

# SuperSpeed V-Modules



## High-Performance subsystem for Texas Instruments DLP® technology



The DLP Digital Light Processing of Texas Instruments represents a proven technology of MEMS spatial light modulators also beyond standard front projection and DLP Cinema®. The general purpose DLP Discovery™ 4100 platform is different from the DLP standard projector hardware; it provides highest performance and flexibility within the DLP chipset family. The SuperSpeed V-Modules of ViALUX combine the USB 3.0 data transfer with the speed and steering capabilities of Discovery 4100 and represent the highest performance class of DLP catalog products available. ViALUX V-Modules offer unique flexibility in mirror control enabling a wide variety of new emerging applications.

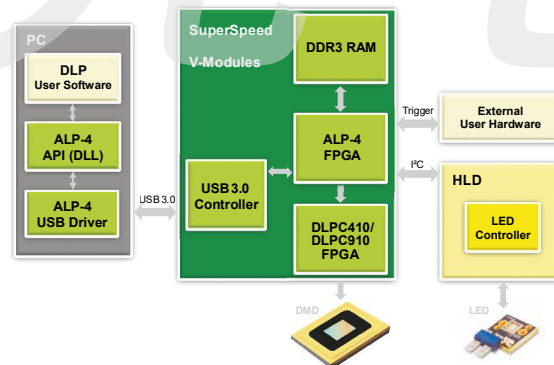
Outstanding pattern frequencies of 22727 global array updates per second are achieved taking advantage of the 50 Gbit/s bandwidth of the Discovery4100 chipset.

The usable spectral range covers all wavelengths from 363 nm UVA to 2 500 nm NIR. The Type A DMD package has efficient cooling options enabling up to 160 W sustained optical power illumination of the micromirror array.

All V-Modules enable a rapid launch into application development with DLP technology. The ViALUX controller boards come with completely configured high-speed FPGA logic and USB 3.0 controller firmware so that customers save time and costs for a 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 chipset on the V-Modules is 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.

The USB 3.0 SuperSpeed transfer is the key for streaming data into the on-board RAM (8 or 16 GByte) further enhanced by lossless on-the-flight compression. Low latency updates of the micromirror array enable feedback-loop operation via PC with  $\leq 1.5$  ms refresh cycle period. The V-Module software API, a DLL library, fits seamlessly into standard programming platforms like C++, .NET, LabVIEW, MATLAB and is fully compatible to all former ALP-4 versions.\*



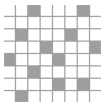
Six V-Modules are available and three windows of the micromirror can be selected for use with visible, ultra-violet or near-infrared light.

- V-7001 VIS/UV** with 0.7" XGA DMD for visible or ultra-violet light (DLP7000VIS/DLP7000UV)
- V-6501 VIS** with 0.65" 1080p DMD for visible light only (DLP6500VIS)
- V-9501 VIS/UV** with 0.95" 1080p DMD for visible or ultra-violet light (DLP9500VIS/DLP9500UV)
- V-9601 VIS** with 0.96" WUXGA DMD for visible light only (DLP9600VIS)
- V-9001 VIS/UV** with 0.9" WQXGA DMD for visible or ultra-violet light (DLP9000XVIS, DLP9000XUV)
- V-650L NIR** with 0.65" NIR WXGA DMD for near-infrared light (DLP650LNIR)

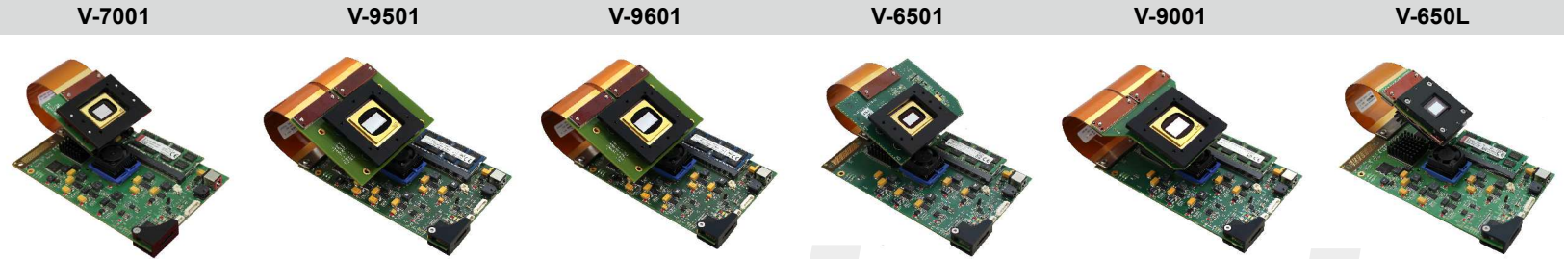
All SuperSpeed V-Modules are based upon the same main board and differ in the DMD extension board attached by one or two flexible cables, respectively.

