

DS-1

Operation Manual

DIGI-SPEC®
CORPORATION

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Van Nuys, CA 91406**



A new way of looking at things...

RAC220493

DS-1

Operation Manual

Digital Video Motion Detector

Version 1.14b
DS-1

Digi-Spec Corporation

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INTRODUCTION:

Congratulations on your purchase of the Digi-Spec DS-1 Digital Video Motion Detector. You are now the owner of one of the most innovative, precise and reliable video motion detectors available today. Digi-Spec would like to personally thank you for your purchase and would like to provide you with additional information on this remarkable little unit. The DS-1 utilizes a new technology developed by Digi-Spec - Quantivision. This development divides a video image into over 262,000 pixels and analyses it 30 times per second, to assure instantaneous motion detection. By utilizing pipeline processing, the DS-1 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. Special features such as the Black-out and Trace mode, as well as the Delta Effect allow security personnel to quickly ascertain and respond to suspect motion. These features and many more are just small examples of the innovation built into the product. This unit is perfect for indoor/outdoor, low light and difficult applications. Regardless of the job, the DS-1 can handle it.

The flexibility of this unit has been proven in a variety of environments. Machine vision systems have been developed within the industrial marketplace. The DS has also been utilized to assist in ground breaking research in the Medical arena. The extreme sensitivity of this product allows very precise analysis of any video image. By utilizing the unit's RS-232 port and a personal computer, motion can be studied and plotted over time or output to a paper chart recorder to facilitate motion signature analysis. The limit of the DS-1 is limited only to the creativity of the user.

Regardless of your application the DS will open up numerous possibilities for you. This ground breaking technology is representative of our corporate 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.**

CONNECTING THE VIDEO:

TYPES OF CAMERAS

PRECAUTIONS: The DS-1 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.

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

TUBE TYPE: The DS-1 operates well with all high quality tube type cameras. A tube type camera may be preferable in environments with a lot of fluorescent light. Tube type cameras should primarily be used in indoor applications.

CCD: High quality CCD cameras will work well with the DS-1. 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

DESCRIPTION: 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 for video transmission.

When installing, make sure that you do not run the cable near any power lines for they may cause interference in video transmission. If you are cabling between floors or long distances, use conduit to protect the cable from noise. Proper protection of the video cable from external power interference, weather, and water is important to insure a clear transmission of video signal and reliable motion detection.

LIGHTING & ENVIRONMENTAL CONDITIONS

Unless a camera is in a controlled environment, fluctuations in conditions will occur. The DS-1 provides flexibility to configure the Video Motion Detector for two separate sets of conditions.

DAY/NIGHT: The DS-1 works in both day and night environments. But, each may require different configurations. The DS-1 provides two sets of settings that can be programmed by the user. One group of settings can be used for day settings and the other for night settings or for whatever other conditions the user wishes to set them for. Night settings require higher sensitivity, lower trigger levels, and shorter tracking times, making the DS-1 more sensitive to motion. The Day/Night mode may be toggled from day to night by giving a relay closure to ground on the Day/Night input - pin 8. See page five for more information.

FLORESCENT LIGHTING: Gradual or sudden lighting changes, video noise, intermittence or glitches in video lines, or power surges can be ignored by the DS-1. 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 solid state CCD camera (rather than a tube type) is used. To remedy this, try different lights or use a tube-type camera.

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 Vpp into 75 ohms unbalanced EIA standard RS-170a/NTSC video format or CCIR/PAL video format.

CONNECTING THE ALARMS:

BACK PANEL DIAGRAM

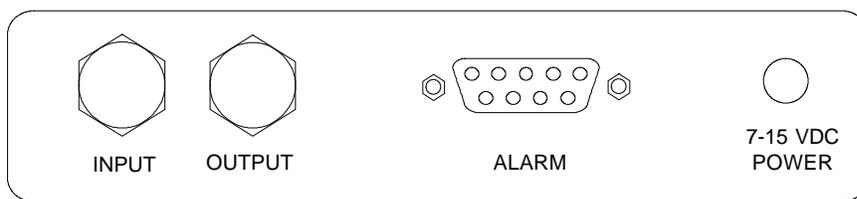


FIGURE 1.

ALARM OUTPUT

The unit has one alarm output in the normally open (N/O) configuration. It will produce a closure whenever an alarm occurs. An alarm occurs when the DS-1 detects motion or there is video loss and the alarm has been enabled by pressing the ALARM ON-OFF button (red LED on). The contacts remain closed for the duration programmed in the Relay Hold time. If the unit is set with a Relay Hold time of zero, no alarm will be produced. The location of the alarm output connector is seen in Figure 1 and the pin-out configuration for the 9 pin DSUB connector is seen in Figure 2.

An alarm connector cable is provided with the unit. Attached to it are four wires; two are the relay contacts, one is the ground and one is the Day/Night input. The wires are labeled accordingly.

Some equipment may require a dry contact closure (normally open). For such equipment, the two dry contact leads need only be run. There is no polarity; so 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 one of the dry contact leads to ground and the other dry contact lead to the input of the equipment. There is no voltage on the alarm connectors of the DS-1. No damage can be done by incorrect wiring.

The VMD has a female DSUB 9-pin connector with one alarm output. Figure 2 shows the pin-outs for the DS-1.

ALARM CONNECTOR

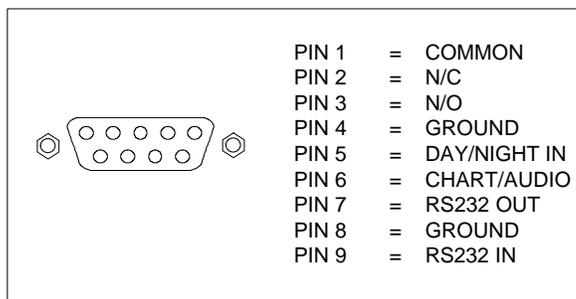


FIGURE 2.

DAY/NIGHT INPUTS

The Day/Night input switches settings from day settings to night when the unit receives a closure to ground on this input. If left open, day settings will be effective. An external timer, switch or photo cell can be used to switch from day to night.

RS-232

The DS-1 has an RS-232 interface for motion analysis and system configuration that can be used in conjunction with an IBM compatible PC.

