SEMTECH

LoRa®

SMART AGRICULTURE USE CASE

CHIPSAFER

Monitoring Cattle in Real Time

SEMTECH'S LoRa ENABLES SMART AGRICULTURE

DESCRIPTION

LoRa® devices and the LoRaWAN® open protocol make it easy and economical for ranchers to better track their cattle. From in-ear temperature sensors to GPS-free tracking, LoRa-based devices effectively track and transmit data back to the Cloud, even over long distances.

LoRa enables long-range, low-power wireless transmission of data, allowing the use of low cost sensor units. For cattle tracking applications, LoRa-based sensors must be affordable, support long-range wireless in non-GPRS supported ranges and include at least a year-length battery life.

BENEFITS

With LoRa-based devices, ranchers can track and detect anomalies in cattle behavior at any time. Data tracked remotely on wide-open cattle ranches can be collected and shared with a veterinarian anywhere in the world. With the early detection of disease, cattle can be removed to prevent the spread of infection.

Also, with LoRa-based sensors, ranchers are able to locate their cattle in real time to better manage the herd and reduce cattle theft. Sensors typically cost the rancher between $10 and $50 USD, enabling a return on investment (ROI) against disease, loss or theft of animals.

APPLICATION

A large cattle ranch needs to track its herd as they range for months or years at a time and reduce cattle theft.

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LoRa®
Use Case

IoT Challenge

- Remotely monitor cow health and location in large ranches
- Provide accurate data for ranchers to predict and prevent disease

LoRa Devices Used

- Chipsafer created its sensors on the LoRa SX1272/3 and SX1301 chipsets, and use gateways based on SX1276/7/8/9
- The LoRaWAN protocol offers long range network coverage to connect sensors miles from the nearest gateway

Victoria Alonsoperez, a Uruguayan electronics and telecommunication engineer who co-invented and founded Chipsafer, refers to the technology as the "Internet of Cows."

HOW IT WORKS

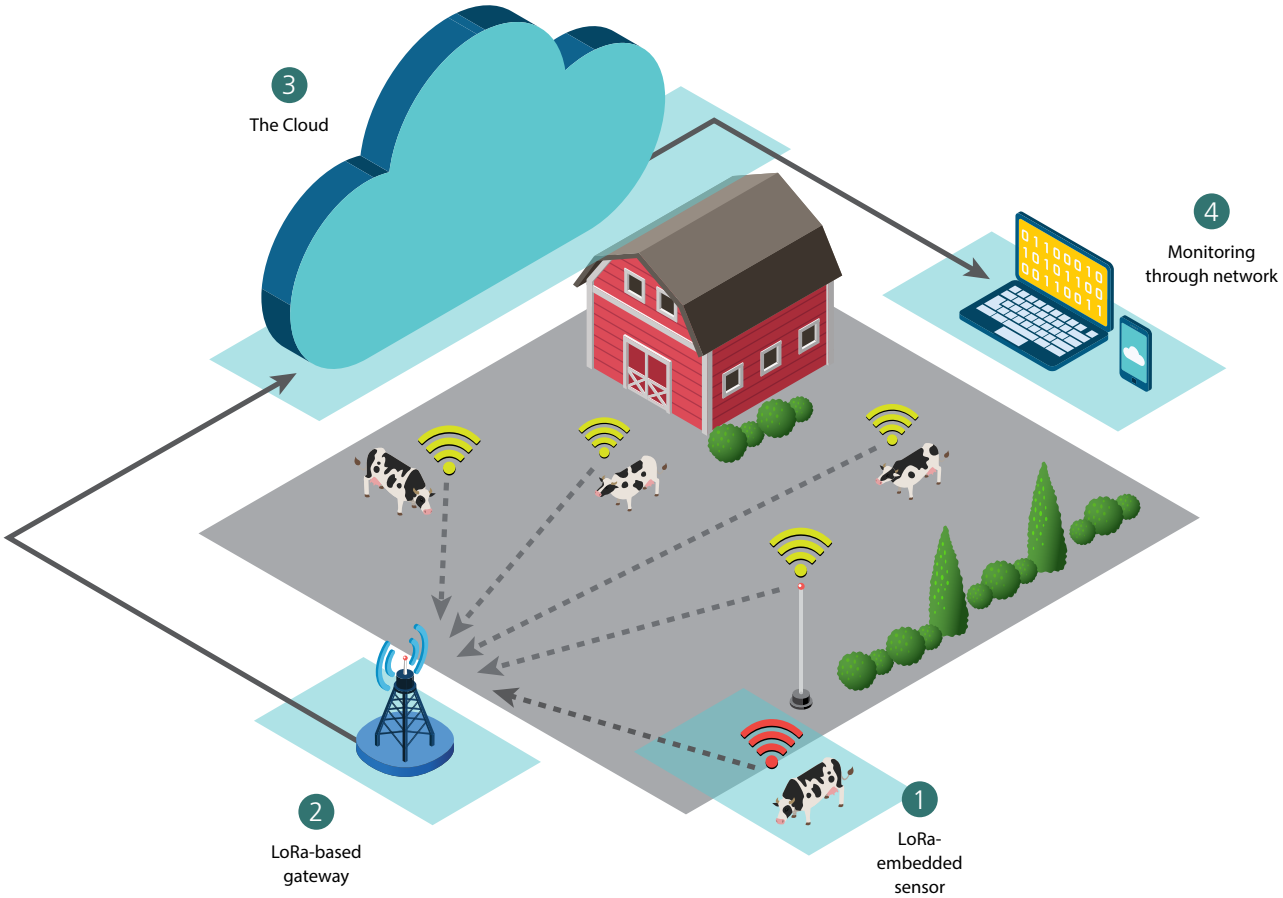
Semtech's LoRa devices and the LoRaWAN protocol enable long range motion tracking of animals over long periods of time.

