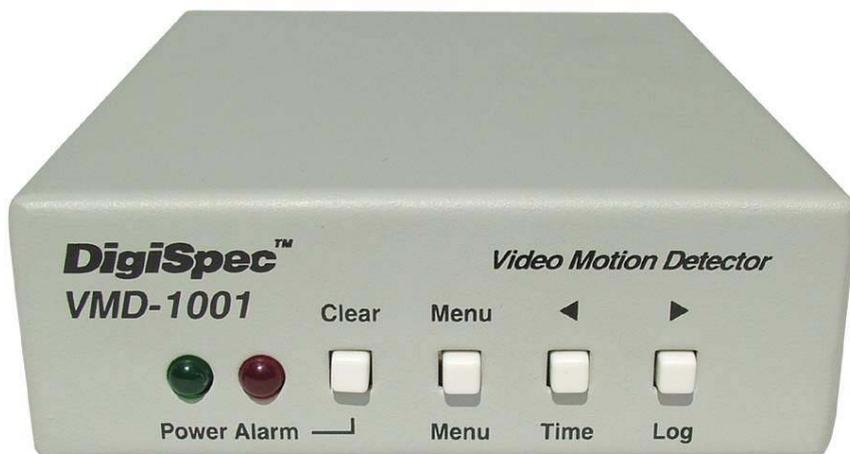


VMD-1001

Digital Video Motion Detector

Version G



Operation Manual

DigiSpec

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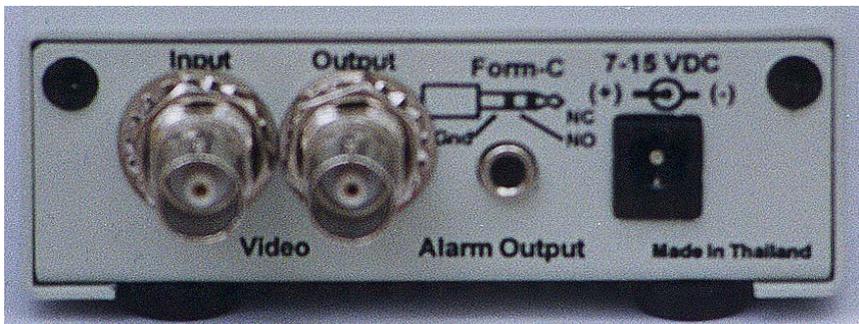
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INTRODUCTION

Congratulations on your purchase of the VMD-1001 Digital Video Motion Detector. You are now the owner of one of the most innovative, low cost video motion detectors available today. We would like to personally thank you for your purchase and would like to provide you with additional information on this remarkable product. The VMD-1001 analyzes the video image 30 times per second to assure instantaneous motion detection. By utilizing RISC processing, the VMD-1001 handles millions of calculations per second, which greatly decreases the decision time and increases reliability.

Traditionally, motion detection has been used for surveillance and security applications. This unit is perfect for indoor or outdoor, low light and difficult applications. Regardless of the job, the VMD-1001 can handle it.

This ground breaking technology is representative of our commitment to incorporate Quality, Value and Innovation in every product we manufacture. We are and will continue to be the leader in Digital Video Motion Detection Technology.



FEATURES

- **Compact Size**
- **Simple Installation and Easy Set up**
- **198 Independently Selectable Zones**
- **99 Levels of Sensitivity**
- **Duration Settings from 0-99 seconds**
- **On-Screen Programming**
- **100-Entry Event Log**
- **User Access Security Code**
- **No external synchronization required**
- **Low Power 7-15VDC @ 50mA**

CONNECTING THE VIDEO

Type of Cameras

Precautions: The VMD-1001 functions best with high quality video cameras. Cameras must be securely locked down so the picture is stable and jitter free. If the picture jitters or the Video Motion Detector's (VMD) character display jitters, the VMD may false trigger. If the camera has any sync or phase adjustments, try adjusting these first.

To select the right camera for your application (i.e. indoor, outdoor, low light, no light), you should consider the advantages and disadvantages of each type.

CCD: High quality CCD cameras will work well with the VMD-1001. The higher the resolution, the more precise the motion detection. CCD cameras work equally well in both indoor and outdoor environments. It is recommended that B&W CCD cameras be used in outdoor applications due to their increased resolution. B&W low light level CCD cameras should be used in low light conditions. CCD cameras are sensitive to Infrared (IR) light and can be used for night vision with the aid of an Infrared Illuminator.

