



RAM3

Remote Alarm Module

INSTRUCTIONS

Installation and Operation of the
AMC-RAM3 with AMC Monitors

IMPORTANT:

Please read this installation and operating instructions completely and carefully before starting.

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NOTE

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1 GENERAL INFORMATION

1.1 WARRANTY

The AMC-RAM3 is warranted against defects in material and workmanship for a period of two years from date of delivery. Maintenance items are not warranted. During the warranty period, *The Armstrong Monitoring Corporation* will repair or replace components that prove to be defective in the opinion of AMC. Any equipment deemed to be defective by the user should be returned to *The Armstrong Monitoring Corporation* for evaluation (see product return below). Site visits by Armstrong personnel, to evaluate/repair equipment, are not covered by this warranty. AMC is not liable for auxiliary interfaced equipment, nor for consequential damage. This warranty shall not apply to any product, which has been modified in any way, which has been repaired by any other party other than a qualified technician or authorized AMC representative, or when failure is due to misuse or conditions of use.

Note: Extended warranty mail in calibration programs are available (please call 1-800-465-5777).

1.2 LIABILITY

All AMC products must be installed and maintained according to instructions. Only qualified personnel should install and maintain the equipment.

AMC shall have no liability arising from auxiliary interfaced equipment, for consequential damage, or the installation and operation of this equipment. AMC shall have no liability for labour or freight costs, or any other costs or charges in excess of the amount of the invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THE FACE THEREOF.

WARNING

CHECK TO ASSURE THE WORKING AREA IS FREE FROM HAZARDS DURING INSTALLATION OR WHEN PERFORMING MAINTENANCE, AND USE PROPER PRECAUTIONS.

1.3 PRODUCT RETURN

All products returned for warranty or service should be shipped by prepaid freight. Please obtain a Return Material Authorization (RMA) number from AMC prior to shipping and ensure this RMA number is clearly visible on the outside of the shipping container. Material shipped without RMA will be rejected and returned. All products returned to the client will be shipped by freight collect.



1.4 CONTACT INFORMATION

For information please call 1-800-465-5777 or through contacts at www.armstrongmonitoring.com or through email directly at support@armstrongmonitoring.com.

1.5 MODIFICATIONS AND SUBSTITUTIONS

Due to an ongoing development program, AMC reserves the right to substitute components and change specifications at any time without incurring any obligations.

1.6 References

Document Number	Document Name
3419405D	AMC1800 User Manual
3093405C	AMC1400 Multi-Channel Monitor User Manual
3156405C	AMC VersaTox Instruction Manual
3367405B	AMC 1DBX Digital Monitor User Manual
3132405C	AMC1A1 Gas Monitor User Manual
3113405E	AMC1A2 Gas Monitor User Manual

1.7 Glossary

AMC	Armstrong Monitoring Corporation
AMC1800	A product manufactured by AMC, monitor with modular I/O cards that supports up to 32 sensors (in increments of 8)
RAM	Remote Alarm Module
AMC VersaTox	A series of Transmitters that employ various electrochemical Sensors with an optional relay board.
AMC1DBx	A digital monitor manufactured by AMC that supports up to 988 sensors and up to 64 relays
AMC1400	A monitor manufactured by AMC that supports up to 4 sensors and up to 16 relays.
GAS Monitor 1A	A monitor manufactured by AMC that supports up to 2 transmitter interfaces and up to 5 relays.
Relay NO	Normally open. Contact state when relay is de energized (not connected to COM contact. When relay is energized this contact is connected to COM contact.

2 PRODUCT INFORMATION

2.1 AMC-RAM3

AMC Part Number	
Power Supply Requirement	12 to 24 VDC
Supply Current Drawn	275mA
Operating Temperature	-30° to 50° C (-22° -122°F)
Operating Pressure	Ambient atmospheric pressure
Relative Humidity	0 to 99% RH, non-condensing
Warranty	Two Years



Figure 2-1 AMC-RAM3



3 PRODUCT DESCRIPTION

This section provides a general product description and is followed by a detailed list of the AMC-RAM3 features.

3.1 GENERAL DESCRIPTION

The AMC-RAM3 provides a remote alarm indication when employed with monitors, such as the AMC1400, AMC1800, AMC Gas Monitor 1A or the Digital Gas Monitor 1DBx. The AMC-RAM3 can also be switched on with a VersaTox Transmitter that has a relay card. An acknowledge switch is provided to silence the audio alarm of the AMC-RAM3.

A red strobe light is provided as a visual indicator. The strobe light remains active until the alarm is cleared.

The Audio alert is provided by a buzzer which emits a 2900hz tone at in excess of 90 dB(A) (at 24 inches). The audio alert is activated upon entry into alarm and is silenced by either pushing the acknowledge switch or clearing the alarm.

The AMC-RAM3 employs a water resistant (NEMA 4X) molded fibreglass enclosure.

A terminal block is provided for terminating the field wiring between the AMC-RAM3 and the monitor.

The AMC-RAM3 requires a power source which provides 12 to 24VDC, 275 mA.

3.1.1 FEATURES

Each AMC-RAM3 provides the features as listed and described below.