CONNECTING THE POWER

The DS-1 operates from a DC supply range from 7 V to 15 V DC. 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. The unit may be operated off of the regular 110 or 220 V AC household supply using a transformer to supply the required 7-15 V DC.

OPERATION

Four buttons on the front panel give full control of the unit. All settings are guided by on-screen prompts. Simply press the MENU button and follow the on-screen instructions.

The three LEDs indicate the state of the unit. The green POWER LED indicates appropriate power. The red ALARM LED indicates the unit is armed when solid and alarmed when flashing. The yellow LED on the MENU button indicates the unit is in "set-up" mode.

FRONT PANEL

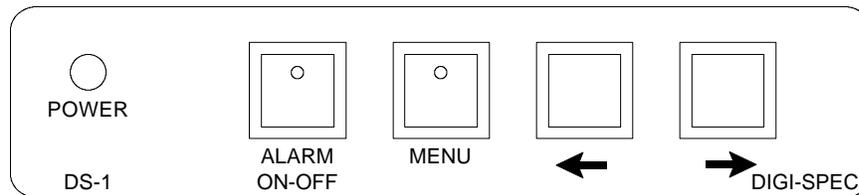


FIGURE 3.

BUTTON FUNCTIONS:

ALARM/ON-OFF Button: The ALARM button has five functions: **1)** It turns the Alarming feature on (Red LED solid) and off (Red LED off), **2)** It Clears the Alarm Memory (Red LED flashing), **3)** It turns zones on and off during set-up (Red LED will be off if zone is off and on if zone is on), **4)** It clears the trace memory and **5)** It Enables/Disables the blackout mode "Auto" feature.

MENU Button: The MENU button accesses and sequences through the units on-screen menu prompts. During set-up, the Yellow MENU LED will be lit.

LEFT ARROW Button: The LEFT ARROW button decreases the value of a prompt, clears the Trace Memory and moves the zone cursor left during the zone pattern set-up.

RIGHT ARROW Button: The RIGHT ARROW button increases the value of a prompt, clears the Trace Memory and moves the zone cursor right during the zone pattern set-up.

ARMING AND DISARMING:

To ARM and DISARM the VMD, press the ALARM button. The red LED will be lit if the unit is armed and off if the unit is disarmed. The unit must be armed to detect motion and produce alarms. When armed and subsequently alarmed, it will sound a buzzer sound and output an alarm in the form of a relay closure for the duration programmed in the Relay Hold time. To show the user that an alarm has occurred, the ALARM LED will flash and remain flashing. To clear this ALARM MEMORY feature, simply press the Alarm button. The unit will remain ARMED.

VIEWING ON-SCREEN PROMPTS:

To view the on-screen prompts, a monitor must be connected to the video output. If you are using a matrix switcher or sequential switcher with multiple DS-1 units, manually select the channel you wish to configure on the switcher first.

OPERATING REMOTELY VIA RS-232:

The DS-1 can be configured and operated remotely using the optional PC based Setup software. This software sends system configurations via RS-232 to the unit.

PROGRAMMING THE UNIT

OPENING SCREEN

OPENING SCREEN

DIGI SPEC CORP .
DS-SERIES VIDEO MOTION DETECTOR V1.14 NTSC ###
PH 800-222-9510

DESCRIPTION:The Opening Screen only appears on power-up of the DS-1 unit. This tells you whether the unit is configured in the NTSC or PAL video standard. Also, It indicates the channel address (0-127) for each camera. The address default from the factory is "0." This address can be changed using the PC Setup software

MOTION SETUPS

MOTION SETUPS - PROMPT SCREEN 1

MOTION SETUPS	-D
TRIGGER LVL: #####	
SENSITIVITY: ##	
TRACKING: #.# SEC	
PRE-ALARM ## SEC	
RELAY HOLD: ## SEC	

DESCRIPTION: The Motion Setups configure the attributes involved in calculating motion. Five attributes (Trigger Level, Sensitivity, Tracking, Pre-Alarm & Relay Hold) determine the characteristics of how, when, and whether motion triggers an alarm.

To access Prompt Screen 1- Motion Setups, press the MENU key. Each consecutive prompt is accessed by pushing the MENU key. The LEFT ARROW and RIGHT ARROW keys change the value of the prompt.

The range of acceptable values for the attributes above is:

TRIGGER LEVEL	:	1-262,144 PIXELS
SENSITIVITY	:	1-16 LEVELS
TRACKING	:	0.0-8.0 SECONDS
PRE-ALARM	:	1-99 SECONDS
RELAY HOLD	:	0-99 SECONDS

Once you reach the last value it will automatically roll over to the first value or roll under to the last value depending on whether you are increasing or decreasing.

TRIGGER LEVEL:

DESCRIPTION: The Trigger Level Setting causes an alarm to trigger on a predefined level of motion activity. The Trigger Level appears as a number of pixels next to the trigger level setting. This setting can be set from 1 to 256k. It is increased by the right arrow button. Increments go as follows:

TRIGGER LEVEL STEPPING

1-99	increments of 1
100-990	increments of 10
1,000-9,900	increments of 100
10,000-99,000	increments of 1,000
100,000-260,000	increments of 10,000

TABLE 1

The level is decreased by the left arrow button. The highest trigger level is 260,000 pixels. The exact number of pixels can be set when configuring the DS unit via RS-232.

CONFIGURATION HINTS: Most CCTV applications have no reason for a trigger level above a few thousand pixels. Set the Trigger Level just high enough so that the smallest size object to be detected triggers an alarm. If set too high, objects such as a human may not trigger an alarm. Yet, you want the trigger level high enough to mask out objects that you do not wish to trigger an alarm (i.e. rodents, birds, pets, etc.).

Use the counter to help set the Trigger Level. Set the counter to 'Peak' counter. Allow the VMD to analyze the scene during normal conditions (non-alarming) for a period of time. The counter will register the maximum normal movement (Peak 1). Record this number. In most cases this will be zero.

Next, allow the VMD to analyze the scene once the smallest alarm condition is introduced. The VMD will register the maximum alarm movement for this condition (Peak 2). Record this number. To detect the motion you are looking for, set the trigger level at a level between Peak 1 and Peak 2.

