



***AMR* PEMCO**

PROVEN PARTNER IN TECHNOLOGY

WWW.AMRPEMCO.COM

Corporate Overview



- AMR PEMCO and sister companies operate to provide electronic monitoring, controls, communications, tracking, and collision avoidance systems as well as industrial buildings, circuit breakers, dry-type transformers, and automation integration.
- Markets served include global mining, aggregates, tunneling, power generation, utilities, transit, nuclear, water/wastewater, and general industry.
- Primary sales in the U.S., Canada, Mexico, India, South Africa, and South America with sales in many other countries around the world.

AMR est. 1975



ERM est. 1979



CMS est. 1995



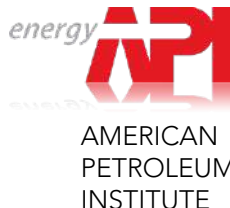
PEMCO est. 1960 - Acquired in 2016



Delivering Projects Worldwide



Codes and Certifications



Experience With Popular Brands



GE Infrastructure
Water & Process Technologies



Clients and Customers



NORTHROP GRUMMAN

Balfour Beatty



TMEiC



**Rockwell
Automation**



Core Capabilities



- Industrial & control buildings (ICB) and equipment enclosures including HVAC systems and design, installation and integration of all types of electrical equipment
- Complete skid mounted systems including switchgear, AC & DC Drives, transformers and control systems
- Complete skid mounted power centers and substations for harsh duty applications
- Custom designed dry type transformers up to 4 MVA and 25kV class.
- Specialty magnetics for custom applications including reactors, inductors, and rectifier duty transformers
- UL and CSA certified control panels with custom enclosure design and fabrication
- 3D modeling capabilities for all enclosures and bus assemblies.
- Electrical, mechanical, and transformer engineering



Mine Wide Monitoring



Since 1987, AMR PEMCO has provided the most flexible and reliable mine monitoring systems available in the mining industry. Our systems optimize operations through real-time monitoring and control, allowing an operator to pinpoint unsafe or hazardous areas, trend machinery data for maintenance, and control devices remotely. Mine operators can choose the standard MC-4000 System, which communicates over simple and durable twisted pair copper cable and uses RS-485 protocol; or select the MC-4000-ET System, which utilizes Modbus over Ethernet protocol on a fiber-optic backbone.





MINE WIDE MONITORING SOLUTIONS

TS-7500 Track Switch



AMR's Track Switch Monitor (TS-7500) is designed to detect a gap in rail track-switch. Once installed, the monitor has the ability to indicate if a track-switch is completely closed, or if it has a gap of 1/8th inch or more. The TS-7500 consists of a base unit enclosed in a rugged polycarbonate housing with a clear light dome and a cylindrical sensor mounted in the track rail. Its functionality includes a flashing LED strobe that indicates the status of the track-switch, and a small pulsing amber LED with buzzer which are used as low-battery warning devices. The unit is powered by a lantern style 12VOC battery or the unit can be AC powered.



As technology changes in the mining industry, AMR PEMCO strives to satisfy the needs of the growing industry. Our new Ethernet-based Mine Wide Monitoring System applies the latest in technology available today. Utilizing a fiber-optic backbone and our Modbus Gateway Remote Stations, gas/belt monitoring has never been easier.

- ▣ Software
 - ▣ As an integral part of this new technology, our ModbusTCP software application runs in the background of your selected HMI system. Utilizing our Gateway hardware, this application is configured to poll our Slave devices and then provide OPC compliant tags for easy display in your HMI software.



MC-4011



The MC-4011 Data Line Interface is a stand-alone RS-232 to line converter with an integral power supply for trunk line sensors. It connects to the serial port or USB of the MC-4010 Master Station and then drives the system's data line.

- ▣ Features & Benefits
 - ▣ 28 VDC power supply for trunk line sensors and remotes
 - ▣ LED indicators for transmit and receive
 - ▣ Watchdog alarm to monitor data line activity
 - ▣ Fused and transient protected outputs



MC-4020



A multichannel, battery-backed, 120 VAC powered remote station provides DC power for specialized sensors and enough I/O points for most applications. For example, the unit could monitor vibration, phase loss, water gauge, motor current, bearing temperature, etc.

