



ProSmart[®]

Predictive Condition Monitoring



ITT

ENGINEERED FOR LIFE

ProSmart[®]

Identifying and Solving problems before they impact production.

*"Time is the most valuable thing
a man can spend."*

– Theophrastus, Philosopher

MINIMIZING PROCESS DOWNTIME

Early warning and advanced diagnostics enable maintenance activities to be planned instead of reactive.

ADVANCED DIAGNOSTIC TOOLS

Tying together both machinery health and process conditions, ProSmart speeds your root cause diagnosis.

CONTINUOUS MONITORING OF MACHINE HEALTH

Automated data collection and analysis every 5 seconds; saving you time from routine data collection.

AUTOMATIC NOTIFICATION OF MACHINERY ISSUES

Resources focus only on machines in need, maximizing productivity.

Applications

Primary Services

A machine does not have to be a critical asset to have a massive impact on plant production when it goes down. Unfortunately, it is a costly proposition to continuously monitor anything but your most critical machines. ProSmart solves this problem by providing near continuous monitoring on machines at an installed cost that is fractions of traditional systems.

Remote Locations

Monitoring hundreds of small cogeneration plants, each with 20-30 pieces of rotating equipment, created a significant challenge. How do you ensure equipment availability and uptime without adding dedicated resources to each plant? ProSmart® solved this by providing data collection and advanced analysis capabilities to each machine, all tied into one system and providing access worldwide and to the best vibration analysts available.

Problem Solving

Periodic bearing failures on your compressor are more than just aggravating; the repair costs and lost production is costly. The challenge of diagnosing problematic equipment is that it typically fails when you're not there. ProSmart has solved this problem by providing the ability to monitor process conditions and motor load conditions in addition to machinery vibration and temperature. Sampling every 5 seconds for 24 hours-a-day means that ProSmart is there when you're not.

Resource Optimization

Walking around and collecting data takes valuable time away from the real capabilities of your vibration analysts – solving problems. In addition, the walk-around misses critical transients and changes in the operating conditions of your equipment, which can lead to faulty conclusions. ProSmart® solved this problem by automating the data collection of your system. This enables your monitoring program to be expanded without having to add hard-to-find resources.



How it Works

Web application...

eliminates software installation and management costs.

Hosted Interface

The ProNet user interface provides the ability to view, analyze, and store data in a secure environment anywhere in the world.

With online reports that range from supervisory overviews to detailed analysis, ProSmart provides benefits to each level of your organization.

Wireless architecture...

reduces installation costs and complexity.

Communication Module

As the gateway to the Internet, the ProSmart® CM provides a secure connection to the ProNet application via LAN, DSL, cellular, or 802.11 wireless routers.

Data Monitor

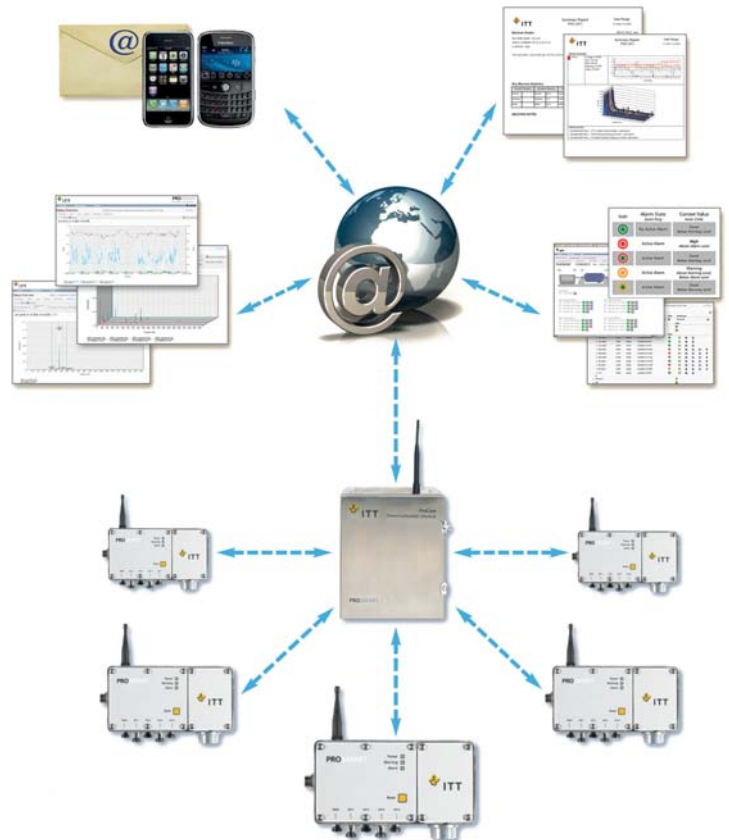
Integrated processing capabilities allow 155 channels of information to be collected every 5 seconds, 24 / 7 / 365.