SENSITIVITY LEVEL:

DESCRIPTION: The Sensitivity Level is the relative deviation between a live pixel and a reference pixel. A value between is assigned to each pixel of the image, which specifies its intensity. The comparison between the live pixel and the reference pixel results in a calculated deviation. The Sensitivity Level has a range between 1 and 16. If the deviation exceeds the maximum set by the Sensitivity Level, then the criteria will be satisfied.

This serves two purposes:

- 1) It discriminates the target from the background (gray-scale variation).
- 2) It filters out induced noise in the camera image.

Each camera's sensitivity must be set individually and adjusted according to the its use. The right arrow button will increase the sensitivity, and the left arrow button will decrease the sensitivity.

SPARKLE EFFECT: The result of the comparison between a live pixel and a reference pixel is seen as the on-screen sparkle effect. The on-screen sparkle does not constitute an alarm but allows the user to view exactly where motion is taking place.

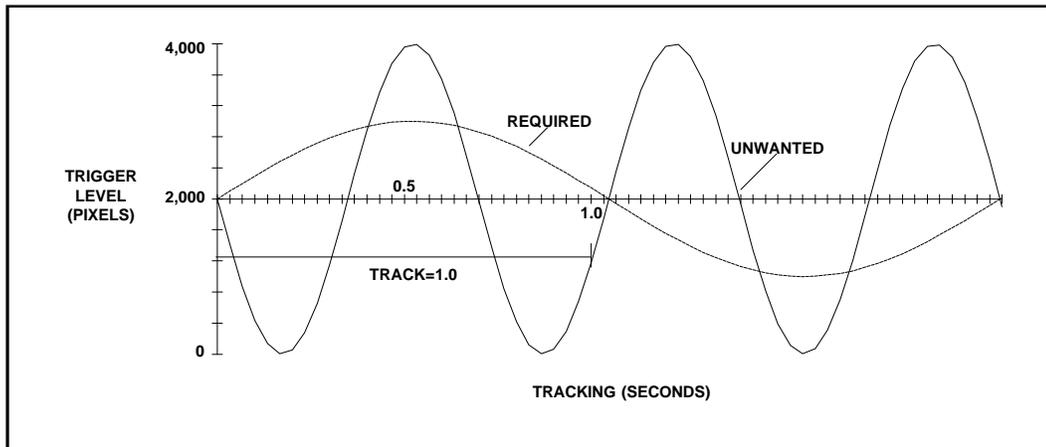
CONFIGURATION HINTS: In outdoor applications, variables such as shadows, precipitation, etc. call for lower sensitivity. These conditions can be screened out so only relevant motion is detected. Experimentation will provide helpful information in determining the correct level.

The sensitivity must be set appropriately for each camera location. If the sensitivity is too low, there may be insufficient contrast between the required object and the background to trigger an alarm. 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 no sparkles are observed on a static image.

TRACKING:

DESCRIPTION: Tracking is the length of time, in tenths of seconds, that motion must be continuously occur to activate an alarm. Tracking can be set at 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. Graph 1 shows required motion compared to unwanted motion.

REQUIRED MOTION COMPARED TO UNWANTED MOTION**GRAPH 1**

The required event is indicated by the dotted line, and the unwanted event by the solid line. Although both events exceed the trigger level, only the required event satisfies the motion sustain requirement. Both requirements must be met if an alarm is to be triggered.

CONFIGURATION HINTS: The Tracking criteria makes the DS-1 excellent for outdoors. By increasing the number of seconds, many natural occurrences can be masked out. For example, lightning will take more than .3 to .4 seconds. A camera shaking in the wind takes perhaps .5 to .6 seconds. Similarly, a tree branch shaking by a gust of wind might only 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 will provide helpful information specific to your application.

PRE-ALARM:

DESCRIPTION: The Pre-Alarm time is the minimum time (1-99 seconds) between consecutive alarms. It is necessary so as not to have alarms overlap. When an alarm has been qualified, the Pre-Alarm time must elapse before the next alarm can be output. Even if all the other Motion Criteria are satisfied during the pre-alarm condition, the Pre-Alarm must elapse and all criteria must remain satisfied for an alarm to trigger. If the Motion Criteria are satisfied any time after the Pre-Alarm has elapsed, an alarm will be output immediately.

CONFIGURATION HINTS: Be careful not to set the Pre-Alarm time too long since alarms cannot be output during the pre-alarm condition even if the Motion Criteria are satisfied. A Pre-Alarm time set too long may not allow the unit to respond to critical motion. It is recommended that a Pre-Alarm time of one second be used for most applications. Special applications may require longer times.

RELAY HOLD:

DESCRIPTION: An alarm can only be triggered from an internal motion alarm. The Relay 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 turned off, or set from 1 to 99 seconds. The following table shows the different possible settings.

SECONDS:	DESCRIPTION:
0	Off
1-99	Alarm for that number of seconds

TABLE 2

MOTION ALARMS: You can enable and disable motion alarms for a specific channel with the Relay Hold. To disable alarms for a channel, set the Relay Hold to zero. If the Relay hold is set for anything other than zero, the motion alarm for that channel will be enabled.

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

For particular applications, you might have certain features enabled or disabled for day use and others enabled or disabled for night use. This can be easily accomplished by using the Day/Night feature which allows you to specify two different sets of configurations.

EFFECTS:**EFFECTS - PROMPT SCREEN 2**

EFFECTS	-D
BUZZER:	XXX
TRACE:	XXX
BLACKOUT:	XXX
COUNTER:	XXXXX
VIDEO LOSS ALM:	XXX

PAGE DESCRIPTION:

The Effects Setups configure the attributes relative to audio, video, and counter features.

To access Prompt Screen 2- Effects, press the MENU key. Each consecutive prompt can be accessed by pushing the MENU key. Use the LEFT ARROW and RIGHT ARROW keys to change the value of the prompt.

The range of acceptable values for each of the attributes above is as follows:

BUZZER	:	OFF, SWEEP, BEEP, SW-BP
TRACE	:	OFF, ON, MEM, FLASH
BLACKOUT	:	OFF, ON, AUTO
COUNTER	:	OFF, PIXEL, PEAK, ALARM
VIDEO LOSS ALM	:	OFF, ON

Once you reach the last value it will automatically roll over to the first or roll under to the last depending on whether you are increasing or decreasing the value.