1. The rancher purchases LoRa-based sensors and gateways. Collars or tags are placed on a steer and gateways are mounted high on poles at between 5 and 20 mile intervals, depending on the terrain.

2. LoRa-based sensors report back to gateways with data tracking location, head motion and other information, such as external temperature, air pressure and humidity. Gateways can be satellite uplinked to reach the Internet.

3. Cloud-based software tracks data collected by LoRa-based gateways and provides ranchers with analysis tools for tracking their herd across hundreds of miles. Automated disease tracking software can spot sick cattle early. Stolen cattle are noticed when sensors are removed, or when they venture outside a specific area.

4. Over time, data is analyzed to track anomalies and alert ranchers by mobile devices or a personal computer.



Semtech Products used in this application:

Sensors
- *SX1272/3*
- *SX1276/7/8/9*

Gateway
- *SX1301*

All application elements (sensing modules, gateways, servers, software) are available through LoRa Alliance® partners.

REAL USE CASE SOLUTION

Chipsafer offers end-to-end cattle tracking solutions, including sensors, third-party LoRa-based gateways, and its own web-based management software. The company offers full-time data analysis and tracking data aggregation to cattle ranchers, particularly in remote areas where satellite uplinks are required. Chipsafer charges $1 per heard of cattle for long term data tracking, which includes automated alerting for theft and disease.

LOW COST

Each sensor device is available for below $50 USD, with prices dropping over time as order volume increases.

STANDARDS-BASED

LoRaWAN, a low-power wide-area network (LPWAN) specification, is an open standard supported by the LoRa Alliance®. Chipsafer sells products that have assured global interoperability and benefit from the economies of scale that reduce unit costs and further accelerate its adoption. The Chipsafer Internet of Things (IoT) infrastructure is provided by LORIOT services and software enabling large scale IoT networks based on the LoRaWAN protocol.

SECURE

Multiple layers of security ensure devices are tracked safely and central management of all devices ensures every piece of hardware on a network is up to date.

LOW POWER

Long term battery life on LoRa-based devices can extend to over 10 years. Such scenarios include one transmission of data every hour ensuring that wireless usage will not drain battery life.

HIGH CAPACITY

A single LoRa base station can handle millions of messages per day, ensuring Chipsafer's asset tracking solution is able to support large, active customer bases.

Contact Us:

Learn about Semtech's LoRa Devices
www.semtech.com/LoRa

Visit the LoRa Developer Portal to Access the LoRa Catalog
www.lora-developers.semtech.com

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LoRa®

Semtech's LoRa devices is a widely adopted long-range, low-power solution for IoT that gives telecom companies, IoT application makers and system integrators the feature set necessary to deploy interoperable IoT networks, gateways, sensors, module products, and IoT services worldwide. IoT networks based on the LoRaWAN® specification have been deployed in over 100 countries and Semtech is a founding member of the LoRa Alliance®, the fastest growing IoT Alliance for LPWAN applications.

SEMTECH

Semtech Corporation is a leading supplier of high performance analog, mixed-signal semiconductors and advanced algorithms for high-end consumer, enterprise computing, communications, and industrial equipment. Semtech, publicly traded since 1967, is listed on the Global Select Market under the symbol SMTC and has more than 32 sales and application support offices in 14 countries as well as representatives and distribution support locations in more than 30 countries. Semtech is dedicated to providing proprietarys, differentiated by innovation, size, efficiency, performance, and reach.

LoRa Alliance®

The LoRa Alliance is an open, nonprofit association that has become one of the largest and fastest-growing alliances in the technology sector since its inception in 2015. Its members closely collaborate and share experiences to promote the LoRaWAN protocol as the leading open global standard for secure, carrier-grade IoT LPWAN connectivity. With the technical flexibility to address a broad range of IoT applications, both static and mobile, and a certification program to guarantee interoperability, the LoRaWAN protocol has already been deployed by major mobile network operators globally and connectivity is available in over 100 countries, with continuing expansion ongoing.