



PREDICTIVE MAINTENANCE SYSTEM

Maximize production and profits with IIoT



PREDICT FAILURES. PREVENT DOWNTIME. ENHANCE SAFETY.

- Cost-effective, end-to-end wireless condition monitoring solution capable of providing real-time, sensor-based insight into almost any industrial application.
- Actionable insights to aid decision-making provided in the cloud via WiFi or LTE and/or in the PLC via EtherNet/IP™ or Modbus TCP/IP.
- User-friendly and intuitive web application combined with secure data storage provides boundless opportunities for data retrieval, visualization, analysis, and reporting.
- Grace's expert technicians will be with you every step of the way for a smooth transition and ease-of-integration, from personnel training to ongoing support.
- Worker safety is enhanced by reducing hands-on and unplanned reactive maintenance activity.

FOR MORE INFORMATION VISIT GRACESENSE.COM OR CALL 1.800.280.9517

SYSTEM OVERVIEW

The field proven GraceSense™ Predictive Maintenance System is an asset condition monitoring system that utilizes wireless sensor technology integrated alongside wired sensors. Advanced data analytics provide asset managers with deep insights to machine health to effectively prioritize resources and maximize the value of their maintenance spend. GraceSense™ technology improves overall plant reliability, safety, and maintenance metrics by remotely monitoring asset health and sending timely notifications to plant floor personnel through SMS or email alerts with pre-configured, step-by-step remediation instructions when anomalous behavior is detected.

1 VIBRATION & TEMPERATURE NODE



Rugged wireless sensor nodes that monitor vibration and temperature to insightfully assess the health of rotating equipment. Using advanced edge processing and IEEE 802.15.4 ZigBee compatible communication, these nodes enable plant floor personnel to continuously monitor equipment, detect defects, and predict health on any rotating equipment. Multiple mounting options ensure quick deployment across applications in any industry. Easy to replace batteries deliver 3-5 years of life, dependent on use.

2 PANEL-MOUNT™ NODE



A cost-effective solution to bring in hardwired third-party sensors via 0-10V, 4-20mA, as well as serial communication over RS485 from devices like the Hot Spot Monitor (HSM). Configurable hardware architecture with a wide selection of inputs, transducers, radios, and power options. Nodes can be mounted in our IP65 environmentally rated housing.

3 GATEWAY (CLOUDGATE™, CONTROLGATE™, COMBOGATE™)



GraceSense™ gateways transfer accumulated field node information to an actionable troubleshooting platform via our Maintenance Hub Cloud and/or your PLC, SCADA, DCS system. Choose one of the following three configurations: Appearance of product shown below may change based on final product configuration.

CLOUDGATE™



CloudGate™ transfers field node information to the browser-based Maintenance Hub where actionable, real-time insights are provided. This WiFi or LTE configuration can provide cloud-based support to all of the GraceSense™ wireless nodes within a 30m radius, making the architecture massively scalable. In addition, third-party sensors can be hardwired into this gateway configuration.

CONTROLGATE™



ControlGate™ is the gateway into plant floor control systems for GraceSense™ Vibration & Temperature Nodes. This gateway configuration provides users quick integration into their control network via PLC/SCADA and EtherNet/IP™ or Modbus TCP/IP communication options. In addition, third-party sensors can be hardwired into this gateway configuration (*coming soon*).

COMBOGATE™



ComboGate™ is a hybrid configuration of the CloudGate™ and ControlGate™ configurations. This option will securely provide data to both PLC/SCADA/DCS systems using EtherNet/IP™ or Modbus TCP/IP as well as featuring communication options for field node information transfers to the Maintenance Hub via LTE or WiFi. In addition, third-party sensors can be hardwired into this gateway configuration (*coming soon*).



4 HOT SPOT MONITOR (HSM)

GraceSense™ Hot Spot Monitor (HSM) is a continuous, non-conductive temperature monitoring device that detects potential hot spots and alerts personnel of abnormalities in electrical equipment. Integrating the HSM with a panel-mount node will allow data from the HSM to be remotely monitored in the browser-based Maintenance Hub (HSM must be hardwired into a Panel-Mount Node to enable cloud connectivity). For more information on the Hot Spot Monitor (HSM) please refer to the product specific datasheet.



