What’s New at Rel-Tek -- In Mine-Wide Monitoring & Control Systems

- Conveyor Belt Controls
- MSHA Approvals
- Longer distance, high security communications
- Really long life sensors
- MagiKal automatic gas sensor calibration
- PID ventilation fan control
- Personnel and equipment location and tracking
- Emergency and post-disaster monitoring
- Temp, seal pressure, CH4, CO, Smoke, Temp, Air-Velocity, Vibration and more.
Millennia-DX® PC Software

- Processor: Windows XP or 2000
- Software -- Rel-Tek’s own, world-class Millennia-DX
- Unlimited screens and tags
- All setup tools are included
- Intuitive programming; avoid consultant fees
- Hard Disc: Sized for Millennia-DX Data logging
- DX-BUS (RS485 revisited) for long distance and branching
- Ethernet and Internet access
- Graphics: Now with animation
- Sound: Windows Compatible, pager-phone announcements
- Super large screen capability -- Wall-sized viewing
- Auto report printout -- scheduled or manual
- Wall-mounted PCs with positive pressure Networking to remote workstations
- Hot standby computer; auto-switchover
- New DX-B-LINK, doubles communication distances
Also available as a wall-mounted panel

Wall-Mount Millennia-DX Central Station

Robust for mine environments
Same computer specs and capabilities
Large 19” LCD monitor, see-thru window
Keyboard and mouse or slide drawer
24x28x8” Steel NEMA-12 enclosure
Tamper-proof, lockable
Positive pressure ventilation
Replaceable air filter
UPS support
High-speed DX-Bus telemetry
Add remote workstations via LAN
Internet access
Full capability for MagiKal
**Hot-Standby Computer -- for max reliability**

- **Primary Computer**
- **Hot Standby**
- RFile constantly updates standby computer files
- RFile determines a primary PC failure
- RFile automatically switches plant communication bus and transfers operations to standby computer
- Standby PC updates values with new data scans and initiates alarms to notify management
Millennia-DX® software

- Configure your own custom screens -- any number
- Graphic setup tools are standard, not extra.
- Compose your own graphics for efficiency, safety and appeal
- Import logos and bit-maps to add pizzaz to your screens
- Pallet icon library has meters, bar charts, graphs, slide bars
- Draw lines, boxes, ellipses
- Insert text and messages
- Use grid, copy, paste, align -- tools for a professional look.
- Enter math equations
Typical Millennia-DX Version 6.1.1, Mine Graphics
Millennia/DX -- Main Menu

- High-speed C++ Code (no shortcuts taken)
- Display particular screens; bring images to front or rear
- Blinking lights show data communications in progress
- Log-in with password for secure access to alter program
- Screen placement options, and full “Help” utility
- Window Maker -- configure your screens using tool/color palette
- Units -- Shows status of all your field I/O stations
- Signals -- Shows status of all sensor and control channel tags
- Controls -- Brings up virtual wiring logic screens
- Alarms -- Configures action thresholds on sensor channels
- PID -- Brings up a powerful feedback control utility
- Logging -- Calls logging setup menu
- Comm -- Set up communication speed and timing parameters
- System -- Edit automatic boot-up and security levels
- Start and stop scanning, easy access for maintenance
- Hide menu as bottom line icon for full screen viewing
Powerful screen drawing utility

- Import scanned photos or logos to enhance your graphics
- Add hot buttons for click-on output controls
- Insert analog and digital meters, linking to particular sensor channels
- Want a graph? Just click on icon and size to suit; then link sensors to the 8 colors.
- Pop-up alarms flag the operator. Enter your initials to acknowledge alarms and silence beeper.
- Slider icons link to analog settings and outputs
- Test your new screen parameters immediately to verify operation. No need to compile.
Customize your controls using Virtual Wiring

- Boolean logic--
- Click and drag
- AND, OR, NOR
- Majority voting
- Set/reset
- Inputs/outputs
- Pulsers and timers
- Flip/Flops
- Calendar/clock
- Expanders
- Audio (wave files)
- Text
- Active paths in color
- Virtual terminations
- 12 pages available
Unparalleled data logging capability

