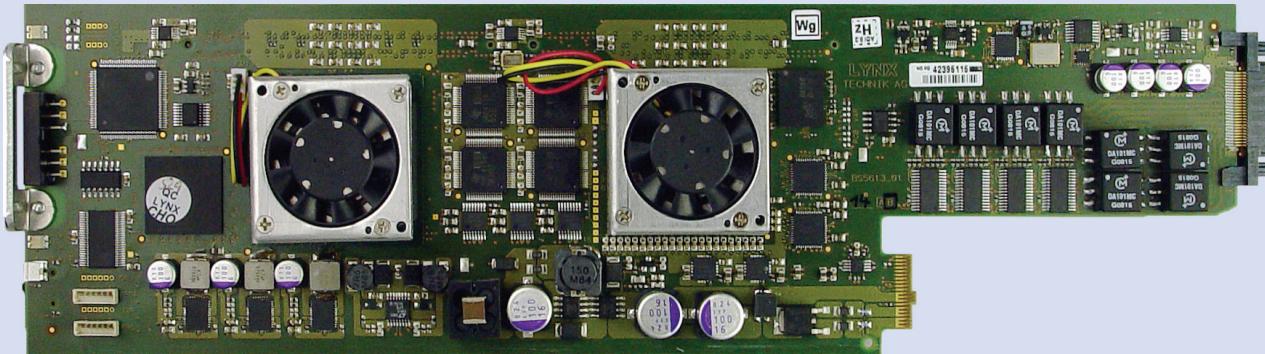


# P VD 5840 FLEXCARD

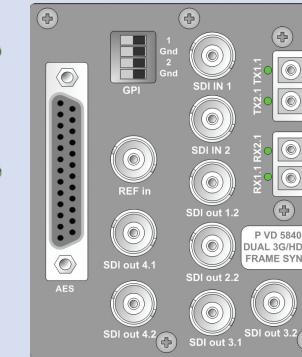


**Content Aware Audio Processing:** The PVD 5840 FLEXCARD features automatic detection of the audio content and distinguishes between standard PCM / DolbyE and other compressed bitstreams. If a compressed audio bitstream such as DolbyE is detected, the module automatically disables the sample rate converters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

# P VD 5840 FLEXCARD

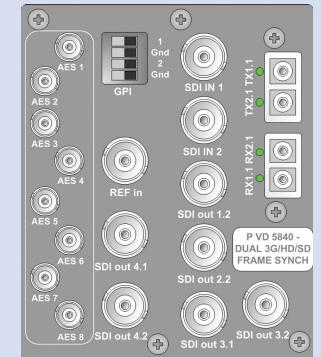


P VD 5840 DO



Balanced AES3 Audio  
25 pin SubD Connector

P VD 5840 UO



Unbalanced AES3id 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-UPXD1** - UP/DOWN/CROSS conversion channel 1
  - **OC-5840-UPXD2** - UP/DOWN/CROSS conversion channel 2
- 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 for 2 with second input option
- AFD / WSS / VI / Closed Caption and Timecode metadata transcoding
- Powerful and intuitive user interface using APPolo control system
- SNMP error reporting if used with RCT 5031 Master Controller option
- Hot swappable

## Fiber I/O Options

The PVD 5840 FLEXCARD has single channel or dual channel fiber transmitter and receiver options, as well as CWDM versions with 18 wavelength selections.

**OH-TX-1**

**Fiber SFP Module:** Single channel transmitter  
1310nm wavelength (non CWDM).  
TX power = -5dBm. Singlemode up to 10km

**OH-TT-1**

**Fiber SFP Module:** Dual channel transmitter  
1310nm wavelength (non CWDM).  
TX power = -5dBm. Singlemode up to 10km

**OH-TX-4-xxxx**

**CWDM Fiber SFP Module:** Single channel transmitter.  
**xxxx** designates wavelength.  
Select from 1270, 1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610nm. TX power = -1dbm  
Singlemode up to 40km

**OH-TT-4-xxxx-xxxx**

**CWDM Fiber SFP Module:** Dual channel transmitter  
**xxxx-xxxx** designates wavelength pair. Select from 1270-1290, 1310-1330, 1350-1370, 1390-1410, 1430-1450, 1470-1490, 1510-1530, 1550-1570, 1590-1610nm  
TX power = -1dbm  
Singlemode up to 40km

**OH-RX-1**

**Fiber SFP Module:** Single channel receiver  
Rx sensitivity -3dBm to -19dBm

**OH-RR-1\***

**Fiber SFP Module:** Dual channel receiver  
Rx sensitivity -3dBm to -19dBm

\* Note: The use of the dual channel fiber SFP receiver module **OH-RR-1** requires the second input option **OC-5840-SCND**