- | | |
|-----------------------------------|--|
| 1) Audio Alarm Acknowledge Switch | Silences alarm, but visual alarm continues until monitored gas clears. |
| 2) Low Voltage wiring | Allows multiple devices to be wired in common conduit. |
| 3) High Visibility Strobe | Alerts personnel when gas concentration exceeds preset limits. Strobe remains active until the alarm condition clears. |
| 4) Alert buzzer | Provides a 90db audible alarm. |

4 INSTALLATION

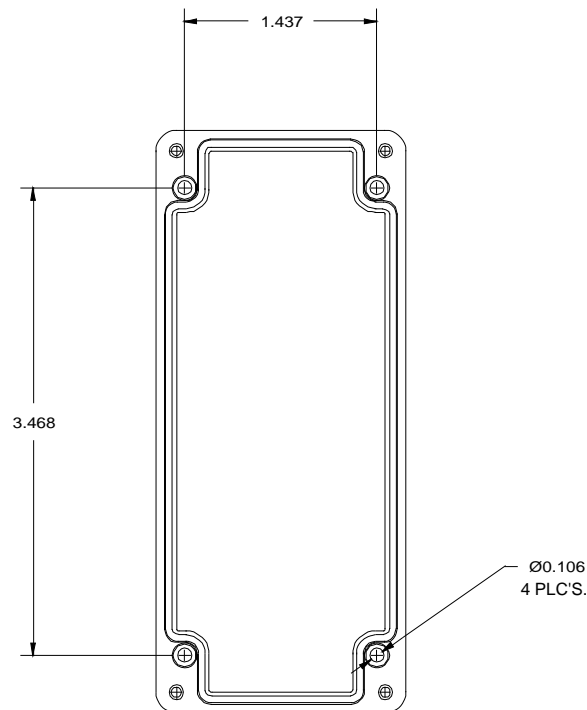
This section relates to the proper installation of the AMC-RAM3 unit. The topics of proper location, sensor wiring selection, and multi-unit interconnection are all discussed in detail.

4.1 LOCATION AND MOUNTING

The AMC-RAM3 is a remote audio/visual alarm module, and is to be mounted in a location where it is visible to anyone occupying the room. The mounting height for the AMC-RAM3 should be such that the beacon is at or slightly above eye level and the acknowledge switch is accessible.

NOTE:

Mounting arrangement of the housing depends on the location and mounting surface. Mounting hardware is NOT supplied.



TOP VIEW
WITHOUT COVER

Figure 4-1 Mounting Holes



4.2 CABLE SELECTION AND WIRING

To gain access to the terminal blocks, remove the four (4) screws and top lid from the housing. This will expose the field wiring terminals. The AMC-RAM3 module inputs (- +) 12-24VDC terminal block is wired to the AMC monitors and/or Power Supplies as defined in the various Figures shown in Section 5 AMC-RAM3 APPLICATIONS.

Connection should be made using 3-conductor cable (shielding not required)

The workable distance between the monitor and the AMC-RAM3 is a function of the following;

- ⇒ Power Supply voltage
- ⇒ Wire gauge
- ⇒ AMC-RAM3 load current

The Monitor power supply is generally fixed, based upon Monitor type;

- ⇒ 24VDC for AMC1400, AMC1800, AMC-1DBx
- ⇒ 19 to 23VDC for AMC Gas Monitor 1A

When an external power supply is employed to power the AMC-RAM3, then the power supply output must be between 12 and 24VDC, typically 24VDC. Use the Power supply voltage output and the wire gauge, with the graph below to determine the maximum distance between the AMC-RAM3 and the power supply.

		Power Supply (V)										
		12	13.2	14.4	15.6	16.8	18	19.2	20.4	21.6	22.8	24
Wire Gauge (AWG)	12	0	1,283	2,567	3,850	5,134	6,417	7,701	8,984	10,267	11,551	12,834
	14	0	839	1,678	2,517	3,357	4,196	5,035	5,874	6,713	7,552	8,392
	16	0	519	1,039	1,558	2,078	2,597	3,117	3,636	4,156	4,675	5,195
	18	0	331	661	992	1,322	1,653	1,983	2,314	2,645	2,975	3,306
	20	0	208	416	623	831	1,039	1,247	1,455	1,662	1,870	2,078
	22	0	130	260	390	519	649	779	909	1,039	1,169	1,299
	24	0	80	160	240	320	400	480	559	639	719	799

Table 4-1 Distance Chart (ft): Power Supply vs Wire Gauge

Note: Products set up with Butt Splice connections are limited to 22-16 AWG.

The distances shown should be reduced if multiple AMC-RAM3 are connected in parallel to the same power supply as shown in Figure 5-6 Multiple AMC-RAM3 Wiring. For example if three AMC-RAM3 were connected in parallel closely together using a 24V DC supply and 18 AWG wire the maximum distance would only be 1/3 of the value shown in the chart or 1102 ft. There is an inverse relationship between the number of AMC-RAM3's and the distance.

