



# Precision Farming

LoRa® APPLICATION BRIEF

## DESCRIPTION

With the average farm size today totaling 441 acres, farmers can benefit from data that helps better manage their land, animals and crops more efficiently. With precision farming, farmers can manage the inherent variability of a spread-out farm by gathering information on the status of the environment, their crops and animals on a hyper local basis to ensure its operating at full capacity.

By implementing a precision farming solution comprised of sensors and gateways embedded with LoRa Technology, and a low power wide area network based on the LoRaWAN™ protocol, farmers can help improve crop yields, animal health and farm operations.

## HOW A LORAWAN-BASED PRECISION FARMING SYSTEM WORKS

Semtech LoRa Technology enables connectivity, real-time analytics, reporting, and additional functions such as geolocation.

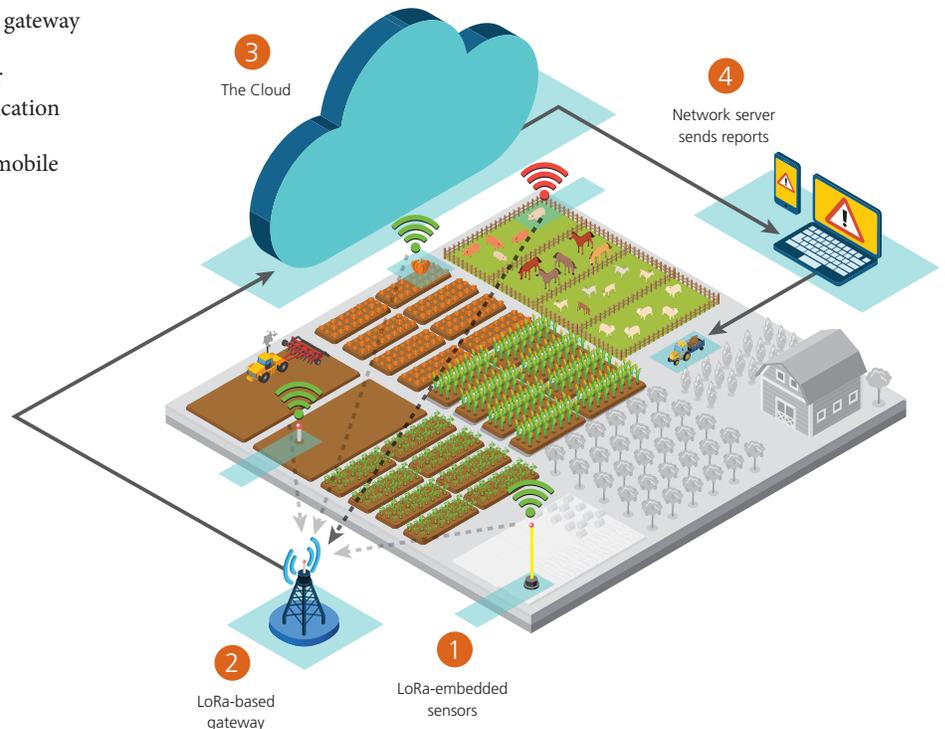
- 1 Soil, weather, plant and animal condition data is collected by sensors embedded with LoRa Technology
- 2 Data from sensors is periodically sent to a LoRa gateway
- 3 LoRa gateway sends information to cloud server where the data is analyzed by Cloud-based application
- 4 Application sends data and alerts to farmer via mobile device or computer

## BENEFITS

- Better understand and plan for inherent variability of farm conditions
- Increase farm yields while reducing resource use
- Minimize in-field workload so farmer can tend to business operations
- Easy to set-up since LoRa sensors do not need to be connected to a power source – an entire farm can be equipped in less than a day
- Low maintenance costs thanks to LoRa sensors low power operation, ensuring batteries can last 10 years

## APPLICATIONS

Farmers leverage LoRa networks to better understand farm conditions to optimize farm management and reduce resource use.



Semtech products used in this application:

- |                |          |
|----------------|----------|
| Sensors        | Gateway  |
| • SX1272/3     | • SX1301 |
| • SX1276/7/8/9 |          |

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



## FIND YOUR IoT SOLUTION FROM SEMTECH'S LoRa ECOSYSTEM

MODULES & MODEMS

SENSORS

BASE STATIONS

NETWORK SERVERS

SYSTEM INTEGRATORS

For a full list of LoRa Ecosystem partners and services, visit our LoRa Community [www.semtech.com/LoRaCommunity](http://www.semtech.com/LoRaCommunity)

## KEY FEATURES OF SEMTECH'S LoRa WIRELESS RF TECHNOLOGY

**LONG RANGE** Penetrates in dense urban and deep indoor environments, connecting to sensors 15-30 miles away in rural areas

**LOW POWER** Enables multi-year battery lifetime of up to 20 years or more

**HIGH CAPACITY** Supports millions of messages per base station

**GEOLOCATION** Enables tracking applications without GPS or additional power consumption

**STANDARDIZED** LoRaWAN specification ensures interoperability among applications, IoT solution providers and telecom operators

**SECURE** Embedded end-to-end AES-128 encryption of data ensuring optimal privacy and protection

**LOW COST** Reduces upfront infrastructure investments, as well as operating and end-node costs

## JUMP-START YOUR IoT DEVELOPMENT TODAY

Semtech offers several training options to help you get started:



Learn about Semtech's LoRa Technology platform: visit [www.semtech.com/IoT](http://www.semtech.com/IoT)



Join the LoRa Community: [www.semtech.com/LoRaCommunity](http://www.semtech.com/LoRaCommunity)



Become a member of the LoRa Alliance™: visit [www.lora-alliance.org](http://www.lora-alliance.org)



Attend a LoRa Boot Camp for a full-day of training featuring LoRa Technology and real world applications: [www.semtech.com/IoT](http://www.semtech.com/IoT)



Follow Semtech on [LinkedIn](#) and our [LoRa Showcase page](#)



To contact one of our global offices in North America, Europe and Asia, visit [www.semtech.com/contact](http://www.semtech.com/contact)



200 Flynn Road, Camarillo, California 93012 • phone: (805) 498-2111 • fax: (805) 498-3804 • [www.semtech.com](http://www.semtech.com)