Wenco International Mining Systems Ltd.

is a world leading manufacturer and supplier of PC based Mine Management Systems. Mine Management Systems monitor and control a mine's mobile assets to help ensure the effectiveness of all departments. Mine Management Systems are a necessity in modern mining and a key ingredient to a successful mine.

Wenco's Mine Management System includes features and benefits ranging from reporting accurate operating information, precise positioning and machine guidance, to equipment health information and sophisticated automatic dispatching systems.

Benefits of Wenco's Mine Management System include

- **Maximize production**
- **Effective equipment utilization**
- **Improve maintenance practices**
- **Achieve specific targets**
- **Extend tire life**

Using the latest GPS monitoring innovations, wireless broadband communication, computer technology, and software applications, Wenco provides proven and sustainable benefits to the mining industry's largest, most respected companies such as BHP-Billiton, DeBeers, Teck Cominco and US Steel.

Wenco is an international company with offices around the world, including North America, South America, Africa, Australia, and Russia.

Benefits

Increased Equipment Utilization

Improved Equipment Availability

Increased Productivity

Improved Ore Quality Control

Improved Maintenance Practices

Reduced Operational Costs

Extended Tire Life

Features

High Precision Machine Guidance

Drill Navigation and Sensor Monitoring

Bench Elevation and Bucket Positioning

Stockpile Management

Auto-Cycling and Reconciliation

Payload Management

Equipment Health Monitoring

Automatic Dispatching

Real-Time Reporting

Intuitive Graphical Interfaces

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Wenco's Fleet Management System features intelligent use of GPS technology utilizing information from OEM systems allowing Wenco to accurately determine equipment activity, location, time, and production information. A user-friendly and intuitive interface offers an unprecedented level of functionality and will improve your supervisors' level of control and confidence.

GPS technology and interfaces collecting information from onboard monitoring, allow Wenco to accurately determine the location and activity of the mining fleet. All status changes and time records are automatically recorded without the need for operator input.

In addition to the collection of equipment utilization and availability information as described above, the system also automatically collects all production information. Location information, shovel ID, hauling truck ID, operator ID, distance traveled, and material destination (location name and GPS long-lat) information is collected for every haul cycle.

Wenco's dispatching algorithm is designed to automatically assign trucks in order to achieve the best utilization of all mining equipment and maximize production. This minimizes shovel wait, truck wait, and truck empty travel time. Benefits of the system include:

- **Improved truck deployment**
- **Reduced truck and shovel waiting time**
- **Increased production**
- **Controlled grade of ore delivered to crushers**

Fleet Control's real-time reports provide immediate information on mine equipment and mine material production. View reports on individual equipment units, or equipment type and fleet summary reports. The reports provide a real-time data view and can be used for monitoring, as well as reporting.

Wenco

Product Benefits

In a typical haul cycle, all data is gathered automatically by the system without input from the truck driver or the shovel operator. This has three main benefits:
Removal of human error
Complete and consistent data
Increased system acceptance from operations

Accurate and Consistent Data Collection

All status changes and time records are automatically determined and recorded without the need for operator input.

Intelligent use of GPS technology and supplemental information from onboard condition monitoring interfaces allows Wenco to accurately collect information on the location and activity of the mining fleet.

For the truck fleet statuses; loading, hauling, waiting at dump location, dumping, traveling empty, waiting at loading point, and all associated times are all collected automatically.

For the loading fleet; waiting for a truck, loading a truck, truck identification, and all times are automatically collected.

Intelligent Use of Technology

The system defines two "zones" at a shovel. The two overlapping zones are defined by the software code and are centered on the shovel's antenna.

The activities of the trucks within these zones are carefully monitored and automatically determine the haul cycle status of both the truck and shovel.

GPS provides both location and velocity readings. The status changes are displayed on the vehicles' onboard computers as well as on the screen in the mine office.

When interfaces to onboard payload or condition monitoring systems are incorporated the accuracy and reliability of data is further enhanced.

Automatic Collection of Production Information

In addition to the collection of equipment utilization and availability information as described above, the system also automatically collects all production information as well.

Location information, activities, material origin, material payload, material type, material grade, loading shovel ID, hauling truck ID, operator ID, distance traveled, and material destination (location name and GPS long-lat) information is collected for every haul cycle.

