



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
- ◆ Ethernet and Internet access
- ◆ Graphics: Now with animation
- ◆ Sound: Windows Compatible, pager-phone and
- ◆ Super large screen capability -- Wall-sized view
- ◆ Auto report printout -- scheduled or manual
- ◆ Wall-mounted PCs with positive pressure Network workstations
- ◆ Hot standby computer; auto-switchover
- ◆ New DX-B-LINK, doubles communication distance





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



LAN

RFile

Referee

Hot Standby



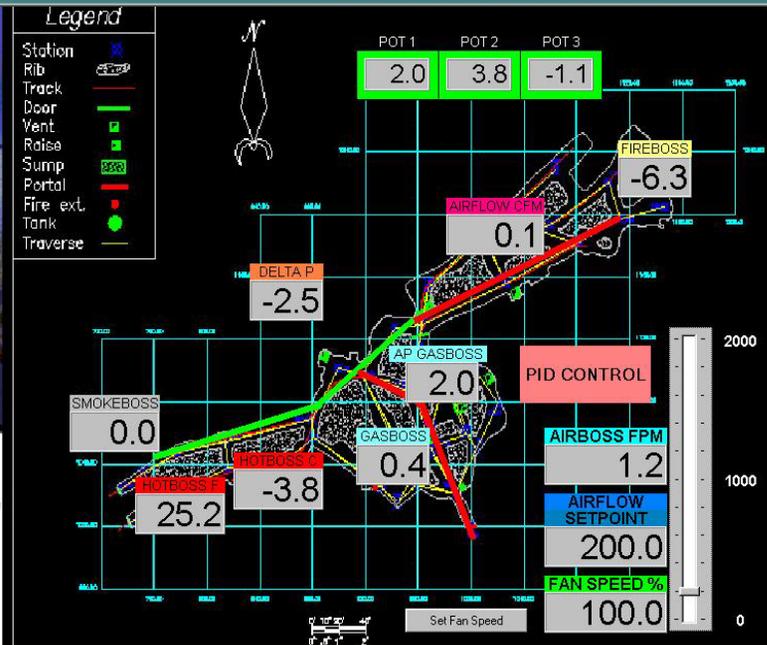
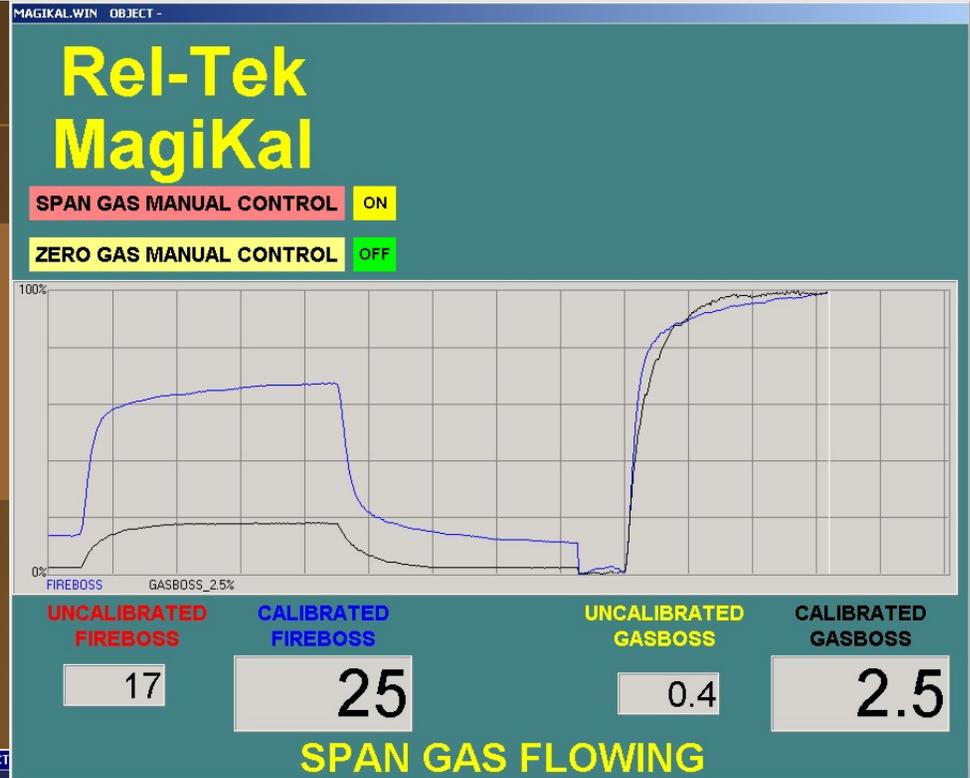
- ◆ RFile constantly updates standby computer files
- ◆ RFile determines a primary PC failure
- ◆ RFile automatically switches plant communication bus and transfers operations to standby computer
- ◆ Standby PC updates values with new data scans and initiates alarms to notify management





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 pizzazz 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

NEWBELT.win OBJECT -

MINE MONITORING SYSTEM

K-MINE

TAIL 0

EAST MAINS #2

BS EM#2 DRIVE 0

BS EM#1 43XC 0 43XC TAIL EM#1

BS EM#1 36XC 0 36XC

BS EM#1 24XC 0 24XC

BS EM#1 12XC 0 12XC

EAST MAINS #1

4XC REG 0 INBY

OUTBY 0

NORTH MAINS #1

BS NM DRIVE 0

BS NM DISCH 0

BS NM#1 DRIVE 0

BS NM#1 DISCH 0

BS NM#1 TAIL 0

BS NM#2 DRIVE 0

BS NM#2 47XC 0

BS NM#2 49XC 0

BS NM#2 56XC 0

BS NM#3 TAIL 0

BS NM#3 DRIVE 0

WEST MAINS #1

BS WM@DISCH 0

BS WM#1 25XC 0

BS WM#1 TAIL 0

BS WM#2 DRIVE 0

BS WM#2 47XC 0

BS WM#2 56XC 0

WEST MAINS #2

BS WM#3 TAIL 0

BS WM#3 DRIVE 0

SOUTH MAINS #1

BS SM DRIVE 0

BS SM#1 10XC 0

BS SM DISCH 0

BS SM#1 0

BS 1S DRIVE 0

BS 1S 12XC 0

BS 1S 24XC 0

BS 1S 36XC 0

BS 1S 46XC 0

BS S1 TAIL 0

1-SOUTH TAIL 0

LEGEND

- CO Sensor Off-Line (Blue)
- CO Sensor Normal (Green)
- CO +10ppm Visual Alert (Yellow)
- CO +15ppm Audio/Visual Alert (Red)
- Belt Running (Green line)
- Belt Stopped (Red line)