5 MAINTENANCE HUB

The Maintenance Hub is a browser-based interface that provides real-time asset statuses using dashboards, plot trends, and analytics. Hosted either in the cloud or on a local server, the Maintenance Hub displays system information, generates reports, and issues alerts via SMS and email containing actionable step-by-step remediation instructions. An open API lets you share data and alerts with existing systems (i.e. CMMS, SCADA, DCS).



6 SERVICE OFFERINGS

Grace Technologies provides an ease-of-integration experience for the entire GraceSense™ Predictive Maintenance System. Our expert technicians ensure a successful transition into the system through a variety of services offerings. These services include Cloud-based monitoring, installation oversight with setup assistance, routine node maintenance, and personnel training. On-site, remote, or a combination of services thereof will instill confidence knowing the system is properly set up, monitored, and maintained to provide actionable information and help maintenance teams make the best predictive maintenance decisions.

A Leading Automobile Manufacturer
has seen

15X ROI in 24 Months

GraceSense™ Predictive Maintenance technology captured **28 Million data points** and provided alerts that prevented eight downtime incidents, **avoiding over \$2 Million in losses.**



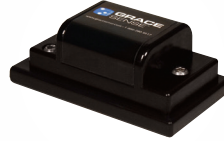
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GraceSense™ Cloud or On-Premises



FIELD-MOUNT™ VIBRATION & TEMPERATURE NODE TECHNICAL SPECIFICATIONS



SERIES	G-FM-VBT1	G-FM-VBT2	G-FM-TMP1
Mounting	Epoxy, Stud, Magnetic Mount, Steel Plate, Fin Mount		
Local Wireless Protocol	IEEE 802.15.4, Range: 30m Line of Sight		
Antenna Type	2.4GHz Patch Antenna via Battery or External 2.4GHz SMA Antenna via Expansion Module		
Operating Frequency	2400 - 2483.5 MHz		
Edge Processor	ARM Cortex M4 32-bit 120MHz with FPU		N/A
Accelerometer	Tri-Axial MEMS		
Sampling Rate	Up to 1600 Hz	Up to 25.6kHz	
Bandwidth	800 Hz	4600 Hz (XY), 2200 Hz (Z)	
Measurement Range	Software Selectable: ±2g, ±4g, ±8g, ±16g		
Resolution	16-bit		
Temperature Range	Operating Range: -35°C to 80°C		Measuring Range: -35°C to 80°C
Environmental Ratings	IP66; Other Ratings Pending		
Power Source	Replaceable, Non-Rechargeable Lithium Metal Battery and/or 24V DC via Power Expansion Module		
Battery Life	3 - 5 Years (use dependent)	2 - 4 Years (use dependent)	5 - 10 Years (use dependent)
Warranty	2 Years		
Optional Accessories	Power and Expansion Modules for 24V Power, Triggering, and Remote Antenna		

POWER AND I/O EXPANSION MODULES

Expansion modules allow for advanced capabilities for any field mount node to be able to handle tasks in the field.



Fully Assembled Vibration Temperature Node with Expansion Module (Vibration & Temperature Node sold separately)

PART NUMBER	DESCRIPTION
G-FM-ACC-EXP-PIO1	External Antenna, 24V DC Power/Triggering, and Battery Configuration
G-FM-ACC-EXP-PIO2	External Antenna and Battery Configuration
G-FM-ACC-EXP-PIO3	External Antenna and 24V DC Power/Triggering Configuration
G-FM-ACC-EXP-PIO4	24V DC Power/Triggering and Battery Configuration (NOTE: Battery is a necessary component even when powering with 24V as the battery contains the antenna for local communication.)

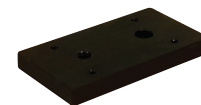
ACCESSORIES



G-FM-ACC-MGB1
Magnetic Mount
(Applicable only to Field-Mount Series)



G-FM-ACC-FMB1
Fin Mount
(Applicable only to Field-Mount Series)