Product Benefits

Wenco's dispatching algorithm is designed to automatically assign trucks in order to achieve the best utilization of all mining equipment and maximize production. This minimizes shovel wait, truck wait, and truck empty travel time. Benefits of the system include:

- **Improved truck deployment**
- **Reduced truck and shovel waiting time**
- **Increased production**
- **Improved grade of ore delivered to crushers**

Using Linear Programming that examines multiple iterations of equipment configurations, Wenco determines the best plan, and then dynamically dispatches trucks to meet the plan. Operational upsets such as equipment breakdowns, equipment coming back into service, changing mine conditions (e.g. weather), or operational delays, are automatically taken into consideration.

Maximize Production

For every assignment there are two calculations; a schedule and a dispatch.

The schedule incorporates the mine configuration: dump location, shovel location, material, destinations, cycle times and available trucks, as well as any constraints, such as maximum crusher dump rate. Using these inputs, the schedule calculates the maximum production achievable. This is expressed in terms of shovel rates, or the number of loads per hour the shovels can achieve based on the current mine conditions and setup.

After the schedule has been calculated, dispatch allocates the trucks in order to best meet that plan.

Flexibility to Meet any Mine's Requirements

The Wenco dispatching algorithm takes into consideration a number of factors to meet any mine's requirements:
- Production rates for the crushers, stockpiles, and/or dumps
- Shovel priorities and shovel rates or production
- Multiple shovel groups or combinations of groups and shovels working in fixed assignment
- Locking of trucks to a particular shovel or destination
- Restricting trucks from particular shovels and destinations

Achieve Ore Quality Targets

Within the algorithm is the ability to specify the ore quality targets that are to be delivered at a certain location. Multiple locations are supported and each can have different requirements.

The algorithm knows which shovels are digging in what material types and what qualities are expected at each location will use these values in the two calculations to schedule and dispatch as described earlier.

The schedule calculation determines the rates required for each shovel so that the best material grade can be achieved. Then the dispatch calculation makes its decision to best meet that plan.   The end result is the delivery of material coming as close to the middle of the grade ranges as possible.

System Dynamically Adjusts to Conditions

The system uses real-time data within its calculations (loading times for each shovel and truck type, cycle times by truck type, etc). As mining conditions change, the algorithm dynamically adjusts to these changes. As a shovel hits harder digging or changing road conditions slow cycle times of the trucks, these changes are automatically incorporated into the calculation.

Also, as trucks go down or a shovel is relocating, these disturbances are accounted for within the algorithm.
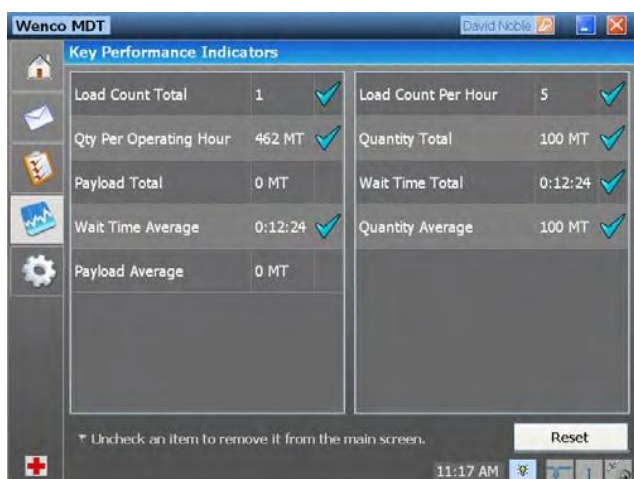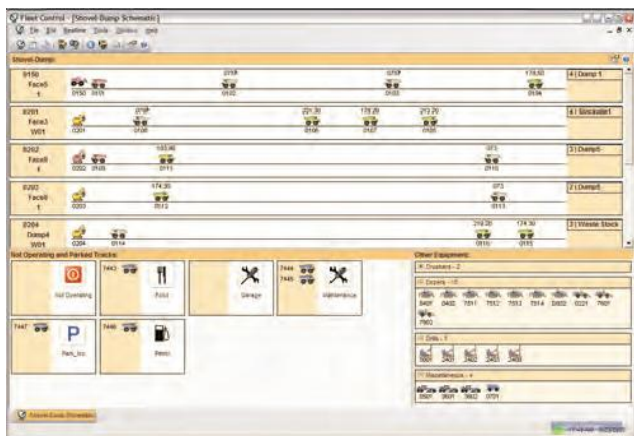
Real-Time Fleet Equipment Productivity

Fleet Control, the primary tool for dispatchers is a user-friendly and intuitive interface providing information and control of all equipment activity in the mine, as well as easy access to real-time fleet or individual equipment productivity and time reports.

Graphical Display

Fleet Control shows the trucks moving to and from the shovel and dumping location. Information on equipment details, locations, estimated arrival times and material tonnages and qualities can be accessed with a simple mouse-over. Fleet Control represents an unprecedented level of functionality in mine management–it is simple, easy to use and will improve your supervisor control and confidence.

