SuperSpeed V-Modules

High-Performance subsystem for Texas Instruments DLP® technology



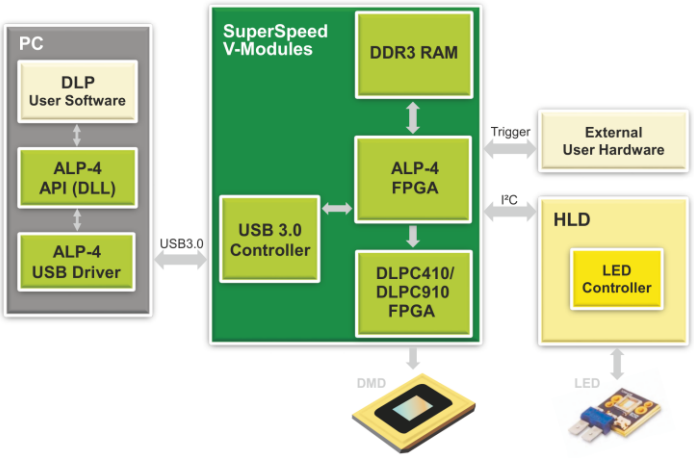
The DLP® **D**igital **L**ight **P**rocessing of Texas Instruments represents a proven technology of MEMS spatial light modulators also beyond standard front projection and DLP Cinema®. The general purpose DLP Discovery™4100 platform is different from the DLP standard projector hardware; it provides 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 Discovery™4100 chipset.

The usable spectral range covers all wavelengths from 350 nm UVA to 2500 nm NIR. The Type A DMD package has efficient cooling options enabling up to 60 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. 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.



Five V-Modules are available and two windows of the micromirror can be selected for use with visible or ultra-violet light.

V-7001 with 0.7“ XGA DMD for visible or ultra-violet light (DLP7000)

V-6501 with 0.65” 1080p DMD for visible light only (DLP6500)

V-9501 with 0.95“ 1080p DMD for visible or ultra-violet light (DLP9500)

V-9601 with 0.96“ WUXGA DMD for visible light only (DLP9600)

V-9001 with 0.9” WQXGA DMD for visible light only (DLP9000X)

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.

V-Module Specifications

	V-7001	V-9501	V-9601	V-6501	V-9001
					
Chipset	DLP7000 & DLPC410	DLP9500 & DLPC410	DLP9600 & DLPC410	DLP6500 & DLPC910	DLP9000X & DLPC910
Type A DMD	0.7 XGA	0.95 1080p	0.96 WUXGA	0.65 1080p	0.9 WQXGA
Window Options	VIS, UV	VIS, UV	VIS	VIS	VIS
Micromirror Array	1024 x 768	1920 x 1080	1920 x 1200	1920 x 1080	2560 x 1600
Micromirror Pitch	13.7 µm	10.8 µm	10.8 µm	7.6 µm	7.6 µm
Active Mirror Array Area	14.0 x 10.5 mm²	20.7 x 11.7 mm²	20.7 x 13.0 mm²	14.5 x 8.2 mm²	19.4 x 12.1 mm²
Controller Board Type	V4395	V4395	V4395	V4390	V4390
Control Board Dimensions	162 x 99 mm²	162 x 99 mm²	162 x 99 mm²	162 x 99 mm²	162 x 99 mm²
DMD Board Dimensions	67 x 50 mm²	102 x 83 mm²	102 x 83 mm²	101 x 78 mm²	95 x 88 mm²
Flexible Cable Length	127/305 mm	127/305 mm	127/305 mm	127/305 mm	127/305 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
Binary Patterns on Board	87 381 / 174 762	31 068 / 62 137	27 962 / 55 924	31 068 / 62 137	16 777 / 33 554
Hardware Trigger	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
Max. Switching Rate 1bit B/W	22 727 Hz	17 857 Hz	16 393 Hz	10 309 Hz	12 987 Hz
Max. Switching Rate 6bit Gray	1091 Hz	987 Hz	930 Hz	871 Hz	1013 Hz
Max. Switching Rate 8bit Gray	290 Hz	266 Hz	261 Hz	266 Hz	303 Hz
Max.Switching Rate 12bit Gray	18 Hz	17 Hz	17 Hz	17 Hz	20 Hz
PC Interface	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

*typical value, can vary depending upon data compression ratio and PC

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