

GE Energy



Bently Nevada* Essential Insight.mesh* Wireless Condition Monitoring



imagination at work



Increasing Reliability in Plants Today

No matter where an asset sits in the plant, the need to understand its health has become increasingly vital. As profits and machine availability become of greater importance, reliability and efficiency have become paramount. Plant owners are now turning to the balance-of-plant to fine tune their operations—focusing on assets that previously may not have been monitored—to elevate plant performance.

Traditionally, pumps, motors, and fans—auxiliary or essential assets that are classified as mid- to low-criticality—have been periodically monitored with a walk-around program using portable data collectors (PDC). Operators have made rounds at scheduled times and recorded the vibration and temperature readings of assets from throughout the plant. While PDCs can be very useful, relying solely on this method of data collection has some inherent flaws. Data quality and consistency can be key issues in developing accurate asset data models. Additionally, the volume of data analysis required can prevent operators from addressing an asset issue in a timely manner.

Data frequency is another fundamental element to consider in condition monitoring. When trending data, it becomes apparent that taking infrequent readings can be insufficient when trying to correlate conditions, draw conclusions, or diagnose machinery failures quickly and efficiently. These activities are key components of predictive maintenance and significantly contribute to improving plant reliability.

Essential Insight.mesh Wireless Solution

The solution to cost effectively augment reliability at your site is GE's Bently Nevada* Essential Insight.mesh* wireless condition monitoring solution. By providing frequent online readings, essential assets can be monitored at a cost point that improves reliability at a fraction of the cost of a wired solution. Built on the proven Bently Nevada condition monitoring technology, essential assets are now easily within reach at plants in upstream oil & gas, hydrocarbon processing, power generation, chemical, pharmaceutical, and many others.

The Essential Insight.mesh solution provides an easy method of swiftly deploying condition monitoring throughout your plant – even in the most inaccessible areas. Since there are no wires to run, the installation is quick, straightforward, economical, and enables most plants to go from start of deployment to data collection in less than two days.

Once the Essential Insight.mesh system has been commissioned, your plant staff become free to perform higher value tasks. This gives your plant personnel a key advantage by minimizing the amount of time that maintenance staff needs to spend gathering information and trying to identify where an issue is occurring. System 1* software empowers the engineering team to immediately initiate corrective actions by knowing where best to focus their efforts before more serious problems develop.



Components

The overall system is comprised of a wSIM*, which is a combination wireless sensor interface module and mesh communication node that supports up to four of any mix of vibration and/or temperature transducers. The wSIM nodes communicate through the Network Manager a wireless gateway to System 1 diagnostic software platform.

Software

The Bently Nevada Essential Insight.mesh system and System 1 software platform provide an integrated solution for your plant-wide condition monitoring program. The solution enables connectivity to process control and automation systems for process data correlation. The result is a unified environment for all your condition monitoring needs, whether wired or wireless, online or portable, essential or critical.

Security

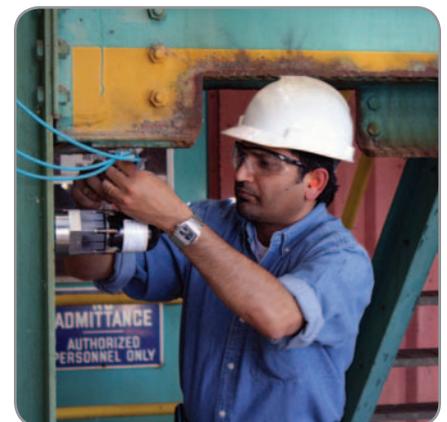
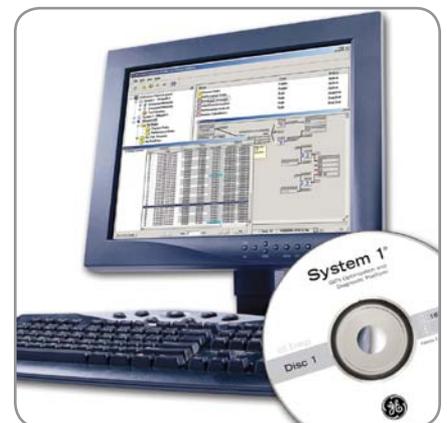
Our solution is based on standards in network communication and security. GE uses standards-based security, the Advanced Encryption Standard (AES, NIST standard FIPS-197). To help ensure the safety of your process and information, we utilize 128-bit AES keys for both join keys and end-to-end message encryption.