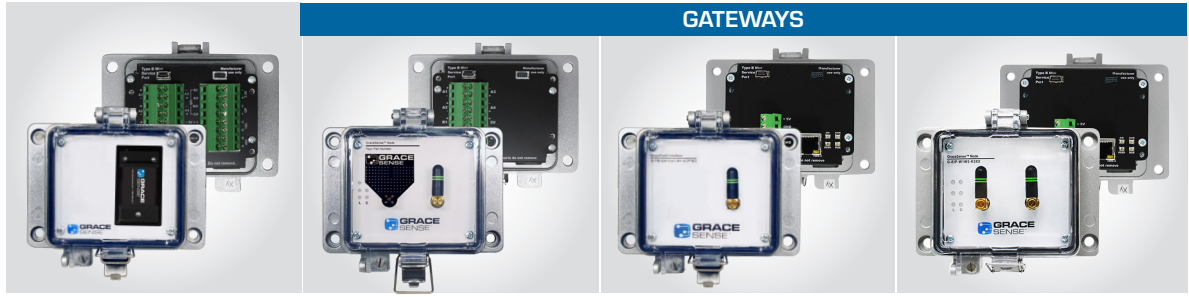
G-FM-ACC-PMB1
Plate Mount
(Applicable only to Field-Mount Series)



G-FM-ACC-BAT3
Replaceable 3.6V 2.8Ah Battery Pack

PANEL-MOUNT™ NODE AND GATEWAY SERIES TECHNICAL SPECIFICATIONS

Appearance of product shown to the right may change based on final product configuration.



SERIES	Node	CloudGate™	ControlGate™	ComboGate™
Mounting	Panel-Mount or Stand-Alone Station <i>(sold separately)</i>			
Local Wireless Protocol	IEEE 802.15.4, Range: 30m Line of Sight			
Antenna Type	Right Angle SMA Whip, 1.8dBi			
Local Communication Frequency	2400 - 2483.5 MHz			
Sensor Channels	Up to 12 Sensor Channels via Terminal block	Up to 6 Sensor Channels via Terminal Block <i>(Coming Soon)</i>		
Sensors Available	Acceleration, Velocity, Current, Temperature, Pressure, Flow, Strain, Load, Fluid Level, Humidity			
Supported Sensor Inputs	4 - 20mA, 0 - 10V, Thermistor, Accelerometer, Strain Gauge, RTD, Thermocouple, Rogowski Coil, Modbus RTU (RS-485)			
Cloud/Control	N/A - Child Only	Cloud: WiFi or LTE	Control: EtherNet/IP™, Modbus TCP/IP	Control: EtherNet/IP™, Modbus TCP/IP Cloud: WiFi or LTE
Max. Number of Connected Nodes	N/A - Child Only	20-30 Nodes Recommended (limited only by the distance to the CloudGate™)	33 Nodes Maximum	
Temperature Range	Operating Range: 0°C to 50°C			
Power Source	All: 24V DC, 5V USB, 5V DC		Panel Mount Node Only: Optional Non-Rechargeable Lithium Metal Battery	
Battery Life	3 - 5 Years (use dependent)	N/A - Must be powered by 24V/5V Supply		
Warranty	2 Years			

ACCESSORIES



G-ACC-PS01
1A Power Supply
120VAC Flying Leads to 24VDC Flying Leads
(Applicable only to Panel-Mount™ Series)



G-ACC-PS02
1A Power Supply
120VAC Plug to 24VDC Flying Leads
(Applicable only to Panel-Mount™ Series)



G-ACC-ENC1
Stand Alone Station
Easily mount your CloudGate™ to the station when a panel is not available.

SUPPORTED THIRD-PARTY SENSORS



G-TD-CTA04-010
100A Split-Core AC Current Transducer with 10' Cables.
0-5V Output that it compatible with AA1 sensor interface.



G-TD-THM01-006
80" Thermistor temperature probe with self adhesive patch.
Temperature range of -80°C to 120°C. Compatible with our AA1 sensor interface.

Please contact Sales for our entire catalog of offerings.

CONFIGURATION OPTIONS

The Grace Sales Team is here to help you configure a part to meet the needs of your application. Contact us at sales@gracetechnologies.com or by calling 1-800-280-9517 and select Option 3 for Technical Support when prompted. Listed below are a variety of configuration options for any application.

