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# Open-Standard Panel PCs Drive the Future of Patient Monitoring and Connected Healthcare

**To provide connectivity and intelligence for digital healthcare applications, the medical-grade Kontron MediClient Panel PC offers a powerful, extensible foundation based on Intel® Core™ and Intel® Celeron® processors. Open system architecture and COM Express-enabled upgradeability enable innovative healthcare applications based on best-of-breed components from across the ecosystem.**
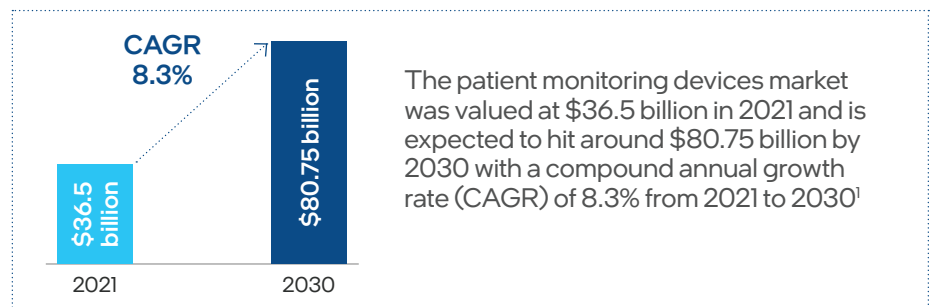
**kontron**

## Key Takeaways

The Kontron MediClient Panel PC:

- Brings powerful, flexible compute to the patient bedside and to the diagnostic and nursing units.

- Unifies patient monitoring data and puts it to work reducing costs and improving care.

- Is a standards-based, medical-grade Panel PC for next-generation patient monitoring applications.

Connected healthcare offers a compelling universe of use cases based on the Internet of Things (IoT). The ability to capture and derive insights from all manner of patient data promises to improve medical outcomes as well as operating efficiencies for hospitals and other clinical providers. Providing compute power at the patient bedside enables deployment of software functionality to help interpret patient data in real time. Novel capabilities can help reduce costs and improve the quality of care.

**CAGR 8.3%**

$36.5 billion — 2021

$80.75 billion — 2030

The patient monitoring devices market was valued at $36.5 billion in 2021 and is expected to hit around $80.75 billion by 2030 with a compound annual growth rate (CAGR) of 8.3% from 2021 to 2030[1]

Growth in this segment includes wearable and implantable devices, as well as monitoring and stationary equipment. Together, these building blocks form a digital fabric that connects patient data sources to intelligent healthcare applications, while placing a premium on interoperability and extensibility. At the same time, compute requirements for patient monitoring are growing rapidly, due to factors that include cybersecurity requirements and increased deployment of AI and machine learning functionality.

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The Kontron MediClient Panel PC is designed to provide a connectivity gateway for monitoring endpoints and back-end systems, as well as a human-machine interface with robust computation resources. These all-in-one Panel PCs enable medical providers to take advantage of increasingly sophisticated software functionality — including AI and deep learning — to provide headroom for emerging capabilities in patient care. In addition to patient monitoring applications throughout clinical facilities, the device is well suited to any application with high hygienic requirements, such as laboratories, clean rooms and pharmacies.



## Patient care without digital silos

As a central aspect of medical care, continuous patient assessment brings together real-time monitoring and historical chart data with the professional expertise of nurses, doctors and other caregivers. While human judgment necessarily remains at the center of that assessment, computer-aided patient monitoring is a vital adjunct. This technology can increase efficiency, reduce mundane tasks and enhance outcomes as data sizes and software intelligence grow. The provision of real-time data thus creates added value for patient care while also reducing the cost of care.

The success of that vision depends on open connectivity among equipment, monitors and sensors from different vendors. To facilitate that open approach, MediClient can run the IEEE 11073 service-oriented device connectivity (SDC) standard. The associated communication protocols enable open interoperability with medical devices and medical information systems. They ensure safe data exchange in distributed systems based on hardware, software and service components provided by unrelated parties, enabling standardized communication across manufacturer boundaries.

Connecting clinical IT with medical devices and wearables.

