The World's Most Adaptable I-IoT Wireless Sensor System

LEAP SENSORS

PHASE IV ENGINEERING INC.

Take advantage of Phase IV's 25 years of wireless sensor expertise. We've designed the Leap Wireless Sensor System to be highly configurable at a price well below a custom-designed sensor project. ***It is a major leap forward in wireless sensing.***

Multiple sensors per transmitter.

Fast, inexpensive proof of concept

Leap's modular, highly adaptable design means you can live-test a prototype for your specific needs within weeks, not months.

Highly adaptable gateway delivers data "any way you want it"

No SaaS required. Integrate with your existing data management infrastructure, or use our cloud-based Sensor Manager program.

Trusted, standard data security protocol

6LoPan with TLS security and the same AES encryption that financial institutions use for their internet transactions.

Adaptable to any sensor

Standard sensor comes with options for temperature thermocouples, humidity, accelerometer, pressure, strain, amp clamp, and more.

Customize form factor, enclosure, antenna

Sensor size, enclosure type, and antenna range can be designed to your specifications, Including intrinsically safe (ATEX) enclosures.

Leap Sensors—Rugged Miniature and Industrial

UNIQUE, HIGH-VALUE FEATURES

- *Supports every sensor type*—and multiple sensors.
- Rugged and industrial. Electronics and battery rated to 120C.
- Sensor automatically datalogs when there is no wireless connection
- Easy to set-up and use—up and running in less than 5 minutes.
- Long-range transmissions—over 2000 ft. w standard antenna.
- DSSS Radio optimized for industrial environments.
- Designed to connect with existing systems or custom software.
- Ultra-long battery life—5 to 10 years in typical applications.
- Extreme temperature (-300C - 1800C) sensing with thermocouples.
- Powerful on-board microprocessor for edge computing.
- 2-way communication for sensor control and firmware updates.
- Miniature Version—~ 1.5 inch square with 300-foot range.
- *Designed to be customized* leveraging modular design

industrial | adaptable | feature-rich | high-reliability

©PHASE IV ENGINEERING, INC. | 2820 WILDERNESS PLACE, UNIT C | BOULDER, COLORADO 80301
1-866-608-6168 OR 303-443-6611 | SALES@PHASEIVENGR.COM | WWW.PHASEIVENGR.COM

Document Number: 61-100068-00 Rev 1.6

Leap Wireless Sensor System — Specifications

Leap Sensor Module Design

Multiple sensors per Leap module

- Multiple sensors to each transmitter keeps cost per sensor low.
- *Leap transmitter available with 9 precision temperature sensors.*
- Breakthrough modular design means any sensor you need can be efficiently integrated.

Wireless Sensor Operating Environment of -40C to **120C** *operating* rating (-40F to 248F) for sensor electronics and battery

- *No other wireless sensor operates above 85C.*
- Options available for temperatures **higher than 120C.**

Sensor Enclosure Options

- Standard enclosure: 2 x2x1.4 (h) inches (5x5x3.5 cm) + mounting flanges - rated to 120C
- Miniature enclosures: as small as 1.6x1.6 inches (4x4 cm)
- Harsh environments: IP67 sealed metal, epoxy encapsulation
- Ultra-thin options: less than 0.2 inches (5 mm) thick

Long-life Battery makes our sensor "Practically Battery-Free": 8+ years of battery life in typical industrial monitoring applications.

- Battery life can be fined tuned to your needs.

2.5 GHz radio with DSSS modulation.

- Highly RF noise-immune in industrial environments.

Antenna Options

- On-circuit-board antenna for miniature sensors - range 300+ feet
- External Antenna options - range of 2000+ feet

Transmitter Options:

- Recommend: 2.4 GHz DSSS transmitter 802.15.4 6LoPan with Thread - other transmitters also supported
- Cellular "direct to internet" transmitters for remote sensors - using the latest Cat-M protocol. No gateway required with this option.
- Bluetooth Low Energy.
- Other options such as LoRa and Iridium Satellite—just let us know.

Sampling Rate: high-speed sampling and high memory, when needed

Edge-Computing and Data Logging Option

- Automatic datalogging (65,000 readings) when no wireless link
- Leverage the Leap Sensor's powerful on-board computing power to store and process data before it is transmitted.
- Configure the Leap Sensor to transmit only on certain conditions.

Custom Labeling: ask us about our White Label program.

Sensor Outputs: LEDs, displays, relays, other outputs... just let us know.

Available Sensors for Demonstration Kits

Temperature

- 2 K-Type Thermocouples with a temperature range from ***-300C to 1800C*** (-508F to 3270F)

Accelerometer - 3 Axis

- Average and Max G-Force during variable sampling time
- Magnet-mounted cabled accelerometer installs in seconds
- Custom vibration FFT frequency spectral analysis available using on-board sensor processor and edge computing capability
- Inclinometer
- Vibration or "bump" wake-up for sensor

2 Full-Bridge Inputs with instrumentation amplifier that can be custom configured

- **Strain** sensors
- **Pressure** Sensors
- Other small signal sensors

Humidity Sensor—can be externally mounted

Analog Inputs—can be configured for every type of analog sensor

SPI and I2C Sensor Inputs—support a huge selection of digital sensors

4-20mA Sensor Input—supports a wide variety of off-the-shelf industrial sensors, such as pressure, flow, liquid level...

Need something else? Let us know - We can probably adapt the demonstration kit for your needs.

Gateway - Data Receiver

Connectivity - your way: USB (default for demonstration kit), Ethernet, Cellular, Satellite, RS232, RS485, even analog outputs.

Data Output:

- Recommended: IPv6LoPan - easy internet connectivity
- Modbus, SCADA
- Custom protocols to support legacy systems

User Interface and Data Management

Web-based user interface—configurable so the software can reside:

- On the gateway host processor—connect with any web browser.
- On an on-site server.
- On a cloud server - such as Amazon Web Services.
- Using a Leap Cloud server.
- Simple API connectivity to other cloud services, like ThingWorx.

Highest data security using standard internet-based security methods

- 802.15.4 over the air protocol
- 6LoPan and Thread standard network interface
- TLS - same security protocol used on internet and local networks
- AES NIST data encryption standard

industrial | adaptable | feature-rich | high-reliability








©PHASE IV ENGINEERING, INC. | 2820 WILDERNESS PLACE, UNIT C | BOULDER, COLORADO 80301
1-866-608-6168 OR 303-443-6611 | SALES@PHASEIVENGR.COM | WWW.PHASEIVENGR.COM