

# P VD 5840 UO/DO

**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, two noise reduction channels and two RBG color correction channels, which can be user-mapped using the internal signal router.

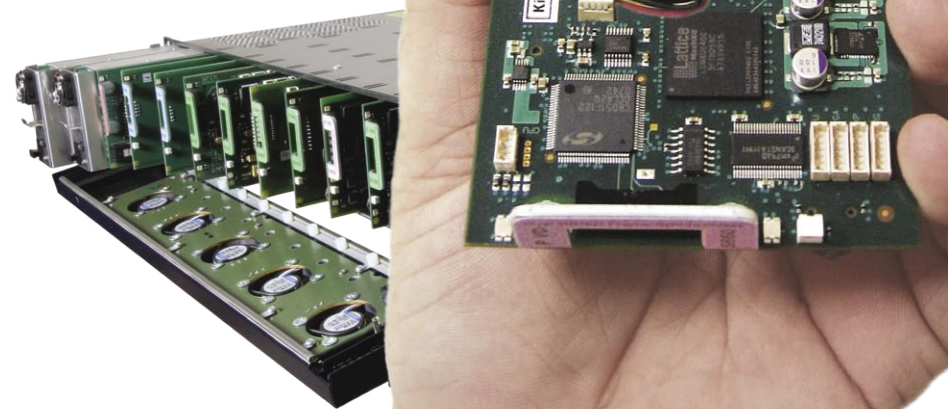
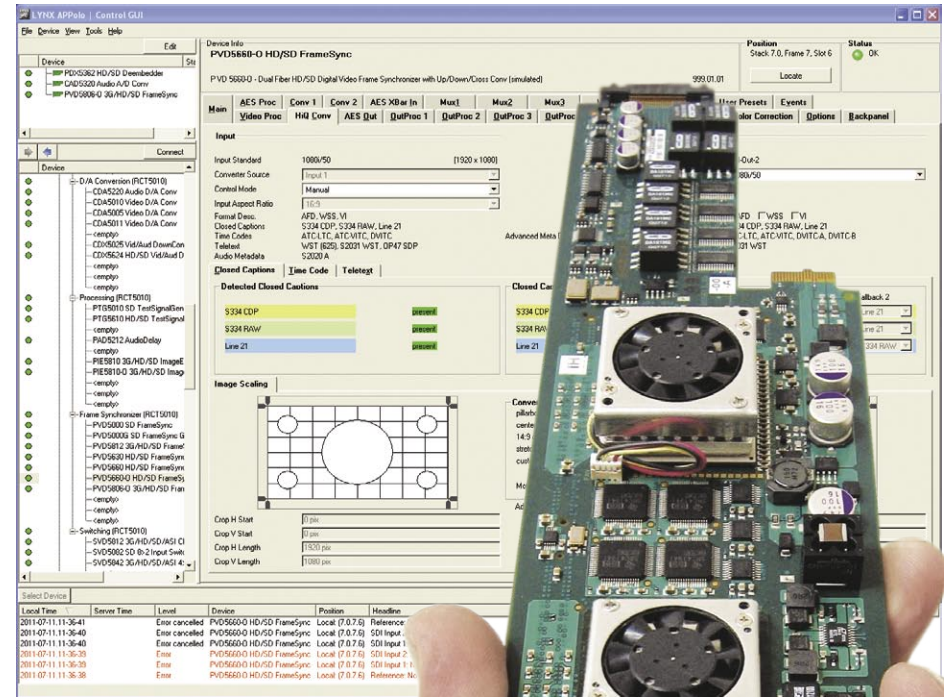
The audio processing capabilities are extensive. The module de-embeds all audio as well as providing support for eight external AES inputs or outputs. Multiple internal crossbars allow for extensive audio shuffling. It also provides content aware audio processing, DolbyE synchronization, full audio processing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