BUZZER MODE:

DESCRIPTION: The Buzzer Mode audibly notifies the user of an alarm condition. The buzzer modes are:

Sweep: It will produce an audio sweep proportional to the amount of motion detected. It will saturate at 1024 pixels, unless configured differently by the PC software. The steady saturation sound does not necessarily mean there is an alarm.

Beep: A quick beep means all motion criteria have been satisfied, and the channel is in alarm. A slow beep means there is video loss on the channel.

Sweep-Beep (SW-BP): This configuration combines the functions of the above two settings giving an audio sweep proportional to the amount of motion as well as the appropriate beep when motion has been qualified or there is video loss.

TRACE:

DESCRIPTION: The Trace mode tracks movement and overlays its trace on the image. The Trace mode is a version of the Delta or Sparkle Effect. It is termed this way because it looks like sparkles on the image where motion occurred or is occurring. The Trace Memory or Flash shows the variance between the current image and a reference image showing the path of past movement. Since the microprocessor captures two past frames of motion, it indicates the direction of motion as it traverses the image. The four trace mode are:

Off Delta Effect disabled

On Delta effect enabled. The variance between the current frame and a reference frame will be injected on the image. This variance is updated and cleared every frame so as to display current activity. A memory of previous activity will not be overlaid on the image.

Memory The Memory mode does not clear the Trace until it is cleared by the user. This allows the unit to track an object as it moves through the image, giving an overlay of an objects path.

Flash The flash mode is the same as the Memory mode except that it will flash the overlay every four frames. This will give four clean frames of video and then flash the overlay for four frames.

CLEARING THE MEMORY MODE: Since the memory configuration is an accumulative effect, it will stay in the image if not cleared. To clear the trace, press the ALARM key or one of the ARROW keys on the front panel of the DS-1.

CONFIGURATION HINTS: The Trace modes are useful for displaying where motion has taken place. If a guard is monitoring the system and is called away momentarily, these modes will indicate where motion occurred during the guards absence.

The Trace mode is especially useful in perimeter control applications or for monitoring large areas. Enabling the Trace Memory or Flash feature allows you to determine the trajectory of intrusion or where small motion has taken place.

TRACE "MEMORY"

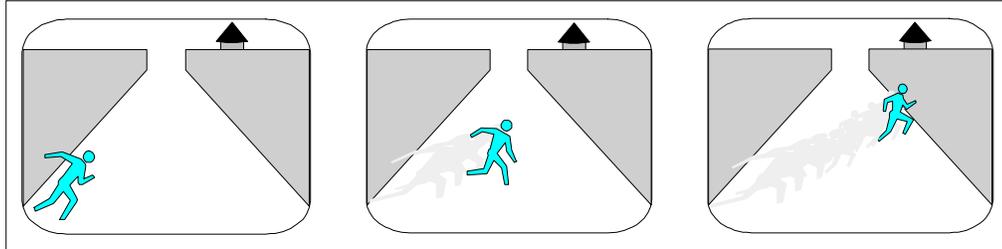


FIGURE 4

BLACKOUT "ON" & TRACE "ON"



FIGURE 5

BLACKOUT "AUTO"

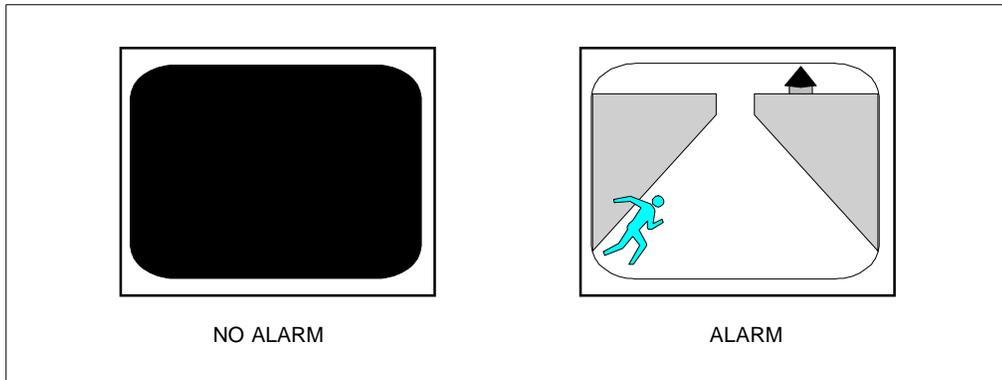


FIGURE 6

BLACKOUT MODE:

DESCRIPTION: The Blackout mode is a unique feature utilizing the lack of live video for special applications. The Blackout mode has three modes, one inactive (off) and two active (on and auto). The active modes are:

On Blackout mode "On" displays a black background with no live video displayed. Do not be confused by this. The VMD is still analyzing video for motion. This mode must be utilized with one of the active Trace modes for it to demonstrate its effect. The trace will be injected on to the black background. Doing so allows the user to view motion without seeing the background.

This is intended for use in high security areas where special clearance is necessary (i.e. military warehouses). An operator or guard, who does not have clearance, can see that inappropriate activity is occurring without being able to see what else is in the restricted area.

Auto Blackout mode "Auto" turns the video to black during non-alarming conditions but turns the video on during alarms. This allows the user to be visually notified when an alarm occurs. When a user is viewing many monitors, it may be difficult to determine where motion is occurring. With the Blackout mode, only channels in alarm or previously alarmed and not reset will display live video. The others will be black. Thus, monitors with live video draw immediate attention. The blackout mode does not inhibit motion detection.

SETTING THE "AUTO" BLACKOUT MODE: The Blackout mode is set for each channel independently. To use the "Auto" blackout feature, you must first turn the mode to "Auto" at the Blackout prompt. Next, you must enable the alarm with the ALARM key.

After an alarm turns on live video, the "Auto" blackout mode must be manually reset by pressing the ALARM key. This assures that the viewer looks at the alarmed camera before resetting.

If the Trace is used in conjunction with the Blackout mode, the Trace will track from the point the video comes on.