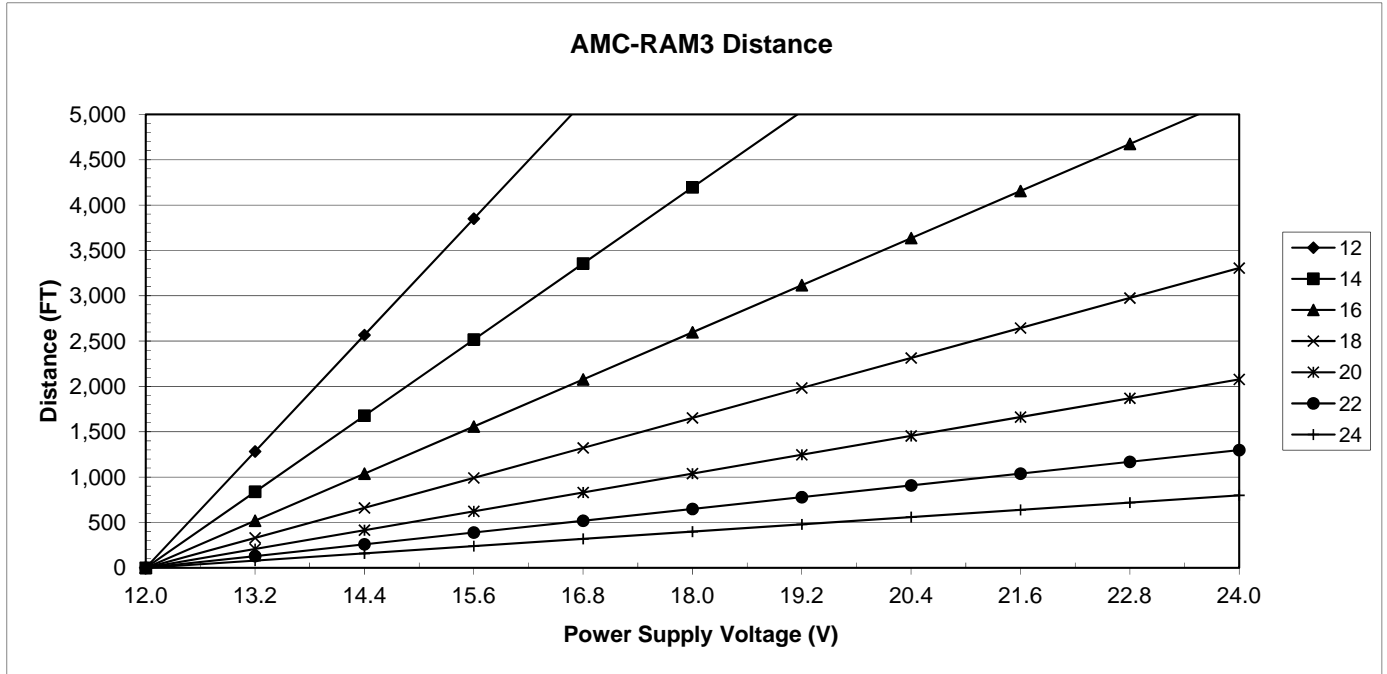


Figure 4-2 Distance Graph (ft): Power Supply vs Wire Gauge

5 AMC-RAM3 APPLICATIONS

This section provides wiring diagrams for the AMC Monitors, AMC VersaTox transmitters with relays, and power supplies.

5.1 AMC1400

When the AMC-RAM3 is connected to the AMC1400:

- ⇒ It is typically powered by the AMC1400 power supply.
- ⇒ The AMC-RAM3 can also be switched through individual channels or events by connecting to the desired relays.
- ⇒ The AMC1400 is configured to activate the relay upon detection of an Alarm condition.
- ⇒ Always consult your AMC1400 manual for proper configurations as the example shown is for the current standard configuration, which may or may not be applicable.
- ⇒ Wiring assembly AMC-RAM-1400-WH is required to interconnect the AMC-RAM3 to the Gas Monitor 1A assembly.

5.1.1 CONNECTING THROUGH CHANNEL RELAYS

It might not always be convenient to have an AMC-RAM3 activate whenever any alarm for every channel is detected. Alternatively you can individually connect the AMC-RAM3 to whichever relay you desire. Figure 5-1 AMC1400 Channel Relay Wiring shows how to connect an AMC-RAM3 through a desired relay. When this relay is activated by an alarm condition 24VDC from the AMC1400 power supply is switched through the NO contacts to power the AMC-RAM3.

Note: If several AMC-RAM3's are employed check load requirements, as an external power source could be required.

