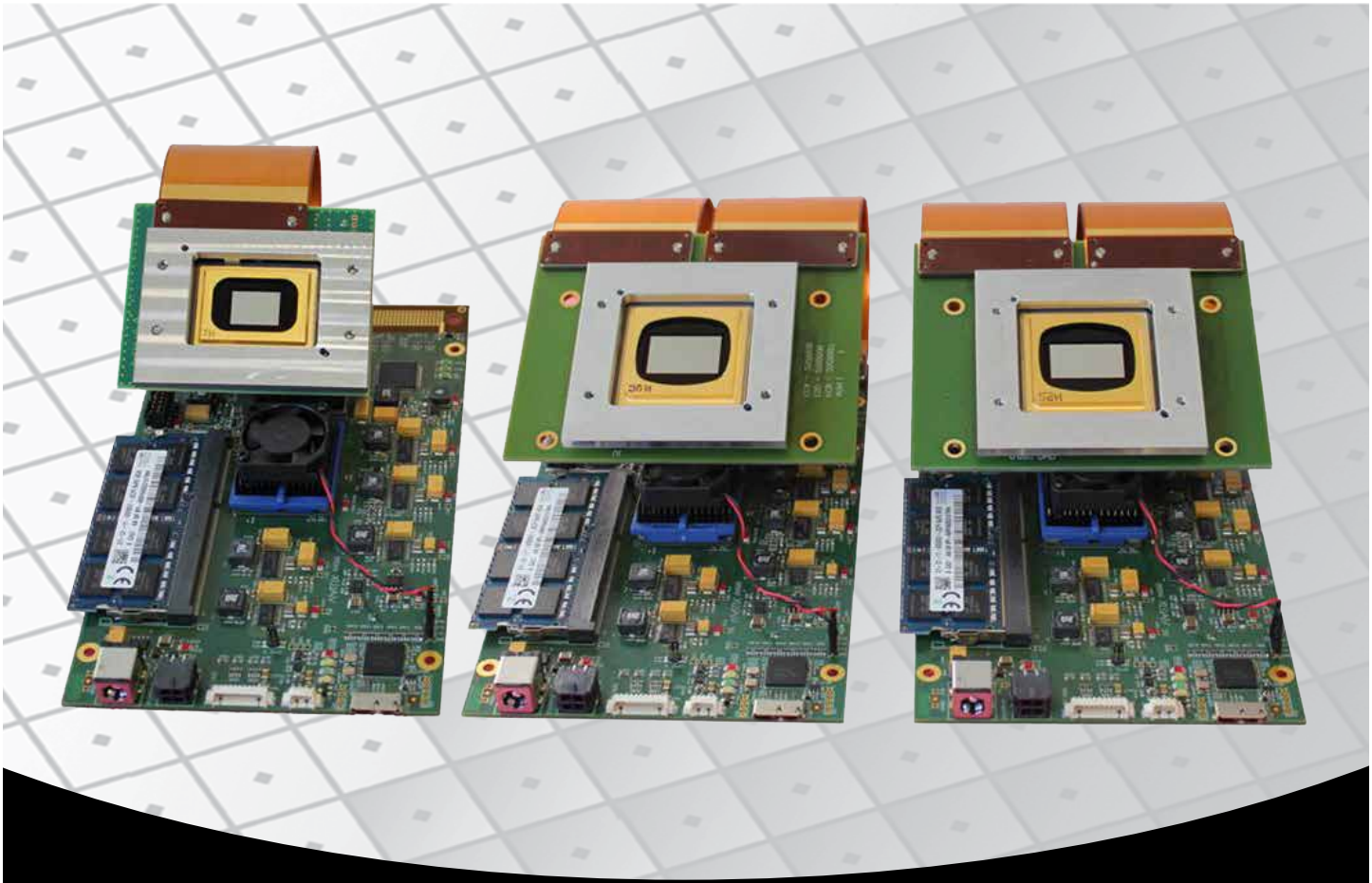


DLi DIGITAL LIGHT innovations

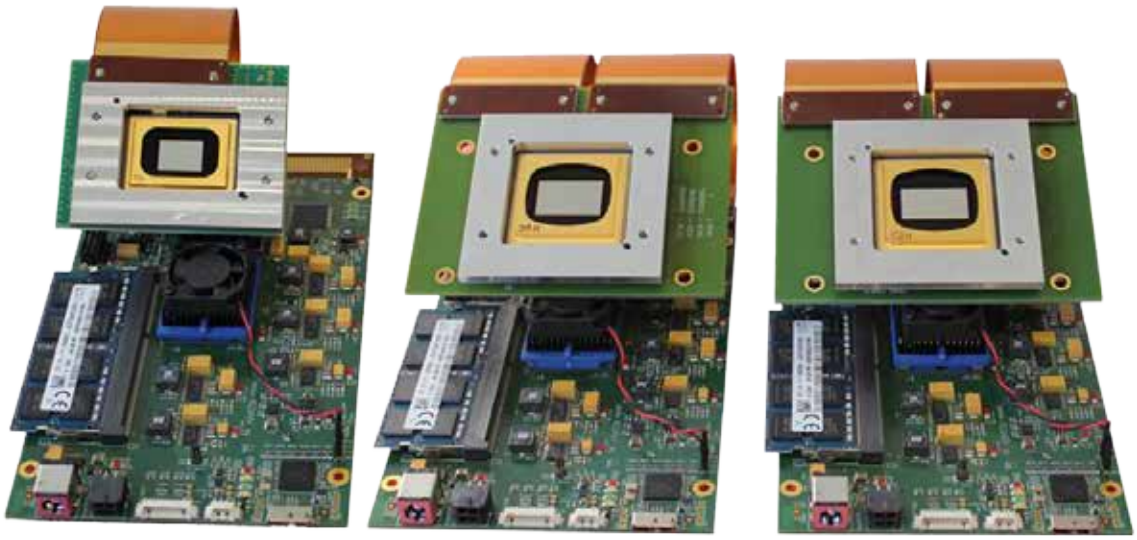
A TyRex Technology Family Company

SuperSpeed DLP® V-Modules

PRODUCT GUIDE

World Leader in DLP® Light Exploration

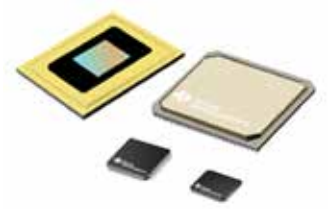
Digital Light Innovations · (512) 617-4700 · dlinnovations.com



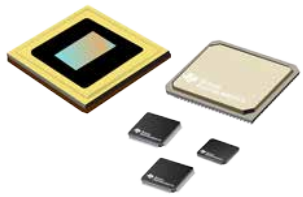
SuperSpeed DLP V-Modules

DLi is proud to carry **SuperSpeed USB 3.0 DLP® V-Modules** from our partners at ViALUX. The SuperSpeed V-Modules give the user full access to the DLP Discovery™ 4100 and LightCrafter™ 9000X Chipsets without the need of time-consuming developments for software, firmware and high frequency FPGA logic code.

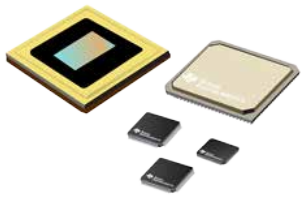
The SuperSpeed V-Modules are available in 4 x DMD sizes: 0.7" XGA, 0.95" 1080p, 0.96" WUXGA and 0.9" WQXGA. The DMD can be specified in operation with UV and Visible wavelengths.



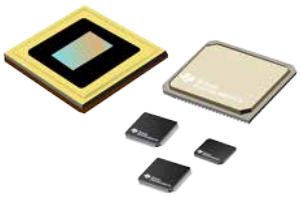
0.7" XGA (VIS / UV)
1024 x 768



0.95" 1080p (VIS / UV)
1920 x 1080



0.96" WUXGA (VIS)
1920 x 1200



0.9" WQXGA (VIS)
2560 x 1600

The SuperSpeed V-Modules are the premier performing platform of the DLP catalog because they combine the highest-speed version of USB with the latest memory technology on the most versatile DLP architecture. V-Modules offer unique flexibility in mirror control enabling a wide variety of new emerging applications.