COUNTER MODE:

DESCRIPTION:The Counter Mode keeps track of the amount of motion or triggered pixels and displays it on-screen. The Counter modes are:

Off	If the counter is turned off, the Day/Night display and the Alarm Status display will also be turned off.
Peak	This mode displays the peak number of pixels triggered up to 262,144 pixels and will continue to update the peak if the previous level is surpassed.
Pixel	This mode will display the number of pixels being triggered at any instant up to 262,144.
Alarm	This mode will display the total number of alarms triggered on a given channel up to 1 million alarms.

To scroll through the different modes on the configuration screen, use the LEFT and RIGHT ARROW keys.

CONFIGURATION HINTS: The Pixel counter will register amount of current motion (before, during, and after an alarm). The Peak counter will indicate maximum movement. These two counter modes can help you set the trigger level. See Trigger Level.

The Alarm counter will keep track of the number of alarms on a given channel. It can also be used to count objects moving into and out of a scene such as people entering a room or objects on a conveyor belt.

VIDEO LOSS ALARM:

DESCRIPTION:The DS-1 is equipped with video loss detection. When video is lost on any channel (e.g. the camera fails or the cable is severed) the user is alerted by an audio alarm. A Buzzer for the alarmed channel will emit a slow low-pitched beep for the length of the video loss.

In addition to the audio alarm, the channel in alarm will output a relay closure/open on the corresponding alarm output.

CHARACTER GENERATOR:

CHARACTER GENERATOR - PROMPT SCREEN 3

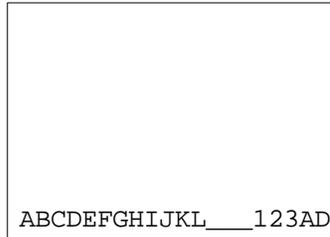
CHARACTER GEN.	-D
ABCDEFGHIJKL	
-	

PAGE DESCRIPTION:

The Character Generator allows the user to give the camera a defined label. The user can set a 12 character identification for each camera. This may consist of most of the standard ASCII characters, i.e.. A-Z, 0-9, !, ?, /, +, -, *, etc. If no identification is chosen, identification will default to DIGI-SPEC.

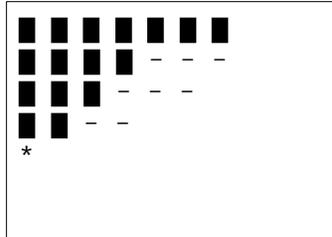
To access Prompt Screen 3- Character Generator, press the MENU key. Each consecutive position can be accessed by pushing the MENU key. Use the LEFT ARROW and RIGHT ARROW keys to change the character.

CONFIGURATION HINTS: It is best to give each camera an identification that is meaningful, such as its location (i.e.. FRONT DOOR, WAREHOUSE, FILE ROOM, etc.).

ON-SCREEN DISPLAY-NORMAL SCREEN

DESCRIPTION: The total on-screen display consists of a 12 character camera identification, a maximum of a 6 digit counter display, an alarm indicator showing the current alarm status and a Day/ Night indicator.

ABCDEFGHIJKL	:	12 Character Generator (Camera I.D.)
___123	:	6 Digit Counter
A, T, -, P	:	Alarm Satisfied, Trigger Level Satisfied, Alarm Memory, Pre-Alarm Condition
D,N	:	Day, Night

ZONE PATTERN:**ZONE PATTERN - PROMPT SCREEN 4****PAGE DESCRIPTION:**

The DS-1 has the ability to sensitize certain areas within an image while blocking out other areas by using a grid of small zones that can be activated or deactivated for motion detection. The zone pattern grid is 20 across by 14 down for NTSC (280 zones) and 20 across by 18 down for PAL (360 zones).

To access Prompt Screen 4- Zone pattern, press the MENU key. Each consecutive prompt can be accessed by pushing the MENU key. Use the LEFT and RIGHT ARROW keys to scroll the cursor in that direction. Use the ALARM key to turn a zone on or off. Press the MENU key to exit.

ZONE MODES: The following Zone Modes indicate the status of the zone.

- : ZONE ON
- : ZONE OFF
- * : CURSOR OVER ZONE

CONFIGURATION HINTS When using multiple DS-1 units, a unique Zone Pattern should be set for each camera. The versatility of having a zone pattern grid gives the user the flexibility to customize each zone pattern to meet individual camera needs. You may block out machines that produce motion such as fans, FAX machines, lighted telephones, and answering machines. You may also block out windows that view outside activity or florescent lighting to avoid false triggering. Any trouble spot can be blocked out of the camera image and unsensitized for motion.

By customizing the zone pattern for each camera, several cameras can be looking at the same image but each one concentrating on a particular portion of the image. Unlike other motion detectors, only one zone block needs to be on to trigger an alarm. Each zone consists of many detection points.

OPTIONS:

VIDEO FORMAT:

DESCRIPTION:The Video Format will be configured at the factory and cannot be altered by the user. It is set for either NTSC or PAL standards.

OPENING SCREEN:

DESCRIPTION:The opening screen is configured at the factory. It can be configured to have a custom setting for OEM's and special circumstances. This cannot be changed by the user.

VMD TYPE:

DESCRIPTION:The VMD Type is the way that the VMD will analyse motion activity and classify it as an alarm. It will usually be configured by the factory as a motion detector. There are two VMD types.

Motionless Detector (MLD)	An alarm will be triggered if motion goes below the level set by the Trigger Level or ceases. It will appear as MLD on the screen prompt.
Motion Detector (MD)	An alarm will be triggered if motion exceeds the level set by the Trigger Level. It will appear as MD on the screen prompt. This is the default configuration.

CONFIGURATION HINTS: Most CCTV applications will only require the motion detector mode. Applications in the medical and manufacturing industries might need the motionless detector mode which will cause an alarm when motion goes below a set threshold level. This might be used in the medical field where a patient is being monitored and an alarm is needed when the patient ceases to move. Similarly, a manufacturing plant might use a camera to watch a conveyor belt or manufacturing line and alarm at the cessation of motion.

EXPANDING THE SYSTEM:

The DS-1 Video Motion Detector is a flexible and expandable unit. Up to 128 can be networked together.