- ▣ Features & Benefits
 - ▣ 8 analog inputs
 - ▣ 8 digital inputs
 - ▣ 8 user configured inputs (either as 8 additional analog, 8 additional digital or 4 of each)
 - ▣ 6 control relay outputs
 - ▣ Addressable from 1 to 99
 - ▣ Rechargeable battery backup
 - ▣ LED indicators for transmit and receive



MC-4025



This small, addressable, line-powered remote station can be attached anywhere on the MC-4000 data line to monitor, belt functions such as slip, gob, remote switch, etc. Relay outputs can be used to control belts and pumps.

- ▣ Features & Benefits
 - ▣ Operating Voltage: 28 VDC Line Power
 - ▣ No backup battery
 - ▣ Inputs: 4 Analog, 8 Digital
 - ▣ Outputs: 2 Control Relay
 - ▣ Display: No
 - ▣ No self test feature



MC-4040



The MC-4040 is used to split and extend the MC-4000 data line. This unit can be line-powered just as the MC-4210 addressable sensors are, or it can be integrated into a MC-4020 remote. The MC-4040 also has two on-board analog channels and two control outputs for controlling external devices.

- ▣ Features & Benefits
 - ▣ 3 data line outputs from 1 input
 - ▣ 2 analog inputs, 2 control outputs
 - ▣ Can be ordered as a line-powered or 120 VAC powered unit
 - ▣ Addressable from 1 to 99
 - ▣ Low current operation



WinMAC



- Monitor multiple unique gases simultaneously
- Sensors available include: CO, CO₂, CH₄, O₂, NO, NO₂, H₂, H₂S, SO₂ and others
- Diesel Nullifying available using NO and CO sensors
- Calibration data, including last calibration date*, stored in each individual sensor module (Wi-Fi Only with time synchronization server)
- No tools required for sensor module replacement
- Automatic detection of installed sensors
- Automatic date & time synchronization (Wi-Fi Only)

The screenshot shows the WinMAC software interface. At the top is a menu bar with options: File, Windows, Status, Alarms, Utilities, Reports, Configuration, Help. Below the menu bar are tabs for Remotes, Sensors, Alarms, and Events. The main window is divided into two sections. The top section, titled "Sensor Status", contains a table with columns: Address, Name, Description, Value, Units, Gas, Peak Value, Status, Accuracy, and Start Time. The bottom section, titled "Remote Status", contains a table with columns: Address, Name, Description, Status, Accuracy, and Start Time. At the bottom of the window is a status bar with a red background and the text "ALARM".

Address	Name	Description	Value	Units	Gas	Peak Value	Status	Accuracy	Start Time
1	MC-4210-CO	Slope Tail	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P
2	MC-4210-CH4	#1 North Return	0.00	%	CH4	0.00	OK	50.0%	08/07/2003 2:48 P
3	MC-4231-CO	Section Alarm	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P
4	MC-4210-CO	First North #1 Sensor	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P
5	MC-4210-CO	#1 N break 20	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P
6	MC-4210-CO	Second North Drive	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P
7	MC-4210-CO	#2 N break 20	0.00	ppm	CO	0.00	OK	50.0%	08/07/2003 2:48 P

Address	Name	Description	Status	Accuracy	Start Time
1	CB-FR0	Circuit Breaker Controller	OK	14.3%	05/12/2003 2:13 PM
2	MC-4020	#1 North Power Supply	OK	50.0%	08/07/2003 2:44 PM
3	MC-4040	2 Section Splitter	OK	50.0%	08/07/2003 2:45 PM