ALARM SILENCE

17:07:23 I/O_CARD_1.OFF LINE St:Ack Pr:Alarm 0.00

17:07:23 I/O_CARD_10.OFF LINE St:Ack Pr:Alarm 0.00

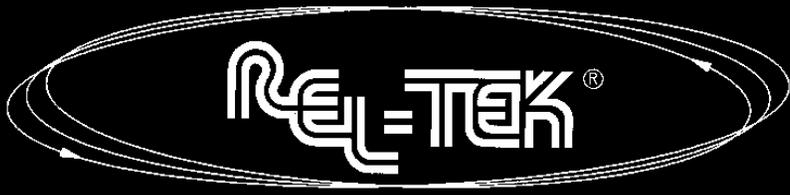
17:07:23 I/O_CARD_12.OFF LINE St:Ack Pr:Alarm 0.00

17:07:23 I/O_CARD_13.OFF LINE St:Ack Pr:Alarm 0.00

ACK ALARMS

CAL-NOW

Buttons: PAGE NORTH MAINS, PAGE WEST MAINS, PAGE 1-SOUTH, PAGE EAST MAINS



Millennia/DX -- Main Menu

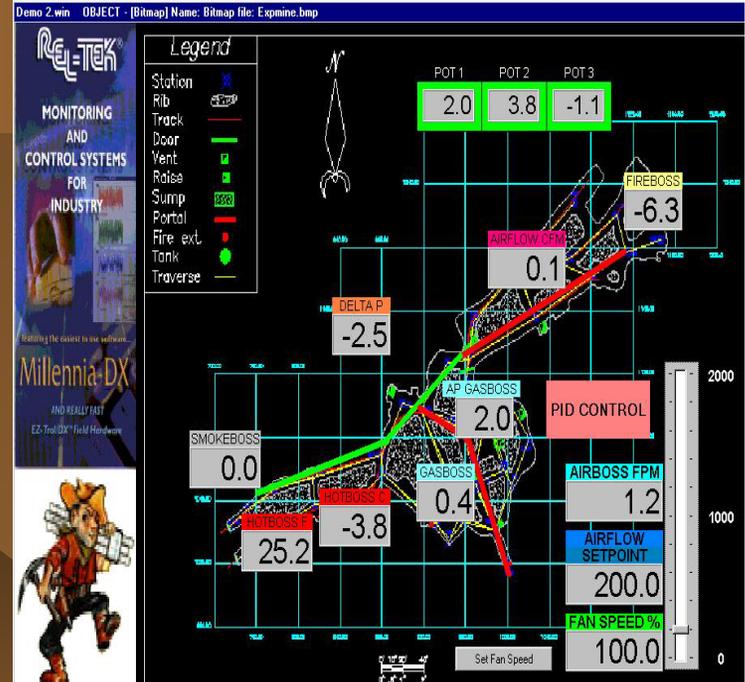
- ◆ High-speed C++ Code (no shortcuts taken)
- ◆ Display particular screens; bring images to front or rear
- ◆ Blinking lights show data communications in progress
- ◆ Log-in with password for secure access to alter program
- ◆ Screen placement options, and full "Help" utility
- ◆ Window Maker -- configure 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



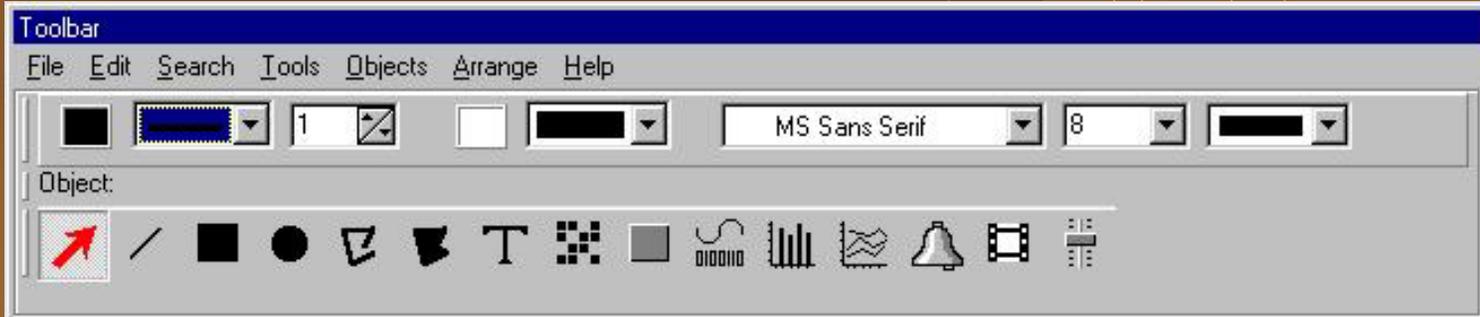


Powerful screen drawing utility

- ◆ 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.



Floating tool bar





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

Control Editor
File Edit Options Help Running

Page 1 / Page 2 / Page 3 / Page 4 / Page 5 / Page 6 / Page 7 / Page 8 / Page 9 / Page 10 / Page 11 / Page 12 /