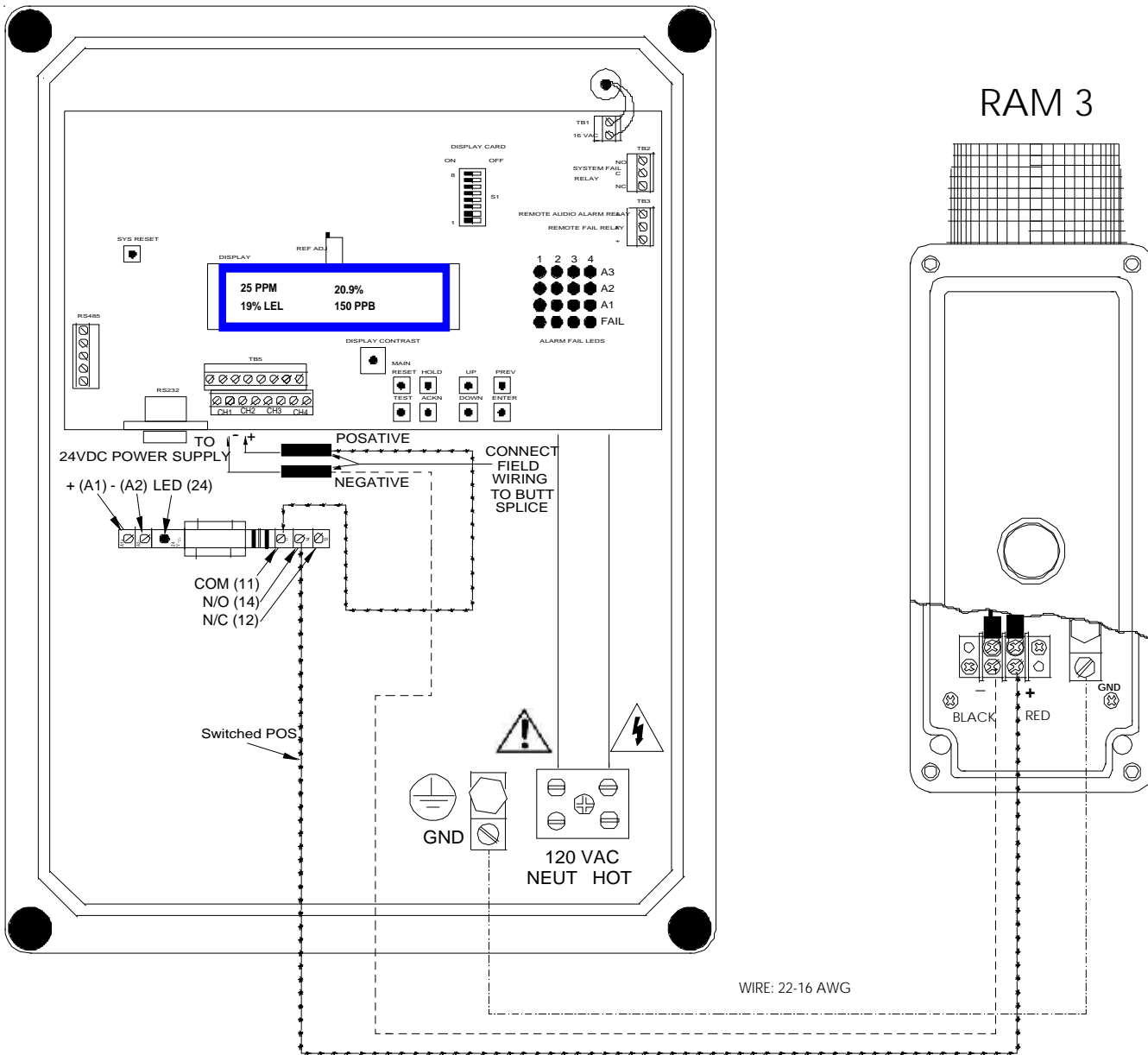


Figure 5-1 AMC1400 Channel Relay Wiring

5.2 AMC1800

When the AMC-RAM3 is connected to the AMC1800:

- ⇒ It is typically powered by the AMC1800.
- ⇒ Power to the AMC-RAM3 is switched through an alarm relay within the AMC1800.
- ⇒ The AMC1800 is configured to activate the relay upon detection of an Alarm condition.
- ⇒ The AMC-RAM3 can also be switched through individual channels or events by connecting to the desired relays.
- ⇒ Always consult your AMC1800 manual for proper configurations as the example shown is for current standard configuration, which may or may not be applicable.

5.2.1 CONNECTING THROUGH CHANNEL RELAYS

You can individually connect the AMC-RAM3 to whichever relay you desire. Figure 5-2 AMC1800 Channel Relay Wiring shows how to connect an AMC-RAM3 through a desired relay. When this relay is activated by an alarm condition 24VDC from the AMC1800 power supply is switched through the NO contacts to power the AMC-RAM3.

Note: If several AMC-RAM3's are employed check load requirements, as an external power source could be required.