IR: Infrared cameras should be used for no light applications or very sensitive night vision applications. IR cameras are better equipped for night vision than CCD cameras.

Cable

It is important that you use the proper cable type and installation procedures when installing the cameras and your VMD. Make sure you use standard RG-59U coaxial cable with at least 95% braided shield for video transmission. When installing, make sure that you do not run the cable near any power lines for they may cause interference in the video transmission. If you are cabling between floors or long distances, use conduit to protect the cable from interference. Proper protection of the video cable from external power interference, weather, and water is

important to ensure a clear transmission of video signal and reliable motion detection.

Grounding problems between the various components of a video system may cause noise or hum bars to appear in the video image. This must be eliminated by properly grounding all equipment to an earth ground and making sure all shields are intact in all video coaxial cables. Grounding problems will effect the reliability of motion detection.

Lighting & Enviromental Conditions

Unless a camera is in a controlled enviroment, fluctuations in conditions will occur. The VMD-1001 provides the flexibility to configure the Video Motion Detector for two separate sets of conditions.

Florescent Lighting: Gradual or sudden lighting changes, video noise, intermittence or glitches in video lines, or power surges can be ignored by the VMD-1001. To compensate for such occurrences a balance must be reached in the configuration of the motion criteria (see Motion Criteria). Fluorescent light may result in high speed flickering when a CCD camera is used. Various cameras have shutter selections for flickerless option or you may have to disable the Auto White balance feature on DC versions. Another solution is to change the lighting ballast to an electronic one that operates at a higher frequency than the video sync signal.

Video Input / Output

The video input and output are located on the rear of the unit. (see Figure 1). The video input connects to the video source via the left BNC connector. The video output connects to a display, recording device, switcher, or other equipment via the right BNC connector. Both the input and output are 1 V P-P into 75 ohms unbalanced EIA standard RS-170A / NTSC or CCIR / PAL video format. Improper input termination or looping will cause the video level to be too low and effect the motion detection. Improper output termination will make the image or the video recording poor.

Connecting the Alarms

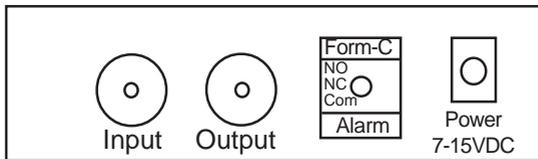


Figure 1 - Back Panel Diagram

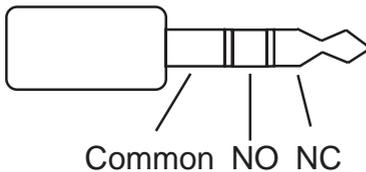


Figure 2 - Alarm Plug

Alarm Output

The VMD-1001 has one Form-C alarm output with a normally open (N/O) and normally closed (N/C) configuration. When power is lost, the contacts are as follows.

The contacts change state (open to closed N/O, or closed to open N/C) whenever an alarm occurs. An alarm occurs when the VMD-1001 detects motion and the alarm has been enabled by pressing the ALARM ON-OFF button (red LED on or slow flashing). The contacts remain closed or open for the duration programmed in the Relay Hold time. The location of the alarm output connector is seen in Figure 1. The state of the relay when there is no alarm can be selected as N/C or N/O so that power loss will indicate either an alarm or no alarm. For more information, consult the Relay Contact Section of this manual under Alarm Setup.

Some equipment may require a dry contact closure (normally open). Connect such equipment to the N/O and common leads. For a normally closed alarm, connect between the N/C and common leads. There

is no polarity; these leads may be swapped around. Other equipment may require a closure to ground. In this case, a ground connection will be provided on such equipment. Connect the common lead to ground and N/O lead to the input of the equipment. There is no voltage on the alarm connectors of the VMD-1001. No damage can be done by incorrect wiring.

For installation guidelines, consult the Relay Contact Section of this manual under Alarm Setup.

Connecting the Power

The VMD-1001 operates from a DC supply range from 8V to 15VDC. The power input connector, a standard 2.1mm power jack, must have positive (+) on the center and negative (-) or ground, on the outer shell. The unit is reverse protected and correct polarity is indicated by the green Power LED being lit on the front panel.

