

Open Standard Simplifies Digital Signage Development and Deployment

Intel creates specification that increases compatibility and interoperability



NEC

*Driving Standardization
In Digital Signage*

The Open Pluggable Specification

Intel developed the Open Pluggable Specification (OPS) to simplify the device installation, usage, maintenance and upgrade of digital signage infrastructure. This open standard comprises electrical, mechanical and thermal specifications for media player boards and display boards connected together via a 80-pin JAE connector that supports commonly used interfaces such as DisplayPort* and USB, among others. The overall objective is to enable digital signage manufacturers to deploy interchangeable systems faster and in higher volumes, while lowering the costs for deployment and implementation.

Simplifying Development, Installation and Administration

Today, the rapidly growing digital signage market is highly fragmented, which is limiting the compatibility and interoperability between current and evolving components, such as media player and displays (i.e., LCD, plasma and other types). OPS was created to overcome these issues and save system manufacturers the development and implementation cost of driving such a standard on their own.

The OPS specification benefits both digital signage system manufacturers and users. When manufacturers employ the OPS specification, their products will be compatible with more systems - installed and future - which opens up new sales opportunities. Users can upgrade their infrastructure more easily because components will be interchangeable by design (Figure 1). Additionally, installing digital signage equipment based on Intel® architecture helps users implement scalable applications that can network easily with other equipment. This approach further safeguards interoperability and simplifies application upgrades in a way that allows users to future-proof their technology investments.



Figure 1. Pluggable Module is Interchangeable by Design

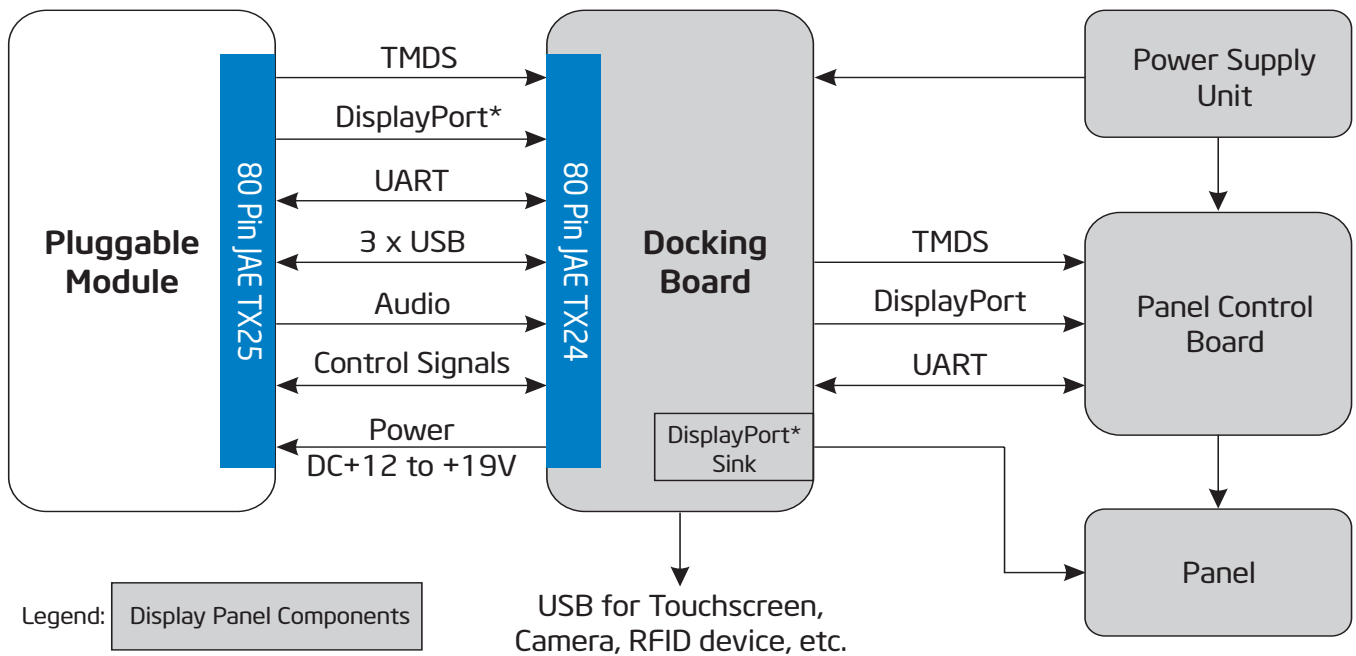


Figure 2. OPS Standard Components: Pluggable Module and Docking Board

OPS Standard Components

OPS defines standards for a pluggable computing module used in media players and a docking board in display panels, as well as the connector and signals that link them. The docking board interfaces to the control board, which drives the display panel. The three board implementation, as illustrated in Figure 2, comprises the following boards:

- Pluggable Module: A computing board with an 80-pin JAE connector in the media player
- Docking Board: An interface board that passes relevant signals from the pluggable board to the control board
- Control Board: The board that drives the digital signal display

OPS specifies the physical shape and internal design of the pluggable module and the docking board. The pluggable module is compact, measuring 180 x 30 x 119 mm (width, height, depth), as shown in Figure 3. The connectors include a JAE TX25 plug for the module and a JAE TX24 receptacle for the docking board. The connectors support 500 insertion/removal cycles, allowing the module to be plugged in and out repeatedly without impacting reliability. Manufacturers can also consolidate the docking and control boards into one board.

The connectors have a total of 80 pins, supporting power and signal lines. Power lines drive 12 - 19 volts from the pluggable module to the docking board; Transition Minimized Differential Signaling (TMDS) signals and DisplayPort lines carry display signals; audio lines transmit audio signals to the docking board (2 channel stereo); USB lines support the user interface, sensors and other connections; UART lines provide serial data communications; and OPS lines handle OPS control information. The connector also has nine unused pins that are available to support future requirements.

Digital signage systems using OPS Pluggable Modules have several advantages over proprietary and built-in solutions:

- Development and implementation cost can be spread over higher volumes, thus reducing cost per unit
- Fewer cables, smaller space requirements and no additional hardware brackets
- Lower power consumption
- Easier installation

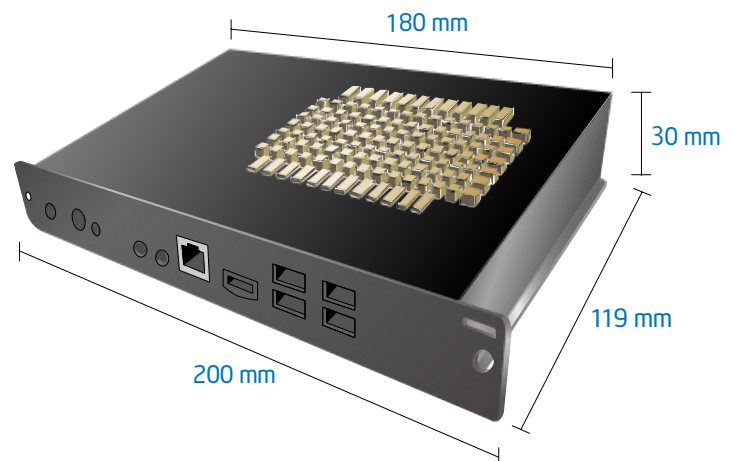


Figure 3. Pluggable Module

Benefits of Modularity

OPS-compliant systems are modular in nature, which provides significant operational benefits. For instance, a media player with a hardware fault can be repaired quickly by simply replacing the entire pluggable module. This is a significant advantage over built-in solutions, which require the replacement of the entire display unit in case of a PC failure. Some displays, like the NEC* P-Series, allow for access to the OPS slot without dismounting the display, enabling service to be done by a single person.

Modularity also provides more lifecycle management flexibility compared to built-in solutions because upgrades can be performed at a subsystem level. As a result, it is possible to exchange out short lifecycle components, like the control unit, to incorporate the latest technology, while leaving in long lifecycle components, such as the display panel, user interface and sensors. Likewise, OPS-defined pluggable modules can be easily upgraded when newer technology is available, thus keeping a digital signal system up-to-date in a cost-effective manner.

Getting Maximum Value from OPS

Digital signage is pushing the envelope of computing technology, particularly with the emergence of sophisticated applications, such as anonymous facial recognition and audience response measurement. Defined with these applications in mind, OPS supports today's high performance Intel® Core™ i7 processors and Intel® Core™ i5 processors, and paves the way for future pluggable modules based on next-generation Intel® processors.

Another option is to employ the Intel® Atom™ processor, which delivers exceptional processing performance, while minimizing power consumption and heat generation.

Lowering the total cost of ownership for digital signage, Intel® Active Management Technology (Intel® AMT)¹ takes remote management to a new level. It enables IT management consoles to fix a wider range of systems issues over the wire, even when the operating system is down, thereby reducing the number of expensive onsite repair visits. For example, it is possible to repair corrupted drivers, application software or the operating system for a non-responsive signage system that won't run or boot. Intel AMT can also be used to automatically power systems on/off during off hours, resulting in sizeable utility savings.

