The Importance of Low Powered, Resource Constrained Microcontrollers in IoT

This article aims to highlight the growing importance and advantages of low-powered, resource-constrained microcontrollers within the Internet of Things.

STOCKHOLM, SWEDEN, April 25, 2023 /EINPresswire.com/ -- As the Internet of Things (IoT) continues to expand, the demand for efficient and cost- effective solutions becomes increasingly important. One key component in the IoT ecosystem is the micro-controller, which serves as the "brain" of a connected device. While powerful micro-controllers have their place in the industry, resource-constrained micro-controllers are emerging as a crucial element in many IoT applications. These low-power, low-cost devices cater to specific use cases where size, energy efficiency, and affordability are of paramount importance.

The widespread adoption of IoT devices across numerous industries has highlighted the need for low-powered, resource-constrained micro-controllers. These devices offer cost-effective solution for their products. As these micro-controllers are designed for specific use cases, they often require fewer resources and are available at a lower price point compared to more powerful alternatives. This cost advantage can be passed on to customers, making IoT devices more accessible and affordable. They also typically have a smaller form factor, allowing device manufacturers to create compact, discreet devices that can be easily integrated into various environments, including wearables, smart home appliances, and industrial monitoring systems.

End-users of IoT devices also stand to benefit from the use of low-powered, resource-constrained micro-controllers. Energy efficiency is a critical concern for battery- operated devices, as it directly impacts the device's operational lifespan between charges or battery replacements while also contributing to a smaller carbon footprint, promoting sustainability and reducing the environmental impact of IoT devices.

In addition to cost and energy efficiency, low-powered micro-controllers can be tailored for specific applications, ensuring that they provide just the right amount of processing power and functionality needed for a particular use case. This allows IoT devices to be more focused and efficient in their operation, optimizing performance without sacrificing reliability. In scenarios where complex processing is unnecessary, resource-constrained micro-controllers offer a practical and efficient solution that caters to the specific needs of the end-user.

The global chip shortage, which began in 2020, has had far-reaching consequences across

numerous industries, including the IoT sector. A perfect storm of increased demand due to the rise in remote work and digital transformation, disruptions in the supply chain, and trade restrictions have all contributed to the shortage. Major chip manufacturers, have struggled to keep up with the growing demand for semiconductors, leading to delays in production and delivery for many electronic devices.

In the midst of this crisis, low-powered, resource-constrained microcontrollers have emerged as a welcomed alternative for device manufacturers. These microcontrollers offer several advantages that help mitigate the impact of the chip shortage on IoT device production. Some advantages include diversification of supply sources, flexibility in design, reduced lead times, and cost savings.

By adopting low-powered, resource-constrained microcontrollers as an alternative to more popular options, IoT device manufacturers have been able to continue production despite the ongoing chip shortage. This adaptability has not only helped mitigate the immediate impact of the shortage but also highlights the importance of diversification and flexibility in supply chain management, which can lead to greater resilience and success in the ever-evolving IoT landscape.

Ongoing technological advancements, such as energy harvesting, have also had a significant impact on the growing adoption and potential of low-powered, resource- constrained microcontrollers in the IoT space. Energy harvesting refers to the process of capturing and converting ambient energy from various sources, such as solar, thermal, vibration, or radio waves, into usable electrical power. As energy harvesting technologies continue to evolve and improve, their potential applications in powering IoT devices become increasingly viable - but also promote the use of renewable energy sources, thereby reducing the environmental impact of IoT devices. This focus on sustainability aligns well with the energy efficiency of low-powered micro controllers, supporting the development of environmentally-friendly IoT solutions.

Security has always been a critical concern in the world of IoT devices, and the use of low-powered, resource-constrained microcontrollers can present unique challenges for developers. Some of these challenges include limited processing power, memory constraints, and scalability. Recognizing these challenges, [RIoT Secure](#) has developed a lifecycle management platform that addresses security concerns while allowing developers to focus on their IoT applications. The platform utilizes a dedicated microcontroller for communication and security, providing a hardware sandbox that isolates the application-focused microcontroller, which can be low-powered and resource-constrained, from external threats.

RIoT Secure's approach offers several advantages. First, it enables the separation of concerns, allowing developers to focus on their application without worrying about implementing security features within the resource-constrained microcontroller. Second, it provides hardware isolation, ensuring that the application microcontroller is isolated from potential threats, such as malware or unauthorized access. Finally, it simplifies management by streamlining the process of

managing security updates and patches for a large number of devices.

By addressing these security challenges, RIoT Secure's lifecycle management platform enables developers to harness the benefits of low-powered, resource- constrained microcontrollers without compromising on security. This innovative approach ensures that IoT devices remain secure and reliable, even as the industry continues to evolve and expand.

About RIoT Secure
RIoT Secure is a Stockholm-based technology enabler within the IoT industry. Founded in 2017 by Aaron Ardiri and Bjorn de Jounge, who are engineers and entrepreneurs, RIoT Secure offers a unique lifecycle management platform for resource-constrained microcontrollers, enabling developers to deploy and maintain IoT devices securely. The company's mission is to ensure that security technology exists in the foundations of software development for IoT solutions and to make security available to all IoT things, regardless of the computational and memory resources available.

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