ADLINK
® Leading EDGE COMPUTING

Selecting the Right Industrial-Grade Panel PC for Your Embedded Application

ADLINK offers a wide variety of panel PCs, providing a choice of displays, computing power, mounting systems, and chassis ingress protection (IP).

Why Choose a Panel PC

Considerably different than box PCs (Figure 1), panel PCs are all-in-one computers that satisfy many special embedded application requirements, such as:

- Cleanliness: Food processing plants and healthcare
- Space savings: Factory automation and in-vehicle
- Easy installation: Schools and public agencies
- Ease-of-use: Transportation kiosks
- Waterproof connectors: Locomotive computers

Box PC   **Panel PC**

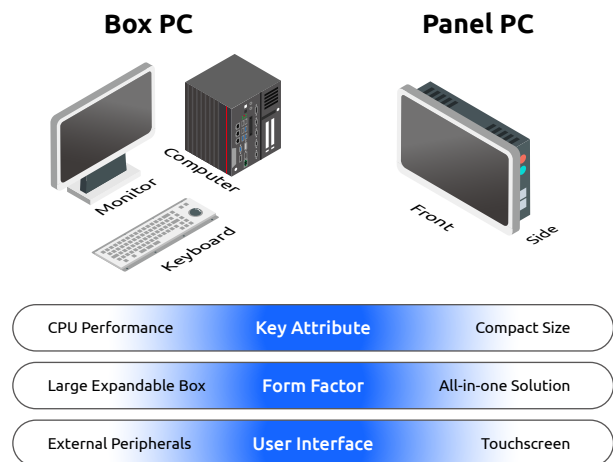|	Key Attribute	
CPU Performance		Compact Size
Large Expandable Box	Form Factor	All-in-one Solution
External Peripherals	User Interface	Touchscreen

Figure 1. A Comparison of Box and Panel PCs

Panel PC Selection Criteria

OEMs, ODMs, and systems integrators may have the opportunity to customize panel PCs, as shown in Figure 2. There are typically various display sizes and features from which to choose, including different touch screen technologies. Solution developers can also pick from a mix of PC platforms that offer different levels of performance, heat dissipation, and I/O expansion. There may be mounting system options, as well as a possibility to store the power supply unit (PSU) inside the chassis. Furthermore, vendors may support several ingress protection ratings (IP) associated with degrees of protection against particulates and liquids.
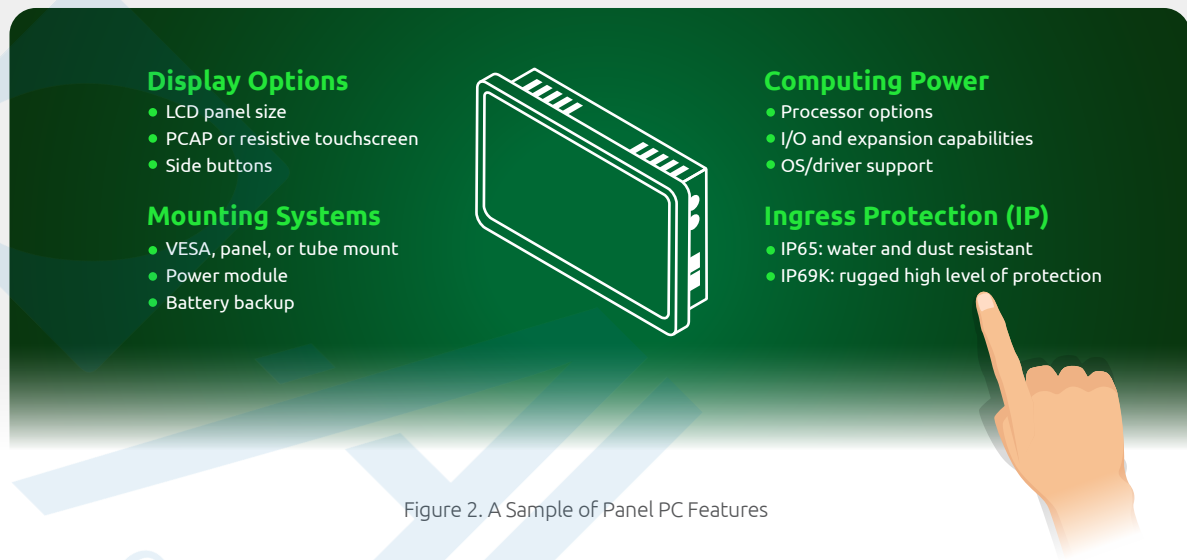

Figure 2. A Sample of Panel PC Features

Display Options

In addition to selecting an appropriate LCD panel (i.e., size, resolution, luminance, and viewing angle), solution developers must decide which touchscreen technology is best suited for their embedded application, and whether side buttons are desired.