Productivity Monitoring and Control

Dispatchers can assign or re-assign trucks with an easy drag-and-drop, or make a selection including delays or downs from a drop down list. Fleet Control also provides the Dispatcher with the initial set-up for automatic dispatching over the entire shift.

Support and stand-by equipment are also tracked on-screen. Support equipment will display activities, personnel, locations and activity cost codes which can be exported to the mine's costing center.

Real-Time Reports for Monitoring and Reporting

Wenco's FleetControl application presents detailed summary information in real-time to the Dispatcher. As information is collected into the database it is available for reporting. Fleet Control's Real-time Reports provide immediate information on mine equipment and mine material production. View reports on individual equipment units, or equipment type and fleet summary reports. The reports provide a real-time data view and can be used for monitoring, as well as reporting.

Equipment Reports

Status Current

Status Summary

Production Detail

Production Totals

Fleet Summary Reports

Status Current

Status Summary

Haul Cycle Time Averages

Material by Location

Production Detail

Production Totals

Production Totals by Equipment

Loading Equipment Summary

Locked Trucks
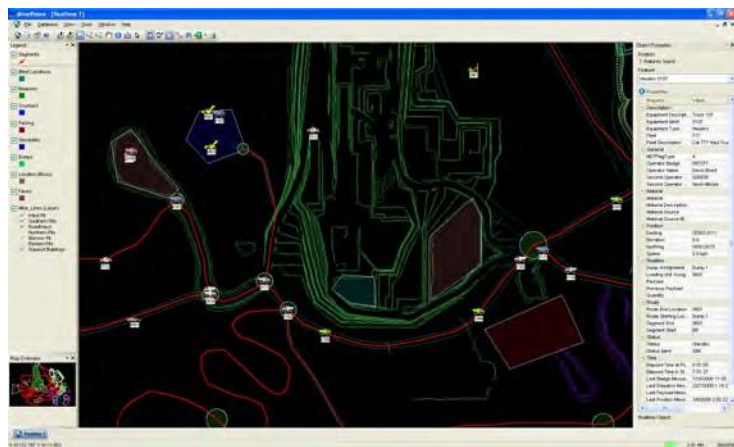
Real Time Polling and Status Information

MineVision is the perfect complement for Fleet Control, offering a mine-wide view of all equipment including real-time positioning and status information. MineVision uses familiar Windows controls to pan, zoom, find and select objects. Individuals can perform database editing such as stockpile location modifications graphically. As your mine grows and changes, the ability to perform edits to stockpiles and routes graphically is a huge time-saver.

The GPS Advantage

MineVision gives users a near real-time view of the mine. Configurable visual graphics enable quick recognition of equipment activities including; details and summary of all equipment statuses, current segment and route location, payload information, and assignments.

Location and Dump Playbacks

Knowing exactly where a dump occurred, or what route a truck took can be invaluable to mining operations staff. MineVision offers flexible equipment position playback options, as well as playbacks isolating digging or dump locations.

Information at Your Fingertips

Mousing over a truck or shovel reveals operational information on demand, such as equipment details, locations, estimated arrival times and material tonnages and qualities.

In a dynamic operation with continually changing priorities, MineVision provides the instantaneous feedback that is required to ensure that the most productive and cost efficient decisions are being made.

Haul Route Management

Manage haul roads allowing the user to close roads for maintenance or restrict usage to ease congestion.

Alarm notification and trace to location. Information, event and alarms are signaled in real time with full details.

Comprehensive SQL Compliant Database

The Wenco system includes the WencoDB database, a comprehensive SQL compliant database of all static and transactional data recorded by the Wenco system during its real-time operation.

WencoDB records its data at the highest quality resolution, such as individual haul cycles and discrete events which occur to each machine.
Freedom of Information

Available in MS SQL Server, WencoDB is based on an open 3rd party database with the inherent ability to import and export data, using built-in SQL Server tools. In addition, Wenco's database editors give the user the ability to perform exports of individual tables in various formats (Excel, HTML or text files that are delimited by commas, tabs or any other character).

Intranet Reporting

ViewPoint is a web application that allows for report and document management from WencoDB. Users can log on to their local intranet to access reports and documents that are automatically scheduled, generated and posted to the ViewPoint interface.

Reports

When viewing data using Wenco's database editors, the user has a wide range of filter options. For example, one can view the recorded haul cycle transaction data in either table view or graphical format based on the application of numerous filters.