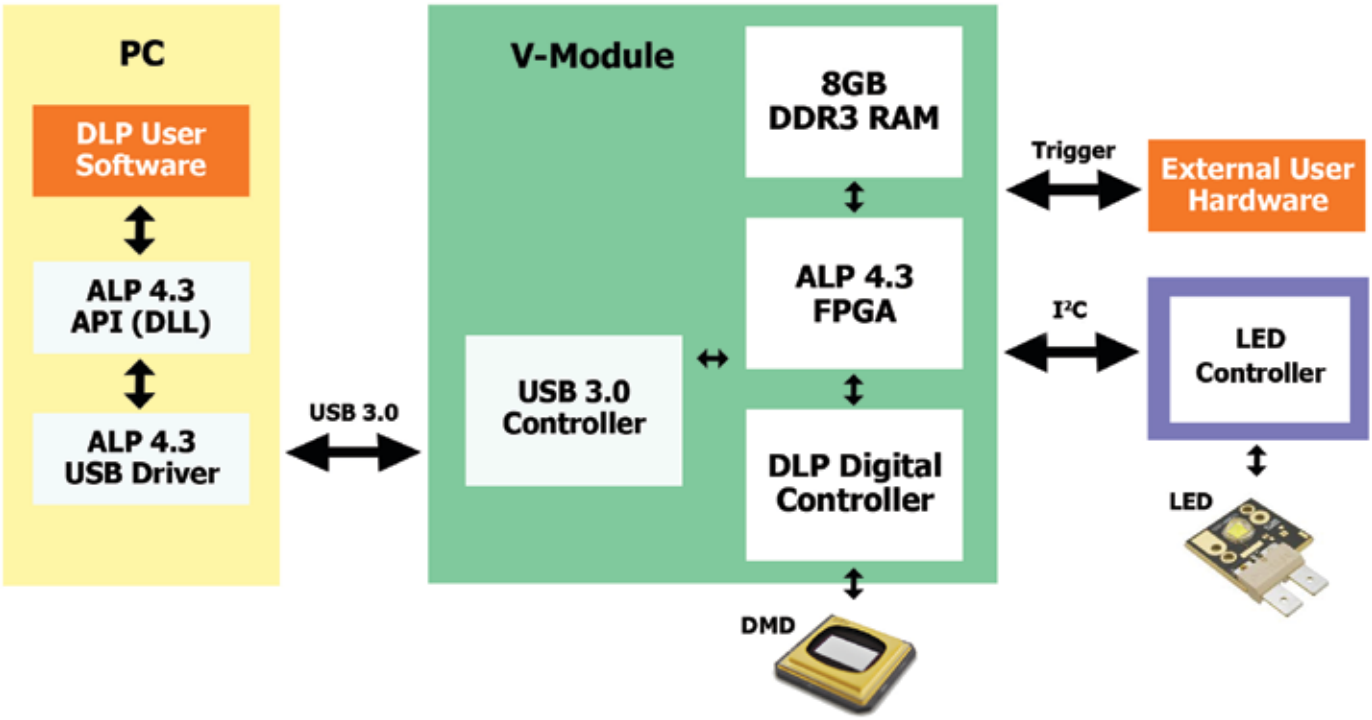
SuperSpeed V-Modules support a wide variety of emerging applications such as Maskless Lithography, Spectroscopy, Laser Marking, Compressive Sensing, Defense & Security Systems, Holography & 3D Volumetric Display, 3D Scanning & Metrology, 3D Printing, Rapid Prototyping, Remote Sensing, and Hyperspectral Imaging. SuperSpeed V-Modules offer users a flexible platform to develop a proof of concept, serve as a reference design for a market-ready product, and facilitate scientific experimentation that utilizes the proven reliability of DLP technology.

