

Cellular modules and LoRa® chips: Cloud Enables Medical Devices

Healthcare digital transformation equates to devices which have connectivity built-in

The ability to connect equipment and transmit large amounts of detailed information is transforming the way many industries operate. Medical Telecare devices, which include both medical and environmental sensing, are two areas with huge potential for optimization by using the Internet of Things (IoT). Once inert and mainly mechanical machines, connected medical telecare devices are now being used to closely monitor patient health, reduce hospital readmissions and improve health outcomes. The success of these products is reliant on both the simplicity to connect and the quality of the connectivity layer. Clinical medical devices used in hospital, ambulatory and laboratory environments typically have a lifetime lasting decades. This is due to several reasons including regulation, rigorous amounts of testing, certification and cost. However, today's hyperconnected world empowered by AI means that data from these devices needs to be accessible almost the instant it becomes available. Cloud connection simplifies a number of workflows including both control plane (device management such as software updates) as well as data plane (extracting the data from the device) reducing the overall TCO. As a result, the healthcare industry is increasingly only purchasing devices which have connectivity built in during replacement cycles.

Benefits of embedding WAN radios into devices

Wireless connections offer the benefit and convenience of being able to bring a device online without worrying about cabling. Although Wi-Fi is prevalent, bringing these devices into a clinical environment can add complexity and time, as it typically involves collaboration with the IT department adding additional security validation and other operational overheads. In addition, the high-power consumption of Wi-Fi makes it unsuitable for battery-operated devices. Connecting devices via Wide Area Networks also allows device manufacturers to own the connectivity to the device to offer additional value add services such as service and maintenance in addition to getting metadata such as the location of devices sold. Semtech offers two types of connectivity solutions for embedding into devices: cellular modules and LoRa® chips. Cellular modules are ideal for devices which require high data rates. LoRa is suitable for devices which are battery operated and transmit small amounts of data. Both can be connected to private or public networks.

Cellular Modules

Semtech offers a variety of cellular modules to choose from, depending on your requirements for network you want to connect to, data rates, geographical scope and power requirements.



LPWA MODULES

[LPWA modules](#), such as the HL7900 module, are engineered for ultra-low power consumption combined with worldwide coverage. This makes them perfectly suited for battery-operated medical devices, ensuring reliable performance across global locations. For instance, these modules can significantly enhance the functionality and efficiency of portable medical equipment, a critical aspect for healthcare providers prioritizing patient care and mobility.



RC71 CAT-1 BIS MODULES

The [RC71 Cat-1 bis modules](#) are also well-suited for medical devices when higher bandwidth is required. These modules are ideal for devices requiring consistent, low-power and ubiquitous connectivity capable of streaming rich patient data quickly, such as those used in monitoring sleep apnea. Such reliable connectivity ensures that healthcare professionals can access vital patient data in real-time, enabling prompt and accurate diagnosis and treatment.

Learn more: <https://blog.semtech.fr/exploring-the-potential-of-lte-cat-1-bis-technology-in-simplifying-iot-deployments>.

Beyond the technological advantages, Semtech's cellular modules are rigorously tested to minimize project risks, providing peace of mind for healthcare technology developers. Our dedicated team of IoT experts stands ready to offer comprehensive support, from informed decision-making to swift issue resolution, helping your projects proceed smoothly and efficiently.

Furthermore, our module solutions are designed with simplicity in mind. Features like pin-compatible [Common Form Factor 3 \(CF3\)](#) allow for hassle-free upgrades, while built-in eSIM and secure elements offer high security for sensitive patient data. Coupled with our powerful firmware over the air (FOTA) and device management platform, you can easily initiate device update campaigns, helping your healthcare solutions remain at the cutting-edge.



LoRa® Chips

Semtech is owner and inventor of the LoRa® radio technology. LoRaWAN® is a Low Power, Wide Area (LPWA) networking protocol designed to wirelessly connect battery operated 'things' to the internet. LoRaWAN is a global standard, defined by the LoRa Alliance and recognized by the ITU-T. LoRaWAN is ideally suited to transmitting small amounts of data over long distances. In the healthcare space, this means it can be used for medical telecare devices such as blood pressure, SpO2, glucometers, and pill boxes. The benefit of LoRaWAN® over technologies like Bluetooth in the healthcare market is that LoRaWAN can communicate directly to the cloud via public networks. This can be essential with elderly or sick individuals who may not have the technical knowledge or capacity to properly pair the device with their smartphone. LoRaWAN can also be used for small battery operated sensors such as presence detection, temperature/humidity, CO2, and movement. These sensors can be utilized for aging-in-place solutions to enable monitoring of elderly or sick to detect anomalies and prevent adverse events before they occur.

The LoRa Alliance is maintaining a marketplace website on which you could find healthcare applications developed by some of its members: https://lora-alliance.org/marketplace/search/?mp_verts%5B%5D=4451

There are also several companies from our LoRaWAN ecosystems who are using LoRaWAN in Healthcare, just to name a few:

<https://www.microshare.io/eversmart-hospitals-and-healthcare/>

<https://tektelic.com/key-verticals/healthcare/>

<https://market.thingspark.com/search?q=healthcare>

<https://www.semtech.com/lora/lora-applications/smart-healthcare>



Contact us to Learn More

For more information on Semtech's LoRa Chips & Cellular Modules please visit semtech.com or contact us directly at 1.877.687.7795 or sales@semtech.com



About Semtech

Semtech Corporation (Nasdaq: SMTC) is a high-performance semiconductor, IoT systems and cloud connectivity service provider dedicated to delivering high-quality technology solutions that enable a smarter, more connected and sustainable planet. Our global teams are committed to empowering solution architects and application developers to develop breakthrough products for the infrastructure, industrial and consumer markets.

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