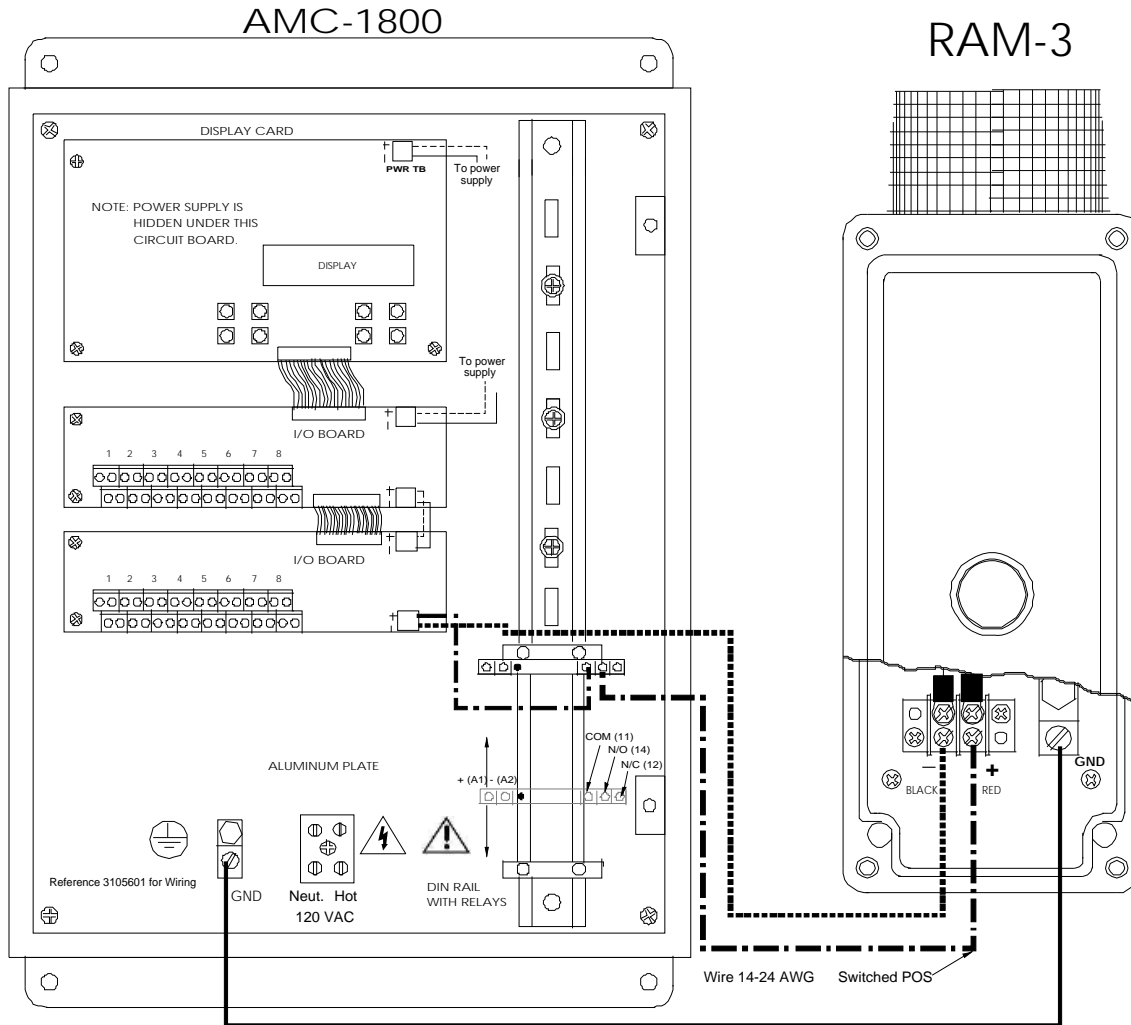


Figure 5-2 AMC1800 Channel Relay Wiring

5.3 AMC Gas Monitor 1A

When the AMC-RAM3 is connected to the AMC Gas Monitor 1A;

- ⇒ It is typically powered by the AMC Gas Monitor 1A.
- ⇒ Power to the AMC-RAM3 is switched through an alarm relay within the AMC Gas Monitor 1A.
- ⇒ The AMC Gas Monitor 1A is configured to activate the relay upon detection of an Alarm condition.
- ⇒ Wiring assembly AMC-RAM-1A-WH is required to interconnect the AMC-RAM3 to the Gas Monitor 1A assembly.