The Wenco System provides standard reports that provide end-user usage data at your fingertips. The reports capture data on a complete range of information on mine equipment and mine material production. Each report is also updated in real-time onscreen so you can also use the reports as monitoring tools. You can print reports and export them as .PDF, .RPT, .DOC, .XLS, and .RTF files.

Built-in Database Inquiries

Another way of filtering data is with WencoDB Inquiries. For rapid reporting and data analysis, WencoDB has a suite of built-in database inquiries. The capabilities of WencoDB Inquiries are similar to that of the WencoDB editors:

- Multiple levels of grouping and sorting
- Filter by value or range of values
- Export data in Excel, tab-delimited, comma-delimited or HTML formats
- Include summary fields
- Create custom columns, hide or re-order columns


Production Profile by Shift

Mining

Report Date:	3/20/2002				Shift: 2				
Ore					**Waste**				
	Date	Time	Truck	Shovel	Material	Date	Time	Truck	Shovel	Material
Loads First	3/20/2002	2:00:00 PM	0003	0903	SSul Low Ore	3/20/2002	2:04:16 PM	0015	0901	Sap Min Waste
Loads Last	3/20/2002	9:58:56 PM	0011	0902	Sap Low Ore	3/20/2002	7:38:48 PM	0005	0903	Sap Min Waste
Dumps First	3/20/2002	2:00:00 PM	0004	0902	Sap Low Ore	3/20/2002	2:00:00 PM	0015	0901	Sap Min Waste
Dumps Last	3/20/2002	9:59:30 PM	0404	0202	SSul High Ore	3/20/2002	7:47:36 PM	0005	0903	Sap Min Waste
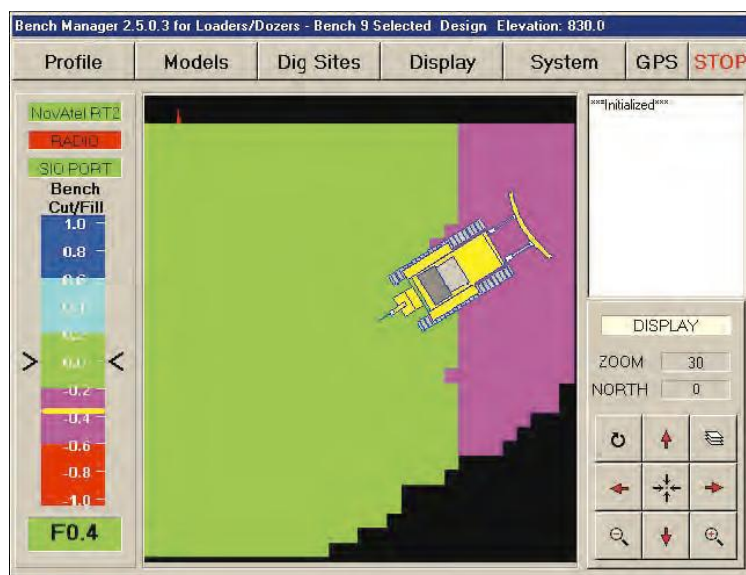
Product Benefits

BenchManager helps operators achieve proper bench elevation, bench drainage, ramp grades, leach pad elevation, stockpile management, road grades, and blast line placement with increased efficiency. Benefits include:

- Reduced surveying
- Increase availability and equipment utilization
- Improved operator efficiency
- Enhanced safety
- Improved bench drainage
- Minimized re-excavation
- Reduced blasting costs

Real Time Control of Elevation and Grade

Bench Manager for Dozers utilizes a combination of software, broadband radio communications, onboard computers and GPS equipment to precisely determine the unit's track elevation to less than 5cm.

BenchManager displays cuts, fills and the unit's orientation and communicates the data to the host system. BenchManager collects as-built survey data automatically as the dozer progresses through the mine.

This data is displayed on the screen to show the operator where the previous shift was working as well as the current progression.

A combination of three different display modes is available: Plan, Profile, and a combination of both. The views display real time GPS elevation compared to surface design.

Elevation Wirelessly Transmitted to Units

A design Digital Terrain Model (DTM) containing design elevations, is wirelessly transmitted from the office to the unit in the mine. BenchManager compares the current elevation of the tracks or wheels of the dozer to the DTM. The DTM files contain the design bench elevations and are interpolated with every position update. BenchManager displays to the operator the cut/fill with respect to the design via a graphical gauge as well as numerically.

