

# DM005200

## MARADIN 2D MEMS PROJECTION EVALUATION KIT

The DM005200 is the industry's first evaluation kit supporting the all-digital MAR2200 MEMS controller integrated with the MAR1110 MEMS Mirror and the MAR3200 video controller.



The MAR2200 revolutionizes MEMS control based on dynamic MEMS models, utilizing more accurate and flexible control schemes than current state of the art controllers, resulting in improved MEMS performance. Additionally, the MAR2200 all-digital controller produces unprecedented

operational stability despite temperature changes and MEMS manufacturing tolerances. An example of its flexibility is the support of on-the-fly resolution, field of view adjustments, and easy customization for different MEMS mirrors.

The DM005200 is provisioned with a newly modified version of the MAR3200 Video controller. These new video board modifications include dramatically reducing the laser power of conventional control systems by as much as 70% for smart glasses. The video board also allows dynamic foveated rendering of pixel distribution, enabling cooler and longer battery life smart glasses designs.

### THE KIT INCLUDES:

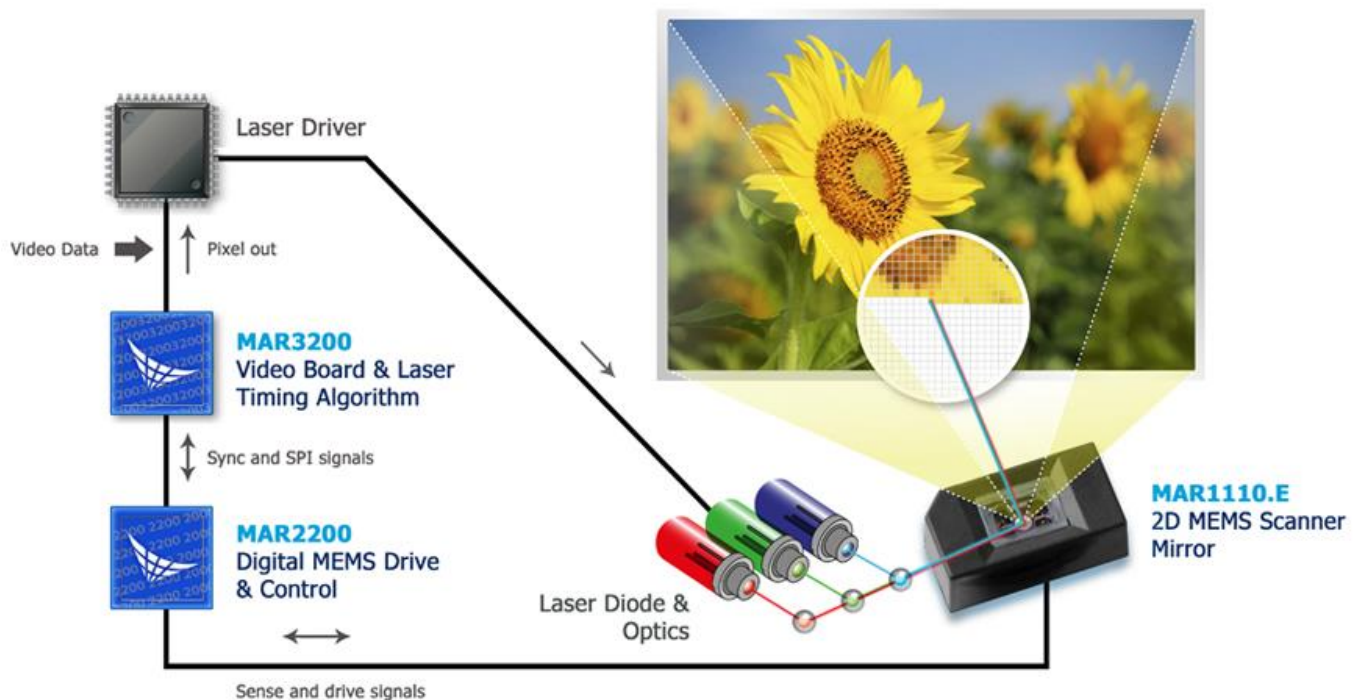
- MAR1110.E MEMS Scanner
- MAR2200 digital MEMS Controller
- MAR3200 Video Controller
- API For direct system control
- Windows demo control application

\* Upon special request, Maradin can provide laser and optics components.

## FEATURES

- Plug and play EVK
- Advanced MEMS digital controller based on dynamic MEMS model
- Operated using API and a control software
- Different image sources (pattern generator, image stored on memory, and HDMI video streaming)
- Real-time synchronization between MEMS and laser modulation compensating for temperature changes
- Pixels adaptive timing for foveated view and laser color adjustments up to 6 laser diodes
- Laser color and intensity control with a high-resolution dimming capability (1:4000)
- Laser power saving mode – up to 70% laser power saving over conventional power control solutions
- Based on MAR5200 reference design, shortening OEM time to market

## SYSTEM BLOCK DIAGRAM



## SYSTEM CHARACTERISTICS

#	Parameter	Min	Typical Value	Max	Unit	Remarks
<b>General</b>	Scan Type		Raster			
	Frame Rate	10	60	200	Hz	
	Video input		HDMI			
<b>Image</b>	Resolution (H)	1	1280	1920	Pixel	Horizontal
	Resolution (V)	240	480	940	Pixel	Vertical
	Optical Angle (H)		45	45	Deg.	HFOV – Image size
	Optical Angle (V)		17	30	Deg.	VHOV – Image size
	Throw Ratio		1.2	1		Distance/Diagonal FOV
	Position error		150		mRad	Both vertical and Horizontal
<b>MEMS Scanning module</b>	Resonant frequency (H)	10,250	10,500	10,750	Hz	
	Resonant frequency (V)	1500	1700	1900	Hz	
	MEMS Scanning Module dimensions		10x5.5x5		mm	Length x Width x Height
	Effective mirror size (H)		1		mm	
	Effective mirror size (V)		1.1		mm	Y Vertical direction Y for torsion bar
	Package		Plastic, Non-Hermetic			Optional: Ceramic, Hermetic
<b>Optical</b>	Mirror reflectance		90	98	%	The coating material is according to the Laser wavelength
	Overall reflectance	84		94	%	Mirror and Optical window
	Wavelength range for reflection	400	400-700	1550	nm	
	Laser max power			1000	mW	

## ELECTRICAL INTERFACE

#	Interface	Description
<b>System Power Supply</b>	12V/2A (Main Supply); 5.5x2.1mm Power jack	System Power Supply
<b>Video</b>	mini HDMI Interface (HDMI type C)	Video
<b>Projection System Parameters Control (Using GUI interface)</b>	Computer to EVK connection using USB to mini USB cable	Projection System Parameters Control (Using GUI interface)
<b>General Propose connector</b>	Synchronization and Projection control signals output for external use	General Propose connector
<b>Optical Module</b>	Drive Up to 6 different laser diodes. The lower number of lasers can be driven with a high current.	Optical Module
<b>Warping and Tiled display</b>	Dedicated USB cable to control image warping correction and up to 2 tiled images	Warping and Image Tiling

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