![Noblis logo — For the best of reasons]

AN/SYM-3 (V)
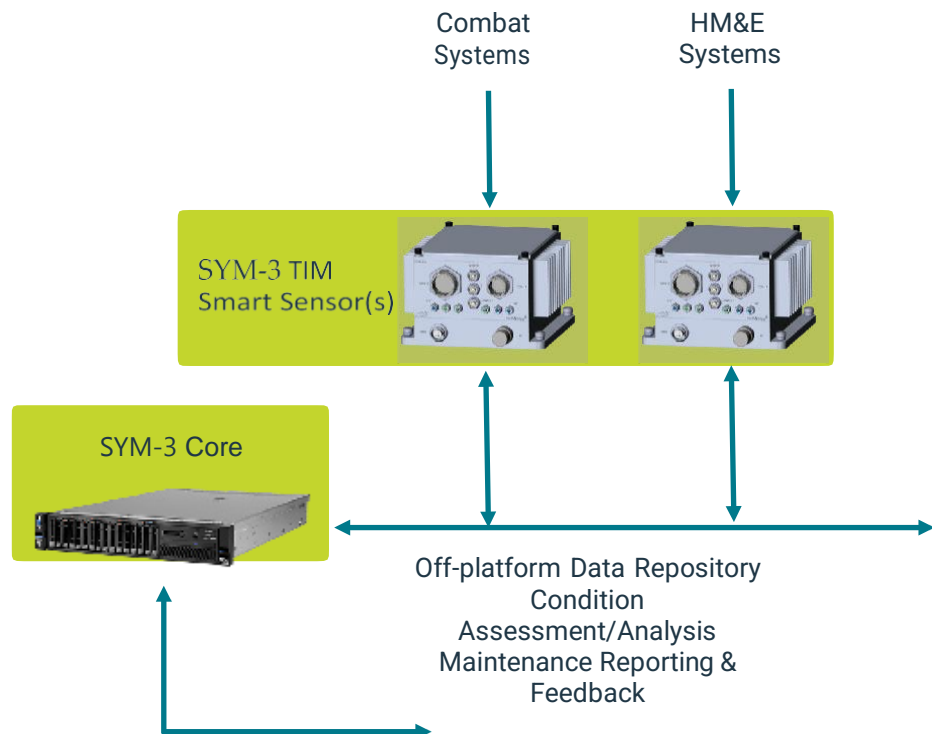## CONDITION BASED MAINTENANCE

FEATURES
- Automated real-time data acquisition
- Real-time monitoring
- Open architecture
- Industry-standard technologies
- Cybersecurity compliant
- Scalable to any size system
- Intelligent alert notifications
- Simplified logistics support
- Data standards compliance
- Security conscience system design

APPLICATIONS
- Condition Based Maintenance (CBM) Systems
- Health Management Systems (HMS)
- Predictive Anticipatory Maintenance
- Smart Sensor Applications
- Maintenance Solutions

The AN/SYM-3 (V) (also known as the ADEPT® Distance Support Sensor Suite) is an advanced CBM system that provides remote monitoring, secure networking and advanced analytics for maintenance of complex distributed systems. It uses an open architecture with industry-standard hardware and cybersecurity compliant software to acquire and process system operational and maintenance data.

The AN/SYM-3 leverages technology developed for Noblis' ADEPT product line of preventive maintenance tools and operates unattended to automate the capture of real-time system operation, environment and maintenance data. SYM-3 Target Interface Modules (TIMs) are smart sensors that use standard hardware interfaces to capture leading indicators from the target systems. Data collected by TIMs is transferred to the SYM-3 Core which provides local data storage and event alert notifications and serves as a network gateway. The SYM-3 Core transfers data off-platform through a government communication link to a data repository to support further analysis, maintenance reporting and feedback.

Combat Systems

HM&E Systems

SYM-3 TIM Smart Sensor(s)

SYM-3 Core

Off-platform Data Repository
Condition Assessment/Analysis
Maintenance Reporting & Feedback

BENEFITS

- Improved Operational Availability
- Increased System Readiness
- Increased System Reliability
- Reduces Mean Time to Repair
- Reduces Mean Logistics Delay
- Remote Monitoring
- Remote Support Capable
- Maximum use of existingdata, can use data interfaces and sensors already in place
- Augments existing maintenance systems

OPEN ARCHITECTURE

The AN/SYM-3 (V) implements a comprehensive open architecture approach for hardware, network, software and data design. The TIM hardware is packaged in a rugged, watertight enclosure with conduction cooling. Industry-standard PCIe/104 hardware provides data acquisition interfaces for Ethernet, RS-232/422/485 serial, secure USB and data bus connection capability. Commercial-off-the-shelf sensors and mini PCIe peripherals can be connected as needed. The SYM-3 communication network uses either TCP/IP or UDP standards with robust publish/subscribe message delivery. All SYM-3 software is Linux and Java based.

Data collection is controlled through a configurable test script so that software changes are not needed to handle data changes or include new data points as they become available. All data is stored in the eXtensible Markup Language (XML) format using the IEEE SIMICA standard.

ALERT NOTIFICATIONS

SYM-3 monitors key parameters and sends local e-mail alert notifications whenparameters move out of tolerance. Thesealerts are configurable and can be sent via e-mail or other message systems.

SECURITY

SYM-3 is cybersecurity compliant and provides automated distribution methods for security updates. The SYM-3 system can use a range of secure networks including the U.S. Navy Total Ship Computing Environment (TSCE). All software components are certified U.S. Navy applications. TIM hardware can be configured for passive one-way monitoring to eliminate any possible interaction with target systems, a real advantage for combat systems certification.

DATA ANALYSIS

SYM-3 truly provides the PLUS in CBM+ systems. It pairs seamlessly with Noblis' Prognostics Framework® analytics software to provide accurate, powerful condition assessment. The Prognostics Framework can be embedded on-platform on the SYM-3 Core to performreal-time prognostics, diagnostics and status monitoring, or utilized off-platform to process all data collected by the SYM-3 smart sensor suite.

QUALITY

Noblis is ISO 9001:2015 compliant and is certified under NAVSEA Technical Specification 9090-310F, Appendix C and Fiscal Year 2015 NAVSEA Standard Item 009-04. Our quality management system ensures our software and hardware meet our clients' requirements and remain reliable and secure.