G-AA1DA0-W1W2-K3XX



Rear Wired Interface Options: (Choose up to two)			
CODE	OPTION	CODE	OPTION
SENSOR INTERFACE		COMMUNICATION	
XX	No Application Interface (CloudGate only)	EIP	EtherNet/IP™
AA1	(2) 10kΩ inputs (thermistor) and (4) 0-10 VDC Inputs, 12 bit	MIP	Modbus TCP/IP
AA2	(2) 10kΩ inputs (thermistor) and (4) 0-10 VDC Inputs, 16 bit	Multiple sensor procurement options available. Please call us at 1-800-280-9517 for details.	
AB2	(4) 4-20 mA 16 bit		
AC2	(4) 3-Wire RTD's 16 bit		
AD2	(3) 4-Wire RTD's 16 bit		
AE2	(6) Thermocouples, 16 bit		
AF3	(2) Triaxial Accelerometers, 16 bit + Stream Processing		
AG3	(4) Single Axis Accelerometers, 16 bit + Stream Processing		
DA0	(1) I2C Port, (1) RS 485 Port, (1) SPI Port		

Sensor Conditioning not currently available for ControlGate™ and ComboGate™ configurations.

- ControlGate™ Options
- CloudGate™ Options
- ComboGate™ Options (contains one of each ControlGate™ and CloudGate™)

Front Wireless Interface Options: (Choose up to two)	
CODE	OPTION
XX	No Wireless Communication
W1	802.15.4 (Node to Node Communication)
W2	WiFi 802.11 b/g/n
C1	AT&T LTE (standard)
C2	Verizon LTE

Housing Options: (Choose one)	
CODE	OPTION
K2	Type 4X, Panel-Mount Housing
K3	Type 4, Panel-Mount Housing
K4	Type 12, Panel-Mount Housing

Battery Type Options: (Choose one)	
CODE	OPTION
XX	No Battery
B1	2800mAh Non-Rechargeable Lithium Metal Battery

TOP CONFIGURATIONS BY TYPE

PANEL-MOUNT™ NODE

G-AA1AB2-W1-K3XX

Panel-Mount™ node configured with AA1 and AB2 sensor interfaces. AA1 card is configured for 12-bit temperature and current measurement. Can accept up to two thermistors and four 0-5V sensors. AB2 card is configured for 4-20mA. Can accept up to six 4-20mA sensors with 16-bit resolution. Includes a panel-mount IP-65 rated enclosure. Powered by 24V. Has local communication via IEEE 802.15.4 wireless communication (Zigbee).

CLOUDGATE™

G-XX-W1W2-K3XX

CloudGate™ only configured with IEEE 802.15.4 wireless communication and cloud connectivity via WiFi for the CloudGate™ and all of its leaf nodes. Includes a panel-mount IP-65 rated enclosure and powered by 24VDC.

G-AA1-W1C1-K3XX

CloudGate™ configured for up to 2 thermistors and 4 analog based sensors. Has IEEE 802.15.4 wireless communication and cloud connectivity via AT&T LTE for the CloudGate™ and all of its leaf nodes. Includes a panel-mount IP-65 rated enclosure and powered by 24VDC.

CONTROLGATE™

G-MIP-W1-K3XX

ControlGate™ configured for IEEE 802.15.4 wireless communication (Zigbee compatible), and Modbus TCP/IP using RJ45 Ethernet port. Allows for integration with Modbus TCP/IP enabled controllers including data from the ControlGate™ and all of its leaf nodes. Includes a panel-mount IP-65 rated enclosure. Powered by 24VDC. No cloud connection to Maintenance Hub.

COMBOGATE™

G-EIP-W1C2-K3XX

ComboGate™ configured for IEEE 802.15.4 wireless communication (Zigbee compatible), cloud connectivity via Verizon LTE, and EtherNet/IP™ using RJ45 Ethernet port. Allows for simultaneous Cloud connection to the Maintenance Hub as well as integration with EtherNet/IP™ enabled controllers including data from the ComboGate™ and all of its leaf nodes. Includes a panel-mount IP-65 rated enclosure. Powered by 24VDC.

HOT SPOT MONITOR (HSM)

The Hot Spot Monitor (HSM) continuously monitors, logs, alarms, and enables the user to trend temperature variations that are indicative of a potential fault. As a component of the Predictive Maintenance System, when the HSM is integrated with a facility's Electrical Preventive Maintenance (EPM) program, as defined in NFPA 70B, the user is enabled to plan and schedule maintenance tasks that will avoid unplanned shutdowns and monetary damages. Plant-wide integration of the HSM is made simple when the device is connected via EtherNet/IP™ or Modbus TCP/IP.



The HSM allows the user to monitor, record and retrieve temperature data for critical connections in electrical equipment. The unique non-conductive fiber optic technology with secured connections allows simple field installation in low, medium, and high voltage electrical systems up to 80kV. Grace's safety-by-design philosophy combined with the HSM's remote monitoring capabilities eliminates the exposure to high incident energy and loss of production due to unplanned shutdowns.

