INCREASE Equipment utilization and productivity
MAXIMIZE Material movement
REDUCE Waste and operating costs
MANAGE Development and production processes
TRUST More than 25 years of underground mine management experience

Automated, Real-Time Monitoring, Management and Visibility of your Underground Operations
**INCREASE EQUIPMENT UTILIZATION AND PRODUCTIVITY**

› Monitor production target status through automated tracking capabilities  
› Track equipment location via an RFID tagging system  
› Manage workflow through active task management

**MAXIMIZE MATERIAL MOVEMENT**

› Increase amount of tonnage moved  
› Inherit density and grade data from source locations  
› Use grade records to manage material qualities

**REDUCE WASTE AND OPERATING COSTS**

Alleviate workflow bottlenecks through automated next-task assignments  
› Alleviate workflow bottlenecks through automated sequential task assignments  
› Ensure that the appropriate equipment is in the right location when needed via active task management  
› Reduce non-productive travel and idle time

**ENHANCE OPERATOR SAFETY**

› Utilize paperless Prestart checklists to ensure operator accountability for assessing equipment condition  
› Review Pass/Fail Prestart checklist items on a per-unit basis to confirm equipment is safe for operation  
› Receive emergency notifications through exceptions monitoring  
› Use login credentials and training records to verify operator qualification for specific equipment types

**UNPARALLELED VISUALIZATION**

**MINEGRAPHICS**

The MineGraphics perspective provides dispatchers, supervisors, and other personnel in the central office enhanced visualization of current activities within the mine. With MineGraphics, users can:

› View locations and travel ways in real time  
› Illustrate the complex in Section View or Plan View, or both perspectives, simultaneously  
› Filter by elevation, equipment types, location types and more

**MOBILE APPLICATION**

The DISPATCH Underground system mobile user interface (UI) is specifically designed for use in low-light environments. Operators interact with the system via a 7" color touch screen display installed in each:

› Load haul dump (LHD)  
› Truck  
› Production and development drill  
› Bolter  
› Explosives truck  
› Generic auxiliary unit

Each mobile device provides:

› Large, easy-to-use buttons and icons  
› Night and day-specific color schemes  
› Crisp, high-resolution display

By providing increased levels of visibility, flexibility and adaptability, the DISPATCH Underground system offers a holistic view of your underground operations.
LOCATIONS MANAGEMENT

Locations Management allows Dispatch Engineers to create hierarchically-structured (Parent/Child) lists of the locations within the mine.

The hierarchical locations structure provides the operator an intuitive navigation tool that presents contextually relevant information based on the operator's current RFID-tracked position.

ACTIVE TASK MANAGEMENT

Active Task Management handles all tasks and work orders assigned to the mobile fleet. By automating any development or production process or workflow, Active Task Management easily creates and monitors the progress of all scheduled tasks to:

- Eliminate the need for manual task assignments and reassignments
- Prevent undue waiting time
- Synchronize sequential tasks

When paired with the optional Location Reason Codes module, management of the horizontal mining process and associated tasks becomes seamless.

Location Reason Codes also:

- Enable the DISPATCH Underground system to instantly inform operators of new tasks as location conditions change
- Provide context-specific location status information based on location type
- Allow operators to advance stages of a work cycle based upon the Location Reason Code of the working face
- Reduce reaction times to draw point hang ups, ore pass blockages, and other delays at the working face

SYSTEM HIGHLIGHTS

LOCATIONS MANAGEMENT

LOCATION TIME RECORDS

TIME TRACKING

Equipment Tracking provides real-time equipment location via RFID tags affixed to mine infrastructure and tag readers mounted on mobile equipment. GPS technology monitors haulage unit position on the surface. The bi-modal positioning system automatically determines when to use RFID or GPS technology.

Track the location of LHDs, trucks, development drills, production drills, and auxiliary units.