For mobile operation, a negative ground system is required, unless the video ground is isolated from the automobile chassis ground. If operated in a vehicle, make sure the power supplied to the VMD-1001 is properly filtered so alternator, radio or other equipment does not generated noise that might effect the motion detection performance. The unit may be operated off of a regular 110 or 220 VAC household supply using a transformer to supply the required 8-15VDC power.

NORMAL OPERATING MODE

Front Panel

Four buttons on the front panel give full control of the unit.

The two LEDs indicate the general state of the unit. The green Power LED indicates appropriate power is applied. The red Alarm LED indicates the unit is armed when solid and alarmed when flashing rapidly.

Note: Motion detection is inhibited during setup and during the time or log display.

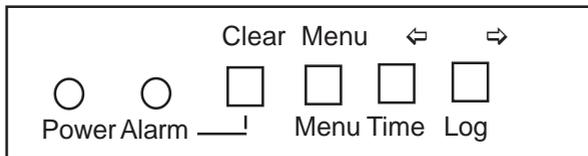


Figure 3 - Front Panel

In the normal operating mode, the VMD is processing alarms (if enabled) and displaying the date and time (if enabled). The 4 buttons provide all the necessary functions.

Alarm Button

This button toggles between alarm enabled and disabled. When enabled, the VMD-1001 will generate alarms whenever the motion detector qualifies valid motion. When the alarm is disabled, no alarms will be generated. However, the red LED will still flash whenever motion is detected. This feature is useful when setting the Sensitivity Level. The red LED will light solid or slow flashing when the alarm is enabled.

If an alarm is active (i.e. the VMD-1001 is generating an alarm) pressing the Alarm button will clear the alarm. After that, the alarms will toggle between enabled and disabled.

Menu Button

This button brings up the Programming Menu as white letters overlaid on the video and starts the Programming Mode.

Time Button

Momentarily displays the current data and time on the screen.

Log Button

Displays Log Page #1 and starts the Log Display Mode. The most recent alarm events, and their date, time, and alarm number are displayed. Pressing the Left or Right button scrolls forward or backward through the log. Pressing the Clear button clears the Log Page and reverts back to normal running operation. Normal operation also resumes when no buttons have been pressed for 10 seconds.

Remember, motion detection is inhibited when the log is being displayed.

ON-SCREEN DISPLAY DURING RUNNING OPERATION

Alarm Display

Whenever an alarm occurs, a message is shown on the bottom line of the screen which indicates the date and time of the alarm as well as the number of accumulated alarms (1-99). This display will continue for the duration of motion detection plus the programmed alarm Hold time. In USA and 12 hour format, the display will appear as follows.

MM/DD/YY HH:MM:SS A##

where ## is the number of alarms accumulated since last clearing the log.

Present Time Display

The system date and time will momentarily display whenever the Time button is pressed.

<p style="text-align: center;">PRESENT TIME MM-DD-YY HH:MM:SSA</p>
--

MM-DD-YY

Month (01=JAN, 02=FEB, etc.) Date (day of the month) and Year. The sequence of these can be changed in the Clock Format Menu. USA or European formats are selectable.

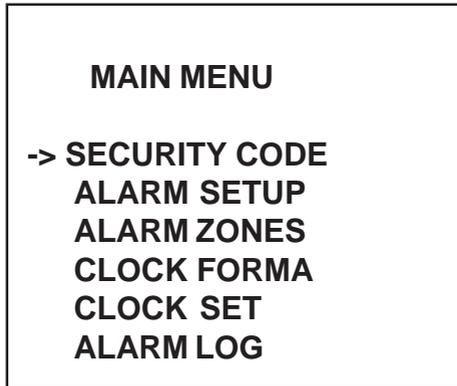
HH:MM:SSA

Hours, minutes, seconds, and am/pm indicators. The format can be changed in the Clock Format Menu to display 12 hour mode (with am/pm) or 24 hour mode (military time). The method used here determines the mode for the Timer Mode menu screen.

Programming the VMD1001

To start the programming, press the Menu button. The Main Menu page will be displayed.

Main Menu



The 6 items on the Main Menu are the main categories for setting the VMD. From this menu, you branch to the menu page associated with each item, where the settings are changed.

During programming, the four buttons function as follows:

Clear Button

Clears the programming mode at any time during programming and reverts back to normal running operation. Changes will be saved to non-volatile memory and will take immediate effect.