Current flowing through loose electrical connections is the leading cause for electrical hot spots. The integrity of internal bolted connections and potential hot spots can be compromised when electrical equipment is subjected to wide load fluctuations or high harmonics in electrical connections of power distribution systems such as busbars, MCCs, drive panels, switchgear, bus ducts, and more. Monitoring these critical connections continuously with the HSM is crucial to protect personnel while enabling them to predict and prevent unplanned downtime. **For more details, refer to our GraceSense™ Hot Spot Monitor (HSM) Datasheet.**

SAFETY BY DESIGN

This two-pronged approach of enhancing worker safety and maximizing productivity is exactly what the HSM was built to achieve. With the benefit of monitoring temperature behind closed doors, personnel are made safer by eliminating the risk of energy exposure during routine open-door thermography inspections. This method of closed-door thermography has been attempted using IR viewing windows, however, users have found that there are often obstructions in their field of view when taking a temperature reading through a window, leading to critical connection failures that go unnoticed. **For more information, refer to our FREE Hot Spot Monitor (HSM) eBook.**

ACCESSORIES (SOLD SEPARATELY)



Probes - Set of 3
10M (G-HSM-FB3-L010)*
15M (G-HSM-FB3-L015)



Ring-Style Lug - Set of 3
.25in (G-HSM-LG D250)
.375in (G-HSM-LG-D375)
.50in (G-HSM-LG-D500)*



High-Temperature Probe
(G-HSM-FB-HT)



Ambient Probe
Inside (G-HSM-AI)
Outside (G-HSM-AO)



MODBUS Current
Sensor
(G-HSM-MCS)

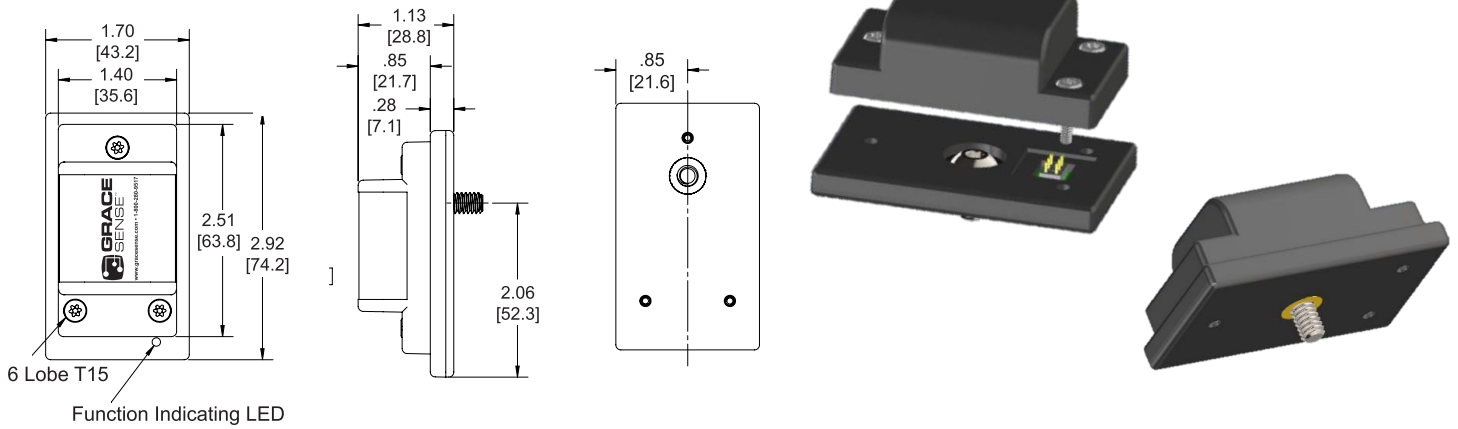
**Included in HSM Kits along with a Probe Tightening Tool, Fiber Trimmer and Quick Start Guide.*

