INCREASE Equipment Reliability and Uptime
MAXIMIZE Equipment and Labor Utilization
REDUCE Operational and Maintenance Costs
ENHANCE Operator Safety

Operational continuity through real-time, data-driven decision making
MAINTENANCE MANAGEMENT SOLUTION

INCREASE EQUIPMENT RELIABILITY AND UPTIME
› Promote condition-based maintenance tactics
› Perform remote diagnostics while reducing shop-to-pit travel, hands-on troubleshooting, and manual data entry
› Embed a reliability-centered maintenance approach
› Make proactive scheduling decisions

MAXIMIZE EQUIPMENT AND LABOR UTILIZATION
› Shorten the gap between fault diagnosis and repair
› Make adjustments based on increased awareness of in-pit conditions and equipment performance criteria
› Decrease waste while increasing efficiency

REDUCE MAINTENANCE COSTS
› Detect problems in advance and respond as conditions dictate
› Eliminate repeat faults and equipment defects
› Prevent catastrophic failures

ENHANCE OPERATOR SAFETY
› Identify and resolve unsafe operating practices
› Reduce dangerous hands-on diagnostics
› Reveal and address hazardous working conditions

Since its introduction in 2003, the MineCare solution has brought mine personnel the information and tools they need to respond to, track, document, research, resolve, and predict mobile equipment health issues.

The MineCare 3 solution builds upon this field-proven foundation with new features, benefits and capabilities that can help you increase and maintain operational continuity.
The MineCare 3 solution delivers the tools and functionality you need to optimize your maintenance management program. By leveraging SaaS and cloud technology, the solution also offers:

**Lower capital costs** – Cloud-based management of IT infrastructure reduces your investment in hardware, software, and IT support staff.

**Seamless installation, upgrades, expansion, and support** – SaaS-provider-managed deployment and upkeep frees you from downloading and applying patches, and installing additional software and hardware as your user base grows.

Centralized management provides a simplified approach to the monitoring, managing, and cost-reduction efforts of system operations.

**Enterprise-wide data/configuration management** – The cloud-based solution scales to accommodate the monitoring of one to thousands of equipment units at a single mine site or across geographically-distributed locations.

**Dynamic resource allocation (DRA)** – In response to the ever-changing demands of the mining environment, DRA ensures that your application, storage, and other computing resources are consistently and sufficiently met.

Actions such as bandwidth allocation, priority setting and load balancing take place automatically as demands fluctuate.
SEAMLESS DATA COLLECTION AND CENTRALIZED ANALYTICS

Streamline the collection of the right data at the right time, and covert the data into actionable information. Gain the insight needed to predict specific failure modes in advance, drive operational continuity and capacity assurance, and promote a condition-based maintenance approach.

The MineCare 3 solution helps you achieve specific data-collection goals by providing the following options:

› Continuous monitoring for full historical data capture
› Conditional monitoring for collecting data under specific operating situations
› Predictive trending for detection of abnormal behavior, rates of change, and parameters outside normal operating limits

REAL-TIME EVENT MANAGEMENT

The MineCare 3 Event Handling application provides concise, at-a-glance insight into the equipment faults occurring across the mine. Troubleshoot and act upon incoming notifications by scheduling a maintenance response or suppressing unnecessary alarms. Configure the Event Handling interface to display:

› Real-time fault notifications
› Events-by-location on the tracking map
› Data snapshots for root cause analysis
› Fault-specific diagnostic details
› User-defined events with custom trigger criteria
› Historical notification trends
VISUAL EQUIPMENT HEALTH TRACKING

When maintenance events occur, you not only need to know what happened; you also need to know where, when, and why. The MineCare 3 visual equipment health tracking application provides complete, equipment-level asset management detail. Real-time status of all equipment units is displayed along with:

› A live geospatial map view of equipment location and health status
› Recent maintenance history correlated with fault data
› Equipment health tile view for simplifies visual layout
› Component-level problem detection and notification
› Operational status and key parameter tracking

Review comprehensive equipment health summary and maintenance history information

Quickly review equipment location tracking and component-level problem detection details

View equipment location tracking markers and component-level problem detection statistics
INTUITIVE, EASY-TO-USE DASHBOARDS

User-configurable dashboards provide a one-stop asset health overview of your mobile mining equipment, and serve as a central hub from which to access individual MineCare 3 solution applications. Dashboard screens can be configured to display:

› Maintenance, equipment, and operator key performance indicators (KPIs)
› Application tiles with summary information
› Goal-oriented user progress tracking
› A visual overview of maintenance tasks

STORE&FORWARD CAPABILITY

Store&Forward ensures that data integrity is maintained in the event of a communications outage. Asset health data is stored on each equipment unit’s mobile device and automatically forwarded to the MineCare 3 database when communication is restored. With Store&Forward:

› Stored and forwarded data is automatically integrated into existing database records
› Uploaded data is reconciled in real time upon reaching the database
› Communication disruption causes no discernible difference in system operation

Integration with the DISPATCH Fleet Management System (FMS)

The MineCare 3 solution can be used as a standalone application or integrated with the DISPATCH FMS. Through integration, you can access and utilize operational data to help achieve maintenance goals. Additional benefits of DISPATCH FMS integration include:

› Ability to monitor operator performance, location, and status
› Reduced need for manual operational data correlation
› Consolidation of operations, location, and OEM data
LARGEST RANGE OF OEM INTERFACES IN THE INDUSTRY

Modular has worked with numerous original equipment manufacturers (OEMs) to develop more than 175 ModularReady interfaces for a vast array of equipment categories, makes and models.

Data captured through the OEM interfaces is instantaneously relayed to the MineCare 3 solution applications, enabling immediate corrective action.

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**General**

**Engine Systems**
- Cummins® Cense J1939™
- Cummins® MCRS
- Cummins® Quantum Technologies®
- Detroit Diesel® DDEC® II/III/IV
- MTU® MDEC and ADEC

**Miscellaneous systems**
- Poseidon System - Oil analysis
- Hour Meter (RS232)
- Tan Delta - Oil analysis
- Vital Signs Monitoring System
- VSI Oil

**Electric drive systems**
- GE® INVERTEX CAN
- GE® INVERTEX I, II
- GE® Statex™ III
- Siemens® ACW

**Tire monitoring systems**
- Bridgestone® B-Tag
- Goodyear®
- Kal Tire
- Michelin® MEMS 2, 3
- OTR Intelligent Tire
- PressurePro™
- Rimex TyreSense™
- TireSmart™
- TPMS

**Miscellaneous systems**
- RoadRoughness

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**Truck**

**Complete systems**
- Caterpillar®, VIMS, VIMS 3G
- Flanders
- Hitachi® Contronics, Contronics J1939
- Komatsu® KOMTRAX Plus, VHMS
- Liebherr® T282C, T282B

**Payload systems**
- Caterpillar® TPMS
- KIMAX 2
- Komatsu® PLM II, III, IV
- Liebherr® (formerly Wiseda®)
- Unit Rig™ Weight System
- Unit Rig® J1939
- VISHAY
- VIST Payload System
- VIST J1939
- XEMC

**Drill**

**Complete systems**
- Atlas Copco® RCS
- Bucyrus® BucErie, BE39HR, SKL20
- CAED PLC5
- Sandvik® D45KS, DR460, Dpi

**Dozer/Grader**

**Complete systems**
- Caterpillar® VIMS Guardian
- Caterpillar® VIMS 3G
- Komatsu® VHMS
- Komatsu® KOMTRAX Plus 2

**Shovel/Excavator**

**Complete systems**
- Bucyrus®, BCS, BCS 3 (ethernet), MIDAS
- Caterpillar® Accuweigh
- Caterpillar® CAES
- Hitachi®, Hitachi*-6
- Komatsu® ECS, VHMS
- Liebherr® LiebExcav
- P&H® Centurion

**Loader**

**Complete systems**
- Caterpillar® VIMS
- Komatsu® VHMS
- Komatsu® KOMTRAX PLUS
- LeTourneau® LINCS I, II

**Dragline**

**Complete systems**
- Modbus
- Pegasus
REMO TecARE™ OFF-SITE MONITORING

Through the RemoteCare program, regionally-distributed Modular specialists remotely monitor the real-time telemetry data generated at your site, and provide directed feedback and recommendations to your on-site maintenance and operations personnel.

VOIP, teleconferencing, and periodic face-to-face visits ensure tight integration with your site-based field supervision, maintenance and engineering staff.

Modular specialists examine your MineCare system event logs to identify potential problem areas. Services provided may include:

- Handling critical events and ensuring that responsible parties receive notification in an expedited manner
- Monitoring equipment health and driving a condition-based maintenance approach
- Reviewing and optimizing configuration
- Creating and monitoring user-defined alarms
- Providing data analysis and reporting

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