## Hospital Network Structure



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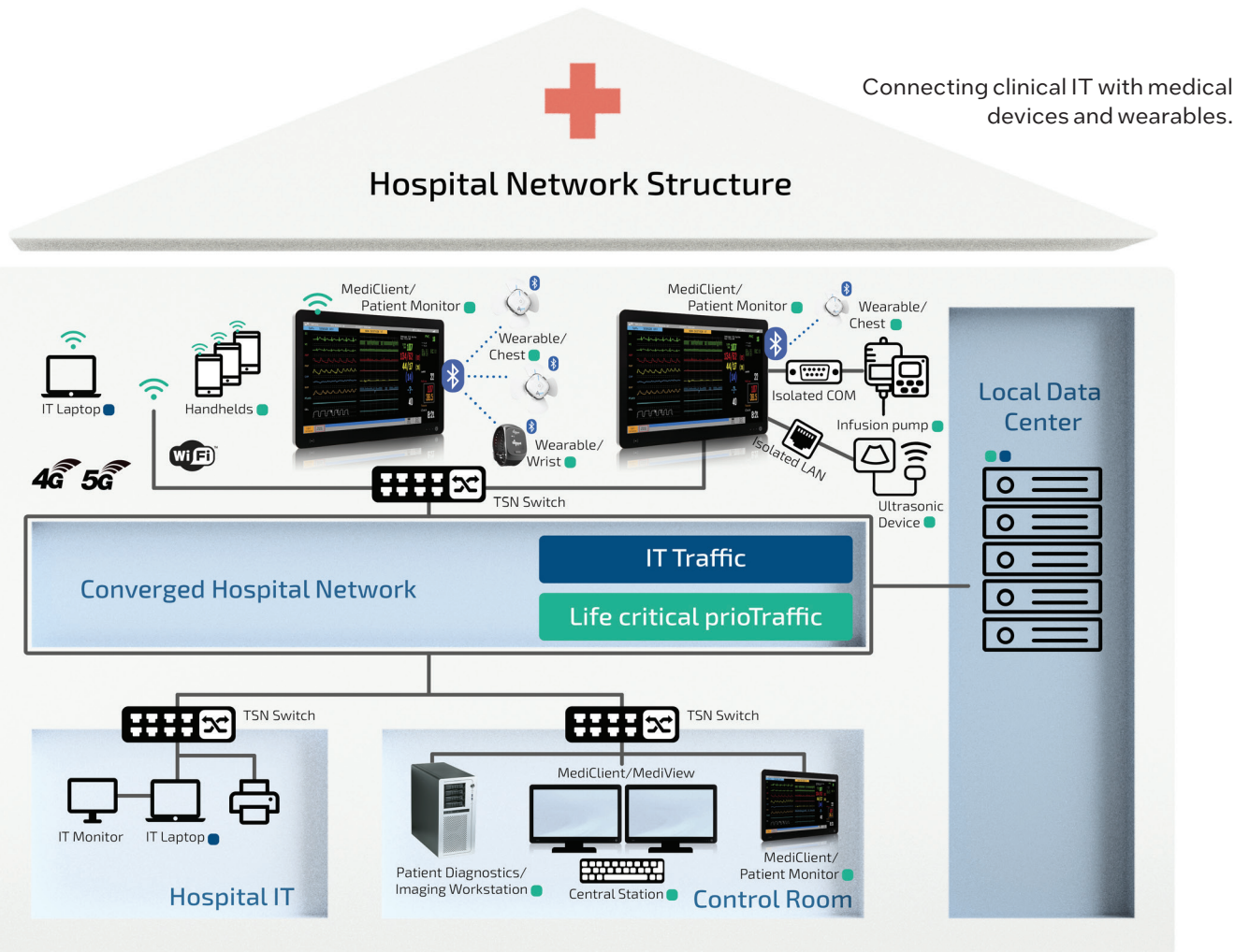
## MediClient: A flexible foundation for healthcare innovation

Drawing data together from an open-ended range of real-time and historic sources, the MediClient Panel PC provides an edge computing platform for analysis, visualization and interpretation. Robust compute in a medical-grade system form factor flexibly supports current and future functionality, drawing on the unmatched ecosystem of hardware, software and development tools for Intel architecture. As AI and deep learning offer new capabilities to assist with patient care, solutions based on these devices are ready to accommodate them.