Menu Button

Steps through the programming options which are displayed on-screen with flashing prompts. Each time the Menu Button is pressed, the next prompt will be selected, indicating a change can be made. At the end of each menu page, the last prompt will wrap around to

the top of the page (the first prompt).

Left Button

Use this button to reduce the value if it is numeric or to sequence backwards if the value is text. During zone pattern settings, the cursor will move to the left. Holding down the button will cause its action to repeat rapidly.

Right Button

Use this button to increase the value if it is numeric or sequence forwards if the value is text. During Zone Pattern settings, the cursor will move to the right. Holding down the button will cause its action to repeat rapidly.

Security Code

<p>SECURITY CODE -> >00< 00 00 00</p> <p>SECURITY ENABLE? YES >NO<</p> <p>ACCEPT CHANGES? YES >NO<</p>
--

A security code may be set using this menu to prevent accidental changes to the alarm criteria settings and subsequent missed alarms.

The Security Code is essentially a password that consists of four groups of numbers (each from 00 to 99)

To set a security code, access this menu from the main menu by selecting Security Code using the Menu button. When the right arrow is pointing to the Security Code, press the Log or Right (>) arrow button. Then Menu button moves the flashing cursor >< around the screen. Move the cursor to the set of numbers you wish to change and then use the Left or Right arrow buttons to change the value.

For example, to set a security code of: 01 02 03 04, move the cursor to the first set of zeros (00) using the Menu button and press the Right arrow once to change the value to "01"

Press the Menu button to move to the next group of zeros (00) and again press the Right arrow to change this value to "02". Repeat this for the third and fourth sets to set "03" and "04" respectively.

Next, using the Menu button, move the cursor to the Security Enable? prompt and press the Right arrow button to toggle to "Yes".

Finally, move the cursor to the Accept Changes? prompt and toggle to "Yes".

Once you have set the code, enabled it, and accepted the changes, press the Clear button to exit this menu.

At this point, the security code numbers you set will be required to enter the Programming menu. Page 27 is provided to record the security code.

Alarm Setup

The Alarm Setup menu is the most important setup for the operation of the motion detector. It is used to adjust criteria for qualifying a valid alarm.

ALARM CRITERIA	
SENS	>02<
TRACK	0.1
HOLD	0.05
RLY CONTACT	
>NC<	N0
BUZZER	
ON	>OFF<

The Two Motion Detection Criteria

There are 2 motion detection criteria for qualifying an alarm with respect to contrast from background, and duration of motion.

Sensitivity Level adjusts for the size of a moving object that will trigger an alarm. A small object requires a higher sensitivity level to trigger. A larger object will trigger at a lower sensitivity. The Sensitivity Level has a range of between 1 and 99.

Each camera's sensitivity must be set individually and adjusted according to its use. Use the Menu button to highlight the SENS setting and either increase or decrease the value using the Left or Right arrow buttons. The right arrow button will increase the sensitivity, and the left arrow button will decrease the sensitivity.

Configuration Hints: To assist in adjusting the sensitivity, disable the alarm (red LED off) using the Alarm button. The red LED will illuminate only when motion is detected. If it blinks often when

there is no motion, the sensitivity is too high. If the LED does not illuminate with motion, the sensitivity is too low.

In outdoor applications, variables such as shadows, precipitation, etc. call for lower sensitivity. These conditions can be screened out so only relevant motion is detected. Experimentation will provide helpful information in determining the correct level.

The sensitivity must be set appropriately for each camera location. If the sensitivity is too low, an alarm may never occur. If the sensitivity is too high, shadows and noise may falsely trigger alarms. Power induced noise, thermal noise, and snow from the camera are types of noise that may cause false triggering if the sensitivity is too high. To filter out noise, set the sensitivity to a maximum and decrease until the false alarms are stopped. Use the Alarm OFF mode to detect false alarms by showing a motion trigger as a flash of the Alarm LED.

Tracking Level is the length of time, in tenths of a second, that motion must be continuously occurring to activate the alarm. Tracking can be set for 0.0 seconds for instantaneous triggering or from 0.1 to 8.0 seconds for triggering equal to that number of seconds. The Tracking is crucial to motion calculation.

Tracking can filter out unwanted or random motion. It must be sufficiently long to filter out this motion, but short enough to capture required events.

Use the Menu button to highlight the Track setting and either increase or decrease the value using the Left or Right arrow buttons.

