KINSOL RESEARCH INC.

SpiderMesh Evaluation Kit
an Internet of Things Enabler

SELF-HEALING MESH RADIO
## LOW POWER USAGE

LONG RANGE CAPABLE
OVER-THE-AIR UPDATES

SPIDERMESH WIRELESS RADIO EVALUATION KIT INCLUDES:

- 1 - Single-board computer gateway and transceiver sink
- 1 - Data acquisition and viewing application
- 3 - SpiderMesh wireless radios
- 3 - AA battery holders for remote radio power
- 3 - PIR motion sensors with cables
- 1 - USB connection cable
- 1 - AC adapter
- 1 - Quick-start instructions

The SpiderMesh Wireless Radio Evaluation Kit is suitable for testing of the behavior of an in-the-field deployment of low-power wireless sensor networks such as those running on the SpiderMesh network stack. This Internet of Things enabler is based on a 900 MHz radio, comprised of an Atmel XMEGA microcontroller, an 802.15.4-compatible transceiver, and a custom RF frontend that provides 24 dBm RF amplification.

The SpiderMesh Evaluation Kit radio is configured with a PIR motion sensor, as well as ambient temperature and battery voltage sensors on each radio, and transmits these data to the sink. A SpiderMesh Sink Cape and single-board computer gateway are included to allow for data storage, viewing, processing and backhauling. A 5V DC power supply is used to provide power to the sink cape and the single-board computer. The system can be accessed via a web application running on the single-board computer or directly via SSH. SpiderMesh proprietary technology corrects for clock drift allowing each radio node to sleep most of the time while maintaining accurate network timing. This also reduces power usage allowing for fewer maintenance visits.

SpiderMesh Network Data Flow
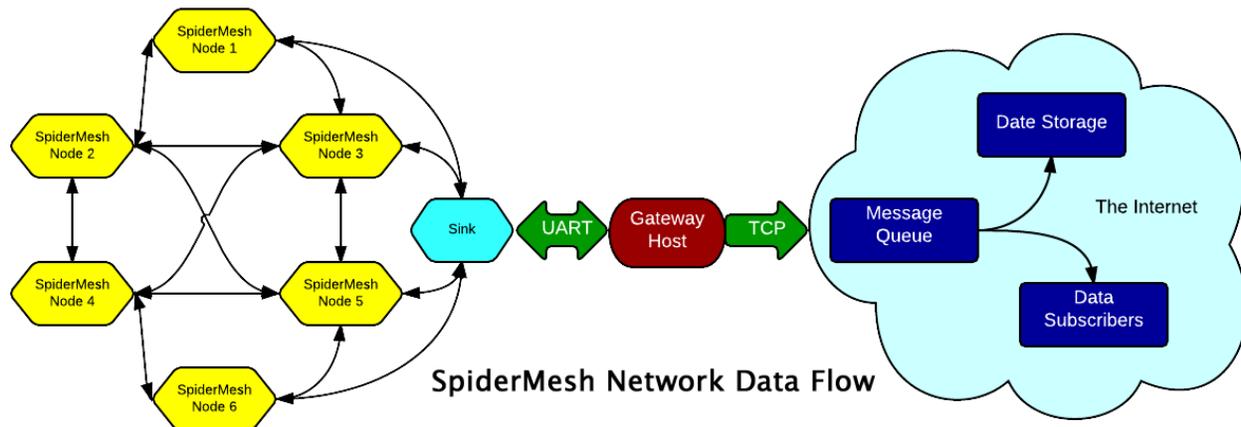
FEATURES

- ✓ Compatible with Arduino shields and Grove sensors
- ✓ Powered by a 900 MHz RF Module
  - o ATxmega256A3 MCU
  - o 900 MHz IEEE 802.15.4 radio
  - o 250 mW transmit power
- ✓ Data rate: 40kbps BPSK to 1000kbps OQPSK
- ✓ FCC compliant
- ✓ Power:
  - o 6.4 to 12 VDC regulated
  - o USB
  - o 2.0 to 3.45 VDC unregulated battery input
- ✓ 8 indicator LEDs
- ✓ Configurable input switch
- ✓ 2 full USARTs + 1 UART over USB
- ✓ TWI, SPI, TWI-Grove port
- ✓ 23 GPIO pins
  - o 4 ADC + 2 ADC/DAC pins
  - o 10 timer outputs
- ✓ Programming and debugging interface
- ✓ 130 µA quiescent current
- ✓ Dimensions: 53mm x 89mm x 14mm

Actual size

APPLICATIONS

- ✓ Sensor networks
- ✓ Large-scale sensor deployments
- ✓ Industrial automation
- ✓ Smart home monitoring
- ✓ Smart HVAC control
- ✓ Lighting control
- ✓ Environmental and agricultural monitoring

OEM AND R&D CAPABILITY

The Kinsol Research SpiderMesh Wireless radio can also be repackaged to accommodate an OEM application. Typically, the footprint of the radio can be greatly reduced to handle the inputs from a custom application. Our experienced team can work closely with your in-house team to insert the device into your product line with both hardware and software designs. The built-in API allows sensors and custom hardware to communicate with the radio and pass data to be transmitted.

The SpiderMesh stack, with its mesh, self-healing, over-the-air update and long range capabilities can also be adapted to your current radio to add the depth of features needed in today's very competitive wireless radio marketplace.

Kinsol Research has the experience to bridge the gap in your product line and make you a leader in wireless mesh radios. Contact us to see how we can best help you achieve your goals!