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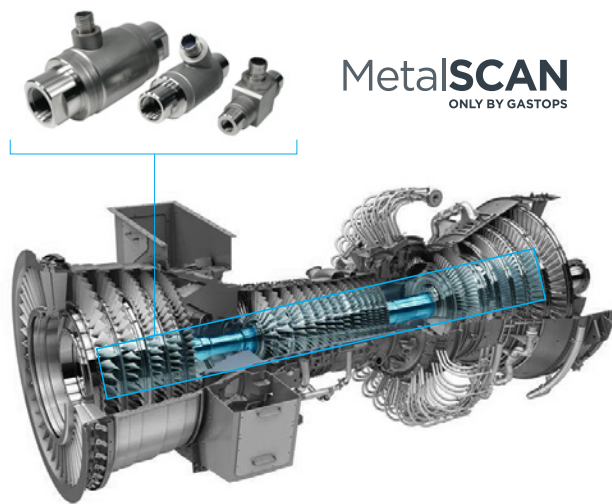
MetalSCAN MS4000 SERIES FOR GE LMS100 (SUPERCORE) GAS TURBINES

Real-time damage detection. Anytime. Anywhere.

MetalSCAN enables gas turbine operators to maximize equipment availability by providing the industry's earliest advance warning of potential damage events.

Overview

Designed for the GE LMS100 gas turbine engine, the MetalSCAN online oil debris system easily installs into the gas turbine lube oil scavenge line.

MetalSCAN is a full flow, nonobstructive, online debris detection system designed to detect the onset of surface fatigue of bearings and gears. It is used as a condition monitoring device to determine the condition of the gas generator, accessory gearbox and Power Turbine (if fitted).

MetalSCAN multi-sensor oil debris monitoring system is installed upstream of the scavenge pump in the individual oil scavenge lines, allowing the enhanced monitoring of individual sump debris detection.

The engine and accessories are monitored continuously, allowing for early detection and tracking of the progressive deterioration of any damaged bearings or gears in real time.

The sensors are installed in the lubrication oil lines with standard flanges and fittings adapted to the turbine configuration.

Several convenient data communication options are available to suit specific needs including direct connection to the engine controller, an existing Host Monitoring System, or by a fully standalone PC connection.
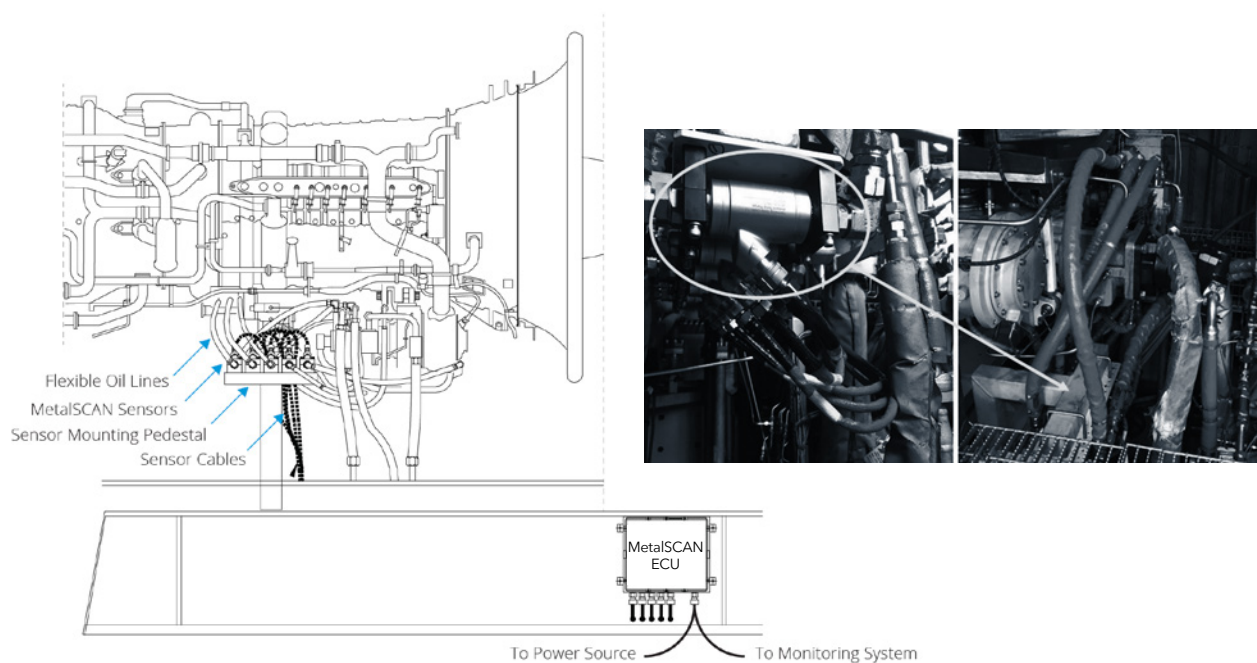
Physical Installation