Configuration Hints: The Tracking criteria makes the VMD-1001 excellent for outdoors. By increasing the number of seconds, many natural occurrences can be masked out. For example, lightning will last no more than 0.4 seconds. A camera shaking in the wind takes perhaps 0.5 to 0.6 seconds. Similarly, a tree branch shaking by a

gust of wind might take 1.0 second. If the tracking is too low, sudden changes such as lighting, insects near the camera, flashing lights, snow, and rain may falsely trigger alarms. The Tracking attribute can require up to 8.0 seconds of continuous motion which is more than sufficient to mask out most natural phenomena as well as intermittent motion. If the Tracking is set too high, the required object moving in the image may not trigger an alarm. Thus, a balance between required and unwanted motion must be achieved. Experimentation is required to properly set this alarm criteria.

HOLD is the length of time (in seconds) that the relay will output an alarm condition to an external device before it resets. It can be set from 0:00 to 3:00 minutes in increments of seconds. Use the Menu button to highlight the Hold setting and either increase or decrease the value using the Left or Right arrow buttons.

Configuration Hints: The length of time you will output an alarm depends on the type of device being controlled. A light or a bell may require a longer alarm time. An external matrix switcher or VCR will usually require only a pulse. In this case, you may want to set the alarm output time to 1 second.

RLY CONTACT allows you to select whether the relay contacts you use will be normally closed (NC) or normally opened (NO) during an alarm. Use the Menu button to highlight the RLY CONTACT setting and either select NC or NO using the Left or Right arrow buttons.

The **BUZZER** simply allows you to enable or disable an internal alarm buzzer. Use the Menu button to highlight the BUZZER setting and either select ON or OFF using the Left or Right arrow buttons. Press the Clear button when complete.

Configuration Hints: Determine if a power failure should indicate an alarm or no alarm. With VMD power OFF, wire up to the N/O or N/C contacts of the VMD which gives the proper indication.

Power up the VMD using the Relay Contact menu, select the proper choice (NO or NC) which indicates no alarm when in fact no alarm exists.

Alarm Zones

By selecting Alarm Zones you are able to change the detection zones of the video motion.

Upon entering this menu, the top left most zone will be flashing a rectangular box. The default is all zones active which is signified by the rectangular box.

To deselect a zone, press the Menu button to toggle to the white dot in the center of the zone. This dot signifies the zone is not active and all motion in this zone will be ignored.

Use the Left or Right button to select the previous or adjacent zone. When you reach the bottom right most zone the cursor will wrap to the top left most zone.

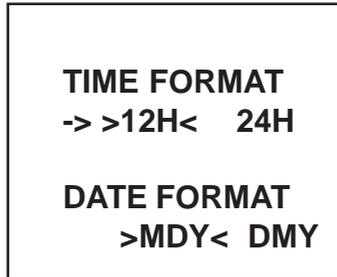
Continuous holding of the Right or Left button will cause the cursor to move quickly to find the correct zone faster.

You can also quickly select or deselect all zones by holding the "Menu" button in when the on-screen display is either selected or deselected. Then hold continuously the Left or Right button. Rapid selection or deselection of the zones very quickly will then be possible.

Clock Format

In this menu the Time format can be configured to either 12 hour or 24 hour format, and the Date to either USA or European format.

Use the Menu button to highlight the Time Format setting and either select 12H or 24H using the Left or Right arrow buttons.



Use the Menu button to highlight the Date Format setting and either select MDY or DMY using the Left or Right arrow buttons.

MDY: Month, Day, Year USA Format

DMY: Day, Month, Year European Format

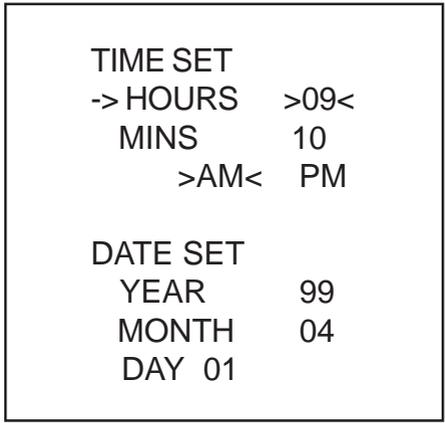
Clock Set

This menu provides the configuration option of setting the current Date and Time. The Time can be configured for AM or PM, if in the previous menu (Clock Format), 12 hour format was selected.