A touchscreen with a resistive touch sensor is often used when users need to wear gloves or when the environmental conditions (e.g., moisture, dirt, oil) are less than ideal.

Projected capacitive (PCAP) touchscreens deliver accurate image viewing and have a conductive grid whose electromagnetic field changes when touched by the user.

Both types of displays may employ optical bonding to prevent condensation, reduce glare, and increase the durability.

Computing Power

The computing power and I/O requirements of embedded applications served by panel PCs varies widely. For example, a retail kiosk assisting customers typically has negligible computing needs, whereas a panel PC controlling industrial equipment and running artificial intelligence (AI) algorithms demands high performance, real-time computing.

Likewise, there are different I/O interface requirements, like USB, HDMI, PCI Express, SATA, and RS-232/422/485, just to name a few. When a type of interface is not supported by the motherboard, some panel PC designs allow these interfaces to be supplied via an add-on module.

Ingress Protection (IP) Ratings

International standards, such as IP65 and IP69K, define levels of enclosure sealing effectiveness. IP65 compliance requires a vacuumed-sealed enclosure that protects against dust (and other foreign bodies) and water projected from a nozzle. Compared to IP65, IP69K requires much more rigorous water and chemical spray testing: longer duration, more angles, higher temperature, and higher pressure.

Mounting Systems

Video Electronics Standards Association (VESA) is a standard for mounting displays to a stand, wall, or pipe. This low-cost method is good for an OEM or ODM that is delivering a complete out-of-box solution.

With panel or wall mount system, the Panel PC is installed into a cutout in the front of an enclosure, such as a kiosk or a machine chassis.

A pipe mounting system protects and organizes the cables running to a panel PC. This option allows systems integrators to run cables from various subsystems in a visually appealing way.

ADLINK Panel PC Offerings

ADLINK offers three panel PC product families (Table 1) designed especially for embedded and industrial applications. Solution developers can choose from five PC platforms that support two to three high-definition (4K) display interfaces. Resistive and PCAP touchscreens are also available.

- **ADLINK Smart Panel Series** offers maximum performance and flexibility through an open architecture that allows solution developers to quickly customize their panel PC.
- **ADLINK Smart Touch Computer (STC) Series** delivers complete, quick-time-to-market panel PCs, including an IP65-compliant front bezel.
- **ADLINK Titan Series** is a family of ruggedized panel PCs, featuring an IP69K-compliant chassis, M12 waterproof cables, 316L (V4A) stainless steel materials, and a 50K hours mean time before failures (MTBF).

ADLINK PANEL PC Series			
	Smart Panel	**Smart Touch Computer**	**Titan**
Key Benefit	• Maximum flexibility	• Quick-time-to-market	• Fully ruggedized
Display Sizes	• 7/10.1/12.1/15.6/18.5/21.5	• 10.1/12.1/15.6/18.5/21.5	• 15.6/21.5/23.8
Computing Power	• Intel Atom and Intel Core processors • I/O and storage expansion options via function modules	• Intel Atom and Intel Core processors • mPCIe slot and PCIe x4 expansion slot	• Intel Atom processors • mPCIe slot and small function modules
Mounting Systems	• Chassis dependent	• VESA mount kit • Panel mount kit	• VESA mount kit • Pipe mount kit
Ingress Protection	• IP65 front bezel	• IP65 front bezel • IP20 back chassis	• IP69K/IP65 full system • Corrosion resistance: stainless steel housing
Chassis	• Not included	• Included	• Included
Power Supply	• 100V-220V PSU	• 100V-220V PSU	• 100V-240V PSU in chassis
Function Modules	Railway Application Full Function	Kiosk/HMI	Medical Titan Compatible

Table 1. Three ADLINK Panel PC Families

Time and Cost Savings

The ADLINK Smart Panel Series is a family of feature-rich, standard products that satisfy the requirements of most embedded applications, thus reducing development time and cost for OEMs, ODMs, and systems integrators.

Function Modules

ADLINK function modules support feature expansion, such as adding waterproof connectors, lockable HMI or USB ports, application integrated circuits (e.g., FPGAs), GPUs for AI, or storage (e.g., mSATA or microSD slots), among other possibilities.

Since function modules typically eliminate the need for customization services, they can reduce their time-to-market and development cost. Development time savings can be as high as seven months (a decrease from 12 to 5 months). Inventory cost savings can be by as much as 70% because ADLINK function modules are standard products that can be ordered without a minimum order quantity (MOQ).

Chassis

The chassis for the ADLINK Smart Touch Computer (STC) Series is designed for high durability, with an aluminum-alloy front panel and a back housing formed from SECC steel (steel electro-galvanized, commercial, and cold-rolled coils). The ADLINK Titan Series is built with a 316L (V4A) stainless steel housing to resist corrosion.

To learn more about ADLINK's panel PCs, please visit the ADLINK website at https://www.adlinktech.com/en/Panel_PCs_Monitors.