EMX
INDUSTRIES, INC.

VMD202™

Vehicle Motion Detector

Operating Instructions

CAUTIONS AND WARNINGS

- Never use the VMD202™ as a safety reversing or presence detection system. The VMD202™ requires that a vehicle be moving for detection. This product is an accessory or part of a system. Always read and follow the manufacturer's instructions of the equipment before connecting this product. Comply with all applicable codes and safety regulations. Failure to do so may result in damage, injury or death.
- DO NOT INSTALL PROBE IN HOT ASPHALT
- PROVIDE AN EARTH GROUND CONNECTION USING GROUND ROD PER INSTALLATION INSTRUCTIONS
- DO NOT EXCEED POWER SUPPLY VOLTAGE RATING 41VDC or 29VAC
- ALLOW 3 MINUTES AFTER POWER UP FOR STABILIZATION
- VMD202 is sensitive to metal objects that move through its field, including bicycles, horses, small vehicles or metal in shoes. Reduce the sensitivity as required to eliminate detection. In areas with high pedestrian traffic, the probe may be buried up to 24" deep to prevent triggering the detector by the metal in shoes.

PRODUCT OVERVIEW

The VMD202 is a compact vehicle motion detector that operates by detecting changes in the earth's magnetic field that occur near the probe. These changes are produced by the movement of ferrous materials such as cars or trucks within the probe's range. The VMD202 produces a trigger signal for free exit. The direct burial VMD202 probe is placed adjacent to a roadway or buried in a concrete or asphalt roadway.

The VMD202 features a removable Remote Control unit that provides a sensitivity adjustment used to fine-tune the probe response for a specific installation. The maximum sensitivity setting provides a 12ft. detection range that is dependent on the speed and size of the vehicle. The VMD202 Remote control provides 10 sensitivity settings. A green LED indicates that power is applied to the unit. The Remote Control may be removed to minimize power requirements.

The probe may be powered direct from operator power and draws 250 microamps (0.25mA) in standby mode. The output consists of form C relay contacts (N.O, N.C., C). The probes are available in a wide variety of cable lengths.

The VMD202 may be used as a free exit sensor in both commercial and residential applications. ***The detector is not for use as a presence detector.*** When presence detection is needed use the Ultra II DTEK and inductive loop.

Specifications

Range sensitivity	12 ft. @ 5mph min. speed Dependent on mass and speed
Sensitivity adjustment	10 settings
Output time	5 second
Surge protection	Probe input circuitry protected by surge suppressors
Relay output configuration	Form C (SPDT)
Relay contact rating	1A @ 24VDC, 1A @ 120VAC
Power indicator	Green LED
Power	9…41VDC or 6…29VAC
Standby current	0.250mA
Detection current	12mA
Operating temperature	-40˚C…82˚C (-40˚F…180˚F) 0…95% relative humidity
Remote housing material	ABS (plastic)
Remote dimensions (L x W x H)	3.0"(76mm) x 0.9"(22mm) x 2.75"(70mm)
Remote weight	0.15 lbs. (68 g)
Probe housing material	PVC water-tight
Probe dimensions (L x Dia.)	24" (610mm) x 1" (25mm)
Probe cable	5-wire, direct burial

OPERATION

After allowing a 3-minute stabilization time the VMD is ready for use. It is possible that the detector will cycle during the power up stabilization period, this is normal. The VMD relay contacts provide the means of indicating to the gate operator or other external equipment, that a vehicle has been detected. Since the VMD is designed to detect vehicle motion it is not suitable for use as a presence detector.

The green LED on the VMD front panel indicates that power is applied to the unit and should always be on.

The sensitivity adjustment, located on the Remote Control, allows the installer to set the system sensitivity for reliable operation. Position 9 is the highest sensitivity while position 0 is the lowest sensitivity.

Sensitivity is a function of speed and mass; the slower a vehicle is moving, the closer the vehicle must pass the probe to trigger the detector.

