Technical Article

Create up to 70-Inch 1080p “Screenless Displays” from Compact Devices Utilizing TI DLP® Pico™ Projection Technology

“Screenless display”, projection from a small device to create a large image, is one of the newest frontiers in the area of pico projection imaging technology. Its potential spans across industries where traditional displays are used, eliminating the need for heavy, expensive display hardware and adds greater flexibility through the ability to turn virtually any surface into a custom, high resolution viewing surface.

What Is a Screenless Display?

Screenless displays are actually a combination of three different technologies. DLP Pico™ technology, wireless connectivity and any mobile operating system are the key components that make up the system architecture. Combining these three technologies allows users to display content on virtually any surface from a small, portable wireless device. For example, the display surface can be a wall or table in an office or a home, the side of a camping tent, or even a garage door.

Screenless Display Advantages over Traditional Displays

Imagine the benefits of having the power to project at all times, on virtually any surface and up to 70-inches in diagonal. This is ideal for enterprise users as well as consumers who travel frequently or live in small homes. For those of us who would rather not have a TV mounted on a wall, a screenless display can be an inconspicuous wireless device that blends in to the décor while creating a large, Full-HD display on a wall or a ceiling as required.

Why Choose DLP Pico Technology for Screenless Display?

DLP Pico technology offers several key advantages that make it a great fit for screenless display applications:

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- *High optical efficiency* – Works with any light source and offers very high optical efficiency, resulting in a high brightness display with low power consumption.
- *Wide range display resolution* – A wide range of available display chipsets ranging from small resolution nHD (640x360), WVGA (854x480) to HD resolution WXGA (1280x800), HD (1280x720) and full HD (1920x1080) resolutions.
- *High contrast* – Depending on the optical design, DLP Pico technology can enable a high contrast ratio, creating deep blacks and improve perceived brightness.
- *High speed* – Each digital micromirror device consists of hundreds of thousands of highly reflective, digitally switchable mirrors. These mirrors can flip thousands of times per second for fast color refresh rates and high frame rates.
- *Advanced image processing algorithms* – The DLP IntelliBright™ suite of algorithms provides two key functions: *content adaptive illumination control*, which is the ability to dynamically adjust each RGB LED to optimize power based on frame-by-frame content, and *local area brightness boost* which can intelligently boost darker regions of images depending on ambient lighting conditions. For more information on these algorithms, see the TI DLP IntelliBright algorithms application note.

System and Electronics Considerations for Screenless Display Applications Using DLP Technology

A typical screenless display system is comprised of two subsystems; a front end subsystem that provides functionality such as WiFi and HDMI, and a DLP Pico projection subsystem that consists of the DLP Pico optical module and DLP Pico electronics. The DLP Pico optical module is the core display component of the system and can vary in size depending on the application and requirements. In general, the higher the brightness the larger the size of the optical module.

How to Get Started

To enable faster time to market, many DLP Pico optical modules of various designs, sizes, and capabilities are readily available from a number of optical design manufacturers (ODMs) who are part of the DLP Pico ecosystem. For more information on the ecosystem and ODM contacts, please visit the DLP Pico Solutions and Services web page.

To learn why DLP Pico technology is a great fit for screenless display applications, download the DLP Pico Technology for Screenless Display whitepaper and the Getting Started with DLP Pico Technology whitepaper.

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