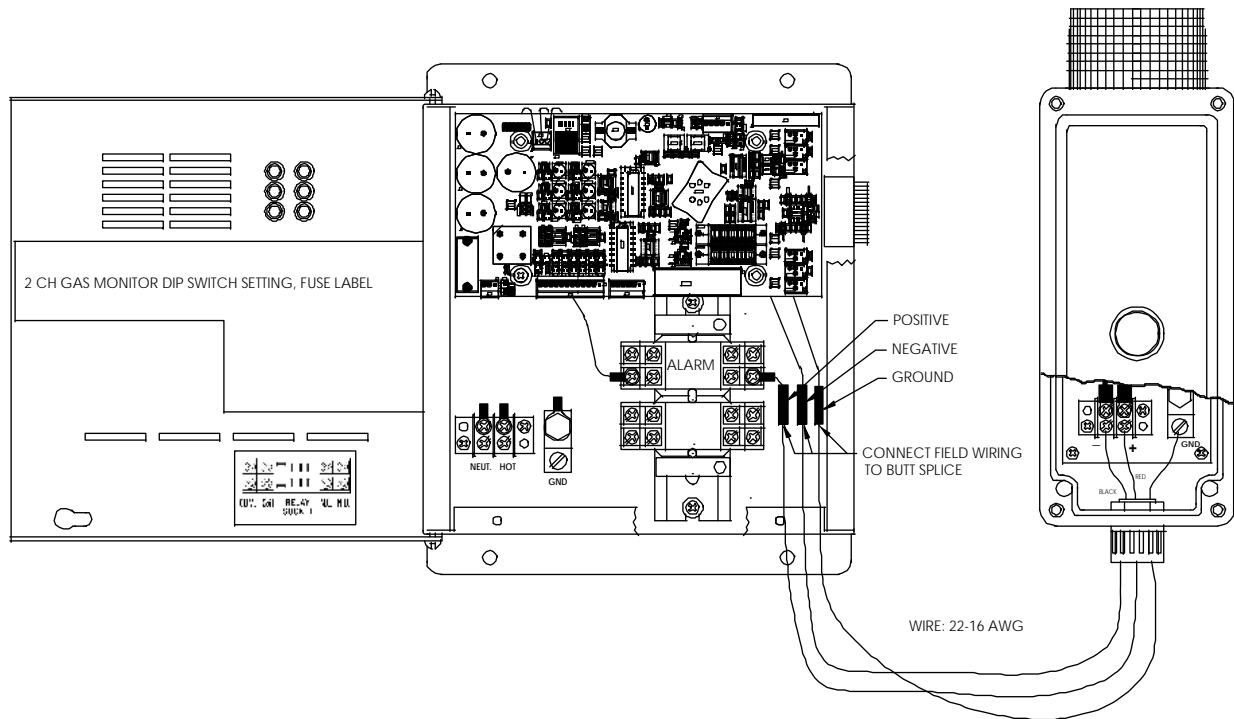


Figure 5-3 AMC-RAM3 to Gas Monitor 1A Wiring

Note: If several AMC-RAM3's are employed check load requirements, as an external power source could be required.

5.4 VersaTox with Relay

Some transmitters offer the feature of an onboard output relay which closes upon an alarm condition, such as the gas concentration exceeding alarm thresholds. The VersaTox transmitter with relay supports this functionality. This transmitter, with an appropriate power source (such as an external power supply or monitor) can switch power on to the AMC-RAM3 when the alarm conditions exist. The drawing below provides the wiring for this example.

Notes:

- ⇒ The VersaTox relay must be strapped for “normally Open”
- ⇒ Observe that the POSITIVE connects to both TB1 and TB2 in the diagram.
- ⇒ The VersaTox in the figure below represents wiring for a DC power source, where relay is set to non-energized and the contacts are ‘normally open’

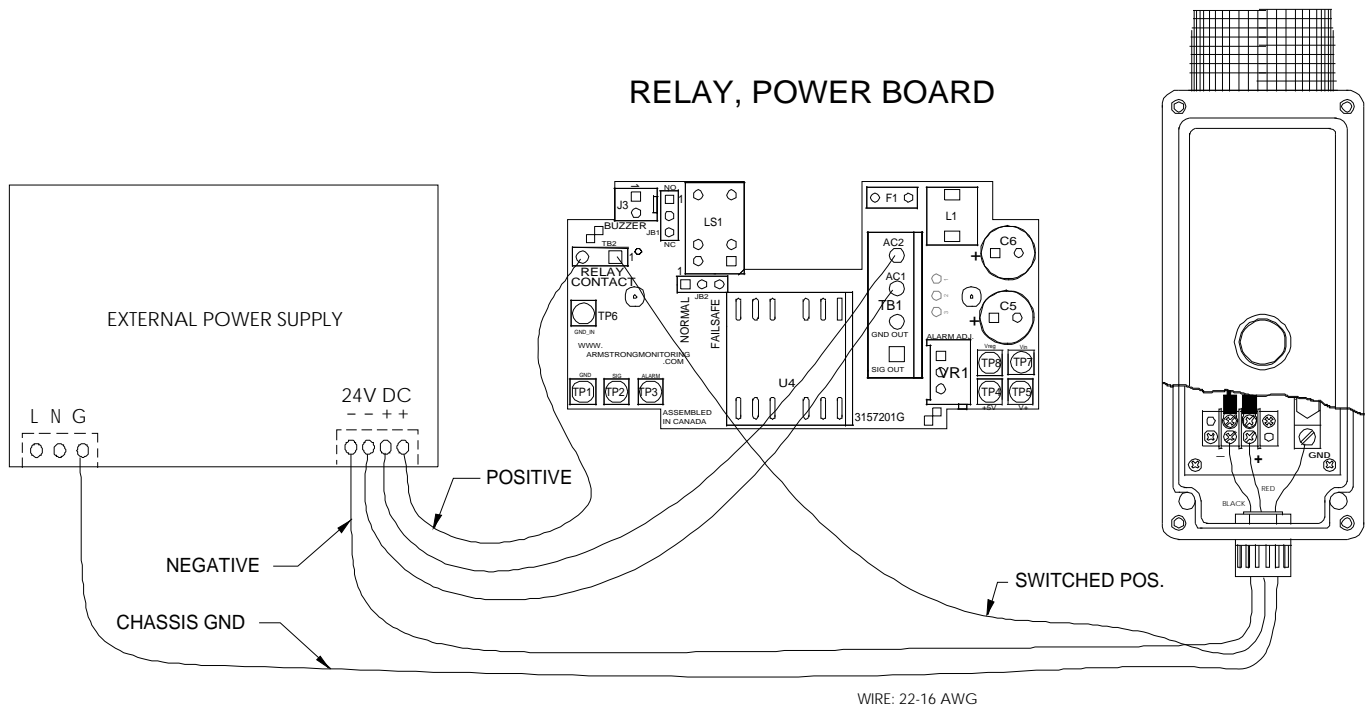


Figure 5-4 AMC-RAM3 to VersaTox Wiring

5.5 External Power Supply

External power supplies may be employed to supplement the power supplies built into the Armstrong Monitoring Corp.'s monitors. External power supplies are used when the total current required by the system (monitor, transmitters, AMC-RAM3, etc.) exceeds the capability of the power supply which is integral to the monitor. Note this method is always used when using the AMC-1DBx Monitor.