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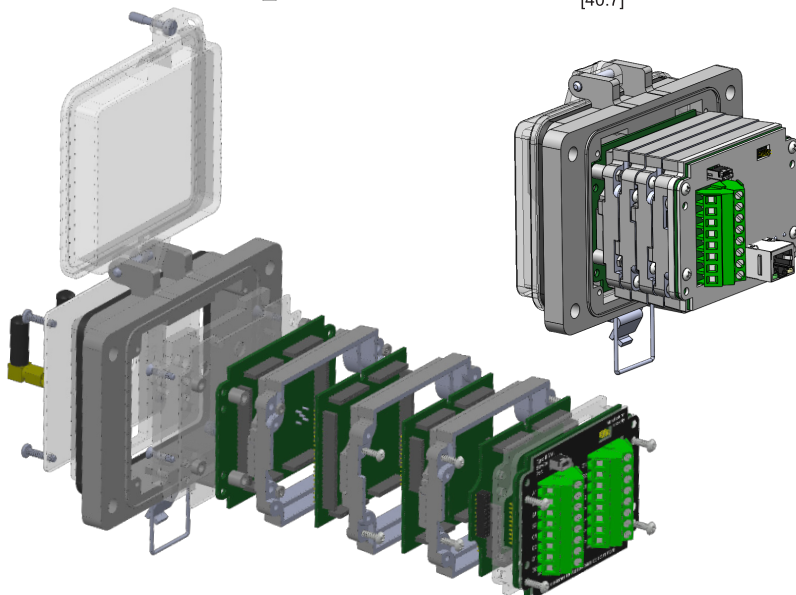
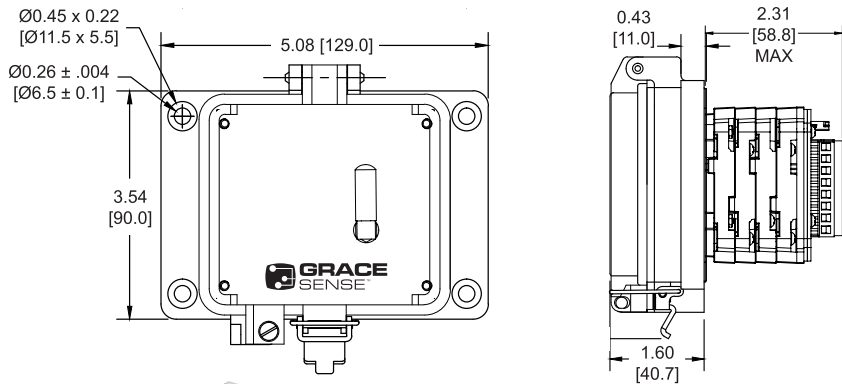
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DIMENSIONS & DETAILS

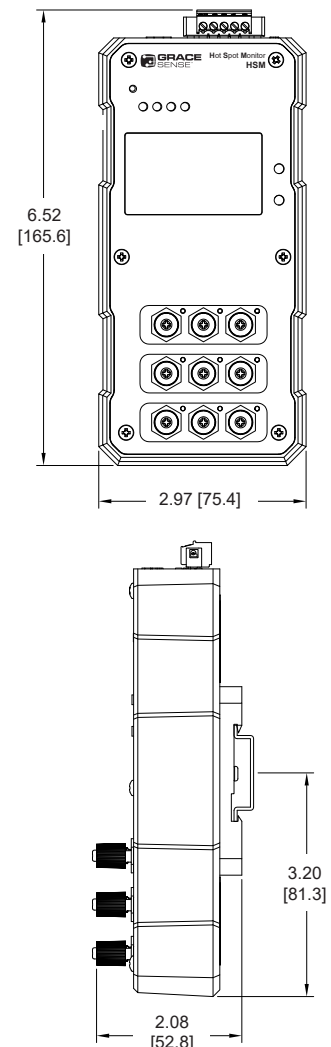
Field-Mount Node



Panel-Mount™ Node, CloudGate™, ControlGate™ or ComboGate™



Hot Spot Monitor (HSM)



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MAINTENANCE HUB

The Maintenance Hub enables users to interface with their Predictive Maintenance System. This browser-based interface translates sensor data from field-mount and panel-mount nodes and displays the health conditions of critical assets. When potential failures in monitored equipment are detected the system will determine what is wrong and immediately alert personnel to the impending problem.



With the entire power of the Predictive Maintenance System at your fingertips, users can view real-time system information, generate reports, and configure alerts that are distributed via email and/or SMS. Our fully customizable alert capabilities within the Maintenance Hub allows users to create preconfigured alerts with actionable step-by-step remediation instructions, pictures of monitored equipment, and recommended tooling for repair. Alerts can be distributed to specific maintenance personnel depending on their work schedule and familiarity with the monitored equipment.

