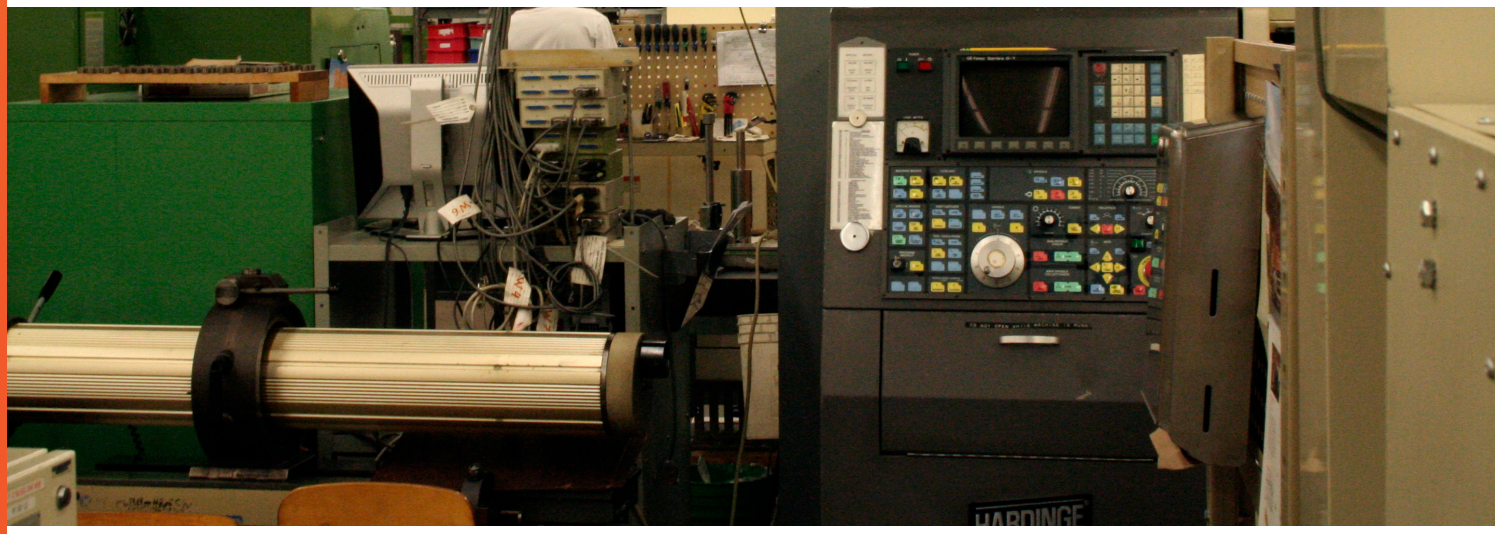
6 QUESTIONS TO ASK WHEN CHOOSING AN INDUSTRIAL AUTOMATION COMPUTER



LOGIC SUPPLY

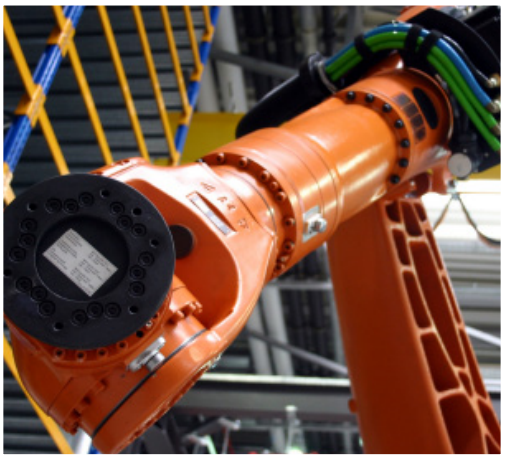
6 QUESTIONS TO ASK: INDUSTRIAL AUTOMATION COMPUTER

Given the growing need to cut costs, more and more control engineers are choosing to “Go Rogue.” They are tired of adjusting their needs to the product lines available from major manufacturers, paying for more than they need and not getting what they want.

Industrial control engineers are seeking out automation computers that are designed to meet their needs, Independent manufacturers that can create solutions for their environments, processes, and locations. Below are 6 questions they are asking, and you will need to as well if you want to assess whether independent PC selection makes sense, configure a unit that will meet your needs, and in the end “Go Rogue” as well.

GO ROGUE

1 Will the PC support your software and connected devices?

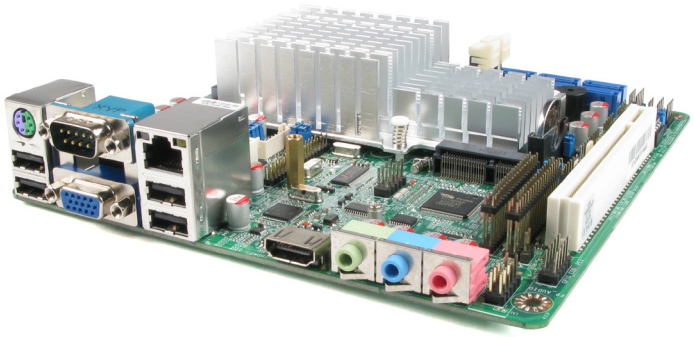


First and foremost, you need to know if there is support for your line of business software and key devices. Your software application and devices were designed to run on a platform, likely Windows or a Linux based Operating System. When moving to a new system, backwards compatibility is a real concern. As Operating Systems change, older programs can have compatibility problems and the drivers your PC uses to interface with other connected machines such as sensors, display panels, and robotic arms may cease to function.