Power

wSims and repeaters are powered by an integrated lithium thionyl chloride power pack, or optionally powered by an energy harvester. Energy Harvester technology is an innovative feature that allows the machine's vibration itself to serve as a power source via a miniature moving-coil generator.

Installation

Installation is simplified with the option of either conventional stud-mount or magnetic-mount options for repeaters, wSIM nodes, and transducers. Magnetic-mount options are ideal for applications where you plan to move the wireless mesh system around periodically or simply need to experiment with the ideal measurement location.



Mesh Network

The Essential Insight.mesh system employs advanced mesh networking technology that delivers:

- Flexibility via identical repeaters and wSIM units, resulting in a simple, reliable network structure with simpler spare parts requirements
- Highly scalable network allowing you to start small and add sensors as needed
- Self-forming and self-healing capabilities
- Extreme reliability with higher throughput and decreased congestion via dynamic network communication load balancing

Unlike conventional networks that require each device to maintain direct contact with the host system, a mesh network allows each wSIM node to both receive and transmit messages from other wSIM nodes in their neighborhood. Because each device is an identical peer, if communication links are interrupted, numerous alternate signal transmission paths exist which enhances data and communications integrity.

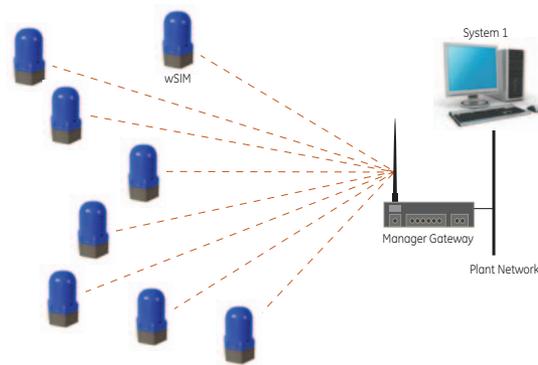
The network is also self-forming, meaning newly securely commissioned wSIM nodes are automatically detected and added to the network.

Interoperability

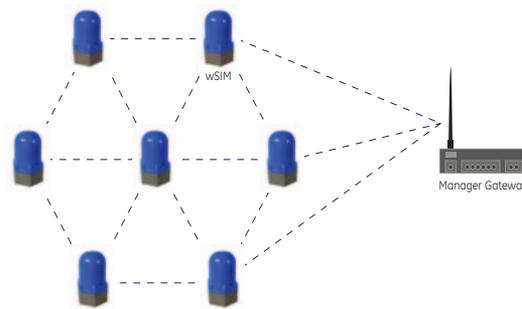
GE is an original member and co-chair on the ISA-100.11a standards and we are fully committed to this standard. ISA-100 is an emerging family of standards for wireless automation and control devices, designed to not only address the rigors of industrial instrumentation and data reliability in such applications, but also to allow wireless devices among different vendors to interoperate.

Proven Technology

The Bently Nevada Essential Insight.mesh system was developed in conjunction with some of GE's most demanding customers



In a conventional network, each field device can only communicate with the wireless gateway, not one another.



In a mesh network, each device is a peer that can talk to other peers, resulting in multiple signal transmission paths, higher reliability, and higher deployment flexibility.

in the oil and gas and power generation sectors. The facilities in which this technology was prototyped, and later proven, combine extremely challenging environments for Radio Frequency (RF) communication interference and aggressive chemical and atmospheric conditions. You can choose the Essential Insight.mesh system with the confidence that it is robust, reliable, and field-proven.

Phased Enhancements

The Essential Insight.mesh system is the first phase in a series of planned enhancements to our wireless offerings that you will see in the coming months. The systems you purchase today will be fully compatible in the coming years.

Ease of Entry

Our innovative Advantage and Basic Packages provide everything you need to quickly and easily monitor your motor-driven assets – today. Both packages enable rapid deployment of 16 points of condition monitoring and allow scalable step-by-step plant-wide roll out.



Changing the Way Plants Are Monitored

The Bently Nevada Essential Insight.mesh enables plant operators to improve plant reliability, availability, and efficiency by extending condition monitoring to their essential assets. By deploying the Essential Insight.mesh wireless solution, plant engineering and maintenance personnel can quickly and easily start monitoring their balance-of-plant to better understand asset health and help improve overall plant reliability.

Visit ge-energy.com/bentlywireless today for more information on how the Essential Insight.mesh system can help improve your plant reliability today!



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