When the AMC-RAM3 is connected to an external power supply;

- ⇒ Power to the AMC-RAM3 is switched through an alarm relay within the monitor.
- ⇒ The monitor is configured to activate the relay upon detection of an Alarm condition.
- ⇒ Consult your User Manual for proper relay wiring.

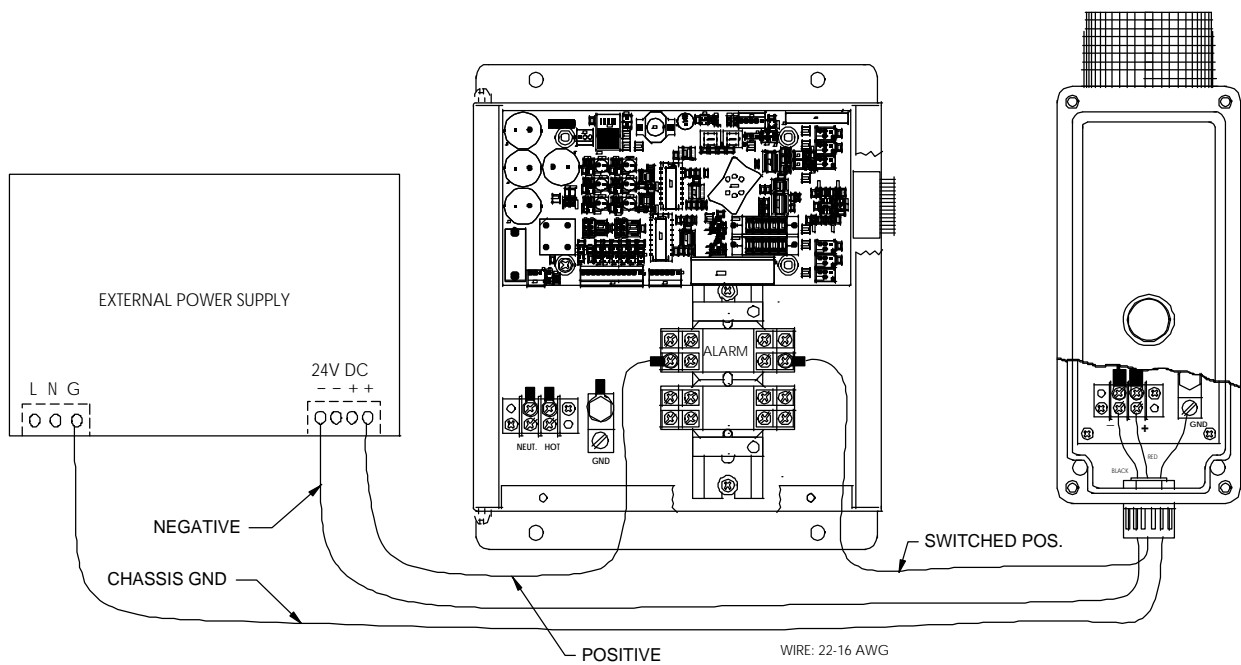


Figure 5-5 AMC-RAM3 Wiring for External Power Supply

5.6 Multiple AMC-RAM3 Modules

When more than one AMC-RAM3 is required, they may be connected in parallel with each other.

Caution: Ensure that the power supply is large enough to power all devices!

Note: The Acknowledge switch will only silence the local AMC-RAM3, not all AMC-RAM3s