CONTROLS AND INDICATORS

POWER INDICATOR

- Green LED

SENSITIVITY ADJUSTMENT

- 10 positions
- Minimum 0 to maximum 9

INSTALLATION GUIDELINES

POWER SUPPLY

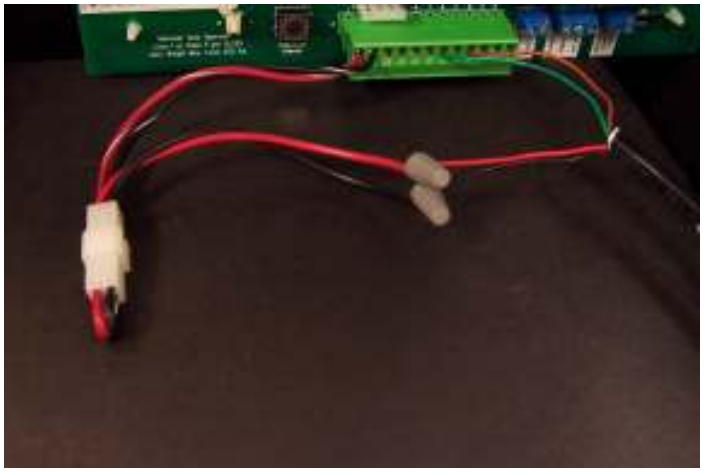
- *Do not exceed 41VDC or 29VAC.* Power requirements are 9-41VDC or 6-29 VAC

Typical connection to operator with VMD202-R remote adjustment installed

SOLAR POWER

- To minimize stand-by power consumption the Remote control may be removed, see solar application wiring diagram for details.

Typical connection to operator with VMD202-R removed, note by-pass jumper in the connector.



PROBE

- **STANDARD INSTALLATION – BURY PROBE 8" – 12" DEEP**

- **HIGH PEDESTRIAN TRAFFIC – BURY PROBE 24" DEEP**
  VMD202 is sensitive to metal objects that move through its field, including bicycles, horses, small vehicles or metal in shoes. Reduce the sensitivity as required to eliminate detection. In areas with high pedestrian traffic, the probe may be buried up to 24" deep to prevent triggering the detector by the metal in shoes.

- Do not install the Probe or lead wire near or parallel to:
    - Low voltage lighting wires
    - Telephone lines or intercom systems
    - Electric motors or control relays
    - Overhead power lines and transformers or underground power lines
    - Cell phone towers, TV towers or communications links
    - Moving metal flagpoles, fences, gates or horses with metal shoes
      Do not mount on any moving surface such as bridges or walkways may vibrate under traffic
    - Underground water lines

- Probes are available in various cable lengths, when possible select the appropriate cable length for the installation. If it is necessary to extend the cable length, use a high quality lead-in cable suitable for direct burial, and a high quality, watertight cable splice to prevent moisture from entering the cable causing false triggering. A splice kit (Part no. 3M SPLICE KIT) and lead-in wire is available from EMX. *All splices must be waterproof.*

- When there is a high incidence of damage from burrowing animals or other potential damaging activities, it is recommended that the cable be placed in plastic conduit (1 ½" I.D.) to prevent damage to the cable. Damage to the cable jacket may allow moisture to enter the cable causing false triggering. When placing the probe in plastic conduit, use foam or tape to assure that the probe does not move or vibrate. It is recommended that the conduit be sealed to prevent water from collecting in the conduit.

- It is recommended that the cable and probe be buried a minimum of 6" below the surface to prevent damage by rototillers or other landscaping equipment.

- The probe must always be installed in such a way that it remains completely motionless. Any movement will cause the probe to trigger.

- The detector is sensitive to minute changes in the magnetic field around the probe. Power lines, transformers, and other electrical devices located in the vicinity of the probe that produce transients could cause disturbances in the magnetic field that may result in triggering the detector. Avoid installation of the probe near these devices.

- The detector sensitivity is a function of mass and speed. A larger, fast moving vehicle will be detected at a greater distance than a smaller, slow moving vehicle. With this in mind, consider the distance of the probe to normal residential traffic, truck traffic, railroad, etc. As a general rule, probe distance to a road way should be a minimum of 40' while probe distance to a railway should be a minimum of 100'.

