

Whitepaper

How compact Industrial PCs solve today's automation and control challenges



The C6030 IPC delivers a high level of computing performance in a very compact format that is unprecedented in the industrial marketplace.

Universal, highly scalable PC-based control technology from Beckhoff

Beckhoff has designed and built open automation systems with PC-based control technology since 1980. Today, the company's extensive portfolio of Industrial PCs (IPCs) in a variety of form factors and performance classes – paired with the TwinCAT software system – forms the core of universal automation solutions for any industry. The versatile Beckhoff IPC portfolio is both highly scalable and sufficiently broad to perfectly match all application requirements. The company's most recent generation of ultra-compact IPCs plays a special role here. The C6030 IPC, for instance, which measures just 132 x 132 x 67 mm, takes advantage of the consistent integration of 6th and 7th Generation Intel® Core™ processors. These powerful processors offer clock frequencies of up to 3.9 GHz per core and deliver high-end computing performance in an exceptionally compact format.

The winning combination of high performance and compact design

The C6015 ultra-compact Industrial PC, launched by Beckhoff in late 2016, heralded a new generation of IPCs. It successfully united Beckhoff IPC qualities, such as long-term availability, robustness, flexibility and high performance. This is accomplished in an unusually compact design with a uniquely flexible installation solution and advanced look and feel, all at an attractive price point.

Encouraged by the unprecedented success of the C6015, particularly in IoT and Industrie 4.0 applications, Beckhoff expanded its portfolio of ultra-compact IPCs for control cabinet installation by rolling out the C6030. Continuing the consistent integration of 6th and 7th Generation Intel® Core™ processors, the C6030 carves out a place for itself in highly complex, computationally-intensive applications. Available with a choice of CPUs up to a

quad-core Intel® Core™ i7 processor clocked at 3.6 GHz and a dual-core Intel® Core™ i3 processor running at 3.9 GHz, this IPC has the computing power to handle almost any automation or visualisation challenge. This can include complex axis control operations and sophisticated HMIs, to extremely short cycle times and high-volume data processing in automation. This level of performance in such a compact format is unprecedented in the industrial marketplace.

Industrial-grade quality and unique installation flexibility

The new, ultra-compact motherboard and die-cast zinc and aluminum housing, are both designed and engineered to the usual high standards Beckhoff is known for. Both offer users "Made in Germany" quality in an industry-ready product that pairs reliability with a premium look and feel.

The C6030 is exceptionally flexible to install in a wide range of scenarios, even where space is extremely limited. For instance, it can be attached at its rear or side panel, vertically or horizontally as required, with free orientation of the connector level using a variety of mounting plates. The C6030 has a long-lasting, speed-monitored and controlled fan and is suitable for a temperature range of up to +55 °C, depending on the selected CPU. Equipped with a standard 30 GB M.2 solid state drive with 3D flash memory, the IPC ships ready-to-run. The flash storage media options provide top of the line, industrial-grade quality as well. Options are available to install Windows 7 or Windows 10 operating systems, plus a second M.2 SSD in a RAID configuration. With a choice of eight different CPUs, the C6030 can be custom-tailored to perfectly match the individual performance requirements of a wide range of applications. TwinCAT 3, the latest version of the automation software platform from Beckhoff is specially developed for multi-core processors and can make full use of the dual- and quad-core CPUs in this latest generation of IPCs. The prior software version, TwinCAT 2, which is designed for single-core processors, can run on them as well, however.

What are today's market challenges?

As modularity and Industrie 4.0 move increasingly to the forefront throughout the manufacturing and machine building sectors, IPCs are expected to deliver exceptional yet affordable

computing power with simple installation, even when space is at an absolute premium. This is where the installation options of the C6030 can solve big challenges. Its ultra-compact housing design and the fact that its connector ports are all on one side mean the IPC can be installed with all connectors facing in the direction of one cable feed (generally determined by a machine's layout). This flexibility is achieved in part thanks to a choice of two different mounting frames. The C6030 can be installed on either frame in such a fashion that all data and power connections face towards the incoming cable assembly. In the past, this was often impossible, precluding the use of IPCs in combination with certain machine designs.

Now, the ultra-compact C6030 IPC can be used in an exceptionally wide range of demanding applications, including:

- Complex axis control systems
- Advanced HMIs
- High-volume data processing
- Control for extremely short cycle times
- Communication
- High-performance Ethernet-based control tasks

Why is the C6030 an ideal solution for these applications?

The C6030 is ideal for demanding applications that require peak performance because it delivers high-end computing combined with a rich feature set. These features include:

- An ultra-compact motherboard
- The computing power of 6th and 7th Generation Intel® Core™ processors
- A choice of CPUs either with four cores clocked at up to 3.6 GHz or two cores up to 3.9 GHz
- A long-lasting, speed-monitored and controlled fan with double ball bearings
- A large number of ports even in the base version, ideal for networking, including an onboard Ethernet interface with four 100/1000Base-T ports, four USB 3.0 ports, and two DisplayPort connectors

Measuring just 132 x 132 x 67 mm, the ultra-compact C6030 is almost half the size of the closest comparable control-cabinet IPC from Beckhoff, and costs up to 34 percent less than the similar C69xx series IPCs. It is also highly flexible to deploy and, with

its robust die-cast zinc and aluminum housing, vibration and impact-resistant. Designed to deliver industrial-grade, "Made in Germany" quality, it can operate in ambient temperatures up to +55 °C, depending on the CPU.

What makes the C6030 unique?

Currently, there is no comparable product that can match the C6030 IPC on its combination of size, performance, flexibility and price.

A single, common C6030 housing design shared across all configuration options, with their various CPUs and SSDs, assures users the consistency they need to plan systems reliably. The sophisticated yet robust and reliable design also dispels any reservations about using PCs in industrial environments. These qualities are also backed by the reputation of Beckhoff, built over decades, to assure the long-term availability of the company's products. With identical IPC platforms generally available for significantly longer than five years, and equivalent devices available for more than ten, the company protects its customers' capital investments.

Why Intel®? What role does Intel® play?

Users demand solutions that align to their applications as exactly as possible in terms of performance, cost and long-term availability. This is exactly what Beckhoff delivers, made possible by the broad selection of Intel® embedded processors available for the IPC sockets.

The diversity of these CPUs ranges from highly cost-effective dual-core Intel® Celeron® processors all the way up to high-performance Intel® Core™i7 quad-core devices. The advanced onboard graphics in these processors eliminate the need for a separate graphics card; this not only enables the design of more compact IPCs, but it enhances their availability as well.

Besides 6th and 7th Generation Intel® Core™ processors, the ultra-compact Beckhoff C6030 IPC also incorporates 32-bit architectures supported by 6th Generation Intel® Core™ processors. This means that customers can continue using older applications built on existing expertise, saving additional cost and engineering effort as a result.

About Beckhoff Automation

Since the company's formation in 1980, Beckhoff Automation has built and sustained a successful business by developing innovative products and solutions based on PC-based control technology. Beckhoff foresaw and successfully introduced many technological advances to the market that have become established standards in automation today. These include industrialized PCs for use in machine and plant environments; PC-based control software for automation, PLC and motion control applications; a wide variety of Control Panels and Panel PCs for HMI and operator interface applications; the EtherCAT industrial Ethernet standard and much more.



About the C6030 Industrial PC ► www.beckhoff.com/c6030

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