| Kontron MediClient Specifications | |
| --- | --- |
| Display | 21.5 or 23.8 inches<br>1920 x 1080 / 16:9<br>Projected capacitive touch (PCAP) |
| Processor | Intel® Celeron® 4305UE processor (2 cores, 2.00 GHz) or<br>Intel Core™ i5-8365UE processor (4 cores, 6MB cache, up to 4.10 GHz) |
| Memory | 4-20 GB |
| Local Storage | 128-512 GB SSD |
| Connectivity | Wired: USB, GbE, RS232, DP++<br>Wireless: RFID, Wi-Fi, Bluetooth |

## Built to demanding clinical specifications and standards

These medical-grade, fanless computers with dust-resistant housings feature a joint-free front made of continuous tempered glass with no sharp corners, making them easy to disinfect. The powder-coated stainless-steel back is likewise easy to clean, with the entire device highly resistant to detergent and chemicals, built for long-term durability, mechanical stability and high reliability.

The PCAP touch display provides an anti-glare, fingerprint-resistant surface built to perform through two layers of gloves and is readable even in challenging lighting conditions. It provides highly effective drop and palm rejection to avoid inadvertent interface events or maloperation. The system is shock and vibration-resistant, easily mountable using VESA 100 for swivel arms or wall mounts.

To meet demanding requirements for hygiene and connectivity, MediClient devices conform to the DIN EN 60601-1 international standard for the safety and essential performance characteristics of medical electrical equipment. Isolation of the power supply minimizes the risk of electromagnetic interference, while EN 60601-1 certified isolated interfaces as well as wireless interfaces (Wi-Fi, Bluetooth) help ensure dependable connectivity between medical devices and hospital information systems. RFID is optionally available for hygienic and contactless user identification.

## Robust compute, flexibility and upgradeability

In its role as a technology leader, Intel has supported Kontron's design and development of the MediClient medical-grade Panel PC. The Intel® Core™ i5-8365UE and Intel Celeron® 4305UE processors are engineered specifically for power-efficient embedded and IoT applications. The choice of processor platforms enables original equipment manufacturers (OEMs) to balance cost and capability requirements. Both deliver high performance per watt and feature Intel UHD Graphics, driving robust display capabilities for graphics-intensive health and life sciences usages.

The MediClient PC is designed using a computer-on-module (COM) architecture, allowing non-disruptive platform upgrades for equipment in the field as application requirements change or new processor generations become available. This feature enhances the overall flexibility and future-readiness of the solution. The Intel embedded processor platforms offer extended availability and support for long-term implementations.

## Ease of modification and customization

MediClient is built for OEMs to readily adapt to their own branding and resource requirements. An individual design can be achieved through factors such as the shape and imprint of the front glass, different case colors, etc., and both the unit itself and the packaging can be customized.

Technology aspects of the systems are also readily customizable. COM Express technology enables selection across CPUs. Changes to I/O, memory and display technology can also be tailored to the needs of individual solution offerings. Front glass can have additional features applied as well, ranging from antibacterial coatings to ultraviolet or infrared protection.

Kontron offers value-added services related to MediClient, such as burn-in and software installation, lowering the bar for OEMs to offer those services to their end customers. In addition, customizable full support services such as repair and lifecycle management contribute to comprehensive solution offerings. MediClient is the point of departure for solution providers to create advanced, flexible medical offerings that help redefine the future of inpatient and outpatient care.

## Conclusion

As providers create the next generation of patient-monitoring solutions, the medical-grade Kontron MediClient Panel PC offers them the compute power to differentiate their offerings, building on mature system technologies and Intel architecture. MediClient is built to adhere to international standards for safety, with interoperability based on open SDC architecture. It lies at the heart of multi-component, multi-vendor solutions that extend computer intelligence throughout patient care, for return on investment that is realized in lower costs and better health outcomes.

Learn more:

kontron.com/mediclient

intel.com/healthcare

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Solution provided by:

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