IMPORTANT: EARTH GROUND CONNECTION

The VMD202 contains transient protection devices to guard the sensitive electronic circuitry from damage and false triggering due to electrical transients caused by lightening or other sources. Provide a good earth ground connection to the GREEN wire from the VMD Remote Control. A 5ft copper rod or cold water pipe provides a sufficient earth ground connection.

PROBE INSTALLATION ADJACENT TO ROADWAY

Please read INSTALLATION GUIDELINES prior to installation.

When the detector is set to maximum sensitivity (position 9) detection distance is approximately 12ft at a speed of 5mph. At higher speeds, 10-15mph, detection distance can exceed 12ft.

1. Prior to permanent installation adjacent to the roadway, place the probe in the desired location; connect the probe to the VMD Remote and the power, output contact and earth ground to the intended equipment. The green wire from the VMD Remote must be connected to the earth ground (reference EARTH GROUND CONNECTION in the INSTALLATION GUIDELINES section).

2. Place the probe parallel to the roadway (driveway) in the desired location.

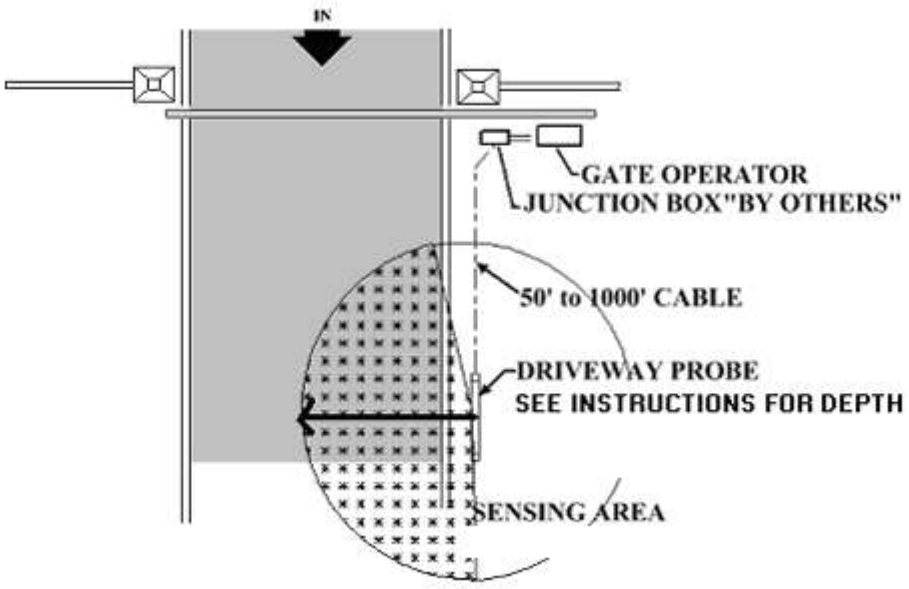
3. Apply power and allow 3 minutes warm-up for system stabilization.

4. Set sensitivity to 5.

5. Drive the vehicle past the probe at a typical speed (approximately 5mph) and to the far side of the roadway.

6. Repeat this step while gradually increase the sensitivity until the system detects the vehicle.

7. Bury the probe approximately 8-12" deep or 24" deep (see INSTALLATION GUIDELINES) at this location and repeat the previous sensitivity check (step 5 –6) to verify proper operation. A higher sensitivity setting than required to detect the vehicle makes the system more vulnerable to triggering from unintended sources such as movement of other objects in the sensitive area or other electrical disturbances.



Typical Installation

PROBE INSTALLATION IN A ROADWAY

Please read INSTALLATION GUIDELINES prior to installation.
DO NOT INSTALL IN HOT ASPHALT

When the detector is set to maximum sensitivity (position 9) detection distance is approximately 12ft at a speed of 5mph. At higher speeds, 10-15mph, detection distance can exceed 12ft.

1. The probe should be positioned in the center of the roadway, perpendicular to the direction of traffic. Place the probe in plastic conduit to prevent damage to probe and cable. Probe should be located at approximately 2" depth in concrete or asphalt. The probe may be located prior to paving, or a cut may be made in the pavement for installation. No rebar should be above the probe.