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

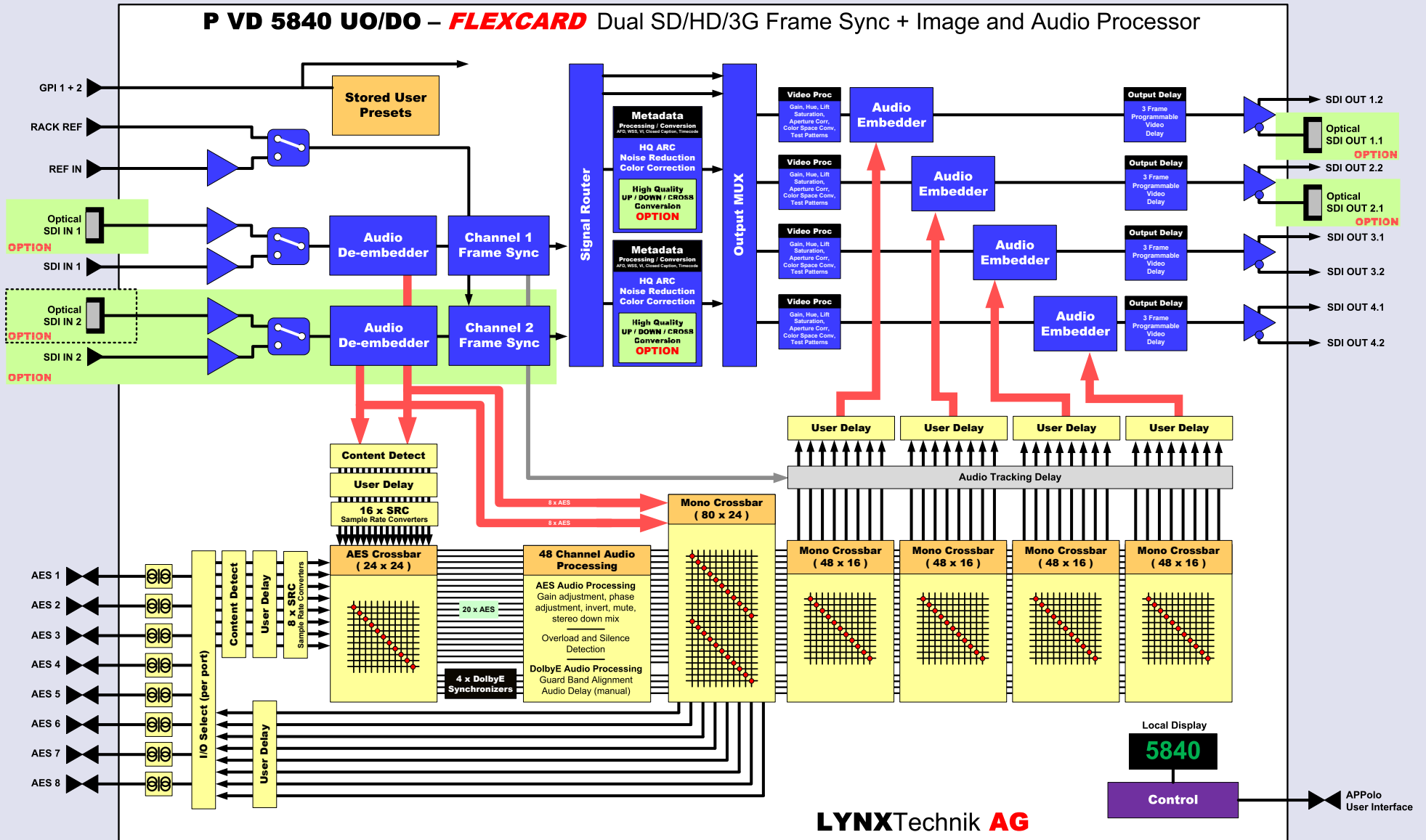
Options include a second input, two broadcast quality up/down/cross converters and fiber I/O which can be used to further expand the module's functionality. All modules are supplied "fiber ready" and fiber I/O can be added at any time by simply plugging in the SFP fiber module. The second input and up/down/cross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



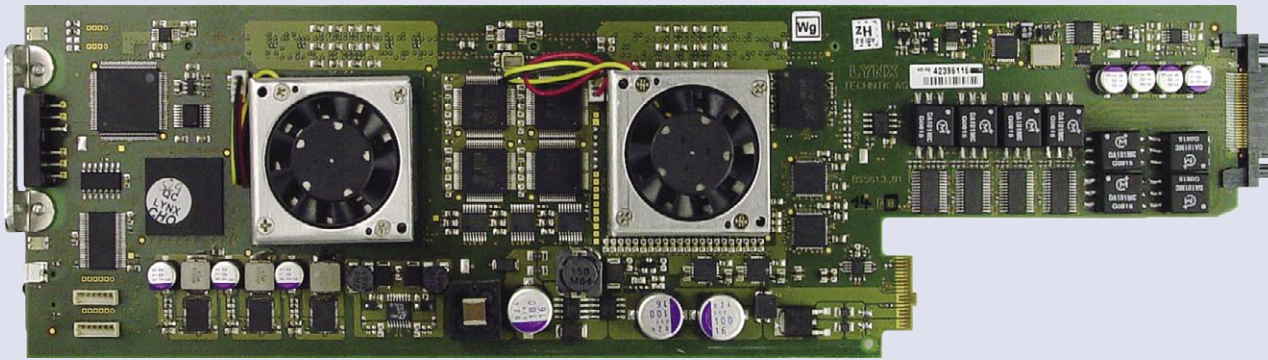
# P VD 5840 FLEXCARD



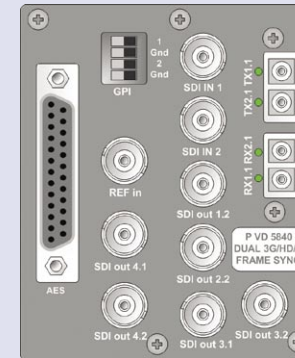
**Content Aware Audio Processing:** The PVD 5840 FLEXCARD features automatic detection of the audio content and distinguishes between standard PCM / DolbyE and other compressed bitstreams. If a compressed audio bitstream the se

