Application Brief
TI DLP® Pico™ Technology 3D Scanning Improvements

TEXAS INSTRUMENTS

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New 3D Scanning Features

TI DLP® technology offers a wide portfolio of high speed chips for 3D scanning applications, including intra-oral scanning, automated optical inspection (AOI) and solder paste inspection (SPI). All of these scanning applications require programmable structured light patterns. New features were introduced in the 9.x.x version of the controller firmware that adds multi-bit monochrome internal pattern display support and allows the choice to start the pattern set at a non-zero start entry index.

Figure 1. DLP® 3D Scanning Product

DLP® Pico Chipsets With New Scanning Features (Version 9.x.x)

DMD	Controller	Resolution
DLP2010LC	DLPC3470	854x 480 (WVGA)
DLP3010LC	DLPC3478	1280x 720 (720p)

Multi-bit Monochrome Pattern

Internal pattern streaming mode displays 1D pattern data stored in flash. The new firmware enables 4, 5, and 6-bit depth monochrome pattern projection in internal pattern streaming mode. This pattern creates two advantages:

1. Enables multi-bit pattern displays with higher pattern rates.
2. Allows storing higher number of patterns within a pattern set.

Number of Patterns Per Pattern Set (DLPC3478)

	Vertical	Horizontal
1-bit	51	64
4-bit	12	16
5-bit	10	12
6-bit	8	10
8-bit	6	8

Minimum Exposure Time and Dark Time Requirements

	Pre-exposure time	Exposure time	Post-exposure time
1-bit	171	200	31
4-bit	171	585	31
5-bit	171	693	31
6-bit	171	887	31
8-bit	171	3464	31

Non-Zero Start Entry Index

User can now configure the start of pattern set with a non-zero index. This feature helps in displaying the same pattern set content with different colors without having the overhead of fetching the pattern data from memory.

Figure 2. Dental 3D Scanner

Additional Information

- Download the DLP® Pico Firmware Selector
- Start development with the DLP3010EVM-LC
- Learn more about TI DLP® 3D scanning

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