Use the Menu button to highlight the Hours setting and either increase or decrease the Hours using the Left or Right arrow buttons.

Use the Menu button to highlight the MINS setting and either increase or decrease the Hours using the Left or Right arrow buttons.

Use the Menu button again to move down and select either AM or PM using the Left or Right arrow buttons.



Use the Menu button again to move down to Year and increase or decrease the year using the Left or Right arrow buttons. Do the same for Month and Day.

Press the Clear button when complete.

Alarm Log

The Clear Log? prompt provides the option for clearing (deleting) the alarm log from memory and restarting the alarm log. The alarm log holds up to 99 events. After 99 events have been logged, new alarms overwrite the oldest (or first) events in the log.

Use the Menu button to position the cursor under Clear Log? and the Left or Right arrow buttons to toggle Yes or No.

Note: If you clear the log, "Please Wait" will appear briefly on the screen while this command processes.

Configuration Hint: If you wish to prevent accidental loss of the alarm log, be sure to setup a security code.

<p>CLEAR LOG? -> YES >NO<</p> <p>ENABLE LOG? YES >NO<</p>
--

Sample Alarm Log:

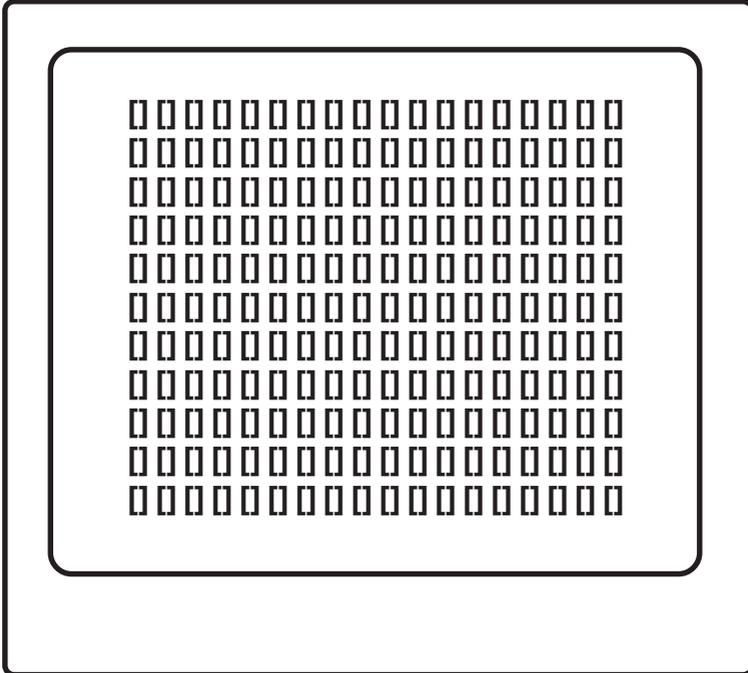
Alarm Log 01	<= Note: page number, press
04/02/99 08:05A 01	Left & Right to scroll through
04/02/00 08:02A 02	the pages of alarm events.
04/01/99 03:25P 03	<= each entry is: date, time and
03/25/99 12:15P 04	alarm number

The Enable Log? menu item will enable or disable the log feature. We recommend that you disable the Log if you normally have more than 30 alarms per day, or if you are not using the Log feature.

Use the Menu button to position the cursor under Enable Log? and the Left or Right arrow buttons to toggle Yes or No. Press the Clear button when complete.

Programming Notes

Alarm Zone Settings



Sensitivity Level _____

Tracking Level _____

Hold Time _____

Relay Contact _____

Buzzer _____

LIMITED WARRANTY

(Terms and Conditions)

For **2 Years** from the date of shipment, Seller warrants to Buyer that the Product is free from defects in material or workmanship **under normal use and service**. Equipment manufactured by other than Seller but furnished by Seller carries the same warranty to Buyer as Seller receives from the other manufacturer, notwithstanding any provision to the contrary. If Buyer has specified a particular manufacturer's product which is not the brand standardly supplied by Seller, Buyer shall look only to the other manufacturer's warranty and Seller shall not warrant such item.