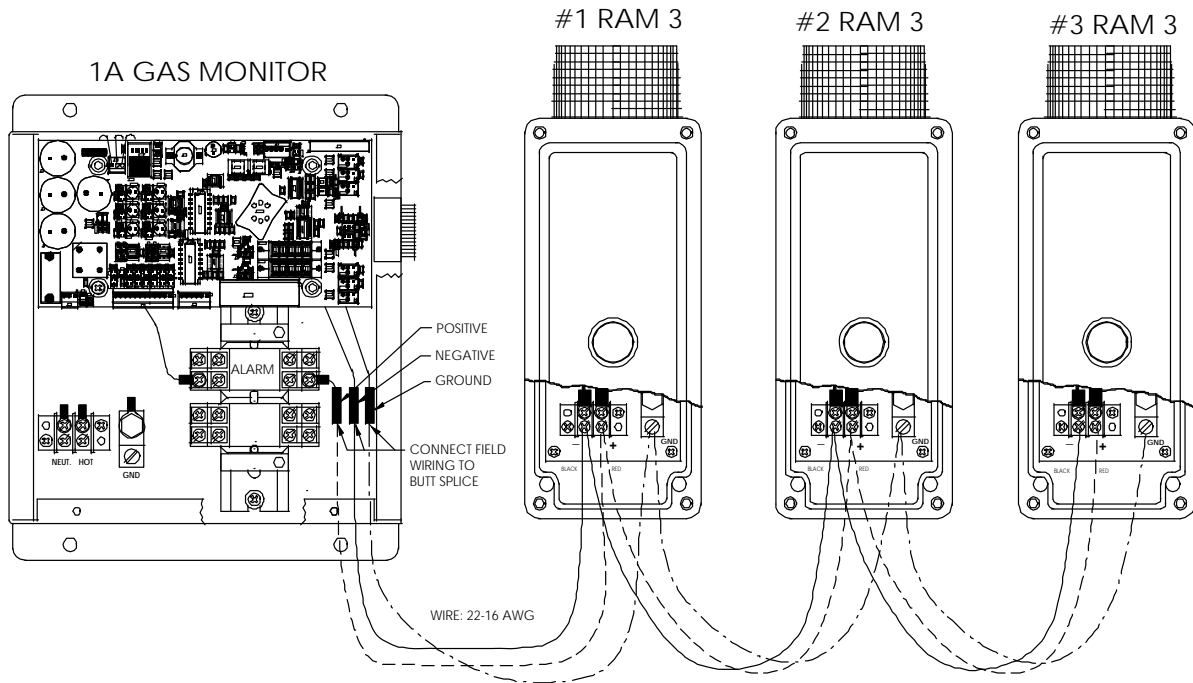


Figure 5-6 Multiple AMC-RAM3 Wiring

5.7 Multiple Monitors

Circumstances may dictate that the AMC-RAM3 may be activated from one of several sources, as shown in the diagram below;

- ⇒ Only one power supply is to power the AMC-RAM3.
- ⇒ The alarm relays on the additional monitors are wired in parallel with the alarm relay on the primary monitor.
- ⇒ Consult your User Manual for proper relay wiring.

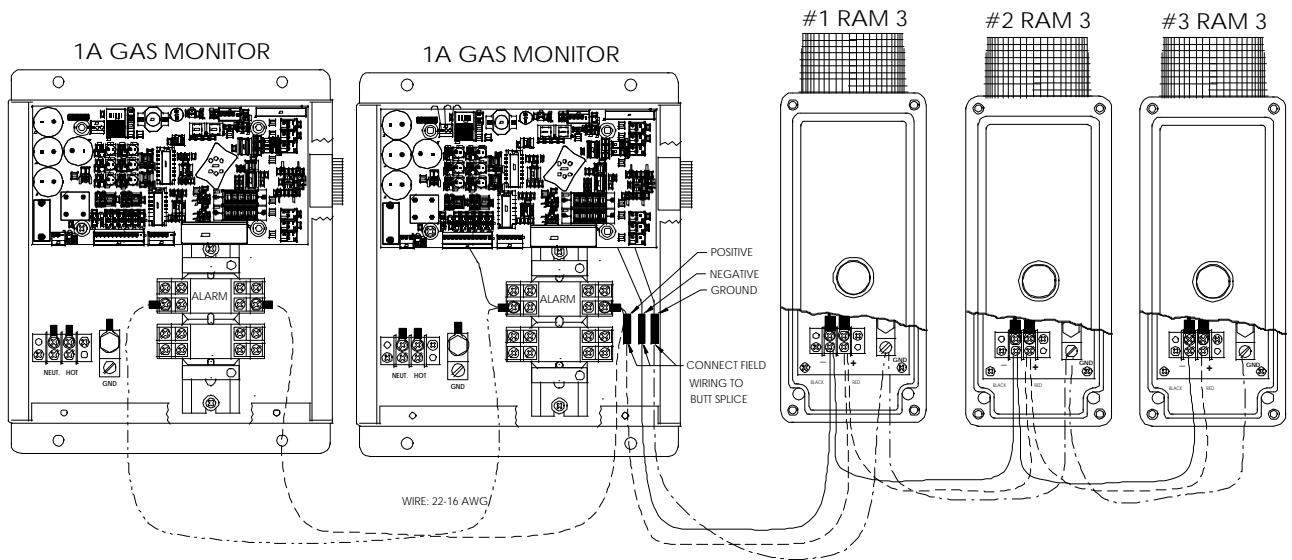


Figure 5-7 AMC-RAM3 Wiring for Multiple Monitors



6 MAINTENANCE

This section covers topics related to the maintenance of the AMC-RAM3 unit.

6.1 GENERAL

The unit **SHOULD NOT** be submerged or placed under conditions where water or other liquids would be able to enter the enclosure.

6.2 VERIFICATION OF OPERATION

Verification of operation should be performed at least once every 6 months at the same time the monitor is being verified.

7 INSTALLATION TIPS

CABLING

- All cabling must enter the enclosure from the bottom to ensure protection against water damage due to water inside the conduit from condensation or leaks.
- Ensure that there are no short or open circuits in the cabling.

EQUIPMENT LOCATION

- Equipment must be positioned such that the chance of water damage is minimized; i.e. away from fire suppression sprinkler heads, away from wet or damp locations where there would be a risk of water damage.