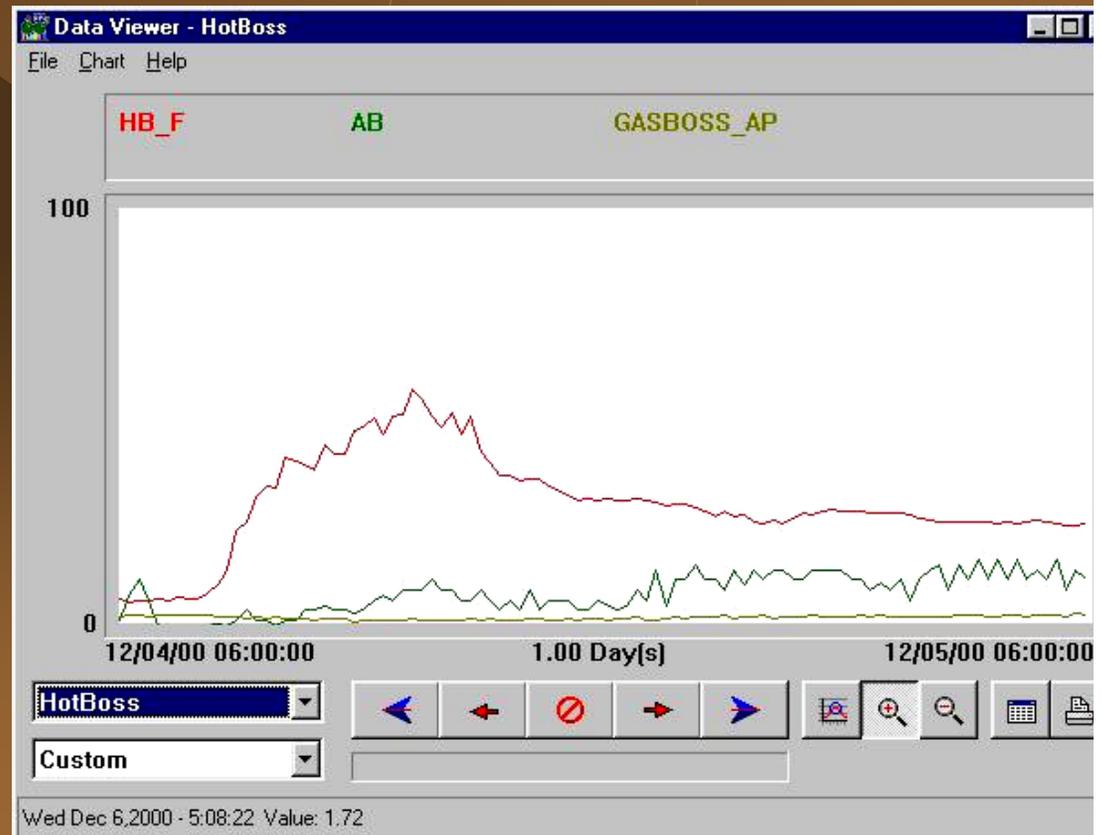


Unparalleled data logging capability



Set up logging

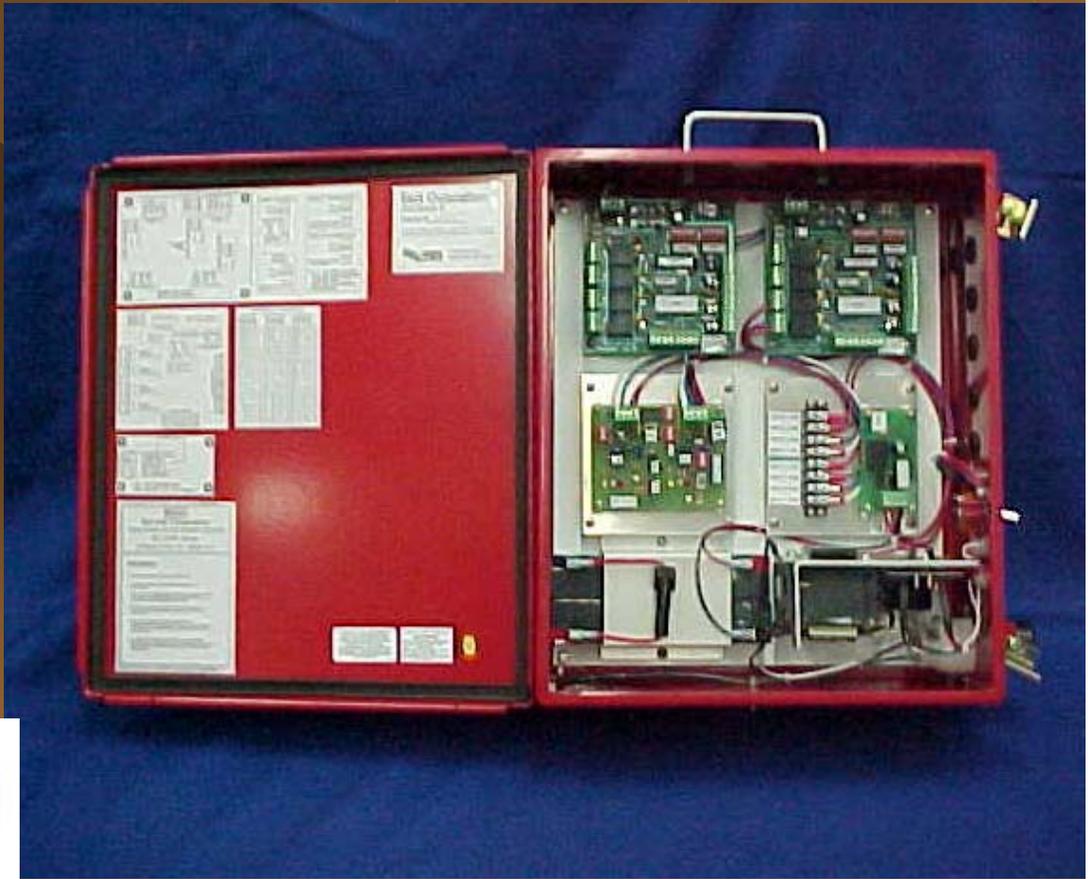
- ◆ Assign sensors to logical groups (CH₄, CO, O₂, Zone 1, Zone 2, etc.) for sorting
- ◆ Select logging time intervals
- ◆ Log only significant changes or every time
- ◆ Set up log groups of 8 sensors each To View
- ◆ Set up displays for logical groups of 8
- ◆ Click on time display options: today, yesterday, 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

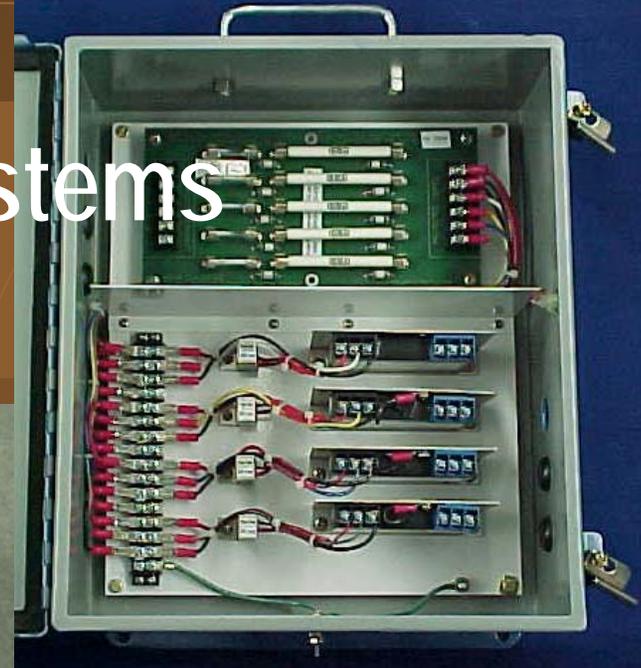
- ◆ Blue outstations serve sensors located in permissible areas -- (with IS Barriers).
- ◆ Red outstations serve sensors in fresh air.
- ◆ Powered outstations include:
 - Power Supply
 - Standby Battery--(4 hours)
- ◆ DX-LINK and I/O cards
- ◆ NEMA-12 dust-tight enclosure even has handle for your convenience