NEC's* Next-Generation Signage Solution To Employ OPS

In November 2010, Intel Corporation, NEC Corporation and Microsoft* Corporation jointly announced their intention to collaborate on the digital signage market in Japan and globally. This includes leveraging OPS, which is not only applicable to digital signage, but to any application that runs on a PC-based platform (Figure 4). NEC intends to roll out a new generation of signage solutions that take maximum advantage of its software technologies and advanced know-how in the field of signage. These solutions will incorporate OPS-compliant control modules based on Intel Core i5 processors running the Microsoft Windows* Embedded Standard 7 operating system.

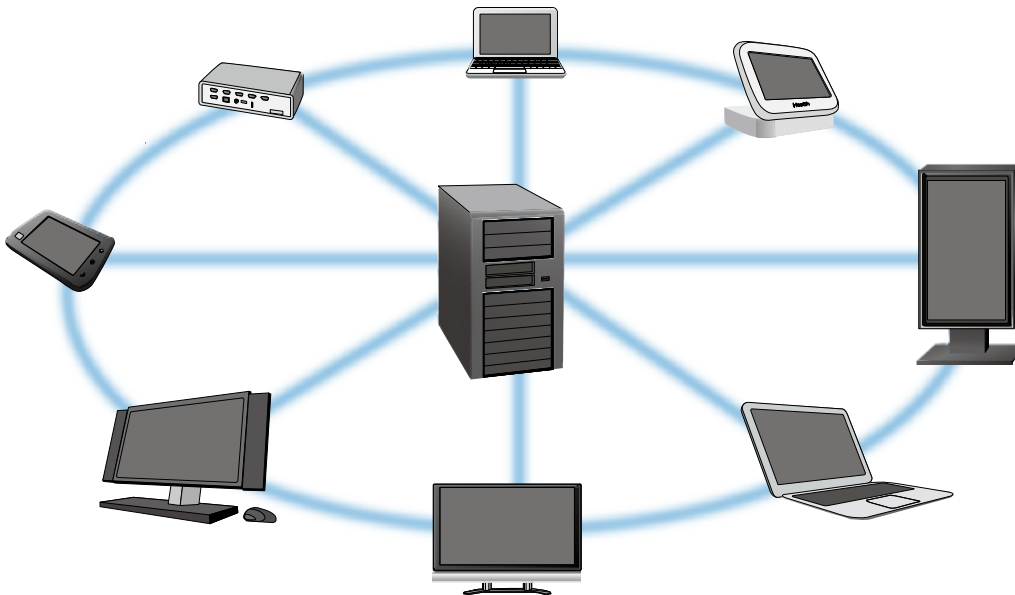


Figure 4. OPS is Applicable to a Wide Range of Applications

Access OPS and Design Guides From Intel Website

Intel maintains the Intel® Embedded Design Center (Intel® EDC) web site, Figure 5, to assist hardware and software engineers developing products using Intel architecture. Developers can download the Open Pluggable Specification, as well as detailed design guides for pluggable modules and docking boards, at <http://edc.intel.com/Applications/Digital-Signage-Solutions/OPS>.

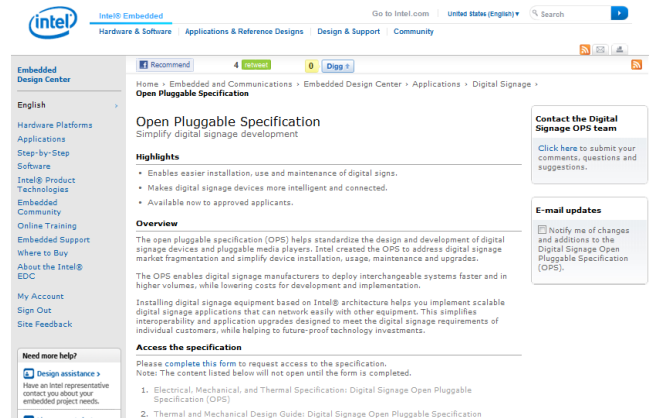


Figure 5. Open Pluggable Specification Website

For more information about NEC signage solutions, please visit www.nec-displays.com

For more information about Intel digital signage solutions, please visit www.intel.com/go/digitalsignage

¹ Intel® Active Management Technology (Intel® AMT) requires the computer system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see www.intel.com/technology/platform-technology/intel-amt/.

