

DEI+

Drill Monitoring



Drill Screens



THUNDERBIRD'S DEI FAMILY OF PRODUCTS INCLUDE:

- Drill monitoring and Data Logging
 - HPGPS Drill Navigation
- Wi-Fi or USB for transferring of data
 - Strata recognition • PDA Interface
- Health monitoring • Interface to drill PLC systems
 - Camera ready • Rock Recognition
- Interface to Fleet Management Systems
- Backbone for remote & autonomous operation

THE DEI PLUS PROVIDES THE DRILL OPERATOR WITH INFORMATION TO ENHANCE BOTH OPERATOR AND DRILL PERFORMANCE.

The DEI Plus uses the latest in display technology to provide an extremely rugged, sunlight-readable, crisp display. The DEI Plus design technology allows it to store data and conduct extensive on-board calculations. The system has built-in diagnostics and troubleshooting to provide ease of use and training.

DEI PLUS FEATURES

Drill Screen

Provides the operator with Depth, Rate of Penetration, Target Depth, Drill Time and Estimated Time to Complete the Hole.

ROP Graph

ROP plot helps operator to optimize drilling, and identify the depth of hard or soft zones, or the location of coal seams.

Pipe-in-Hole

This unique warning feature can prevent drill component damage caused by tramping while drill pipe is still in the hole.

Current Shift and Production Statistics

The DEI accumulates shift and overall production information including: Total Number of Holes, Total Depth, Total Drill Time, Average Hole Depth, Average ROP, and Average Hole Drilling Times

Drill Leveling and Mast Angle

An optional dual axis inclinometer can be added to the DEI Plus. This will assist the operator in accurately leveling the drill and insuring the mast is at the specified angle for cast blasting.

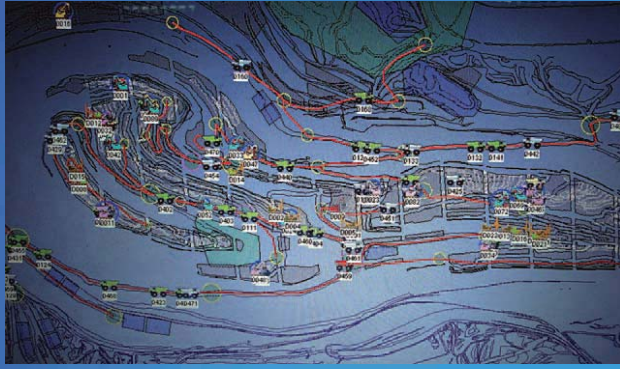
OTHER DEI PLUS FEATURES/SCREENS INCLUDE

- Target depth settings
- ROP and depth alarms
- Built-in calibration instruction
- Diagnostics and troubleshooting
- Help screens
- Spare parts lists



Keep an Eye on Your Drilling and Blasting

Other System Features & Options



Integration with FMS

INTEGRATION WITH FLEET MANAGEMENT SYSTEMS

- Real-time location and production statistics on all drills
- Status of all holes on each pattern
- Set drilling parameter alarm limits and report if limit exceeded
- Report out of tolerance hole positions
- Update drill status, delays and operators from the office

STRATALOGER

- Optional Sensor Manager & sensors
- Allows for monitoring and displaying of pull-down, torque, RPM, & air pressure, and providing operator KPIs
- Use calculated data to improve blasting with better fragmentation and reduced costs
- Real-time display of Specific Energy or Drilling Index

INTERFACE TO DRILL PLCS

- Ethernet interfaces developed for Atlas Copco RCS, and Caterpillar and P&H PLCs
- Display and log drilling parameters generated from the PLC

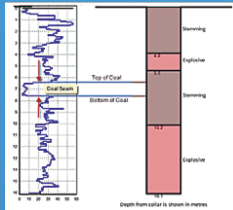
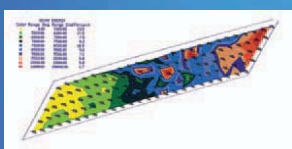
CAMERAS

- Improve safety and productivity
- Multiple fixed cameras mounted to improve operator awareness
- Integrated into Operator Display

RADIO REMOTE CONTROL

- Operate drill in unsafe or unstable locations
- Third party supplied radio remote controls
- Thunderbird provides 2nd display at control location replicating the on-board display

Blasting Based on Specific Energy



Integrated Cameras



Radio Remote Control



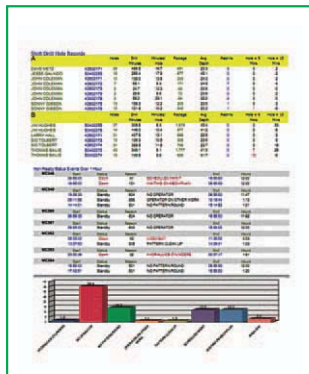
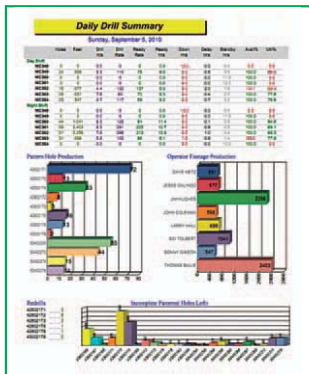
A powerful, innovative platform from which to manage your drill and blast process



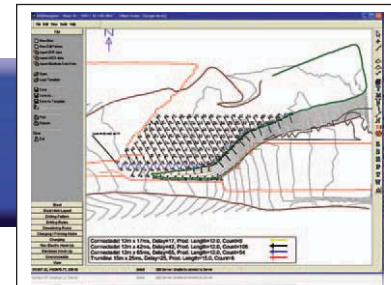
THUNDERBIRD DATA PORTAL

OFFICE SYSTEM DATA PORTAL

- Microsoft SQL database
- Microsoft SQL Reporting Services used for report generation
- Full suite of drill reports including operator KPIs
- Database and system configurations
- Pattern map transfers
- SQL queries easily done
- Easy to export data to other databases
- Integration with Datavis DBS blasting software

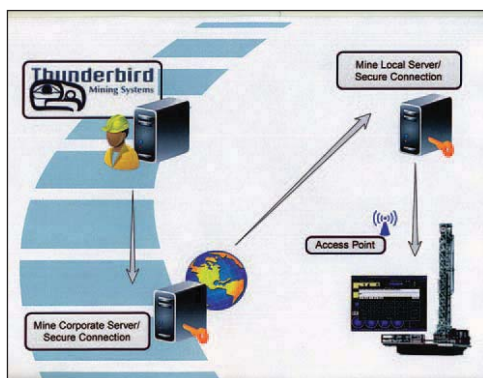
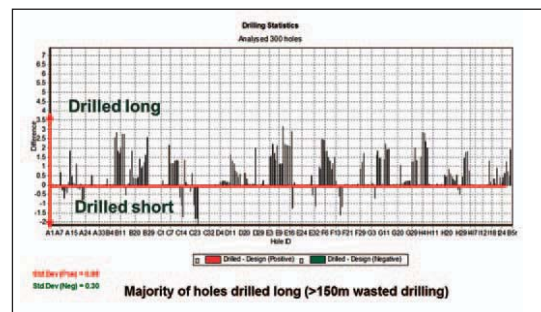


TRANSFERRING DRILL PATTERN MAPS



DATABASE DRILL REPORTS

INTEGRATION WITH DATAVIS



INTERNET SUPPORT & TWO WAY MESSAGING