EXCLUSIONS. Seller's warranty does not cover the following:

- (1) in-transit damage claims, improper handling by carrier or post office (Note: only the consignee of the shipment can file a claim with the common carrier)
- (2) damages caused by incorrect use, modification, carelessness, improper storage, hostile operating conditions, or unauthorized service, installation or repairs without proper training from the Seller
- (3) damages caused by fire, flood, lightning, collision, acts of God or other events beyond the control of Seller
- (4) products or parts thereof that have had serial numbers removed, altered or defaced
- (5) products returned without an RMA number and sales or delivery receipt showing the date of original purchase
- (7) use of components that do not meet Seller's specifications
- (9) external parts such as cabinets or keypads
- (10) periodic maintenance and adjustments resulting from normal use

WARRANTIES EXCLUDED. SELLER EXPRESSLY DISCLAIMS AND EXCLUDES ANY EXPRESS OR IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEEDS OR IS INCONSISTENT WITH THE WARRANTY HEREIN EXPRESSLY SET FORTH.

NON-WARRANTY CLAIMS. In the event Buyer makes a warranty claim and Seller's warranty does not apply, Buyer shall reimburse Seller for all reasonable expenses incurred by Seller in diagnosing the installation/repair problem.

BUYER'S EXCLUSIVE REMEDIES. If the Product supplied shall fail to conform to the contract or any applicable warranty, Buyer shall immediately notify Seller of such condition and afford Seller a reasonable opportunity to inspect said Product. Seller shall, at its option, either repair or replace such nonconforming Product. Seller shall not be responsible for labor charges for removal or installation of such equipment or material or charges for transportation, handling and shipping except as provided in Seller's written service policy. No Product shall be returned without Seller's prior written consent.

SELLER SHALL NOT BE LIABLE FOR ANY SPECIAL, DIRECT INCIDENTAL OR CONSEQUENTIAL DAMAGES OF A COMMERCIAL NATURE ARISING OUT OF OR INABILITY TO USE SELLER'S PRODUCT BY REASON OF THE FACT THAT SUCH PRODUCT DOES NOT CONFORM TO THE CONTRACT OR TO ANY EXPRESS OR IMPLIED WARRANTY. SELLER'S MAXIMUM LIABILITY SHALL BE LIMITED TO THE COST OF REPAIR AND/OR REPLACEMENT OF THE PRODUCT CLAIMED TO BE DEFECTIVE OR NONCONFORMING, SUBJECT TO SELLER'S RIGHT OF REMOVAL AND RETURN OF PRODUCT.

All of the foregoing constitute Buyer's sole and exclusive remedy and Seller's sole and exclusive liability for supplying nonconforming or defective Product.

RETURNS. DigiSpec products are fully inspected and carefully packed to ensure you are delivered a quality product in good condition. If you are not fully satisfied with our product, returns of standard stocking items with no restocking fee can be made within thirty (30) days of invoice to Buyer. All such returns must have prior consent of Seller by obtaining an RMA number and must include the sales or delivery receipt showing the date of original purchase and be in an unused condition contained in its original packaging. Any other returns must have prior written consent of Seller and are subject to a restocking fee of fifteen percent (15%) and freight charges.

RMA NUMBER. The RMA (Return Material Authorization) number must be obtained by contacting Seller prior to the shipment of the the product for return. The RMA number is valid only for 15 days from the date of issue. The RMA number must be clearly displayed on all shipping labels.

SPECIFICATIONS

Video Input:	1V p-p, 75ohm, BNC
Video Output:	1V p-p, BNC, automatic loop-through on power loss
Video Standards:	EIA / NTSC, CCIR / PAL, and SECAM (color or monochrome)
Pixel Resolution:	288 horizontal by 216 vertical
Power Supply:	7 to 15 V DC @ 50mA
Alarm Output:	Form-C relay contacts Normally Open (NO) and Normally Closed (NC) each rated at 1A@250V.
Size:	4.5"Dx3.5"Wx11/8"H or 116Dx88Wx30Hmm
Weight:	14 oz. / .40 KG
Color:	White with metal case

Emergency Security Code

The Emergency Security Code for you VMD-1001 with serial number _____ is 93 12 87 04.

Please do not inform any person or organization of this code except to gain access to this particular unit in an emergency.

Tear out this page and file in a secure area.

DigiSpec

DigiSpec Inc.

1906 Treble Dr.

Humble, Texas 77338

Tel: 281-540-6665 Fax: 281-540-6972

Email: john@digispecvideomotion.com

Web Site: www.digispecvideomotion.com