Ramp Building

Ramps are defined as a set of xyz points defining the geometry of the ramp, including along-track slope and x-track slope. This design is downloaded into the BenchManager software onboard the dozer. BenchManager also allows operator to build a ramp or surface on the fly with waypoint navigation. The operator can mark a position or line with a description and time stamp. The operator can then navigate to each of the marked features.

Hazard Zones & Proximity Warning

Areas of the mine can be marked hazardous and imported onto the operators screen as a graphic file. The operator is warned when approaching the zone (allowable proximity is user defined) and the warning flashes if the operator enters the zone.
A breadcrumb trail stores the dozer's position so that the operator can see where the machine traveled in the past 12 hours.

Product Benefits

BenchManager Shovel Positioning improves productivity and ore quality control with precise bucket positioning and track elevation.

- **Visual confirmation of material type and quality while loading trucks** - eliminates the need for staking and ribbon boundaries.

- **Calculation of load grade on the trucks -** provides ability to dispatch according to material quality, providing accurate blending of material and eliminating misrouted loads.

- **Automatic record of shovel progress into the face**

- **Real-time dispatching and blending -** based on high precision data.

- **Elevation control feature** - allows operator to build smooth bench floors thereby reducing wear and tear on vehicles and promoting faster cycle times.

Precision Positioning and Heading

The shovels, excavators , loaders and backhoes are equipped with RTK dual frequency GPS receivers for accurate shovel positioning and elevation information. This data is coupled with precise heading technology to also generate distance and bearing information of the equipment. When integrated with Wenco's Fleet

Management System, BenchManager is also supplemented with the positions of trucks withing its Load Range. The gathering of all this data provides a detailed account of the machines relative directional heading and the position and orientation of the bucket in relation to the face and the haul trucks. Also available is the option boom geometry measurement, calculating bucket positions to within 21cm.

BenchManager reads the mine's dig block files and records each bucket dig position in relation to those files. Material type and quality is then automatically determined.

Manage Ore Quality

BenchManager Shovel Positioning gives operators visual confirmation of ore quality and visual confirmation of material type, promoting ore quality control at the loading point.

When integrated with Wenco's Mine Management System, truck assignments are automatically determined according to material type, load quality, and requirements of ore quality at the blend points.

Increased Operator Efficiency

Utilizing High Precision GPS, BenchManager improves operator efficiency and equipment utilization by providing current elevation of the tracks or wheels of the equipment as compared to the mine design and displayed to the operator along with the required cut or fill. Elevation measurements are accurate to within 5cm.

Maintenance Monitor

Effectively manages mine equipment in a down status by tracking all events, actions and components.

Onboard Insight - Real Time Polling of Onboard Sensors

Receives and processes data received from the various OEM modules and the means to view the results of data in both real-time trend graphs.

The Eventing System – Onboard Alarm Monitoring

Provides real-time notification of all alarms received from the OEM modules, plus acts as a centralized repository for recording all anomalous events detected in the Wenco system (not just maintenance issues).

Maintenance Monitor

Maintenance Monitor effectively manages mine equipment in a down status. It offers real-time down equipment record display, management, storage, and retrieval of data associated with equipment health, specifically in the areas of down equipment management, onboard-generated event management, and equipment vital signs parameters.

Maintenance Monitor tracks the "critical path" of equipment from the initial down status until the equipment is back in operation. This lets you see the time and labour spent for each maintenance activity.

Accurately tracking time and labour allows you to:
- Reduce unplanned maintenance and rework
- Improve maintenance planning practices
- Reduced your maintenance costs

The Maintenance Monitor graphical interface displays all down equipment and all events and actions that are performed on that piece of equipment. Each action records equipment status code, login name, action start time, action taken, action end time and duration of action in hours.

Maintenance personnel are able to change equipment to a different down status, edit details of a down status, enter new actions within a down status, edit details of actions, manually set the SMU reading for a down event and place a piece of equipment into an operating status.

Maintenance Monitor ensures that all time related information is rationalized so that down equipment status records do not overlap and that all action records are contiguous.
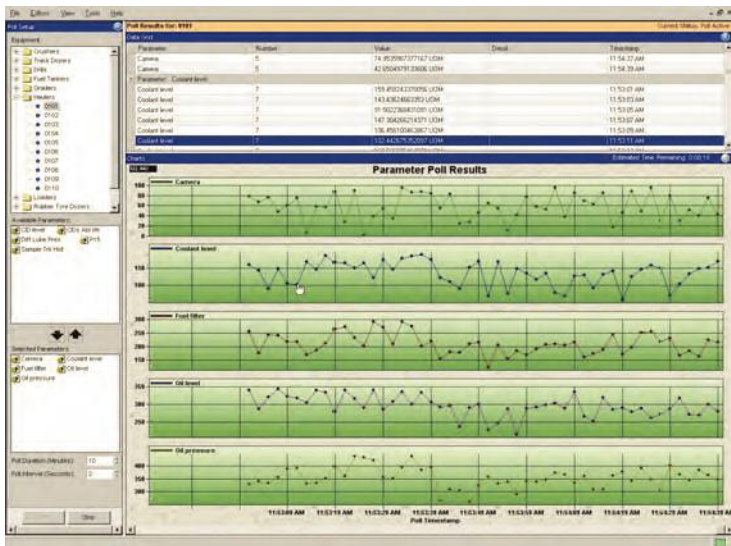
Through the Maintenance Monitor, personnel have access to reports including:

- Daily Maintenance Report
- Down Time by Status Code Report
- Down Time by Component Code Report
- Down Time by Failure Cause Report
- Down Time by Maintenance Action Report
- Maintenance Action Detail Report
- Equipment Availability Report
- Performance Report
- Mean Time Between Failure
- Mean Time to Repair

Onboard Insight

Onboard Insight remotely monitors equipment for a large number of available parameters. To begin, the user selects a vehicle they wish to interrogate, the parameters (oil level, oil pressure, coolant levels etc.) they wish to retrieve details for and how long they wish to poll. Data streams into OI from the remote vehicle as values are retrieved.

The OI interface displays this incoming data in a series of graphical charts and data grids. These charts are updated automatically as new values arrive. Each data point shown on the charts can be interrogated by the user. As a user clicks on a data point within a graphical chart the corresponding record is displayed. The data charts allow the user to change the way the data is displayed allowing change from the default line graph to splines, bar graphs or simply points. The user can maximize the graphing area only to allow for optimized viewing as well as being able to export the data tracked to an image or to a text file.
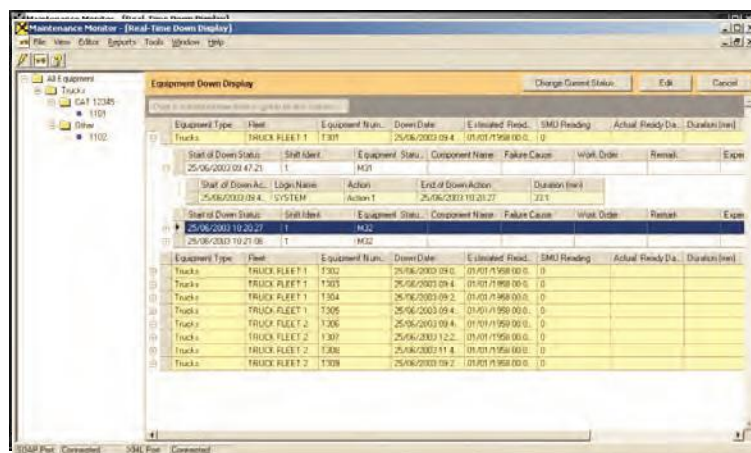
The Eventing System

The Eventing System is used to effectively manage exceptions messages generated from the Wenco System, operating practices (off-route detection, truck stopped on-route) and OEM health system alarms.

Filters allow you to include/exclude specific event identifiers, severities, sources and search patterns within the messages.
When an exception is generated, an event record is raised in the Event Monitor interface displaying event information including time the event occurred, the source of the exception and the severity. The events are configurable by the mine whether they are simply logged to a file or displayed on screen, plus what severity level they require and whether or not they should be acknowledged.

Alarms that require acknowledgement a supervisor "pop-up" on screen until OK'd.

Extend the Life of Your Tires

The highest costs for a mine are typically labour, fuel and tires.

TireMax helps extend the life of your tires by providing real-time monitoring of the tires' work rate.

TireMax tracks each individual tire on a truck and displays the resulting TKPH/TMPH. This work rate is compared to the manufacturer's recommendations and the status is displayed in a color-coded bar graph. The colors provide immediate identification of overworked tires for dispatchers and/or maintenance staff.

With this information, you can take preventative action – slow the truck down, change the assignment, route or haul distance to reduce tire wear before a blowout or unscheduled maintenance. Replacing an inside rear tire can take a truck out of production for 8 hours (4 hours for a front tire).

Customizable Reports

Complete control over how TireMax monitors tires and how it reports on their usage. You can change the alarm levels and colors, units of measure, how often TireMax calculates the usage, and much more.

Accurate Calculations

All calculations come directly from tire manufacturers' specifications. Whether your tires are from Michelin, Toyo, Bridgestone or Goodyear, TireMax makes specific calculations using the manufacturer's own formulas.

