A smart option for your cold chain management solution

The Internet of things is driving innovation across many industries and supply-chain & transit operation is no exception.

IoT sensors provide regular monitoring to ensure products are safe, effective and arrive on time. Above all, the most important aspect is to let carrier companies monitor the quality of their shipments. Some products can easily expire during shipping if equipment malfunctions.

Real-time updates from IoT sensors can alert stakeholders to these errors, informing quick actions to prevent spoilage.


As background, cold-chain products include goods such as perishable food and drinks; chemicals; and many high-value items in the healthcare industry such as pharmaceuticals, biologics, lab samples, diagnostic tests, vaccines and more.

Transporting cold-chain products in a controlled environment from a manufacturing facility to a pharmacy or store, for example, is a challenge many suppliers face.

The cold chain: The stages of vaccine manufacture, storage and transport
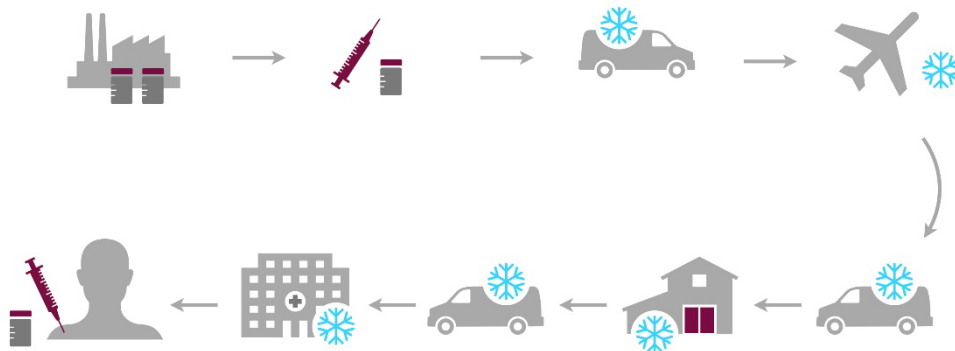
Solutions consist in inserting connected temperature sensors into the transport packaging or freezer to monitor the temperature, status and location of products across the supply chain. If these devices sense that temperatures within a refrigerated trailer drop beyond a certain threshold, they can alert drivers and fleet managers.

Such sensors need to be compact and energy-efficient as low power consumption means long period of operation even on a small battery. Power management circuit (PMC) is key in IoT sensors to ensure that product designer can chose between smaller battery and extended battery-life. Real-Time Clock Module (RTC) acts as a PMC. It has the ability to wake-up microprocessor to perform periodic sensor measurement and to power down the microcontroller when no task is required, resulting in significant power savings.
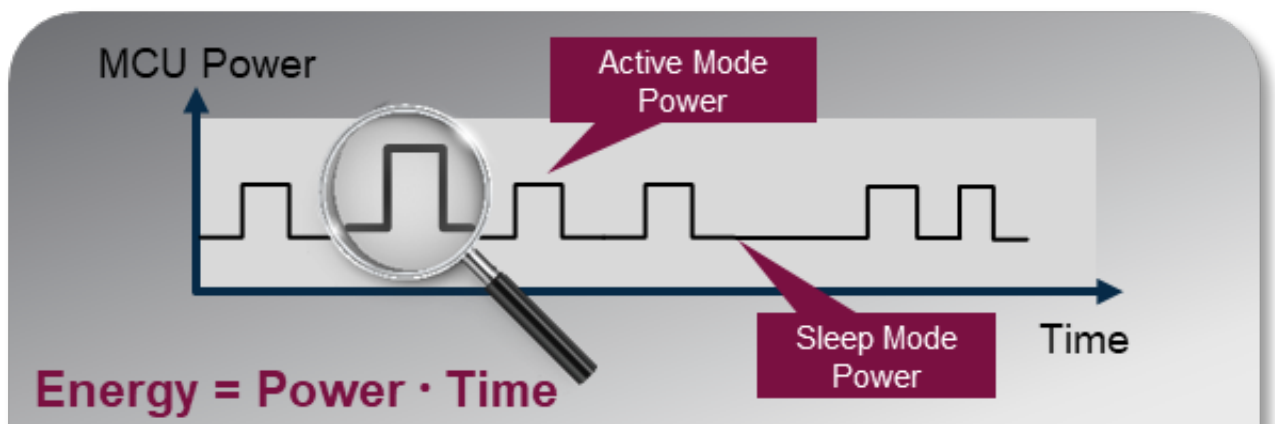
Offering best accuracy of all temperature compensated RTC at ±2.5 ppm (± 0.22s/day) over the industrial temperature range; the new RV-3032-C7 has also an ultra-low current consumption of 160nA. This high performance RTC comes with a variety of features. An innovative and very useful one for the development of low-power IoT cold-chain sensor being the embedded accurate high-resolution (12-bit) temperature sensor. With its programmable temperature window detection interrupt, it enables times stamp for temperature alarm event.

This device provides real-time temperature monitoring at a 1-second refresh period and can wake up the RF-transceiver and MCU to trigger an alarm when the temperature is not within the required range specified for the product. This help ensuring that appropriate action is taken during transport, usage or storage.

Allowing to let MCU stay in a low power standby mode for a very long period of time and limiting RF communication to alarm, the RV-3032-C7 RTC module is key to design ultimate compact wireless ultra-long-life battery powered devices.
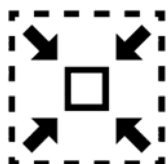
By integrating the quartz crystal and the temperature sensor within the ultra-small RTC package, it allows to minimize the footprint.

The RV-3032-C7 is a calibrated device that simplify manufacturing process where a 1-point temperature verification is sufficient.

Moreover, it can be easily interfaced through the same I^{2}C bus used by other sensors and other hardware devices for easy connectivity.

The factory high time accuracy eliminates any need for oscillator design & adjustment phase and clock calibration during manufacturing. Selecting and using a ready-to-go RTC module solution in your design reduce engineering effort and risk in building your product.

Cost Saving

With its Real-Time Clock Module product line, Micro Crystal masters the Art of Timing to meet extreme requirements in terms of size, power consumption, and performance; helping engineers in developing next generations of IoT devices and other smart products. This covers a wide range of compact applications like typically in metering solutions, POS, automation, health & medical devices, wearables and many more.

To find more detailed information and to learn more about how Micro Crystal has the solution for you, please visit:

microcrystal.com

To get support in RTC selection, talk to our team of experts:

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