



CONNECTED BATTERY SECURITY

CASE STUDY

Altiux, as the product engineering services company, was assigned the responsibility of designing and developing a connectivity solution capable of extracting information from a Battery Management System (BMS) and securely transmitting the data to a cloud application. Although not explicitly required to comply with the EU Cyber Resilience Act of 2022, Altiux proactively prioritized security during the research phase, investigating various operating systems and hardware options to align with the spirit of the act.

The final product boasts numerous features, including flexibility, built-in security, secure package update mechanisms, advanced wireless connectivity, a user-friendly GUI, and integration with a top three Cloud IoT platform. By adopting a robust security framework, Altiux demonstrated its commitment to addressing potential cybersecurity concerns in the development of this innovative connectivity solution.

SECURING COMMUNICATION AND FIRMWARE UPDATES

➤ Communication Security

Securing the communication channel and device configuration presents a complex challenge, as striking the perfect equilibrium between robust security features and efficient operational requirements is crucial. Altiux, with its deep understanding of these intricacies, adeptly implemented a call-home interface, wherein the device establishes a connection to a central server. This innovative approach ensures that no open ports are present on the device, significantly mitigating potential vulnerabilities.

Recognizing the importance of secure device-cloud communication, Altiux harnessed the capabilities of major cloud vendors' IoT APIs, which facilitated certificate-based authentication in both directions. This advanced measure effectively safeguards devices against phishing attacks, reinforcing the overall security posture of the communication channel.

Moreover, Altiux diligently accounted for potential edge cases, such as the timely renewal of certificates, to preempt any communication disruptions for devices

deployed in the field. By addressing these critical aspects, Altiux demonstrates a holistic approach to security, ensuring that the connectivity solution remains highly reliable and resilient throughout its operational life.

➤ Secure Communication

Altiux, in its pursuit of the highest standards of security and communication, implemented an advanced MQTT-based TLS V2.0 protocol to establish a secure and reliable connection between the cloud provider and the device. This sophisticated approach ensured that data transmitted across the network was both encrypted and protected from unauthorized access.

In addition to the secure communication protocol, Altiux employed a robust, security-centric authentication system that utilized temporary tokens, which were systematically renewed at regular intervals. This proactive measure effectively mitigated the risk of man-in-the-middle attacks by preempting the possibility of unauthorized devices attempting to gain access using expired or duplicated tokens.

➤ Secure Firmware Updates

Altiux emphasized the importance of secure firmware updates as a key security strategy. In line with the EU Cyber Resilience Act, 2022. Altiux ensured that the underlying OS supported secure package management and firmware updates. Separating package-based updates limited the update's surface area, while secure package managers checked for the authenticity and integrity of the package, preventing "fake" packages from being downloaded or executed. In addition, Altiux ensured the ability to update the entire firmware as needed.

➤ Open Source Components

Altiux employed open-source components, development stacks, and protocol stacks. This facilitated prompt identification, reporting, and patching of vulnerabilities, enhancing the overall security of the system. Open source contributors often provide patches and fixes, enabling device manufacturers to promptly address issues and stay ahead of potential vulnerabilities.

OUTCOME

With a strategic focus on connecting its power solutions to the internet, the lithium-ion battery manufacturer partnered with Altiux to achieve its goals securely and efficiently. In accordance with the EU Cyber Resilience Act, 2022, Altiux's solution architects selected flexible and modular off-the-shelf software components that offered a wide range of management capabilities. This approach allowed Altiux to complete the project in record time and enabled a small team of engineers to concentrate on customizations unique to the product.

In the development of their advanced connectivity solution, Altiux astutely recognized the significance of prioritizing security, despite the fact that strict compliance with the EU Cyber Resilience Act of 2022 was not a mandatory requirement for this particular product. With a forward-thinking approach, the company thoroughly investigated a wide range of operating systems and hardware options, seeking to identify and integrate the most advanced and secure technologies available.

Through careful research and an unwavering commitment to robust security, Altiux was able to implement key aspects of the security framework outlined in the EU Cyber Resilience Act. This strategic decision not only demonstrated their dedication to cybersecurity best practices but also ensured that the resulting connectivity solution would be well-positioned to meet the majority of the stringent criteria established by the act.



Altiux Innovations is a software & product engineering services organization focused on helping you accelerate development of your IoT solutions and products. We provide specialized engineering services across the entire IoT development cycle from consulting, device engineering, cloud and mobility application development, data analytics, and support & maintenance.

Altiux has developed an IoT Toolkit - BoxPwr™. BoxPwr is a production ready suite of software frameworks for sensor nodes & actuators, communication gateways, Edge computing & Cloud connectivity that helps accelerate IoT product & solution development.

At Altiux, we offer multiple models for commercial engagement that can be tailored to meet your specific needs.

United States

Altiux Innovations Inc,
1551 McCarthy Blvd, Suite 117,
Milpitas, CA 95035, , United States

info_usa@altiux.com
+1 650 282 5757

Corporate Office

Altiux Innovations Private Limited,
Salarpuria Touchstone, No. 133/1-3, First Floor, A Block,
Kadubeesanahalli, Outer Ring Road, Bangalore - 560103, India.

info@altiux.com
+91 80 67204444