Integrated with the System

TireMax leverages the resources already invested in existing tire inventory systems by interfacing with your existing system to avoiding duplicated information.
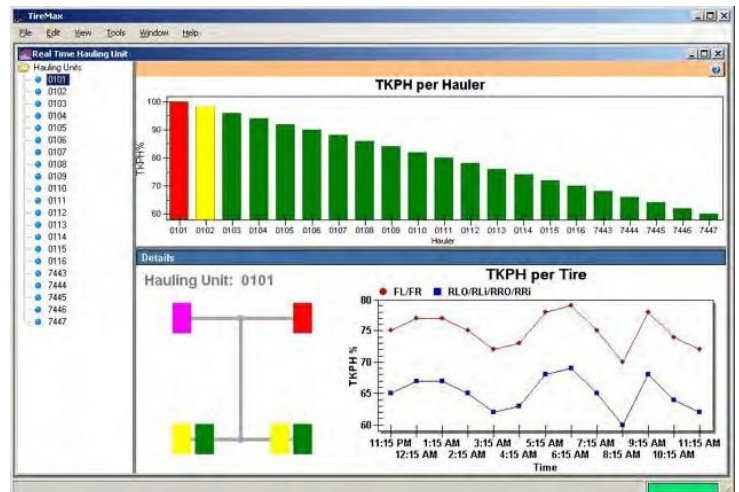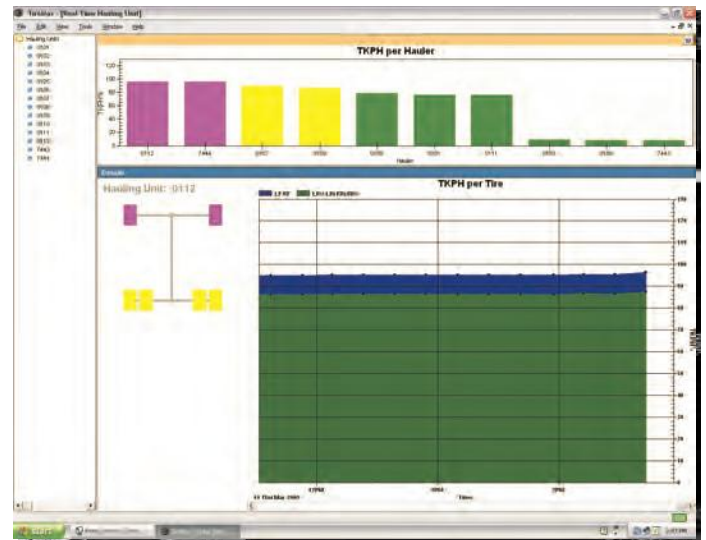
Automated Monitoring

Wenco's Auxiliary Equipment System (AES) is a low-cost alternative to the MDT and is suitable for auxiliary mining equipment such as water trucks, graders, bulldozers, or any equipment involved in ground preparation, construction, or maintenance.

The "black box" is designed to be installed on any auxiliary equipment that does not require the entire functionality of a full Fleet Management System.

Real Time Operational Data

The system is capable of recording the operational statuses and data from the machine without input from the operator.

Machine statuses are user-configurable based on digital inputs, speed & direction of travel & are recorded in the Wenco database in the same way as MDT statuses. The data can then be used in real-time to view the current position & status of a machine as well as to generate historic reports on aspects such as machine usage, cycles & distance traveled.

The mine dispatcher is also able to interact with machines fitted with AES in a similar way that can be achieved with the production equipment– ie: have the capability to view the position and state of the machine using MineVision and Fleet Control and be able to change the status of the machine through Fleet Control.

Productivity Information

The AES software also allows the user to define machine-specific parameters that can then be used to calculate productivity information such as water usage and coverage, material movement volumes, etc.

When coupled with a third party fuel level monitoring system, the AES can report machine fuel levels in real-time.

Wenco

FEATURES

- 1 GHz **-** Very low-power CPU
- Economical w/o sacrificing reliability
- Smallest computer of its class
- -30°C to 70°C fanless operation
- Meets MIL-810G shock and vibration
- Meets SAE J1113-11/ISO-7637-2-2007
- Meets FCC and CE for emissions
- Made in USA

Power Supply
- 8V to 36V input voltage range
- Extensive transient protection Ignition switch input for smart OS shutdown

Wireless
　50-channel GPS, best in class for fast lock and sensitivity - *included*
- GPRS/GSM module - *included* Bluetooth - *included*

Modular/Expandable
　PC/104 and Mini PCI expansion
- 32GB - 128GB Flash Drive option