2. Once the probe is installed, connect the probe to the VMD Remote and the power, output contact and earth ground to the intended equipment. The green wire from the VMD Remote must be connected to the earth ground (reference EARTH GROUND CONNECTION in the INSTALLATION GUIDELINES section).

3. Apply power and allow 3 minutes warm-up for system stabilization.

4. Set sensitivity to 5.

5. Drive the vehicle over the probe at a typical speed and each side of the roadway.

6. Repeat this step while gradually increasing the sensitivity until the system detects the vehicle. A higher sensitivity setting than required to detect the vehicle makes the system more vulnerable to triggering from unintended sources such as movement of other objects in the sensitive area or other electrical disturbances.

Troubleshooting

Symptom	Possible cause
False triggering	Electrical disturbances
	Damaged probe cable
	Moisture in the probe cable
	Movement in the probe's environment

Possible solutions

1. Verify that the earth ground connection to the VMD202 is secure. If the connection is not secure, reconnect to the earth ground and retest the system.

2. Inspect the area around the probe for any metal object that may move such as signs or fences.

3. Disconnect the power and temporarily connect a 9V battery to the VMD202 Remote. Wait 3 minutes for the system to stabilize. If the false triggering stops, consider using a separate power supply for the VMD such as a 120VAC to 12V power converter (min. 100ma). Install separate supply and test the system.

4. If the false triggering continues, inspect the area around the probe to see if any metallic objects may be subject to any movement. These may include fences, flagpoles, signs, etc. Other possible causes are electrical power lines, electric motors and high power lighting.