MC-6410 Multi Gas Monitor



- Monitor multiple unique gases simultaneously
- Sensors available include: CO, CO₂, CH₄, O₂, NO, NO₂, H₂, H₂S, SO₂ and others
- Diesel Nullifying available using NO and CO sensors
- Calibration data, including last calibration date*, stored in each individual sensor module
- No tools required for sensor module replacement
- Automatic detection of installed sensors
- Automatic date & time synchronization (Wi-Fi Only)
- NETWORK INTERFACE OPTIONS:
 - IEEE 802.11 Wi-Fi
 - Radio module for AMR Mine Net™ System
 - RS485 for AMR MC-4000 or other control systems
 - 4-20mA Current Loop
- MSHA Intrinsically Safe Approval # 18-A130001



MC-6415 Smoke Sensor



AMR PEMCO's Patented MC-6415 Wireless Smoke Sensor provides monitoring for smoke and/or fire conditions in key locations. Enhanced detection and reliability are provided with a dual optical sensing chamber along with custom designed hardware to reduce the amount of environmental components such as rock dust

- Ideal for use with fire-retardant conveyor belts
- Dual optical sensors allow for reduced false alarms
- Wireless interface as well as a wired communication option
- Automatically calibrated the alarm point
- Patent pending design to limit exposure to mining environment
- Compatible with MC-4000 and Mine Net™ Mesh Systems



MC-4210 Single Gas Monitors



Line-powered gas monitors,
addressable up to 256 on each sub
network.

- One compact surface mount PC board for sensor and communications
- Wide range four-digit display
- Calibrated without removing cover
- Non-intrusive sensor test and calibration with automatic surface reporting
- Available for eight different gases: CO, CH₄, O₂, NO, NO₂, H₂, H₂S, and SO₂.



MC-4210-CO/NO



Designed to significantly reduce the nuisance alarms associated with using diesel equipment in coal mines. In addition to emitting carbon monoxide (CO), the diesel engine also emits nitric oxide (NO) in a CO/NO ratio of approximately 4:1.

- ▣ Available as O₂, CO, NO, NO₂, SO₂, H₂S, H₂
- ▣ Stand Alone or part of a complete Atmospheric Monitoring System
- ▣ Adjustable alarm and warning outputs
- ▣ Low current operation
- ▣ Easy to read 4 Digit LCD Display
- ▣ Network communications indication
- ▣ Sealed polycarbonate enclosure
- ▣ Optional Input/Output Interface PC Board available



MC-4210-CH4-IR (Infrared)



The MC-4210-CH4-IR Addressable Sensor is a compact monitor designed to be used with our MC-4000 System. The MC-4210-CH4-IR offers a very low current draw and is easily addressable by using three rotary switches. Units can be configured for multiple communications protocols, analog operation, or stand-alone. One compact surface mount PC board for sensor and communications

- Wide range four-digit display
- Calibrated without removing cover
- Sensor cell ZERO calibration error and SPAN calibration error indication
- Advantages Over Hot Filament – (Pellistor) Type
- Lower current draw
- Longer cell life
- Resistant to contamination



MC-4231-CO



Data line connected CO monitor with high visibility LED and audible alarm

- One compact surface mount PC board for sensor and communications
- Wide range four-digit display
- Calibrated without removing cover
- Non-intrusive sensor test and calibration with automatic surface reporting
- Highly visible 360 degree LED array
- 103 decibel Sonalert alarm



BC-Pro Conveyor Belt Controller



- A “stand-alone” unit to monitor and control the many functions at the belt head, the BC-Pro Conveyor Belt Controller is designed to oversee any area involving the transfer of materials in a mining, tunneling, quarrying or processing operation. Through the continuous detection of conveyor speeds, belt sequencing, and real-time slip detection, the BC-Pro provides economic cost saving benefits and an increase in productivity by reducing the downtime of the material haulage system.
- The BC-Pro utilizes an Allen-Bradley PLC control system for years of reliable operation. It reports malfunctions instantly, making it possible to bring the conveyor system back online quickly, either locally or remotely depending on the severity of the problem.





For more information please contact us at:

+1.276.928.1712

SALES@AMRPEMCO.COM

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