SuperSpeed V-Modules combine the USB 3.0 data transfer with the speed and steering capabilities of Discovery™4100 and LightCrafter™9000X, representing the highest performance class of DLP catalog products available. V-Modules offer outstanding pattern frequencies of up to 22,727 Hz and 50 Gbit/second bandwidth.

All V-Modules enable a rapid launch into DLP application development. The controller boards come pre-configured with high-speed ALP 4.3 FPGA logic and USB 3.0 controller firmware so users save time and costs on dedicated hardware and firmware development. V-Modules are well suited for education, academic research, proof of concept, and also as OEM components for series production.

The high-performance Discovery™4100 and LightCrafter™9000X chipsets on the V-Modules are driven by the ALP 4.3 Controller Suite. The ViALUX proprietary FPGA design is the core of the well proven firmware and software interface. The USB 3.0 device driver supports all current Microsoft® Windows® operating systems and guarantees smooth integration with any type of PC. By addressing unique V-Module device numbers, multiple V-Modules can be controlled simultaneously from one application program.

ALP 4.3 CONTROLLER SUITE



For conveniently programming the DMD, a well organized and easy-to-use Application Programming Interface is provided. It offers easily integrated tools for programming operations from a PC running on Windows 8, Win 7, XP, or Vista 32/64-bit. ALP 4.3 is also fully compatible to all former ALP-4 versions.

The USB 3.0 SuperSpeed transfer is the key for streaming data into the 8GB on-board RAM further enhanced by lossless on-the-fly compression. The SuperSpeed V-Module provides high flexibility by free choice of properties of the 3 sequence (Bit Depth, Picture Time, Trigger Control, & Looping/Repetition). This feature enables users to customize pattern sequences to meet their respective application requirements.

Users can also sync the DMD to external devices such as CMOS & CCD cameras. This feature is ideal for imaging applications such as 3D Scanning & Metrology, Spectroscopy, & Medical Imaging. User Configurable Syncs help streamline your workflow and offers a true turn-key solution that allows you to easily integrate other equipment in the setup. In Master Mode, the DMD tells the camera when to take snapshots based on the sequence pattern rate.

An Image Scrolling Option has been added for all cases where the projection is aiming at a moving screen (substrate) as it is typical in direct imaging. Multiple display sequences can be enqueued and can be seamlessly concatenated. Look-Up Table & Area of Interest features are implemented for advanced users.

SuperSpeed USB 3.0 DLP V-Modules

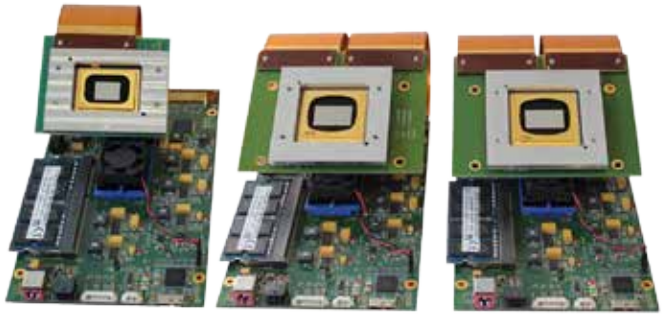
SPECIFICATIONS

- DLP® Digital Micromirror Device (DMD) Options
  - DLP6500 .65" 1080p Type-A DMD
  - DLP7000 .7" XGA 2xLVDS Type-A DMD (VIS / UV)
  - DLP9500 .95" 1080p 2xLVDS Type-A DMD (VIS / UV)
  - DLP9600 .96" WUXGA 2xLVDS Type-A DMD
  - DLP9000X .9" WQXGA 2xLVDS Type-A DMD
- DLP® Support Chips
  - DLP7000 / DLP9500 / DLP9600
    - DLPC410 DMD Digital Controller
    - DLPR410 PROM
    - DLPA200 DMD Micromirror Driver(s)
  - DLP6500 / DLP9000X
    - DLPC910
- Resolution Options
  - 1024 x 768 (XGA)
  - 1920 x 1080 (1080p)
  - 1920 x 1200 (WUXGA)
  - 2560 x 1600 (WQXGA)
- Pattern rates *See product guide for additional pattern rates
  - 1-bit – 22,727Hz (XGA)
  - 1-bit – 17,857Hz (1080p)
  - 8-bit – 290Hz (XGA)
  - 8-bit – 266Hz (1080p)
  - Video – NA
- 2 Configurable I/O triggers for synchronization with cameras and other external devices
- USB 3.0
- On-board storage up to 80,000 binary patterns
- Compatible with all Windows platforms