Symptom	Possible cause
No output	Bad connection
	Failed relay

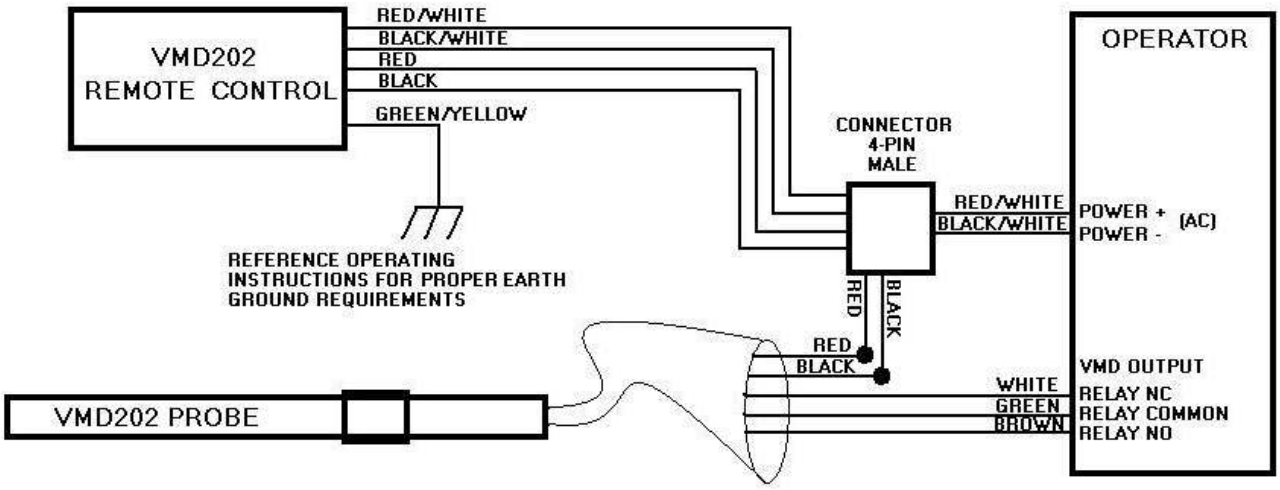
Checking the VMD202 output contacts

1. Disconnect the output contacts from the operator.

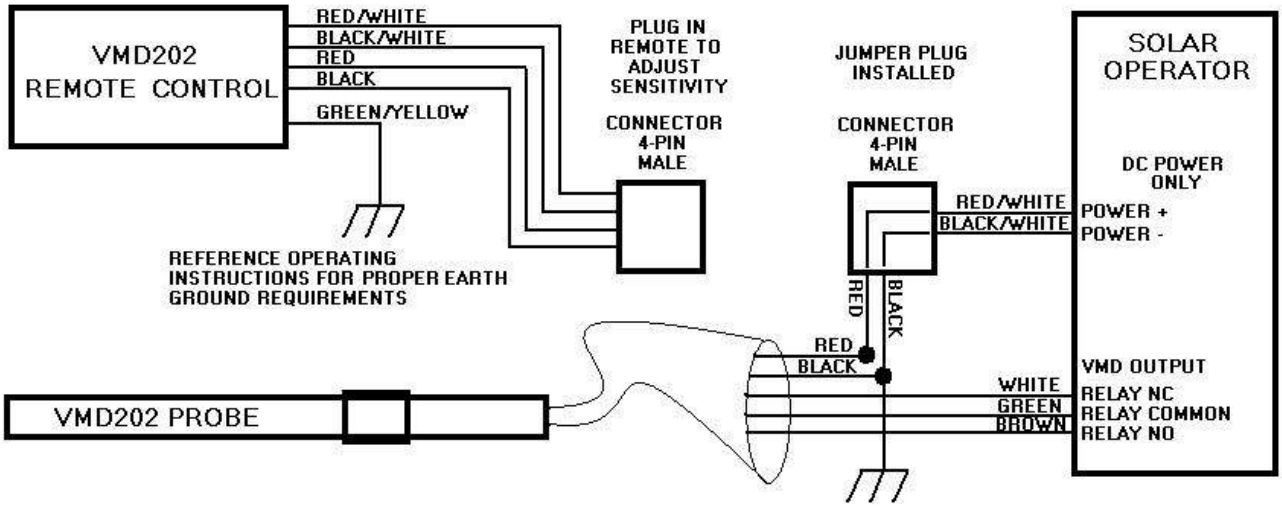
2. Connect a DVM, set to read ohms, to the COM and N.O. contacts. The DVM should read open (infinity). Move a metal tool over the length of the probe, verify that the red LED turns on and that the DVM reads less than 10 ohms.
3. Verify that the green LED is on, if not, check the supply voltage using a DVM. Verify the voltage is 9 to 41VDC or 6 to 29 VAC.

Wiring diagram

Wire color	Description
RED	Power + (9 to 41VDC or 6 to 29VAC)
BLACK	Power - (9 to 41VDC common or 6 to 29VAC)
GREEN	Common (relay common contact)
WHITE	N.C. (relay, normally closed contact)
BROWN	N.O. (relay, normally open contact)



TYPICAL VMD202 WIRING DIAGRAM



TYPICAL VMD202 WIRING DIAGRAM
SOLAR APPLICATIONS

Ordering information

VMD202-R	Vehicle Motion Detector, Remote Control
VMD202-50	Vehicle Motion Detector, 50ft. lead-in wire
VMD202-100	Vehicle Motion Detector, 100ft. lead-in wire
VMD202-XX	Vehicle Motion Detector, (enter length in ft.) lead-in wire

Accessories

3M SPLICE KIT	Cable splice kit
240-56857	Power convertor, 120VAC to 12VDC

WARRANTY

EMX Industries Incorporated warrants all products to be free of defects in materials and workmanship for a period of two years under normal use and service from the date of sale to our customer. This warranty does not cover normal wear and tear, abuse, misuse, overloading, altered products, damage caused by incorrect connections, lightning damage, or use other than intended design.

There is no warranty of merchantability. There are no warranties expressed or implied or any affirmation of fact or representation except as set forth herein.

EMX Industries Inc. sole responsibility and liability, and the purchaser's exclusive remedy shall be limited to the repair or replacement at EMX Industries option of a part or parts found not conforming to the warranty. In no event shall EMX Industries Inc. be liable for damages of any nature, including incidental or consequential damages, including but not limited to damages resulting from non-conformity, defect in material or workmanship.

effective date January 1, 2002

EMX
INDUSTRIES, INC.

4564 Johnston Parkway
Cleveland, Ohio 44128
United States of America
WEB http://www.emxinc.com
E-mail salessupport@emxinc.com
Telephone (216) 518-9888
Fax (216) 518-9884

Revision 1.4
7.26.11