Five MetalSCAN sensors are plumbed into the five oil scavenge lines (A-Sump, B-Sump, C-Sump, D-Sump, and the Accessory Gearbox Sump). Each sensor is mounted on a stand which is secured inside the engine enclosure. They connect individually to the MetalSCAN Electronic Control Unit (ECU) mounted to the outside of the engine enclosure via 20-ft. sensor cables.

The installation hardware, sensor stand, brackets, and warning/alarm limits for the five sensors are included in the installation kit.
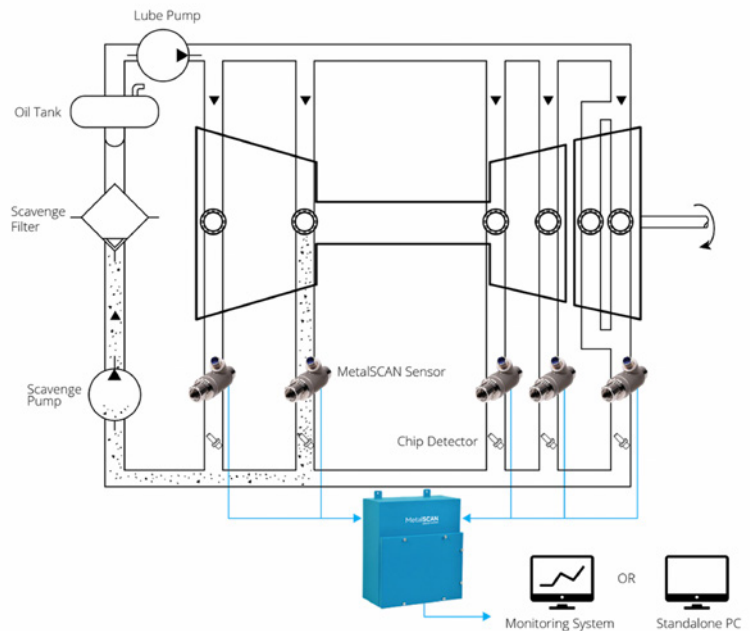
MS4000 Multi-Sensor System

MetalSCAN Installation into Scavenge Lines on GE LMS100 Engine

Physical Installation

The ECU is connected via RS485 Modbus protocol serial communication to a host PC computer or directly to the facility control system.

The entire installation of the MetalSCAN system can typically be completed in less than two days with Field Service Support for installation supervision and commissioning available from Gastops.

Proven and adapted solutions for the LMS100 turbine, MetalSCAN oil debris sensors install easily into the oil scavenge lines.