## Video Inputs / Outputs (electrical)

|                       |  |
|-----------------------|--|
| Signal Type           | Serial digital video SMPTE 292M, 424M, 259M<br>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), > 10dB (2.97Gbit)  |
| 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)<br>< 1.0 UI - Timing, < 0.20 UI - Alignment (1.485Gbit)<br>< 2.0 UI - Timing, < 0.30 UI - Alignment (2.97Gbit) |

## Video Inputs / Outputs (optical - optional)

|                |  |
|----------------|--|
| Signal Type    | SMPTE 297M - 2006  |
| Connector      | LC/PC (singlemode)                                       |
| No. of inputs  | 2 (one per channel)                                      |
| No. of outputs | 2 (one each for channels 1 and 2)                        |
| Wavelengths    | Non CWDM and CWDM versions available. Please see options |

## AES Audio Inputs / Outputs

|                         |   |
|-------------------------|---|
| No. of Inputs / Outputs | 8 (Individually assign 8 external channels as inputs or outputs)                              |
| Signal                  | P VD 5840 UO = 8 x AES3id unbalanced (single ended)<br>P VD 5840 DO = 8 x AES3 balanced       |
| Connectors              | P VD 5840 UO = Mini DIN1.0/2.3, 75 Ohm<br>P VD 5840 DO = Female 25 pin SubD, 110 Ohm balanced |
| Output Level            | P VD 5840 UO = 1 v peak to peak nominal<br>P VD 5840 DO = 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<br>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 | 2 x optional high quality up/down/cross converters   |
| Noise reduction          | 2 x high quality noise reducers (mosquito, block artefact, 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)<br>(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,Cb,Cr)  |
| 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<br><b>1080i</b> / 60 / 59.94 / 50 Hz<br><b>1080p</b> / 30 / 29.97 / 25 / 24 / 23.98 Hz<br><b>1080psF</b> / 25 / 24 / 23.98 Hz |
| Formats : 3.0 Gbit | <b>1080p</b> / 60 / 59.94 / 50 Hz (Level A)   |

## 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

| Part #            | Model                    | Description   |
|-------------------|--------------------------|---|
| <b>5155045840</b> | <b>P VD 5840 UO</b>      | FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (unbalanced AES)  |
| <b>5155055840</b> | <b>P VD 5840 DO</b>      | FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (balanced AES)  |
| <b>6155035180</b> | <b>OH-RPS 5180</b>       | <b>Option:</b> 180W primary power supply upgrade - This upgrades the primary power supply included with the RFR 5012 rack frame to 180W. Required is 5 x PVD 5840 modules are installed in a single rack frame  |
| <b>6155005180</b> | <b>RPS 5180</b>          | <b>Option:</b> 180W Redundant Power Supply. Order in place of the standard RPS 5012 power supply for redundant power protection if primary power supply upgrade (above) is ordered  |
| <b>1300000018</b> | <b>OC-5840-SCND</b>      | <b>Option:</b> Second Input firmware option (licence code)  |
| <b>1300000019</b> | <b>OC-5840-UPXDI</b>     | <b>Option:</b> UP / DOWN / CROSS conversion for channel 1 (licence code)  |
| <b>1300000020</b> | <b>OC-5840-UPXD2</b>     | <b>Option:</b> UP / DOWN / CROSS conversion for channel 2 (licence code)  |
| <b>1155501811</b> | <b>OH-TX-1</b>           | <b>Option:</b> Single channel 1310nm fiber output - non CWDM. TX Power -5dBm  |
| <b>1155401812</b> | <b>OH-TT-1</b>           | <b>Option:</b> Dual channel 1310nm fiber outputs - non CWDM. TX Power -5dBm   |
| <b>1155011811</b> | <b>OH-RX-1</b>           | <b>Option:</b> Single channel fiber receiver, Input range -3dBm to -19dBm   |
| <b>1155101813</b> | <b>OH-RR-1</b>           | <b>Option:</b> Dual channel fiber receiver, Input range -3dBm to -19dBm<br><b>Note:</b> Requires OC-5840-SCND option  |
|                   | <b>OH-TX-4-xxxx</b>      | <b>Option:</b> CWDM Fiber SFP Module: Single channel transmitter. xxxx designates wavelength. Select from 1270, 1290, 1310, 1330, 1350, 1370, 1390, 1410, 1430, 1450, 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610nm. TX power = -1dbm. Singlemode up to 40km (typical) |
|                   | <b>OH-TT-4-xxxx-xxxx</b> | <b>Option:</b> CWDM Fiber SFP Module: Dual channel transmitter. xxxx-xxxx designates wavelength pair. Select from 1270-1290, 1310-1330, 1350-1370, 1390-1410, 1430-1450, 1470-1490, 1510-1530, 1550-1570, 1590-1610nm. TX power = -1dbm. Singlemode up to 40km (typical)  |

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