Set up logging

- Assign sensors to logical groups (CH₄, CO, O₂, Zone 1, Zone 2, etc.) for sorting
- Select logging time intervals
- Log only significant changes or every time
- Set up log groups of 8 sensors each
- To View
- Set up displays for logical groups of 8
- Click on time display options: today, yesterday, this week, last week, etc.
- Shows 8 color graphs at a time
- Add grids; change scales; print
- Bottom line always shows date/time and value for cursor position
- Jog or slew left/right
- Magnify using click/drag scaling
- Archival
- View raw data files showing date/time
Outstations----Blue & Red

- Blue outstations serve sensors located in permissible areas -- (with IS Barriers).
- Red outstations serve sensors in fresh air.
- Powered outstations include:
  - Power Supply
  - Standby Battery--(4 hours)
- DX-LINK and I/O cards
- NEMA-12 dust-tight enclosure even has handle for your convenience
BlueBaby® integrated MSHA barrier boxes
- 3-15 sensor capacity
- Uses our dual-channel I.S. Barriers, MSHA-Classes G, H and L
- Also entity approved to UL-913, Class I, Div 1
- Power circuit barriers are MSHA-rated 600V and 3000V, to suit
- Designed for easy installation and maximum visibility
- Short circuit protected
- No fuses to replace
- Amplifiers for use with high impedance PLCs
Robust telemetry hardware to handle your mine -- smallest to the largest

- High speed data transfer, to 19.2-115.2KB
- Long distances -- to 20 miles over low-cost twisted-pair wires; or unlimited using fiber
- Eight types of field I/O cards -- expand your system modularly to 253 stations
- System maxes out at:
  - 1,000 4-20ma analog inputs
  - 1,000 digital inputs
  - 500 4-20ma analog outputs and
  - 1,000 relay outputs.
- Full line of communication accessories: drivers, splitters, isolators, converters
- Really serious lightning protection
DX-B-LINK
"BLINK"
Architecture at 19.2 KB

Max is 54 BLINK cards on any main bus.

DX-Bus uses a twisted pair cable.

Max 27 BLINK Cards off a optical fiber.

Fiber optic cable (20 miles or more)

To 17 miles

8000
Typ

To 30 miles

Central Station

Optical coupler

DX-BUS

Milenia-DX Computer

Optical coupler

Master BLINKS

DX-DOM
MINETRACER Personnel Tracking System

Secure Loop Communications for Post-Disaster Operation

Central Computer Station

DX-V-LINK Reversible Repeaters

Com Drivers

MineTracer Computer

8,000 ft Typ

DX-Bus

Backbone Communications at 9.6-19.2 KB

Inexpensive twisted pair cable

Up to 16 miles

Distances are estimated based on limited data.
We manufacture all types of sensors
<table>
<thead>
<tr>
<th>Brand</th>
<th>Description</th>
<th>MSHA Approval Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FireBoss (CO)</td>
<td>0-25-50-100-500-1000 ppm</td>
<td>IA-Pending, Classified GHL</td>
</tr>
<tr>
<td>GasBoss (Combustibles)</td>
<td>0-50-100% LEL CH4, H2</td>
<td>IA-532, Class GHL</td>
</tr>
<tr>
<td>GasBoss (TC)</td>
<td>0-100% CH4</td>
<td>IA-532, Class GHL</td>
</tr>
<tr>
<td>OxyBoss</td>
<td>0-21-50-100%</td>
<td>IA-Pending, Classified GHL</td>
</tr>
<tr>
<td>MultiBoss</td>
<td>Low pressure, differential</td>
<td>IA-Pending, Classified GHL</td>
</tr>
<tr>
<td>RP/HP-xxxx</td>
<td>High pressure (to 6,000 psi)</td>
<td>Classified L</td>
</tr>
<tr>
<td>AirBoss, directional</td>
<td>-2000 to +2000 fpm</td>
<td>Classified GHL</td>
</tr>
<tr>
<td>Air-velocity, high range</td>
<td>0-8,000 fpm, linear</td>
<td>IA-Pending, Classified GHL</td>
</tr>
<tr>
<td>AirBossHotBoss</td>
<td>0-392F (-18-200C)</td>
<td>IA-532, Classified GHL</td>
</tr>
<tr>
<td>WetBoss</td>
<td>0-100% RH</td>
<td>Classified GHL</td>
</tr>
<tr>
<td>SmokeBoss</td>
<td>0-10% optical density</td>
<td>IA-Pending, Classified GHL</td>
</tr>
<tr>
<td>Toxic gases</td>
<td>CL2, H2S, SO2, HCN, etc.</td>
<td>IA-Pending, Class GHL</td>
</tr>
<tr>
<td>VibraBoss</td>
<td>0-1 inches/sec velocity</td>
<td>Classified L</td>
</tr>
<tr>
<td>Thermal Fire Sensor</td>
<td>Bi-metal - analog output</td>
<td>Classified GHL</td>
</tr>
<tr>
<td>Voltage</td>
<td>0-120-250-500-1,000 VAC</td>
<td>n/a</td>
</tr>
<tr>
<td>Current</td>
<td>0-250-500-1,000A</td>
<td>n/a</td>
</tr>
<tr>
<td>RotaBoss</td>
<td>0-1,000-2,000 RPM</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Alarms for all situations