SYSTEM HIGHLIGHTS

EQUIPMENT TRACKING

Main Features

- Real-time, automated production, time, and operator tracking
- Visual equipment and critical locations monitoring
- Integrated task management
- Wireless 802.11 and SIAMnet communications network compatibility
- Rugged, purpose-built mobile field computers for development and production equipment

ACTIVE TASK MANAGEMENT

Central and Mobile Views

SYSTEM HIGHLIGHTS

ACTIVE TASK MANAGEMENT

Central and Mobile Views

LOCATIONS MANAGEMENT

SYSTEM HIGHLIGHTS

EQUIPMENT TRACKING

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TIME TRACKING

Time Tracking enables operators to quickly alert dispatchers to changes in equipment status. Status Tracking, the primary Time Tracking method, determines the current status (Ready, Delay, Standby or Down) of an equipment unit or location.

These statuses can be further broken down into reason codes, which can then be re-mapped into the following time categories for reporting purposes:

- Operating
- Planned Maintenance
- Planned Delay
- Non Planned Maintenance
- Non Planned Delay
- Other Non Planned Maintenance
- Shiftchange
- Standby
- Tire Maintenance

If needed, operators can also enter user-configurable reason codes to provide additional status information.
Crew Management

Personnel management tools are available to define crew rotations, create work calendars, and configure shifts, including:

- **Crew Rotation** – Schedule crew rotations and define site-specific intervals, for example: 4 on/3 off, 3 on/4 off, or 14 on/14 off
- **Mine Calendar** – Display crew rotations and idle days in a monthly calendar format. Publish in .ics format and import into applications such as Microsoft® Outlook®, if desired
- **Shifts** – Adapt the DISPATCH Underground system to most shift time schedules. A graphical representation of time in the Shifts perspective illustrates time schedules across a 24-hour day

The optional Lineup Management module of Crew Management allows supervisors to identify equipment location at shift change and make location-based assignments for incoming crew.

Material Management

Material Management calculates material at faces and stockpiles between survey intervals. Real-time inventory updates occur as material is added or removed from a given location.

Critical operational parameters, including tonnage, volume, and grade metrics, are monitored and managed for production and non-production locations and destinations, such as:

- Draw points
- Ore passes
- Stopes
- Stockpiles
- Material sources
- Crushers

Draw Card Management

An optional Draw Card Management module enables dispatchers to distribute a draw point extraction plan to LHD mobile field computers. Use Draw Card Management to:

- Present operators with a visual representation of the draw point extraction plan
- Monitor statistics of completed loads per assigned loads
- Provide supervisors with a graphical alert on the central computer when the executed extraction plan deviates from the original plan

The DISPATCH Underground system proactively delivers relevant information to each piece of mobile equipment, allowing the operator to make the right decisions for the current circumstances.

**Communications** – Use an existing 802.11 (Wi-Fi)-compliant, distributed antenna system or other wireless data network to communicate between mobile equipment and the DISPATCH Underground system central server.

**Position tracking** – Track equipment locations using rugged radio frequency identification (RFID) tags mounted at intersections, loading areas, dumping zones, and other strategic points, and tag-readers mounted on mobile equipment units. Modular’s approach to RFID equipment tracking presents an affordable, granular deployment of an RFID network.

Additional standard features that increase production include: time tracking, equipment scheduling, production reporting, and purpose-built hardware installed on all mobile equipment units.
COMPREHENSIVE DATA MANAGEMENT

STORE&FORWARD

Store&Forward ensures that data integrity is maintained when equipment travels outside the wireless data network. While operating without communications, all event data is stored on the mobile device and automatically forwarded to the central server when communication is restored. With Store&Forward:

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

DATA IMPORT AND EXPORT

Data Import/Export enables importation of information from third-party mine planning applications into the DISPATCH Underground system. Import profiles are used to map comma-delimited ACSII file data to fields in the DISPATCH Underground system database. Use this feature to:

› Import production schedules and draw cards
› Create new database records for entities such as locations, personnel, and equipment lists
› Reduce error-prone manual data entry

REPORTING

The DISPATCH Underground system utilizes Microsoft SQL Server Reporting Services (SSRS) to enable real-time and historical reporting of the haulage operation. The system includes several standard reports for current or past shifts, or a range of shifts. The reports package focuses on the key areas of:

› Production accounting
› Time accounting
› Safety
› Mobile activity

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