Intrinsic Safety Barrier Systems

- ◆ 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



BB/1 barrier box for mining

Dual Channel IS Barriers



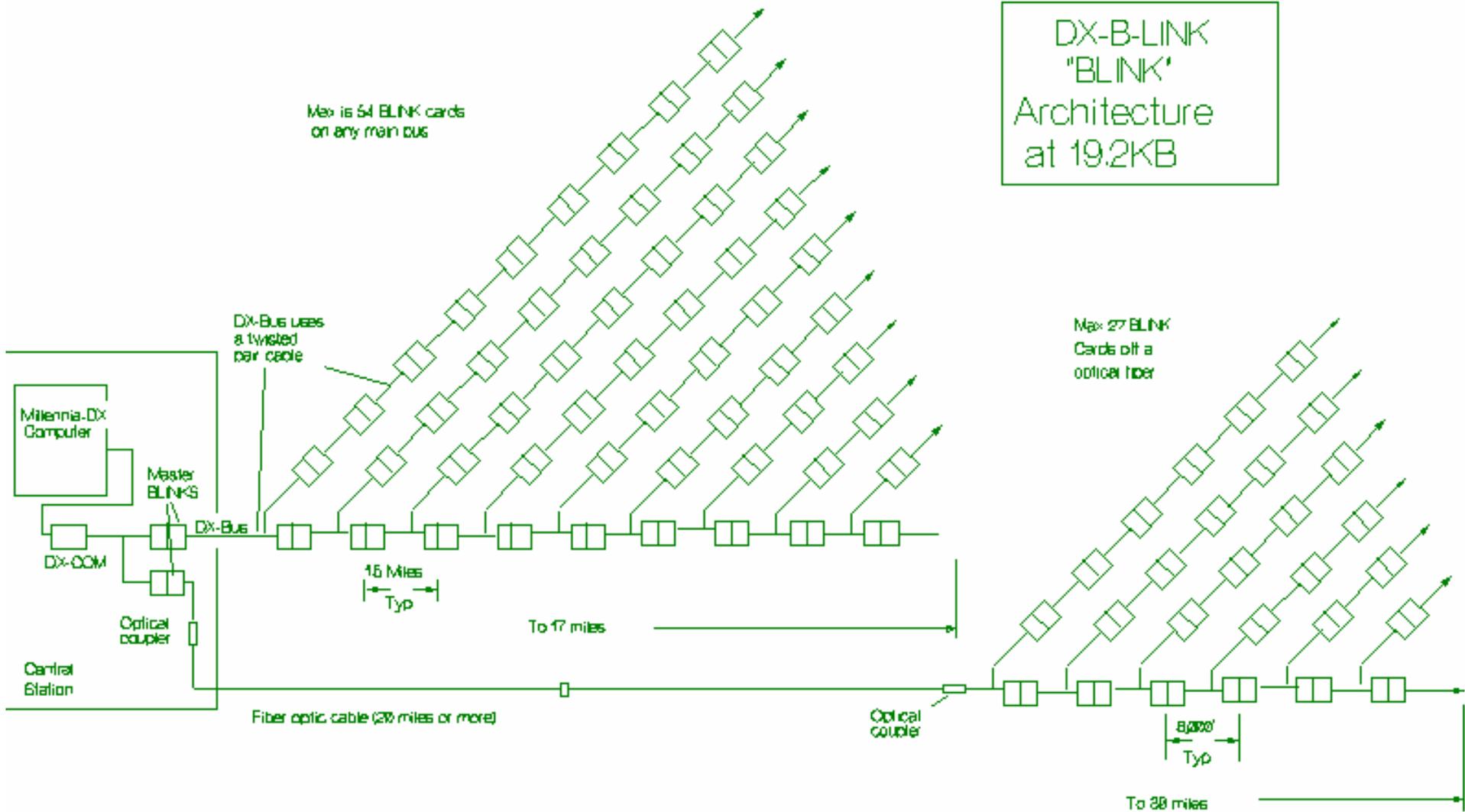


Robust telemetry hardware to handle your mine -- smallest to the largest

- ◆ 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

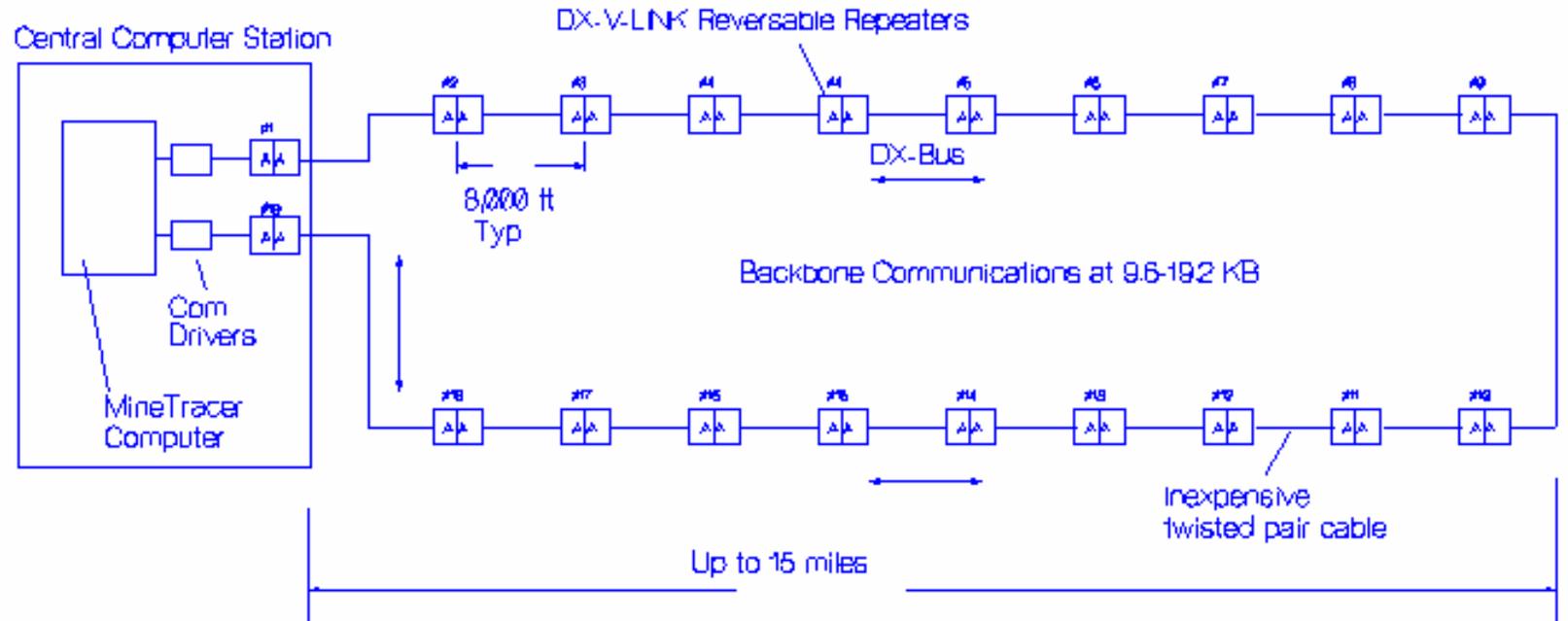


DX-B-LINK
"BLINK"
Architecture
at 19.2KB



MINETRACER Personnel Tracking System

Secure Loop Communications
for Post-Disaster Operation

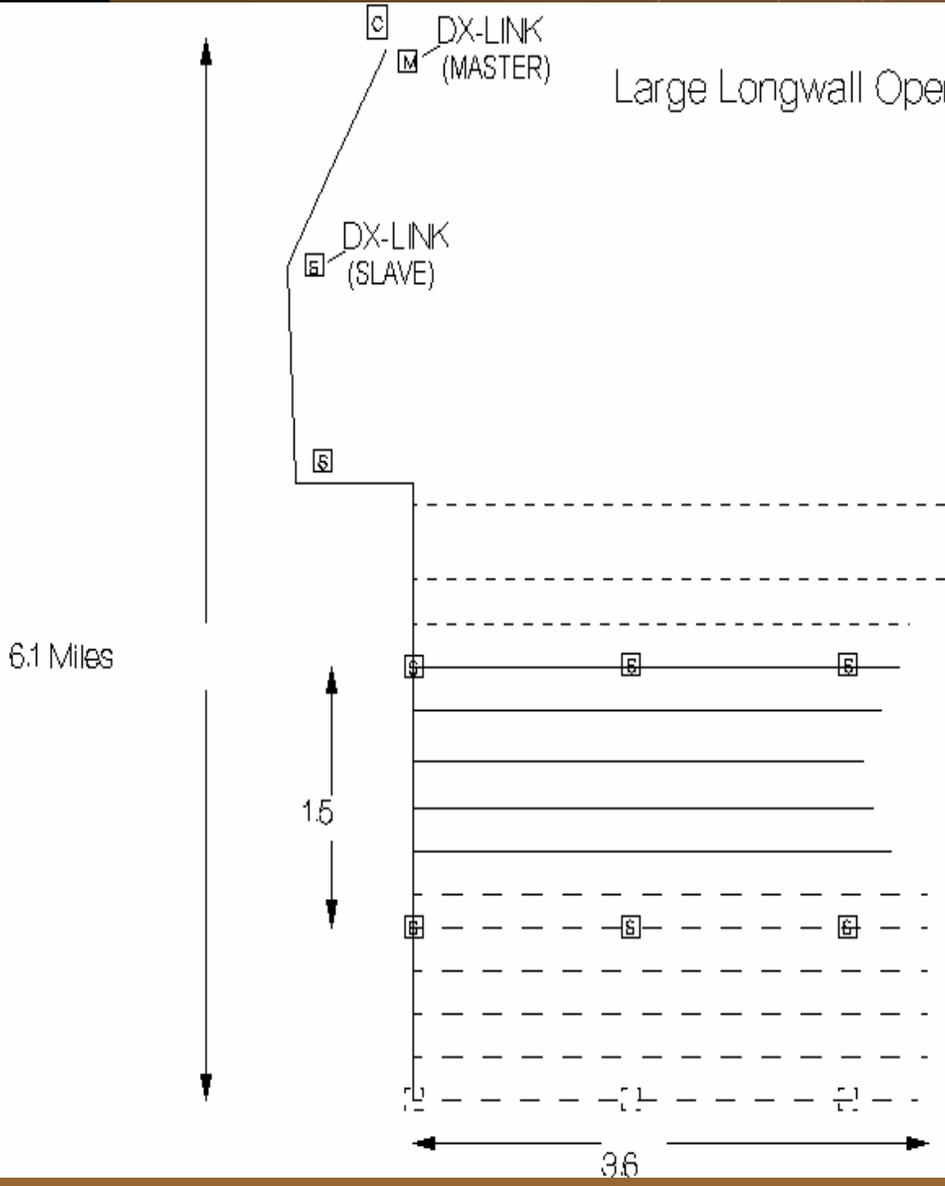


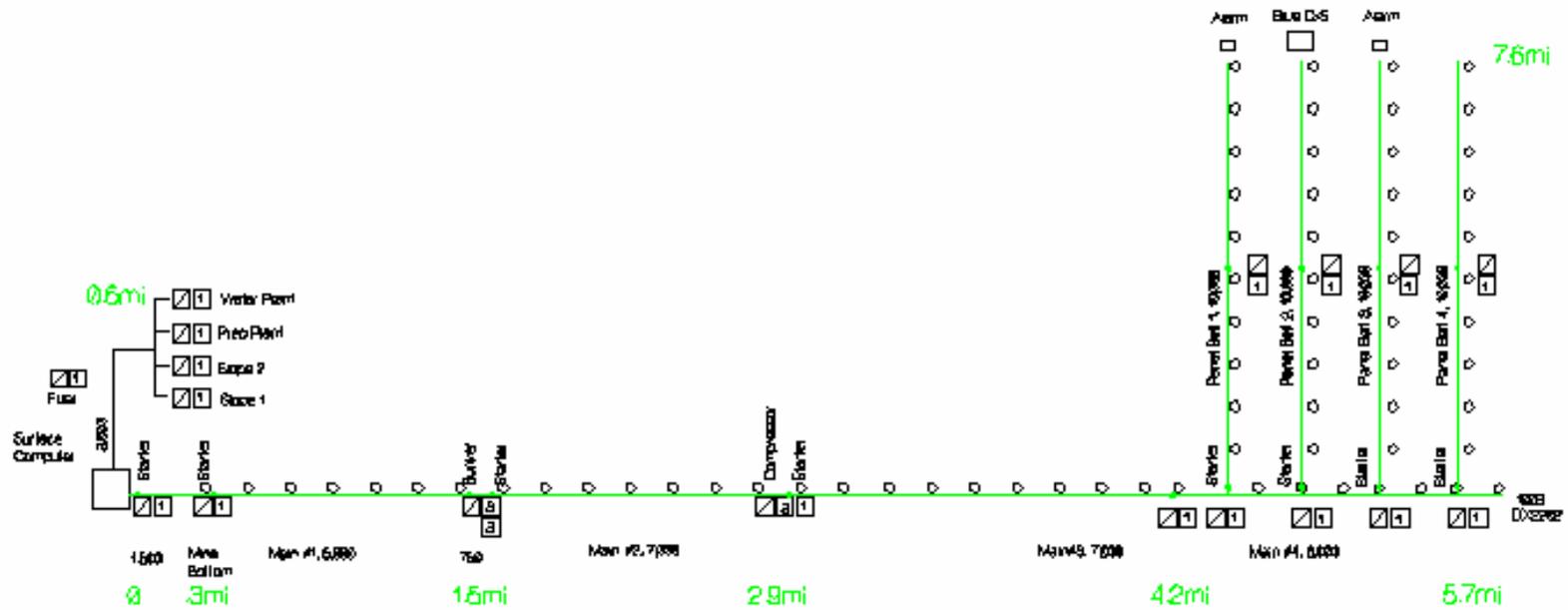
Distances are estimated based on limited data.

MineTracer Loop Communications for Post-Disaster Security		
By	Date 5/13/07	
App	Scale None	
	DR- 706131	REV



Large Longwall Operation



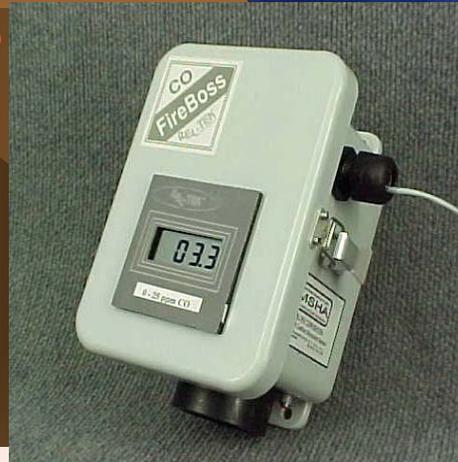