GraceSense™ Vibration & Temperature Nodes and gateway configurations (CloudGate™ and ComboGate™) can all be configured and brought online within the Maintenance Hub. An open API allows configurations, data, and alerts to be shared with existing systems (i.e. CMMS, SCADA, DCS) and the Hub has some other unique capabilities such as an on-premise audit tool and the ability to set multiple alert levels per channel.

DATA SERVICES

Grace Technologies provides complete flexibility via on-premises, Cloud-Based, and hybrid monitoring solutions. Through the Maintenance Hub, the Cloud provides full analytic capabilities of sensor data gathered to monitor asset health and optimize maintenance expenses. A Cloud subscription through LTE connectivity is intended to help facilities have a quick and simple deployment. With a gateway configured as a CloudGate™ or ComboGate™ with an LTE or WiFi module, it can provide Cloud-based support to 100 or more wireless nodes within a 30m line-of-sight radius, making the architecture massively scalable. Grace Technologies offers data service packages for data storage, visualization, and reporting through the browser-based Maintenance Hub. Customers with LTE gateway configurations may also procure data plans from Grace.

MAINTENANCE HUB PACKAGES

PART NUMBER	DESCRIPTION
G-DSP-025-1 G-DSP-025-3 G-DSP-025-5	Cloud Based Support for 25 channels for 1,3, or 5 years.
G-DSP-050-1 G-DSP-050-3 G-DSP-050-5	Cloud Based Support for 50 channels for 1,3, or 5 years.
G-DSP-100-1 G-DSP-100-3 G-DSP-100-5	Cloud Based Support for 100 channels for 1,3, or 5 years.
G-DSP-250-1 G-DSP-250-3 G-DSP-250-5	Cloud Based Support for 250 channels for 1,3, or 5 years.
G-DSP-500-1 G-DSP-500-3 G-DSP-500-5	Cloud Based Support for 500 channels for 1,3, or 5 years.

LTE DATA PLANS *(One package required per LTE Gateway)*

PART NUMBER	DESCRIPTION
G-DSP-LTE-VZW-1 G-DSP-LTE-VZW-3 G-DSP-LTE-VZW-5	Verizon LTE for 1, 3, or 5 years
G-DSP-LTE-ATT-1 G-DSP-LTE-ATT-3 G-DSP-LTE-ATT-5	AT&T LTE for 1, 3, or 5 years

NOTE: WiFi communication options are available for CloudGates™ and ComboGates™ and are included in the price of a Maintenance Hub Package.

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SERVICE OFFERINGS

The entire Predictive Maintenance System is designed to provide ease-of-integration through our full-service monitoring packages and individual service offerings. For example, with the presale Initial Condition Assessment, our IIoT Application Engineers will provide an on-site audit of equipment to be monitored and work directly with your team to define your goals, review integration plans, and calculate your ROI.



Upon completing the assessment, we will dedicate oversight by an IIoT Application Engineer to address any questions or issues and provide guidance throughout the deployment of your Predictive Maintenance System. We understand that each application is different and offer custom application engineering solutions for hardware and/or analytics development to meet your precise needs.

MONITORING PACKAGES

Grace offers a wide variety of customizable monitoring packages with three levels of services: Free, Silver, & Gold. Included in every Predictive Maintenance System deployment is guaranteed remote Technical Support during our normal hours of operation, a customer success program, and annual installation base evaluations.

In addition, Grace will provide a full-service warranty for all GraceSense™ hardware. Upgrading to Silver will provide an extended warranty on hardware, annual on-site training, and quarterly reviews of the system. Our Gold monitoring package provides monthly node battery health and on-site system and reliability reviews, remote consulting, an Initial Condition Assessment for new equipment, and more. ***To learn more about what services are included and can be added, refer to our GraceSense™ Service Offerings Datasheet.***

CYBERSECURITY

The entire GraceSense™ family of products have been developed with your cybersecurity in mind and can be locally hosted for additional security. GraceSense™ Nodes are designed to communicate with each other using an encrypted and proprietary IEEE 802.15.4 protocol and cannot be addressed from outside of our proprietary local network. Our GraceSense™ Gateways securely transmit local data to our cloud-based Microsoft Azure databases for storage.