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# P VD 5840 FLEXCARD

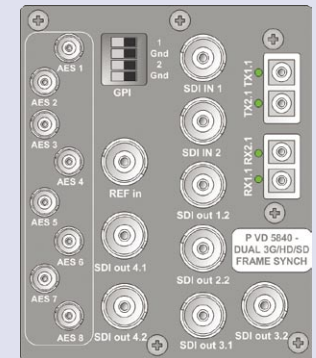


**P VD 5840 DO**



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
- Selectable audio pathways through synchronizer
  - 16 x AES through sample rate converters (selectable on/off)
  - 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 24 mono crossbar for external AES outputs
- Store 7 module user presets, and switch between two 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 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 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) < 1.0 UI - Timing, < 0.20 UI - Alignment (1.485Gbit) < 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) P VD 5840 DO = 8 x AES3 balanced
Connectors	P VD 5840 UO = Mini DIN1.0/2.3, 75 Ohm P VD 5840 DO = Female 25 pin SubD, 110 Ohm balanced
Output Level	P VD 5840 UO = 1 v peak to peak nominal 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 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 ration conversion (SDTV mode only)
Up/Down/Cross Conversion	2 x <b>optional</b> 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) (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 two 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

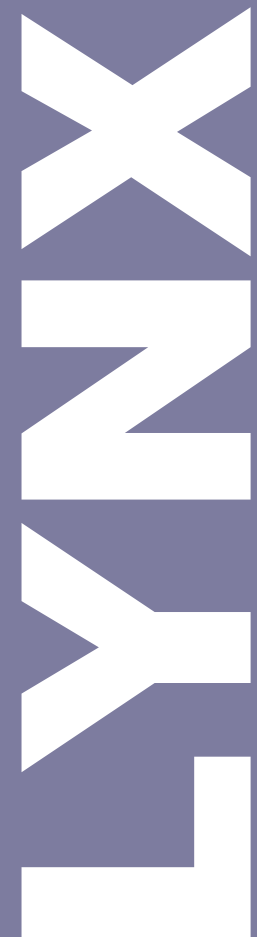
Bits / Color	10 Bit / 4:2:2 (Y,Cr,Cb)
Formats : SDTV	<b>525</b> / 59.94Hz, <b>625</b> /50Hz
Formats : 1.5 Gbit	<b>720p</b> / 60 / 59.94 / 50 / 30 / 29.97 / 25 / 24 / 23.98 Hz <b>1080i</b> / 60 / 59.94 / 50 Hz <b>1080p</b> / 30 / 29.97 / 25 / 24 / 23.98 Hz <b>1080psF</b> / 25 / 24 / 23.98 Hz
Formats : 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
5155045840	P VD 5840 UO	FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (unbalanced AES)
5155055840	P VD 5840 DO	FLEXCARD Dual 3G Frame Sync + Image and Audio Processor (balanced AES)
6155035180	OH-RPS 5180	<b>Option:</b> 180W Primary power supply upgrade - Upgrades the primary power supply included with the RFR 5012 rack frame to 180W. Needed if 5 x PVD 5840 are installed in a single rack frame
6155005180	RPS 5180	<b>Option:</b> 180W Redundant Power Supply - Order in place of standard RPS 5012 power supply for optional redundant protection if 180W primary power supply upgrade is ordered
1300000018	OC-5840-SCND	<b>Option:</b> Second Input firmware option (licence code)
1300000019	OC-5840-UPXD1	<b>Option:</b> UP / DOWN / CROSS conversion for channel 1 (licence code)
1300000020	OC-5840-UPXD2	<b>Option:</b> UP / DOWN / CROSS conversion for channel 2 (licence code)
1155501811	OH-TX-1	<b>Option:</b> Single channel 1310nm fiber output - non CWDM. TX Power -5dBm
1155401812	OH-TT-1	<b>Option:</b> Dual channel 1310nm fiber outputs - non CWDM. TX Power -5dBm
1155011811	OH-RX-1	<b>Option:</b> Single channel fiber receiver, Input range -3dBm to -19dBm
1155101813	OH-RR-1	<b>Option:</b> Dual channel fiber receiver, Input range -3dBm to -19dBm <b>Note:</b> Requires OC-5840-SCND option
	OH-TX-4-xxxx	<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)
	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 (typical)



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