ProSmart® delivers...

key machinery health data directly to you.

Machine Level

ProSmart can be used to provide continuous machinery monitoring of all your rotating equipment. Standard process signals can be integrated for greater diagnostic capabilities.



Data Acquisition and Analysis

WIRELESS

2.4 GHz 100mW power in FCC unlicensed band provides up to 3 km of point-to-multipoint communication range, in harsh industrial environments.

304 SS

Investment cast enclosure rated for NEMA 4X provides protection in the harshest industrial environments. Approved for Class I - Division 2, Group ABCD T4 hazardous areas. Engineered to be forgotten.



TACHOMETER

Plug & Play connection for tachometer input simplifies and speeds field installation.

VIBRATION / TEMPERATURE

Plug & Play connections simplify and speed field installation of the ProSmart Vibration/Temperature sensors. Each sensor is capable of monitoring 3 axes of vibration and temperature conditions.

SIMPLIFIED CONNECTIONS

Easy-to-access terminal blocks for power and process signals easy installation. Required 12-24VDC input power readily available from flexible sources.

- Qty 3 4-20 mA Inputs
- Qty 2 Digital Inputs
- Qty 1 Form-C Relay

Processing Power

A powerful digital signal processor, capable of analyzing 155 channels of data every 5 seconds, including 4,000 lines spectrums on 12 channels of vibration data, the ProSmart® DM22x brings intelligence to your machines.



ITT SMART BATTERY MODULE

- 304SS Investment case enclosure
- Rated for CID2 Group ABCD T4
- Plug-n-Play power connections
- Rechargeable Lithium-ion Batteries



ITT VT-03

- 3-Axis Vibration & Temperature
- MeMs based accelerometer
- Dynamic range +/- 6G
- 6-3,500 Hz



IMI VS-03/VS-01

- 3-Axis Vibration or Single Axis vibration with Temperature
- Piezoelectric based accelerometer
- Dynamic range +/- 15G
- 6-3,500 Hz



ITT ST-02

- Inductive Speed Sensor
- 5 mm sensing range



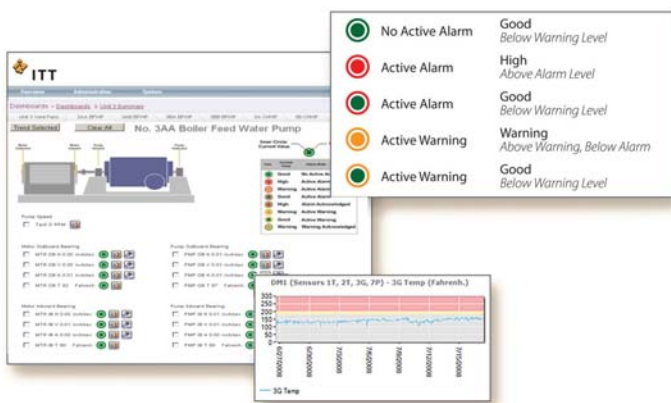
PROCESS TRANSMITTERS

Ability to integrate any standard process signal adds diagnostic capability

ProNet

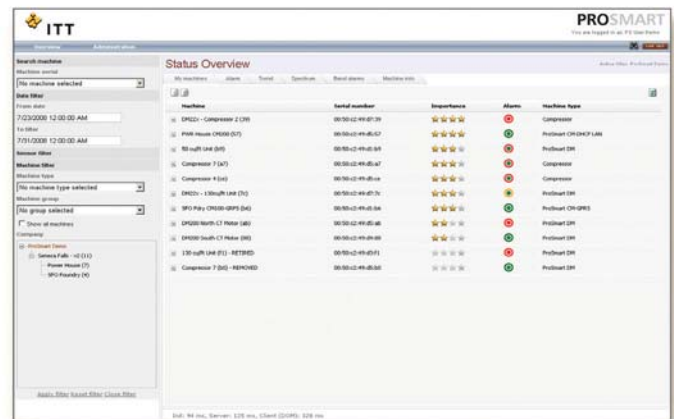
Dashboards

Dashboards take the abstract nature of your machine data and tie it into a visual representation of your machine. ProNet uses easy-to-understand status circles to quickly identify the condition of each machine. A rollover "quick-view" plot of critical data can be viewed from the Dashboard.