MULTIPLE UNIT EXPANSION

NETWORKING: As many as 128 DS-1 units can be networked together in a ring. The network must be operated with a PC, which must initiate and terminate the ring. The DS-Series uses standard RS-232C communications. Information sent from the PC host (i.e., setup configurations) travels around the network and is passed through each unit. The unit for which a command is intended will read the command and others will ignore it. If the command is global, all units will read it. The data terminates when it reaches the host again. Each channel must be assigned a unique channel address. For the user to access a channel, the specific channel must be addressed. Figure 7 is an example of a network ring.

RS-232C PORT: Each DS-1 comes equipped with an RS-232C serial port using a female 9 pin DSUB connector. To use this for a network, you must use a network adapter. It has an input and an output so that information may be passed through each unit. The position of the RS-232C port can be seen on the Back Panel Diagrams.

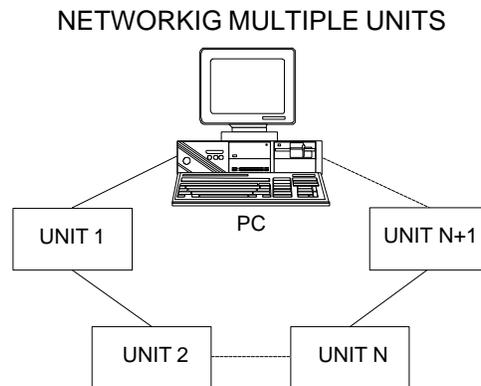


FIGURE 7

NETWORK FAILURE: The network is simple in nature. If there is a problem, check to see if one of these conditions are present.

- 1) The PC host fails
- 2) One of the serial links is severed or disconnected
- 3) One of the serial links is shorted

CONTROLLING THE NETWORK FROM THE HOST: The same commands apply for a network configuration as with single unit configurations. The only difference is that the unit number must be specified. The Setup Software allows the user to choose the unit number from the software configuration screen.

TYPICAL NETWORK RING ADAPTER

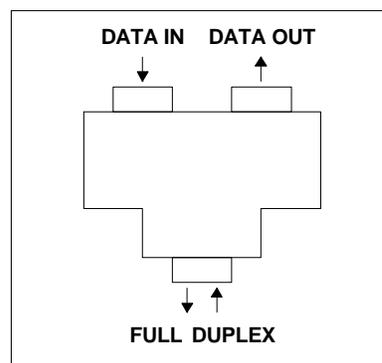


FIGURE 8

ALARM CABLE

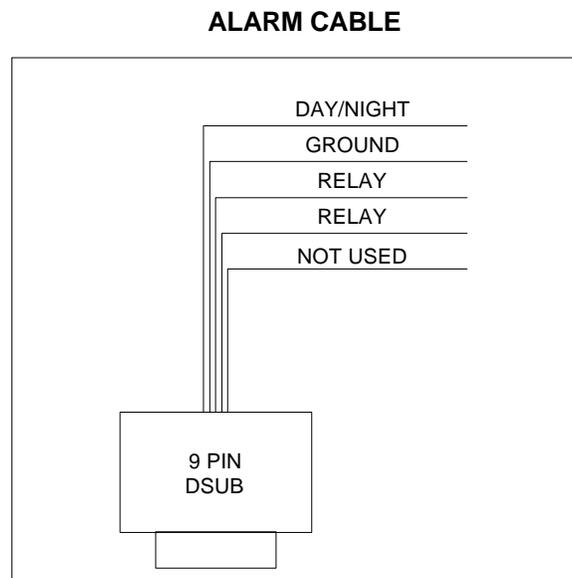


FIGURE 9

DESCRIPTION: The DS-1 comes with an alarm connector with leads for the alarm outputs as well as the Day/Night input. Alarm outputs are connected between the two RELAY leads. The Day/Night input is connected between the Day/Night lead and the Ground lead.

TYPICAL CONFIGURATIONS:

DS-1 BASIC CONFIGURATION

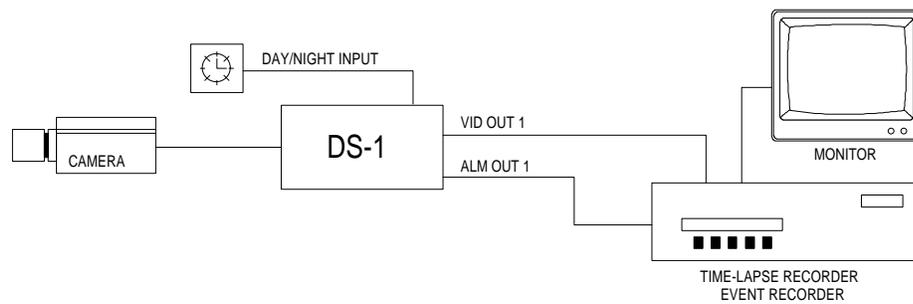
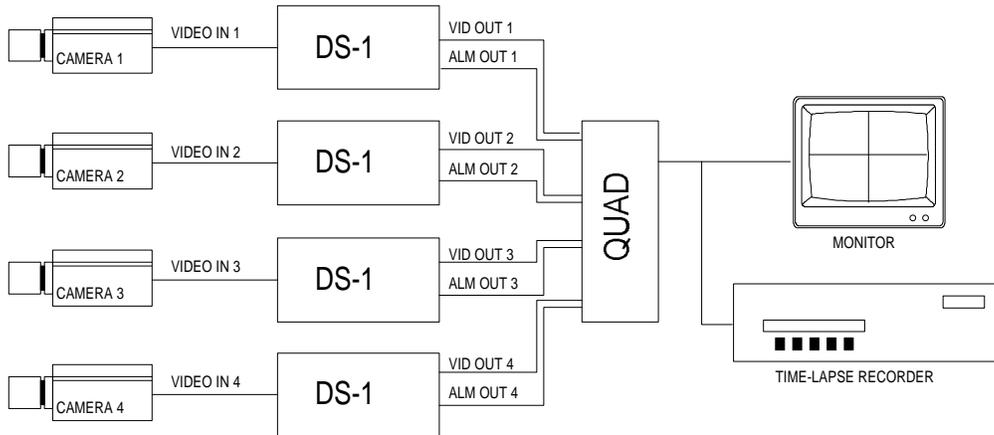
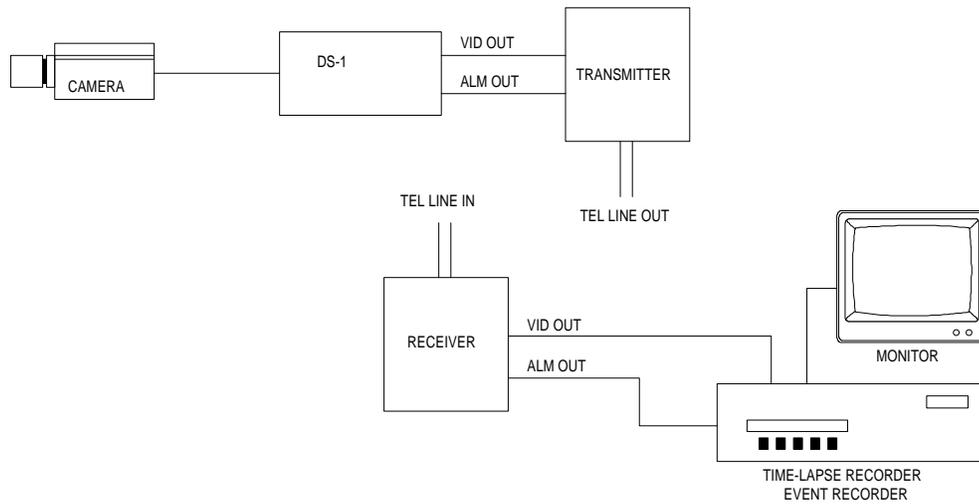