SuperSpeed USB 3.0 DLP V-Modules

CONTENTS

- SuperSpeed V-Module Controller Board
- DLP DMD & Support Chips
  - DLP6500 / DLP7000 / DLP9500 / DLP9000X / DLP9600
  - DLPC410 / DLPC910
- DMD Board
- DMD Hardware
- Flex Cable(s)
- ALP 4.3 Super-Speed Controller Suite
- Light Animator™ GUI Software
- Power Supply & Cable / Benchtop Power Cable



SUPERSPEED DLP V-MODULES SPECIFICATIONS

	V-7001 Development Kit	V9501 Development Kit	V9601 Development Kit	V9001 Development Kit
				
Control Board	DLP® Discovery™ 4100	DLP® Discovery™ 4100	DLP® Discovery™ 4100	DLP® LightCrafter™ 9000
Chipset	DLP7000 .7" XGA Type-A 2xLVDS DMD DLPC410 Controller	DLP9500 .95" 1080p Type-A 2xLVDS DMD DLPC410 Controller	DLP9600 .96" WUXGA Type-A 2xLVDS DMD DLPC410 Controller	DLP9000X .9" WQXGA Type-A 2xLVDS DMD DLPC910 Controller
Window Coating	VIS / UV	VIS / UV	VIS	VIS
Controller Software	ALP 4.3 SuperSpeed API Light Animator™ GUI	ALP 4.3 SuperSpeed API Light Animator™ GUI	ALP 4.3 SuperSpeed API Light Animator™ GUI	ALP 4.3 SuperSpeed API Light Animator™ GUI
Parts & Assembly	.7" XGA Type-A 2xLVDS DMD Board, 5" or 12" Flex Cable(s), DMD Mounting Hardware, Power & Cable Kit, Power Supply	.95" 1080p Type-A 2xLVDS DMD Board, 5" or 12" Flex Cable(s), DMD Mounting Hardware, Power & Cable Kit, Power Supply	.96" WUXGA Type-A 2xLVDS DMD Board, 5" or 12" Flex Cable(s), DMD Mounting Hardware, Power & Cable Kit, Power Supply	.9" WQXGA Type-A 2xLVDS DMD Board, 5" or 12" Flex Cable(s), DMD Mounting Hardware, Power & Cable Kit, Power Supply
Resolution	1024 x 768 (XGA)	1920 x 1080 (1080p)	1920 x 1200 (WUXGA)	2560 x 1600 (WQXGA)
Micromirror Pitch	13.6µm	10.8µm	10.8µm	7.6µm
Controller Interface	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Pattern Rates	1-bit – 22,727 Hz 8-bit – 290 Hz	1-bit – 17,857 Hz 8-bit – 266 Hz	1-bit – 16,393 Hz 8-bit – 261 Hz	1-bit – 12,987 Hz 8-bit – 303 Hz
USB Transfer Rate	>4,000 fps	>1600 fps	>1500 fps	>1100 fps
On Board Memory	8GB DDR3	8GB DDR3	8GB DDR3	8GB DDR3
Binary Pattern Storage	87,380	31,068	27,962	16,777
I/O Triggers	Master/Slave	Master/Slave	Master/Slave	Master/Slave
Configurations *Only included with Optics Bundle	*Fiber (0.7" XGA DMD only)	n/a	n/a	n/a
Optics *Only included with Optics Bundle	*RAY-07	n/a	n/a	n/a

***higher transfer rates depending upon compression rate of data and PC**