Connectivity and I/O
- COM - Three RS-232 (one optional), one RS-485
- USB-Two ports, USB 2.0
- Digital I/O - Two inputs to 36V, one SPDT relay output
- Ethernet - 10/100 Mb
- Video - VGA displays to 1920x 1440
- CAN Bus

Compatible Operating Systems Windows® XPe or Linux All drivers included

Applications
　 Public Transit Systems
　 Construction vehicles
- Military
　Mining
　Trucking

DESCRIPTION

The MOBL D excels in demanding applications like police, trucking, emergency vehicles, transit systems and other applications where the cost of failure is unacceptably high. The careful circuit design, component selection, testing and superior heat dissipation maximize reliability and minimize costly downtime. The use of military connectors for I/O further enhances reliability where cable stress would damage PC style connectors. The shock suppression system is designed for 24/7 abuse, not just passing a brief MIL test.

Long-term reliability is at the core of our design philosophy. The MOBL D incorporates the field-proven, Octagon Hedgehog© power supply technology, providing superior protection from the severe transients common in mobile power systems. It rejects load dumps, repeated transients and overvoltage.

A unique design tightly integrates the electrical, thermal and mechanical components into a complete system with no compromise to any one segment. It is designed for applications where severe environments and high performance meet. This successful design philosophy allows fanless operation over a conservative -30°C to 70°C range, by using components rated for -40°C to 85°C, or better.

The fully developed and proven platform accelerates your design process. It can be supplied with Windows XPe or Linux pre-installed with all drivers.

Wenco

SPECIFICATIONS

Low-Power Processor

- DMP Vortex86MX 6-stage pipeline
- Floating point unit 4-way L2 **cache**
- -40°C to+85°C CPU rating
- 1 GHz clock speed
- Maximum power **-** 2.5W

DRAM Memory

- 1 GB DDR2, industrial temperature grade, surface-mounted

CompactFlash

- 4 GB, industrial temperature grade, error-correcting, automatic wear-leveling **-** optional

Serial Ports

- Three RS-232, two-wire plus ground, (one optional)
- One RS-485
- All ports to 115KB

USB Ports

- Two 2.0 ports, speeds 1.5, 12 and 480 Mb/s

Ignition Input

Assures orderly shutdown when the engine turned off, preventing data loss

Digital I/O

- SPDT relay output, 0.5A contacts
- Two input lines, 8V to 32V, opto-coupled, pullups, reverse logic

Ethernet Port

- One 10/100 Base-T port

Wireless Ports

- 50-channel GPS, fast lock, -160 dBm sensitivity, high immunity to jamming, female TNC connector
. 802.11 b/g Wifi: FCC part 15.247 & CE certified, female SMA connector Bluetooth, 3M range (in cab)

Video

- VGA video to 1920x1440 resolution Display power throuah video connector

Keyboard and Mouse

- Supported through USB ports

Power Supply

. 8-36VDC input voltage (9-32 VDC continuous)
- Protection **-** load dump, reverse voltage, brown-out and transient protection
- ATX mode compatible

Power consumption

- 9-11W at 27VDC input depending upon operating conditions. Less than 1.5W in standby

Status LEDs (bi-color)

- Indicate different power states
- Ethernet link and activity
- Status **light** programmed by user

Environmental

- -30°C to +70°C ambient air temperature
- Fanless operation over the full temp range
- Allow 50 mm on five of six sides for natural convec tion when used in ambients above 50° C
- For user-added electronics derate 2°C/W
- Shock & vibration **-** MIL STD 810G, method 516.5 (Standard shock mount for all vehicles except tracked. Contact Octagon for tracked vehicles)

Emissions

- Meets FCC and CE Class A requirements

Mechanical

- Size: 180 mm wide, 102 mm high, 235 mm deep, including connectors and shock suppression plate (7.1 "x 4.0" x 9.3") Shock mediation system withstands millions of shock cycles
- Weight: 2.26 kg (4.98 lbs) External Finish: Powder coat paint

DIG/CAN Connector

- Digital IN, Relay out and CAN Bus

ETHERNET Connector

- 10/100 BASE T Ethernet

POWER Connector

- 24V Vehicular power and Ignition switch

SERIAL/USB Connector

- Four serial ports St two USB ports

Display Connector

Video, power, touchscreen, control & video

ORDERING INFORMATION

- #8915 MOBL D computer
        #8339 Power Cable, 6 feet with wire leads
- #TBD **Set** of five I/O connectors (water proof)
        #4907914 4 GB, industrial grade, error-correct ing, CompactFlash