FIGURE 10

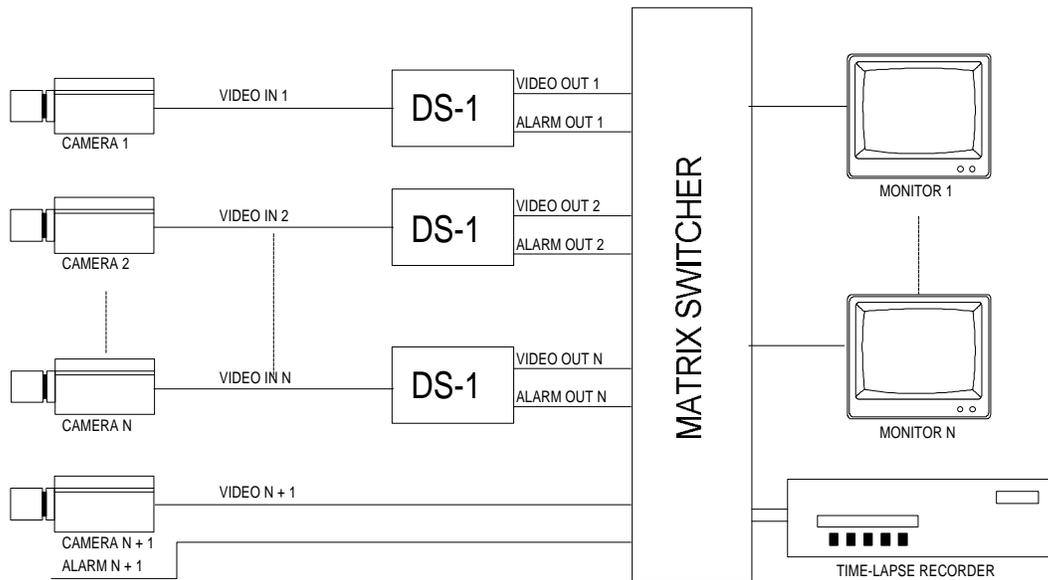
DESCRIPTION: The DS-1 is most commonly used for single channel systems requiring precision video motion detection. An alarm output can be used to trip an event or time lapse recorder into real-time recording. An external timer can be used to toggle the DS-1 between Day and Night modes. Since the unit is 12V DC, it is perfect for covert surveillance applications.

DS-1/QUAD COMBINATION**FIGURE 11**

DESCRIPTION: Four DS-1 units can be connected to a quad; eight can be connected to a duo-quad. A DS-1 alarm output will provide the triggering for the quad or duo-quad to pull up the alarmed quadrant full screen. The quad can then be connected to a time-lapse or event recorder.

DS-1 WITH LONG-RANGE VIDEO TRANSMISSION (FAST SCAN)**FIGURE 12**

DESCRIPTION: The DS-1 can be used as the triggering mechanism for a long range video transmission device such as slow scan. The DS-1 would output an alarm to initiate the transmitter to send an image. A monitor or recorder would be connected to the receiving end.

DS-1 WITH MATRIX SWITCHER**FIGURE 13**

DESCRIPTION: The DS-1 can be used as the triggering mechanism for an external matrix switcher or sequential switcher. The video outputs will feed into the video inputs of the matrix switcher. The alarm outputs of the VMD would feed into the respective alarm inputs of the matrix switcher for matrix control. The monitors and recording devices would be connected to the monitor outputs of the matrix switcher.

