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What Do You Need from an Industrial PC?

Industrial PC computing systems are powering commerce and manufacturing around the world. These networks form the central nervous system of the industrial environment, giving teams the capabilities they need to get the job done and keep the global supply chain moving.

In our latest article, we take a closer look at what defines these industrial PC systems and how you can make sure you select the best components for the task at hand.

What Is an Industrial PC?

An industrial PC, is a computing system that is designed to run reliably in a harsh environment. As factory floors and warehouse environments have grown smarter in recent years — and for some time before the smart technology revolution — teams depend on computer systems and interfaces. An industrial PC provides the capabilities they need.

According to this definition, an industrial PC may simply be a reinforced version of a standard PC. In other words, it may feature toughened glass in its display, protective coverings on inputs and outputs, and user access components designed with the environment in mind.

However, not all PCs will be like this. At Avalue, we recognize how diverse and wide-ranging these machines really are. This is why many of our components and hardware pieces are designed with more specific functions in mind. For example, embedded computer components that offer a streamlined and cost-effective way for businesses to achieve key operational aims.

How to Choose an Industrial PC — What to Look For

So how do you select the right industrial PC for your needs? Here are some key features to look for and consider:

Suitability in Extreme Environments

Not all industrial PCs will be deployed on busy factory floors or in dusty warehouses. Often, they will be found in more extreme environments.

This is something to consider when you choose your computing system components. In our range, the EPM-1722 power module, for example, is intended to handle harsh oceanic and marine environments. Meanwhile, the EPM-1721 power module is built for use within the specific conditions of rail yards and other logistical spaces.

As technological capabilities improve, operability in extreme conditions is becoming increasingly important for facility managers. The ECM-ASL 3.5" SBC is a good example of the potential offered by the latest hardware releases, remaining functional between - 40°C to 85°C, depending on CPU configuration.

Status Monitoring

Businesses always need to remain aware of computing system performance. If a system is running below capacity, there might be a problem that could end up costing you money. If the system is running beyond capacity, you run the risk of expensive damage and replacement. In an industrial environment, however, this need is even more acute.

The harsh conditions found in different industrial applications can exacerbate problems with hardware. Catching these problems early is key to saving money and achieving operational efficiency. The ATX BC680R embedded computer motherboard, for instance, supports CPU temperature monitoring and fan speed control, as well as voltage monitoring, offering insight and peace of mind when the component is deployed.

Display and Interface Inputs and Outputs

While a laptop is a fairly self-contained unit, with a display monitor, keyboard, and trackpad all built into it, a desktop PC requires a system of connections to provide full functionality. A keyboard and mouse, as well as a monitor and other accessories, will need to be plugged into the unit.

An industrial PC could be similar to a laptop, more like a desktop, or somewhere in between.

- An embedded computer will be installed directly within the system it powers. Often, this will be a single-board computer in which all the required components are installed together on just one circuit board.

One application of this could be the control and monitoring system for a manufacturing production line. This production line may feature a unit with control mechanisms and monitoring sensors, and the CPU and other components are embedded into this system. This embedded system may only need to be compatible with the hardware it is housed within. As such, you might not need additional display and interface inputs and outputs or connectivity with external storage.

- Other industrial PC devices may require more flexibility. You may need to connect the computer to other systems via USB ports or link the components to external hard drives for data access and storage.

Consider your specific needs as you select the right industrial PC for your specific application. The MX610HD product, for example, supports HDMI, low-voltage differential signaling (LVDS), and USB 3.2 and USB 2.0 connections. On the other hand, the MX610H offers all of this plus two Dual-Mode DisplayPort (DP++) connections.

Computing Power

In an industrial environment, there is always a balance to be struck. You will need enough computing power to handle the specific operational requirements of the system, but you also want to keep energy and resource costs low.

For embedded computers, there may be a very specific set of tasks the system needs to complete. This makes it relatively easy to gauge how much CPU power is needed. For more general-use PCs, the tasks may be more flexible, making it more difficult to select the right level of processing power.

We stock a variety of components across many different performance levels. Within our 3.5" single board computer range, you will find the ECM-TGUC, with 11th Gen. Intel® Core™ SoC i5/i3 BGA Processor and Intel® Core™ i3-1115G4 or Intel® Core™ i5-1135G7 integrated into the system.

In this same range, you'll also find the ECM-CFS. This features non-integrated Intel® LGA1151 Socket supports and Intel® Core™ i7-8700T, i5-8500T, i3-8100T, i7-9700TE, i5-9500TE, and i3-9100TE processor options. Intel® Pentium® Gold G5400T and Intel® Celeron® G4900T options are also available.

Improved computing power does not need to reduce operational efficiency. The EAX-R680FP ATX Motherboard, among other examples, is designed to achieve optimal output without overloading the power supply.

Get the Support You Need in Selecting Your Industrial PC Components

As you can see, the Avalue range is diverse, with a number of different components suitable for specialized or more general applications. This is particularly true with regard to processing power options, as we make a variety of CPUs available to our customers.

Related Products

Avalue EPM-1722

DC to DC 60W Marine Power Module

Avalue EPM-1721

DC to DC 60W Railway Power Module

Avalue ECM-ASL

Intel® Processor N97, Intel® Core™ i3-N305 Processor & Intel Atom® x7000RE series 3.5"Micro Module

Avalue BC680R

12th/13th/14th Gen. Intel® Core™ i9/i7/i5/i3 Processors, LGA 1700 Socket, ATX Motherboard With Intel® R680E
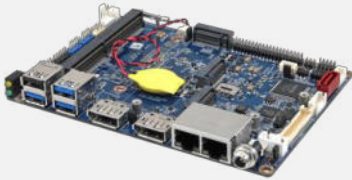

Avalue MX610HD

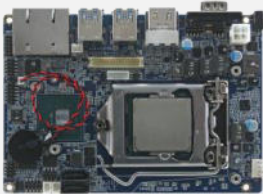12/13/14th Gen. Intel® Core™ i9/i7/i5/i3 Processors, Thin Mini ITX Motherboard With Intel® H610E Chipset

Avalue MX610H

12/13/14th Gen. Intel® Core™ i9/i7/i5/i3 Processors, Mini ITX Motherboard With Intel® H610E Chipset

Avalue ECM-TGUC

11th Gen Intel® Core™ SoC i5/i3 BGA Processor 3.5" Micro Module

Avalue ECM-CFS

Intel® 8th/9th Gen Core™ i7/i5/i3/Pentium®/Celeron® Processor 3.5 Micro Module With Intel® H310/Q370 Chipset

Avalue EAX-R680FP

12/13/14th Gen Intel® Core™ i9/i7/i5/i3 Processors, supports LGA1700 CPU Up to 125W Max