Option 1
Direct Integration

OR

Controller   Monitoring System

Option 2
Gastops Integration

> MetalSCAN Monitor
> Connect Monitoring Services

MetalSCAN Benefits Summary

	Guideline	Benefit Summary
Data	Individual sump debris detection	Allows for individual sump isolation
	Earliest indication	Damage particles reach sensor immediately
	Trending & limits	Trend to sump alarm or combined alarm
	Remote monitoring	Less local involvement
Actions	Active load adjustment	Load reduction to augment RUL trend projection
	Troubleshooting	Early detection enhances advanced troubleshooting
	Proactive planning	Early detection and trending supports planning
	Peaker operation	Opportunity for a more affordable and easy retrofit
ROI	Savings delivered	User feedback: $100k to $1M+ per detection event
	Repair benefits	Damage has been isolated early and did not spread
	Cost	Installation < 1 day (single) vs 2 days (multi)

Condition Monitoring

Once installed, the sensors detect the presence of metallic particles to provide early detection, identify severity, and provide remaining life indication of the bearings and gears located deep within the equipment.

The MetalSCAN sensors detect metal particles above the minimum size threshold and provide particle data, equipment condition and self-diagnostic information to the engine controller, an existing Host Monitoring System, or via an optional standalone PC.

The information collected by each sensor is compared to pre-established machinery condition indicators. These condition indicators are based upon simple criteria which determine whether the equipment is healthy. When damage is detected, condition indicator models help determine how much damage there is and how much longer the equipment can be operated before a potential failure. All analysis is performed locally to the ECU and subsequently transmitted to a host monitoring system.

Increased insight and visibility into the health of the equipment allows for proactive health assessment, enabling effective maintenance planning and empowering operators with real-time knowledge of equipment health.

Software and Services

When connected through the local RS-485 network, MetalSCAN can be interfaced to a MetalSCAN Monitor, a completely client-hosted stand-alone software platform that enables operators to host, monitor and analyse the data locally. MetalSCAN Monitor is a user-friendly software that lends itself to operators with all levels of experience and is designed for monitoring all types of gas turbines and fleet sizes. MetalSCAN Monitor also allows operators to interface to external data acquisition or monitoring systems.

MetalSCAN Monitor can be connected to Gastops Connect Monitoring Services Web-portal, enabling a complete Condition Assessment and Analytics Monitoring Service. The portal provides users with detailed health indicators for each asset, a customisable watchlist for the entire fleet and fully customizable warning, alarm and event notifications. Data is posted on the portal near real-time and allows for customized reporting and cross comparisons of assets by type, location, or any other key characteristic. Operators can also import data and reports in several supported formats or interface to 3rd party systems via a Rest API.

Users can easily subscribe and renew their MetalSCAN Support Service Package which includes monitoring by the Gastops analytics team along with monthly reporting on key health indicators for each turbine, as well as observations and recommendations for the entire fleet.
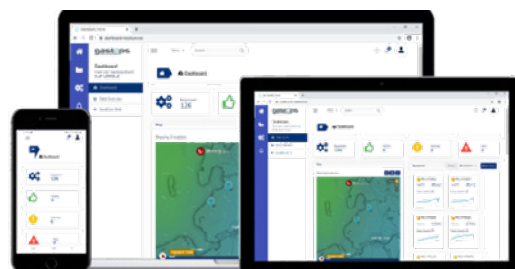
Ordering Information

MetalSCAN System and Installation Kit Order Codes

To place an order or request a quote, email us at **sales@gastops.com** or call **+1 613 744 3530**.

Turbine Type Order Code	MetalSCAN System	Installation Kit Order Code
LMS100	MS4000 System - 5M	Contact Gastops

Options and Accessories

To help you integrate the MetalSCAN MS4000 or MS4110 System into your equipment, we offer options and accessories such as computers, ATEX barrier kits, junction boxes, stainless steel enclosures, as well as software and remote services.

Product	Order Code
MetalSCAN Computer (PC or Laptop)	Option - 01A
MetalSCAN Industrial Computer (CPU only)	Option - 01B
Field Support Services for Installation	Option - 03
MS4000 Stainless Steel Enclosure	Option - 07
MetalSCAN Performance Test Kit	Option - 11
MetalSCAN Support Service Package	Option - 12
ATEX Barrier Kit	Option - 17
MetalSCAN Monitor Software	Option - 22

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