\*DLP is a registered trademark of Texas Instruments. Microsoft, Windows, C++, .NET are registered trademarks of Microsoft Cooperation. MATLAB is a registered trademark of MathWorks.





## V-Module specifications



	V-7001	V-9501	V-9601	V-6501	V-9001	V-650L
Chipset	DLP7000 & DLPC410	DLP9500 & DLPC410	DLP9600 & DLPC410	DLP6500 & DLPC910	DLP9000X & DLPC910	DLP650LNIR & DLPC410
Type A DMD	0.7 XGA	0.95 1080p	0.96 WUXGA	0.65 1080p	0.9 WQXGA	0.65 WXGA
Window Options	VIS, UV	VIS, UV	VIS	VIS	VIS, UV	NIR
Micromirror Array	1024 x 768	1920 x 1080	1920 x 1200	1920 x 1080	2560 x 1600	1280 x 800
Micromirror Pitch	13.7 μm	10.8 μm	10.8 μm	7.6 μm	7.6 μm	10.8 μm
Active Mirror Array Area	14.0 x 10.5 mm <sup>2</sup>	20.7 x 11.7 mm <sup>2</sup>	20.7 x 13.0 mm <sup>2</sup>	14.5 x 8.2 mm <sup>2</sup>	19.4 x 12.1 mm <sup>2</sup>	13.8 x 8.6 mm <sup>2</sup>
Controller Board Type	V4395	V4395	V4395	V4390	V4390	V4395
Control Board Dimensions	162 x 99 mm <sup>2</sup>	162 x 99 mm <sup>2</sup>	162 x 99 mm <sup>2</sup>	162 x 99 mm <sup>2</sup>	162 x 99 mm <sup>2</sup>	162 x 99 mm <sup>2</sup>
DMD Board Dimensions	67 x 50 mm <sup>2</sup>	102 x 83 mm <sup>2</sup>	102 x 83 mm <sup>2</sup>	101 x 78 mm <sup>2</sup>	95 x 88 mm <sup>2</sup>	63 x 47 mm <sup>2</sup>
Flexible Cable Length	105 / 283 / 573 mm	105 / 283 / 573 mm	105 / 283 / 573 mm	105 / 283 / 573 mm	105 / (283) mm	105 mm
RAM Capacity on Board	64 Gbit / 128 Gbit	64 Gbit / 128 Gbit	64 Gbit / 128 Gbit	64 Gbit / 128 Gbit	64 Gbit / 128 Gbit	64 Gbit / 128 Gbit
Binary Patterns on Board	87381 / 174762	31068 / 62137	27962 / 55924	31068 / 62137	16777 / 33554	55924 / 111848
Hardware Trigger	master / slave	master / slave	master / slave	master / slave	master / slave	master / slave
Controller Suite	ALP-4.3	ALP-4.3	ALP-4.3	ALP-4.3	ALP-4.3	ALP-4.3
Max. Switching Rate 1bit B/W	22727 Hz	17857 Hz	16393 Hz	10309 Hz	12987 Hz	10752 Hz
Max. Switching Rate 6bit Gray	1091 Hz	987 Hz	930 Hz	871 Hz	1013 Hz	856 Hz
Max. Switching Rate 8bit Gray	290 Hz	266 Hz	261 Hz	266 Hz	303 Hz	258 Hz
Max. Switching Rate 12bit Gray	18 Hz	17 Hz	17 Hz	17 Hz	20 Hz	17 Hz
PC Interface	USB 3.0	USB 3.0	USB 3.0	USB 3.0	USB 3.0	USB 3.0
PC Transfer Rate	> 4000* fps	> 1600* fps	> 1500* fps	> 1600* fps	> 1100* fps	> 3000* fps

\*Typical value, can vary depending upon data compression ratio and PC.

Contact: [djp@vialux.de](mailto:djp@vialux.de)

VIALUX GmbH  
Am Erlenwald 10  
09128 Chemnitz  
Germany

phone: +49 (0) 371 33 42 47 0  
fax: +49 (0) 371 33 42 47 10  
web: [www.vialux.de](http://www.vialux.de)

Rev-Nr.: P-2014-07