DS-1 WITH MULTIPLEXER

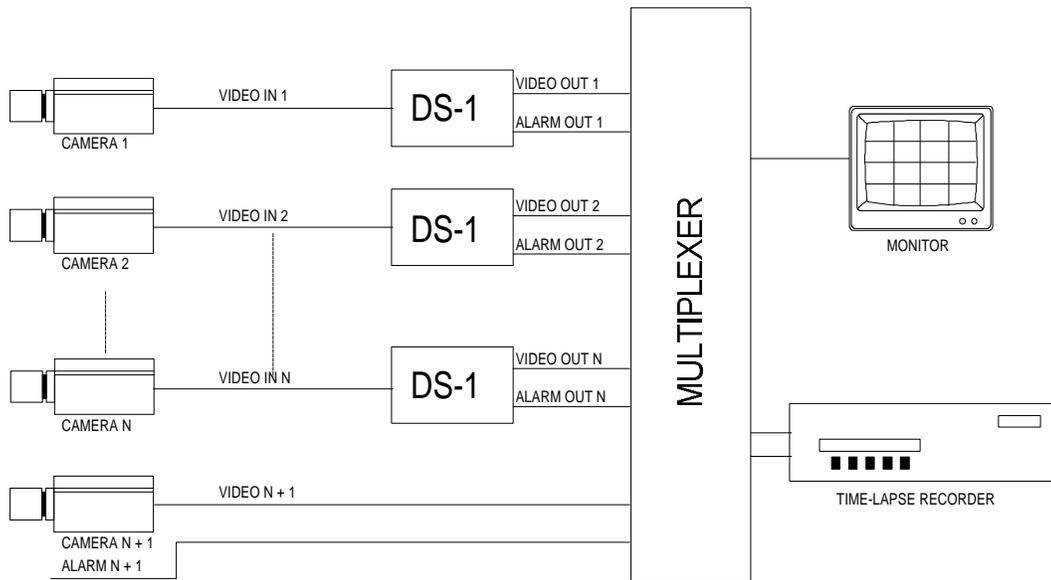


FIGURE 14

DESCRIPTION: The DS-1 can be used as the front end of a video multiplexer. Some Multiplexer devices have activity detection as a built in function but it is not the same as digital video motion detection. For reliability and flexibility, you can use video motion detection as the triggering mechanism for the multiplexer, especially in outdoor applications. The video outputs and alarm outputs of the DS-1 feed into the video inputs and alarm inputs of the multiplexer. The DS-1 provides accurate reliable motion detection and provides alarms to control the multiplexer. The monitors and recording devices connect to the monitor outputs of a multiplexer.

TROUBLE-SHOOTING GUIDE:

PROBLEM	SYMPTOMS	REMEDY
False Triggering	Small objects falsely triggering alarms	Increase Trigger Level
	Shadows and noise falsely triggering alarms	Decrease Sensitivity Level
	Sudden image changes such as lightning, insects near the camera lens, flashing lights, snow or rain falsely triggering alarms	Increase Tracking
	Motion triggering in unwanted areas of camera image	Turn zones off in those areas of the camera image
	Florescent lighting causing false triggering	Use linelock camera
	Vibration causing false triggering	Mount camera properly or increase tracking
	Objects too large or small	Use proper lens
Serial Communications	No Serial Communications	Serial link bad disconnected or severed
	Not interfacing with Analyzer Software properly	Set RS-232 Mode to ranged (A Must) and Serial Interval to one per frame

PROBLEM	SYMPTOMS	REMEDY
No Output Alarms	Required object not triggering alarms	Decrease Trigger Level
	Insufficient contrast between the required object and its background may not trigger alarms	Increase Sensitivity Level
	Required object moving into and out of image too quickly may not trigger alarms.	Decrease Tracking
	No alarms being triggered or output at all	Set Relay Hold above zero or Enable ALARM key
	Motion not triggering in required zones of camera image	Turn zones on in those areas of camera image
	Alarms being output opposite of when they should	Change output type from N/O to N/C or vice versa
No Video Output	Video not looping through the unit	Camera off, bad, or disconnected or Cable bad, severed, or disconnected

DS-1 SPECIFICATIONS:

DS-1

UNIT SIZE	4.5"(w) x 1.5"(h) x 6.7"(d)
UNIT WEIGHT	1 lb. (0.45 kg)
CHASSIS	Aluminum with black baked enamel finish
VIDEO FORMAT	NTSC/RS-170A or PAL/CCIR 0.5-2Vpp, 75 ohm termination
DIGITIZATION	256 gray scale
VIDEO INPUTS	1 BNC
VIDEO LOOPING OUTPUTS	1 BNC
ALARM INPUTS	1 Day/Night (N/O)
ALARM OUTPUTS	1 Form-C
ALARM OUTPUT TIME	0-99 seconds
CONTACT RATING	30V DC @ 3A
DETECTION METHOD	Proprietary pipeline processing of full digitized image
DETECTION POINTS	262,144 per channel
ZONE PATTERN MATRIX	20 horiz. x 14 vert. (NTSC) 20 horiz. x 18 vert. (PAL)
SYS. CONTROL & SETUP	Programmable via front panel w/on-screen prompts or RS-232 with a PC
MICROPROCESSOR	8-bit embedded
MICRO. FREQ.	11.059 MHz
PIXEL CLOCK FREQ.	4fsc
PIPELINE DEPTH	5 stage
PIPELINE PERFORMANCE	52 MIPS
BACKUP MEMORY	EEPROM (nonvolatile)
POWER REQUIREMENTS	12V DC max 1.2W
FACTORY WARRANTY	2 year parts & labor

WARRANTY INFORMATION

Digi-Spec Corporation offers a limited two year parts and labor warranty on all DS-Series equipment. Digi-Spec will repair or replace, at our option, any unit covered by this warranty at no cost to you (excluding shipping charges). This warranty pertains to defects in workmanship or parts in the DS-Series unit, as determined by Digi-Spec Corporation. This warranty applies to the original end-user purchaser and is applicable from the date of purchase. Service performed after this period will be billed at our standard shop rates.

This warranty does not cover defects that result from abuse, misuse, or negligence, including, but not limited to: (1) improper operation; (2) failure to follow instructions or heed cautions included with this unit; (3) exposure to hazardous environments or submersion; (4) service or modification by an unauthorized party; (5) connection of excessive voltages to the inputs.

The customer is responsible for providing cameras which are compatible with the VMD. Digi-Spec cannot be responsible for problems caused by cameras which, in our opinion, do not produce a steady enough output or have non-standard sync.

Contact your local sales agent for warranty service. If it is unavailable through your sales agent, the purchaser should contact the factory for instructions on receiving factory service. Digi-Spec does not provide and will not authorize on-site field service. All factory warranty work will require the customer to provide a detailed description of the problem, the original sales agent's name, and a copy of the original sales receipt or invoice.

We will return your DS-Series product at no charge by UPS surface freight. Faster shipment is available, at the purchaser's request, at additional cost. We recommend that you insure the unit(s) for their full value when returning merchandise for repair.

Digi-Spec will honor repair or replacement only. This warranty has been drafted to comply with the federal law applicable to electronic products manufactured after July 4, 1975. This warranty gives you specific legal rights which may vary from state to state.

DISCLAIMER OF WARRANTY

Digi-Spec offers no other express warranty written or implied, including warranties of merchantability or fitness for a particular purpose. In no case shall Digi-Spec Corporation, or any of our agents, be held liable for incidental or consequential damages resulting from the use, failure of, or the compromising of any DS-Series products.