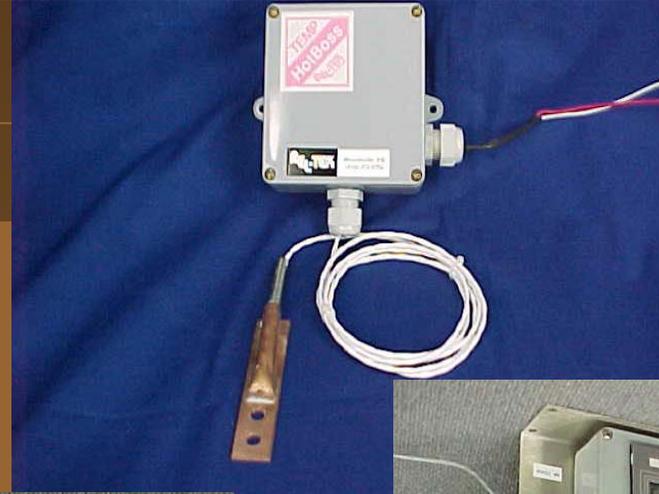


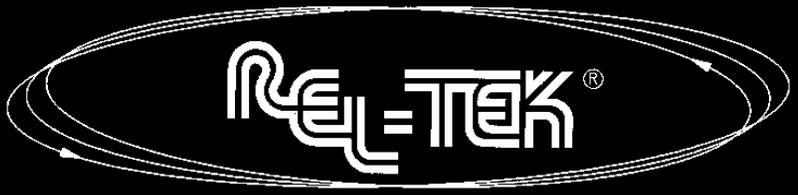
- Powered cabling with 4-DX4401, 4-DX3301 and 4-DX-Link. Includes 7.4V battery and KILL utility.
 - Unpowered cabling with up to 8 I/O cards (DX4401, DX4401 or DX3301) quantity as indicated. Starline panels 16" x 46" perforated metal. Quantities shown are not precise.
 - CO server and DX3242 card in plastic box. Quantities shown are not precise.
 - Bid drive
- Monitoring and control communication and cabling cables are not shown.

Al Ketler:



We manufacture all types of sensors

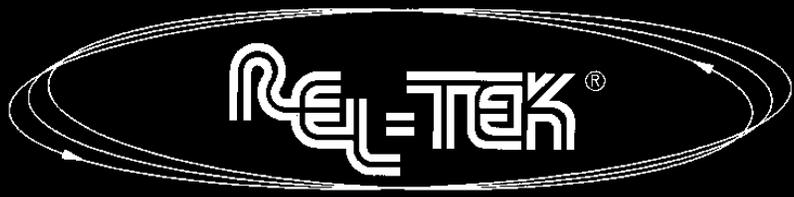




Sensors for Monitoring and Controls

		MSHA Approval Status
◆ FireBoss (CO)	— 0-25-50-100-500-1000 ppm	IA-Pending, Classified GH
◆ GasBoss (Combustibles)	— 0-50-100% LEL CH ₄ , H ₂	IA-532, Class GH
◆ GasBoss (TC)	— 0-100% CH ₄	IA-532, Class GH
◆ OxyBoss	— 0-21-50-100%	IA-Pending, Classified GH
◆ MultiBoss	— Low pressure, differential	IA-Pending, Classified GH
◆ RP/HP-xxxx	— High pressure (to 6,000 psi)	Classified L
◆ AirBoss, directional	— -2000 to +2000 fpm	Classified GH
◆ Air-velocity, high range	— 0-8,000 fpm, linear	IA-Pending, Classified GH
◆ AirBossHotBoss	— 0-392F (-18-200C)	IA-532, Classified GH
◆ WetBoss	— 0-100% RH	Classified GH
◆ SmokeBoss	— 0-10% optical density	IA-Pending, Classified GH
◆ Toxic gases	— CL ₂ , H ₂ S, SO ₂ , HCN, etc.	IA-Pending, Class GH
◆ VibraBoss	— 0-1 inches/sec velocity	Classified L
◆ Thermal Fire Sensor	— Bi-metal - analog output	Classified GH
◆ Voltage	— 0-120-250-500-1,000 VAC	n/a
◆ Current	— 0-250-500-1,000A	n/a
◆ RotaBoss	— 0-1,000-2,000 RPM	n/a





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!