The system users access data through our secure Microsoft Azure-hosted web application built with SSL for end-to-end encryptions. New users added to the Maintenance Hub must go through a two-factor authentication step in order to be approved by the system's administrator.

IIoT SUCCESS STORY

GraceSense™ Predictive Maintenance technology was recently deployed at a Leading Automobile Manufacturing Stamping Plant. Like many automotive stamping plants, this facility encompasses millions of square feet and houses more than a dozen stamping lines. These lines usually operate 20 shifts per week and produce parts that are shipped to numerous other facilities across the United States and around the world.

During an initial pilot at the Stamping Plant, the GraceSense™ Predictive Maintenance System captured nearly 28 million data points over a 24-month period. In that time, a swift return on investment was realized as the system provided alerts that prevented eight downtime incidents, preventing over \$2M in losses and providing a 15X ROI over the life of the project.

FOR MORE INFORMATION VISIT [GRACESENSE.COM](https://www.gracesense.com) OR CALL **1.800.280.9517**

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FREQUENTLY ASKED QUESTIONS

Q: What is the wireless local communication protocol between the node and gateway?

A: The wireless Vibration and Temperature Node (or Panel Mount Node) utilizes an IEEE 802.15.4, Zigbee compatible protocol to communicate with the gateway.

Q: How far apart can the GraceSense™ Wireless Nodes and a Gateway be installed?

A: The maximum range between the Wireless Node and the Gateway is 30 meters line of sight.

Q: What is the difference between a Panel Mount Node and the different gateway options?

A: A Panel Mount Node acts as a child in the network and requires a Gateway in order to get their data to the Maintenance Hub cloud and/or control system. They are typically just used to bring in hardwired third party sensors.

A CloudGate™ uses WiFi or LTE to bring its data and data from any of its children to the GraceSense Maintenance Hub cloud.

A ControlGate™ uses EtherNet/IP™ or Modbus TCP/IP to bring its data and Field-Mount Node data into the control system.

A ComboGate™ combines the functionality of the CloudGate™ and ControlGate™ to bring data to the Maintenance Hub and Control System at the same time.

Q: How many wireless nodes can a Gateway support?

A: The number of wireless nodes a gateway can support depends on the configuration of the gateway. A CloudGate™ can support hundreds of nodes but 20-30 nodes is recommended for any Gateway. A ControlGate™ or ComboGate™ can support up to 33 nodes, depending on options selected..

Q: What if I do not want to use WiFi or no WiFi network is present?

A: If there is no WiFi network present for the CloudGate™ or ControlGate™, we do offer 4G LTE options via Verizon or AT&T. Some customers also use this option to simplify the wireless setup during pilot projects.

Q: What different types of systems can be done with the GraceSense™ Predictive Maintenance System?

A: We offer a wide range of sensing options to meet our unique customer needs. The most common sensing types are temperature, vibration, and current. We offer a variety of sensing types that can be brought in on a 4-20mA or 0-10V analog channel. Different applications will require specific sensing types including flow, pressure, humidity, and more. These can all be brought in using third party sensors and our panel mount node or gateway options.

Q: Can I use my company's data plan for an LTE cloud connection?

A: While we could use your companies AT&T or Verizon plan, our LTE nodes utilize a machine-to-machine IOT plan that may not be supported by your company plan. Typically customers choose to utilize the Grace data plan.

Q: What is an Sensor Interface and why should I use it?

A: A Sensor Interface is essentially in I/O module. This allows for additional data types; providing a more complete condition monitoring solution. For example, in a motor monitoring application, you may include a 0-10V or 4-20mA Current Transducer to measure motor current draw in addition to Vibration & Temperature monitoring provided by our nodes..

Q: Can I bring data from the nodes into my PLC or SCADA/DCS system?

A: Yes you can. The main way is to use a ControlGate™ or ComboGate™ to bring in the tags via EtherNet/IP™ or registers via Modbus TCP/IP. Additionally, you could use a RESTful API that allows 3rd party software to pull the data they need from our Maintenance Hub cloud interface.

Q: What is the warranty on the GraceSense™ Predictive Maintenance System?

A: The warranty on the GraceSense™ Predictive Maintenance system is 2 years, excluding the battery.



For a complete listing of Frequently Asked Questions please scan the QR Code to the left to go to our Knowledge Base.