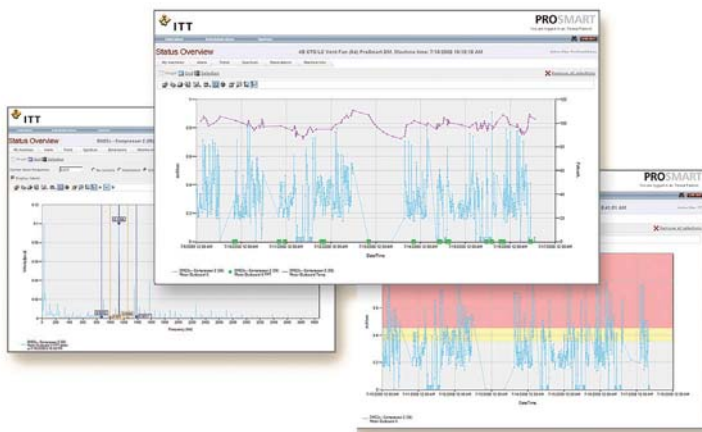
My Machines

ProNet provides the ability to easily manage the machine you are monitoring by automatically sorting machines based upon user-defined machine importance, then by alarm state. Status circles on each page quickly and easily identify machine condition.



Trends

ProNet provides the ability to trend and overlay data to easily visualize the interaction between different signals and perform root cause diagnosis. Advanced analysis tools, such as time waveform and spectral data with harmonic and side band cursors, are available.



Reports

Reports can be easily created and published on a periodic basis. Report options include statistical averages of key sensor data, overall trends with high-low-averages, and notes and actions taken on different alarm conditions.



Technical Specifications

| | | | |
|---------------------|--|-----------------------|---|
| INPUT VOLTAGE | External 12-24 VDC or Smart Battery Module | RADIO FREQUENCY | 2.4 GHz FHSS ¹ |
| VIB/TEMP SENSOR | 12 channels vibration 4 channels temp | RADIO OUTPUT POWER | 100 mW |
| TACHOMETER INPUT | 1 channel | WIRELESS PROTOCOL | Proprietary FHSS |
| 4-20Ma ANALOG INPUT | 3 channels 12 Ω resistance | WIRELESS ARCHITECTURE | Point-to-Multipoint |
| DIGITAL INPUT | 2 channels | TRANSMITTING RANGE | 1.6 miles LOS ² typical 650-130 ft |
| FORM-C RELAY OUTPUT | 1 channel resistive load | NETWORK PROTOCOL | Standard Ethernet |
| SAMPLING CYCLE | 5 seconds | NETWORK ADDRESSING | DHCP or Static IP |
| ANALYSIS DATA | FFT Spectrum and Time Waveform | GUI ENCRYPTION | 128 Bit SSL |
| FREQUENCY RANGE | 5-3500 Hz | GUI BROWSER | Internet Explorer |
| SPECTRAL BANDWIDTH | 1 Hz and 0.25 Hz | NETWORK CONNECTIONS | LAN/DSL, GPRS/GSM/CDMA Modem ModBus/TCPIP Slave |
| DATA BLOCK LENGTHS | 1024 AND 4096 | OPERATING TEMPERATURE | -40°C to 70°C (-40°F to 158°F) |
| WINDOWING | Hanning | CERTIFICATION | CSA, FCC, Class 1 Division 2 Group ABCD T4, C-Tick |

¹ Frequency Hopping Spread Spectrum

² Line of Sight

Improving Plant Profitability

Our products leverage over 160 years of process machinery knowledge and provide enhanced control and continuous monitoring, yielding increased UPTIME and decreased MAINTENANCE and ENERGY costs. The ProSmart predictive monitoring system identifies and solves problems before they impact production. Our PumpSmart® control products provide advanced process control, valuable process

knowledge without the need for additional sensors, enhanced reliability through failure prevention, and significantly lower energy costs – up to 65%. The 3196 *i-FRAME*[™] provides early warning of improper operation before catastrophic failure through daily monitoring of thrust bearing vibration and temperature. LEDs provide operators a visual indicator of equipment health.



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PumpSmart



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3196 *i-FRAME*[™]