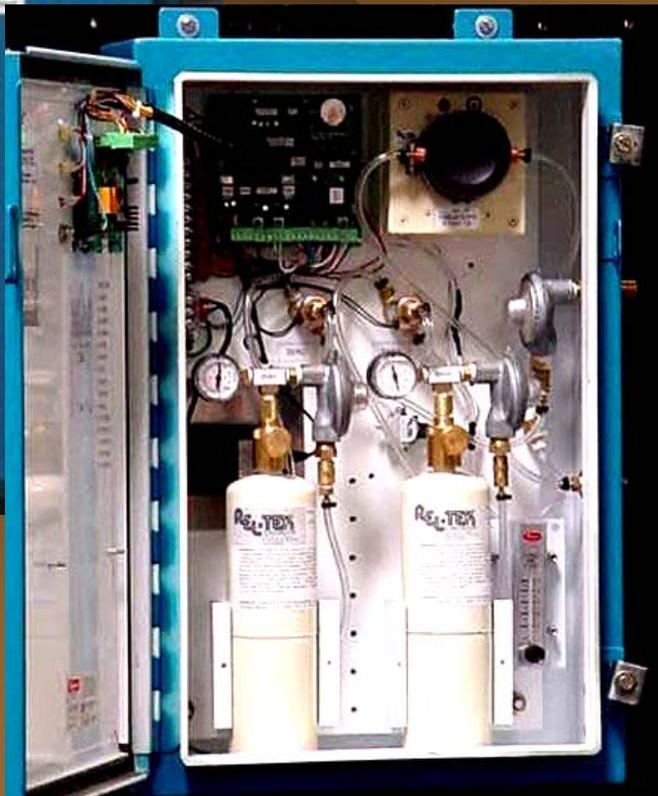


Small, inexpensive tanks handle a sensor or two for a year or more.



Large tanks handle a hundred sensors for a year

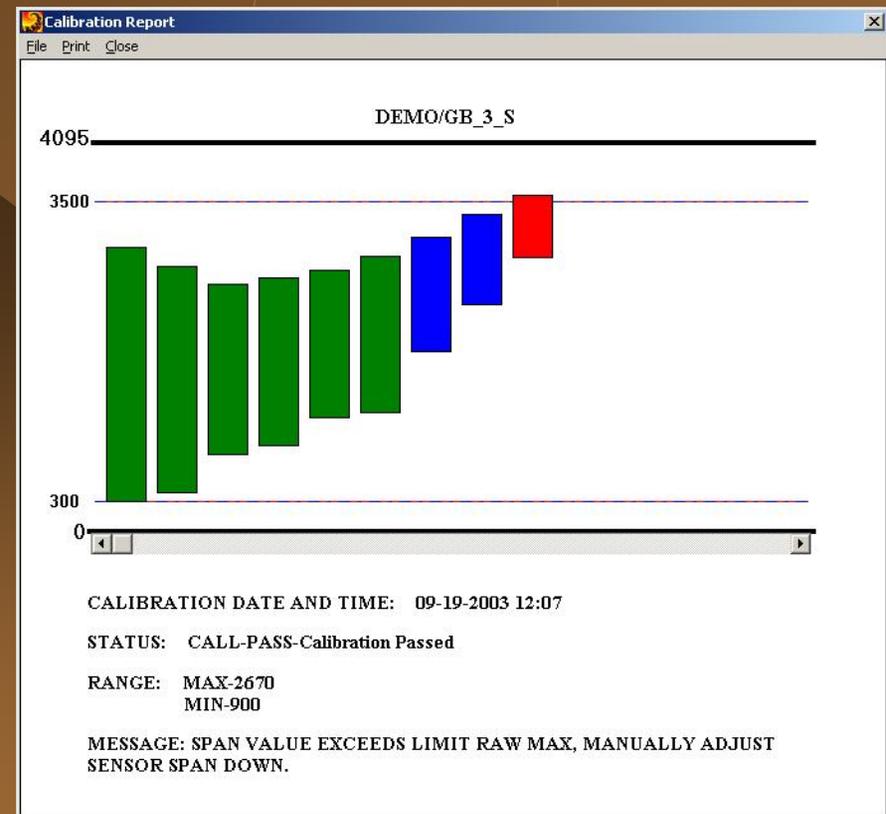
ToxiGuard High Precision, Self Calibrating Sensor