- Permissible or fresh air
- Singles and duals
- High intensity or low current LEDs
- Distinctive shrieking horn 105 dBA @ 1ft
- Flasher and horn, individually activated by 12-28 VDC
- Intrinsically safe, XP or unclassified
- MSHA Classified G, H, L
Typical System Applications

- Carbon monoxide -- conveyor belt monitoring,
- Underground main sump water level, (high alarm)
- Belt Status & Fault Id.-- slip, sequence, motor overload, etc.
- Belt switch status, (indicates switch off & belt down)
- Ventilation fan monitoring -- amps, volts, bearings temp, RPM’s vibration, air velocity and alarms when not running
- Temperature -- (outside & underground) determines activation of slope heaters
- Barometric Pressure
- Incoming Power -- alerts for low incoming power
- Paging sections -- serves as secondary communication
Why Rel-Tek Monitoring Products?

- Truly advanced technology
- Rock solid reliability, especially communications
- Modular buildup
- Start small and expand
- Never outgrow your system
- Fast data scan cycle
- Over 100 MSHA approval actions
- Free factory training
- Remote diagnostics and support
- Quarter century of experience
- Proven in small and large mines
- Rel-Tek’s quarter-century of experience
Automatic gas sensor calibration

- Pioneering products for cutting cost and enhancing safety
- MagiKal is our flagship system providing fully automatic, hands-off sensor calibration
- Includes full calibration time stamps and logged documentation
- Graphical displays of each sensor cal-trends
- Small or large systems -- one sensor or a thousand
- Saves big -- on labor, cal-gas cost and even extends the life of your sensors
- Low pressure gas tanks for additional safety.
- Computer scheduling -- monthly, weekly or daily -- and it never forgets!
ToxiGard -- High Precision, Self Calibrating Sensor

- Monitors CO in compressed air for SCUBA and SCBA refill stations
- Fire departments, diving centers, emergency rescue operations
- 18x24x7” self-contained panel
- Two, settable trip-point alarm relays
- Optional strobe and horn alarms
- Includes MagiKal II automatic calibration utility (patents pending)
- Calibrates itself to +/- 1% on preset schedule, on startup, or anytime... on pressing the Cal-Now button
- Sufficient cal-gas for about 30 calibrations; Easy-change tanks
- Monitors cal-gas pressure to assure adequate supply
- Tank gages show pressures
- 2-year life CO cell
- 110VAC or 24VDC power input
- Shows each sensor calibration trend in color
- Shows the health of sensor
- Flags problem areas
- Helps avoid shutdowns
- Documents calibration events for archives
- Prints out history to focus maintenance efforts

CALIBRATION DATE AND TIME: 09-19-2003 12:07
STATUS: CALL-PASS-Calibration Passed
RANGE: MAX=2670
MIN=900
MESSAGE: SPAN VALUE EXCEEDS LIMIT RAW MAX. MANUALLY ADJUST SENSOR SPAN DOWN.
MagiKal can double sensor life -- Yeah, Right!

- We use 12-bit (.0244%) resolution
- Amplifies tiny .8mA from sensor to generate full scale (4-20mA) 8-bit output
- Keeps old sensors in service well past retirement age
Professionals in Monitoring and Control Systems

- We engineer and manufacture all components in the M/C system -- hardware and software.
- We supply complete systems, not just bits and pieces.
- There’s never any finger pointing to third party suppliers if something goes wrong. We service what we sell.
- We have pioneered in monitoring and control systems for nasty environments for over 27 years.
- Our world-class technology is second to none.
- Our clients include underground mining, tunnels, transit and other demanding industrial firms... nationwide.
- We maintain a factory training center for hands on training and expert guidance.
Ahead, way ahead!

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