Manufacturers of devices and software providers should have compatibility specifications, but you may need a test unit in house to confirm compatibility. Finding out a $200 display is incompatible is one thing, but a million dollar MRI machine is another matter entirely.

2 Will the PC physically connect to the larger system?

The flip side of the software component is the hardware. After determining that the unit will support the connected devices, you need to make sure that the unit physically connects to the machinery, panels, and peripherals in the larger system. This will require you to determine your Input and Output (I/O) needs, namely the type, specifications and quantity. If you need 4 USB ports, determining if they need to be 2.0 or 3.0 is key. If devices connect via COM, you will need to determine if it’s RS232, RS422 or RS485. 10/100/1000 LAN ports, eSATA, DisplayPort, Firewire, S/PDIF, S-Video, TV-out/RCA, TPM, watchdog timer... The list goes on.



Once you have your I/O requirements sorted, it’s important to not immediately jump to the back panel I/O as a litmus test of a boards usefulness. Smart system configurations can meet I/O needs with onboard header pins and daughtercards to expand the motherboard’s capacities.

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3 What are your performance needs?

Next consider what the performance needs of your new automation computer are. Use your current platform as a point of reference along with any minimum hardware specifications. If there are none, consider how graphically intensive your application is, how many processes you will be running concurrently, and the amount or size of data you process. These will help inform CPU, GPU, and single vs. dual vs. quad core choices. When building a custom system, this is where a great deal of efficiency can be found.

By matching the right hardware to the right job, you avoid the trap of over spec'ing and throwing hardware at the problem. If you need a system for simple order-flow management, a simple, low graphics intensive CPU would more than suffice. If you're running an intensive machine vision application, high performance capacity is essential. However, if you have a light RFID Data Acquisition setup, putting in the most powerful hardware is just a waste of money. Don't pay for something you don't need.

DON'T PAY for something you DON'T NEED

4 What environmental conditions will your unit operate in?

Take an honest census of your environment. Assessing the conditions the system will be exposed to will help determine if any additional precautions will be needed. Copious amounts dust and particulate; sudden shock or constant vibration; extreme heat or cold; specific power requirements (110, 220, AC, DC, etc.); or even small space considerations are the sorts of things to take note of.

These environmental considerations drive case, motherboard, power supply, and storage choices. In a dust-rich location, a ventless chassis is essential; in a high heat environment, wide temperature drives can allow the computer to function in blistering temperatures; and in almost all cases --be it dusty, vibration, temperature, or other-- removing the fan can have tremendous benefits to the reliability and longevity of a system by removing a major point of failure and stopping the intake of particulate.

5 What are your storage requirements?

It's important to determine the needs of your automation process, not just in terms of how much space you need, but also how fast you access that data and what the environmental considerations are. Traditional Hard Drives (HDDs) with their spinning discs are one way to go and have a tremendous cost to size of drive ratio. However, they do not take vibration, power loss or dust well at all due to their discs and are a major point of failure. The other option is Solid State Drives (SSDs), which have no moving parts and are especially effective if environmental conditions are a factor. SSDs don't have motors to burn out, spinning moving parts that can be thrown off by movement and can also offer power loss protection, which protects against any data loss in unexpected power outages. However, they are more expensive.

In short, HDDs hold more data for less money, but are more prone to failure. SSDs are faster, more expensive, and less prone to failure. Also, be sure to consider if you will be using network storage when factoring in the space requirements. This can be a tremendous cost saver. Industrial Thin clients and Zero clients can bypass the need for much of, or all, local storage, but bear in mind the influx of potential networking concerns.

6 What are your business/lifecycle requirements?

When factoring a new computer's final cost, determining how long you will have the PC will weigh heavily. Common PC lifecycles are < 3 years for off-the-shelf, 3-5 years for more industrial solutions, 5+ years for hardened industrial PCs. The knee-jerk reaction is to get the longest run out of your PC, but make sure that it is in line with the rest of your business. If you get new sensors every two years, a 7 year old PC will soon be out of date. By contrast a machine that is being embedded in hardware that you don't want to touch for 8 years needs to be able to stand the test of time.

Summary

These 6 questions are the first step in assuring the Industrial Automation Computer you select is the right one for your environment, processes and location. Step away from trying to to fit your problems into someone else's solutions and ask these tough questions of your team, of your Automation Engineer, and of yourself.

It's time to "Go Rogue."

Contact

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