- ◆ 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

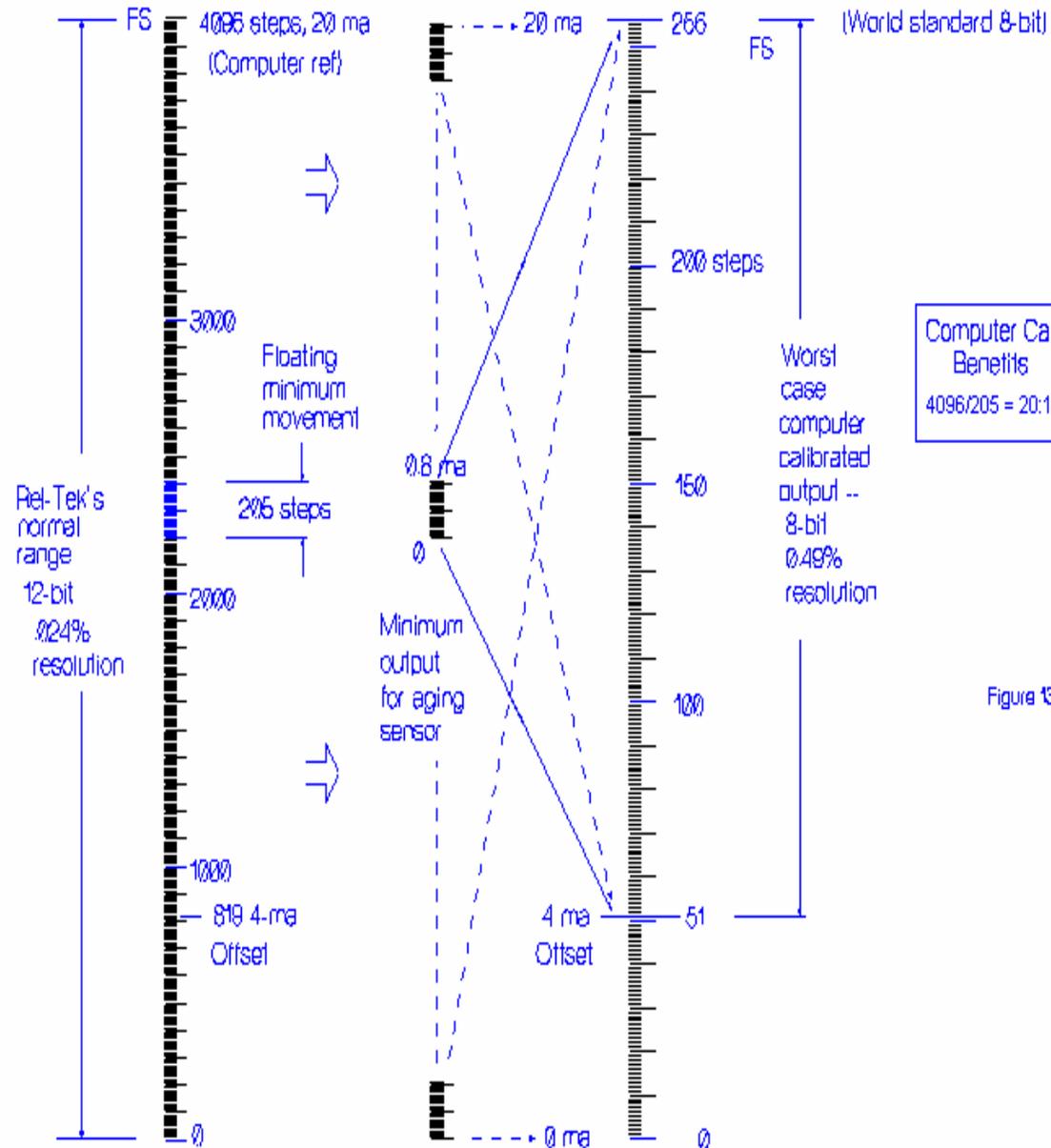


- ◆ Shows each sensor calibration trend in color
- ◆ Shows the health of sensor
- ◆ Flags problem areas
- ◆ Helps avoid shutdowns
- ◆ Documents calibration events for archives
- ◆ Prints out history to focus maintenance efforts



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



Computer Calibration Benefits
4096/205 = 20:1 compensation

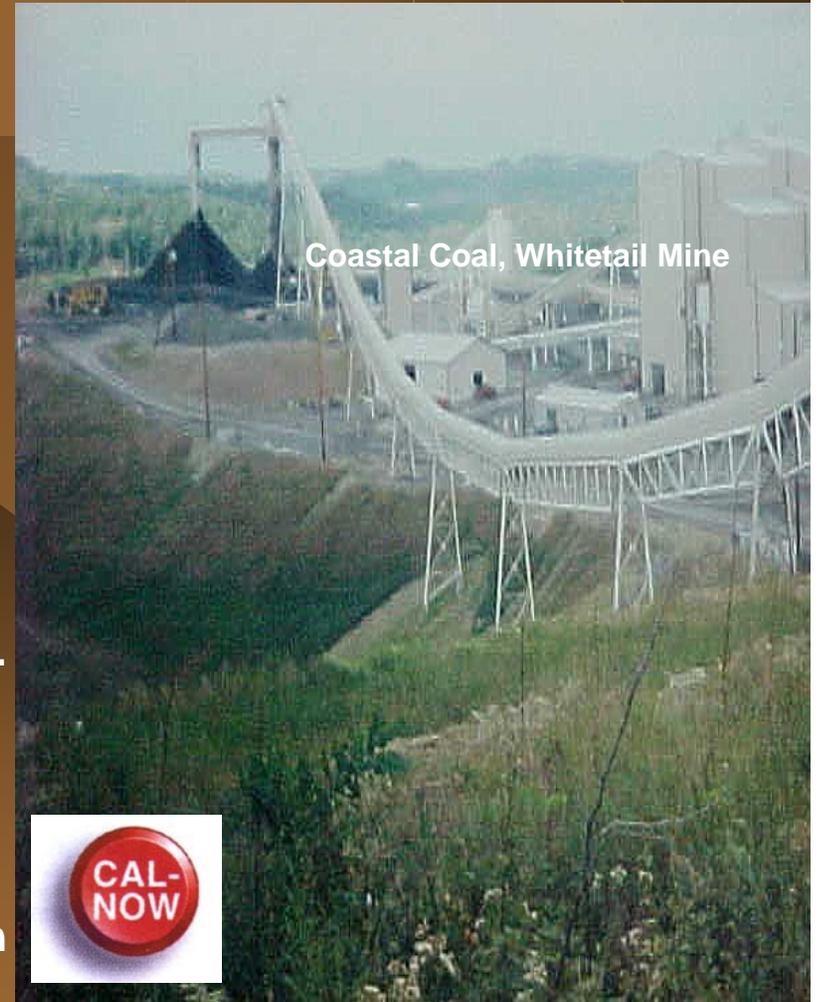
Figure 13

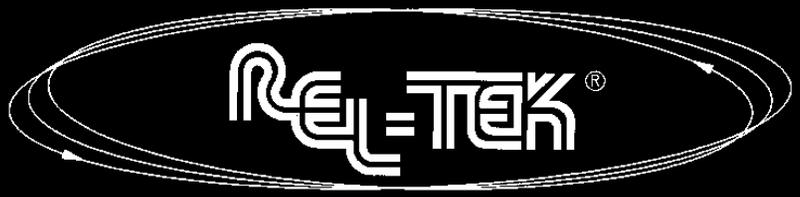




Professionals in Monitoring and Control Systems

- ◆ 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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